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DNF SAFETY BOARD

APR 28 2000

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

Consistent with the Department's implementation plan (IP) for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 98-2, the following provides an update on deliverables.

1. Deliverables 5.1.3 and 5.2.1, #2 – Issue TBP-901. Technical Business Practice (TBP)-901, *Integrated Safety Process for Nuclear Weapons Operations and Facilities*, Issue A, was formally issued through the Sandia National Laboratory system by IER20001033 on February 7, 2000 (enclosure #1). The Department has completed the actions associated with commitments 5.1.3 and 5.2.1.

2. Deliverable 5.1.4 – Project plans and schedules. The integrated weapons activity plan (IWAP), Issue F was approved by the Department on February 7, 2000. The IWAP includes resource-loaded schedules and project plans for each of the weapon systems. The Department requested Mason and Hanger Corporation (MHC) to provide a Pantex Safety Analysis Report Development and Implementation Plan by July 3, 2000 (enclosure #2). Until such time the plan is developed and integrated into the IWAP, the Department does not consider commitment 5.1.4 complete.

3. Deliverable 5.2.2 – Modify associated plant documents to meet the new TBP-901 standards. MHC provided an impact analysis of the new TBP and concluded no cost or programmatic impact (enclosure #3). MHC will submit an administrative change to the Management Integration and Control (MIC) Standards and Requirements Identification Document (S/RID) to reflect TBP-901 supercedes Interagency Engineering Procedure (EP) 401110, *Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons*. This change will be processed in conjunction with other changes to the MIC S/RID that are required to close issues from the Pantex Plant Phase I integrated safety management system verification (ISMSV) review. Since TBP-901 is fully implemented by MHC, the Department has completed the actions associated with commitment 5.2.2.

4. Deliverable 5.2.3, #2 – Implement process improvements. Any remaining corrective actions stemming from the assessment of Pantex practices for tooling design, tooling procurement and procedure development are scheduled for completion by July 2000. The Department will provide an update on the remaining actions in the next status report.

5. Deliverable 5.3.1, #3 – Complete actions from the Authorization Basis (AB) task force. MHC completed development of the *Pantex Plant Integrated Safety Management Authorization Basis Manual* (MNL-254543), Revision 1, on February 21, 2000 (enclosure #4). The Department has additional comments requiring resolution, but considers the manual sufficient for initial use. The Department will provide an update on the remaining actions stemming from the AB task force in the next status report.

6. Deliverable 5.3.2, #3 – Combine requirements in one manual. The Department issued Albuquerque Operations Office (AL) Supplemental Directive 56XB, *Development and Production (D&P) Manual*, Chapter 11.7, *Nuclear Explosive Operations Change Control Process* in June 1999. Chapter 11.7 provides requirements and guidance on how the unreviewed safety question (USQ) and nuclear explosive safety change control processes are integrated. The Department provided a copy to the DNFSB by letter on June 30, 1999. Since D&P Manual Chapter 11.7 combined the requirements into a single document, the Department has completed the actions associated with commitment 5.3.2

7. Commitment 5.3.3 – Assess effectiveness of review process for proposed authorization basis documents. The Office of Oversight, Environment, Safety and Health (EH-2) is conducting an authorization basis evaluation specific to the Pantex Plant. The review is a follow-up evaluation by the Office of Environment, Safety and Health stemming from "opportunities for improvement" identified during an earlier review (*Independent Oversight Evaluation of Headquarters and Albuquerque Operations Office Management of Environment, Safety, And Health Programs at the Pantex Plant*, October 1996). In light of the extent and scope of the EH-2 evaluation, and the earlier assessment performed by the Office of Defense Programs in April 1999, the Department does not consider further evaluations of the authorization basis review process warranted. The Department will address this issue through the impending revision to the IP for Recommendation 98-2.

8. Deliverables: 5.4.2, #3; 5.4.3, #2; 5.5.1, #4; and, 5.5.2, #2 – Revise and issue DOE Order 452.2 and DOE-STD-3015. Department personnel are currently working with DNFSB staff to resolve remaining comments on both the order and the associated standard. The Department will address the schedule for completion of these deliverables through the impending revision to the IP for Recommendation 98-2.

9. Deliverable 5.6.1, #2 – ISMSV Phase I Review Report. The Department completed an ISMSV Phase I review of the Pantex Plant on April 13, 2000 (enclosure #5). The Department anticipates approval of the MHC ISM system description in early May, pending satisfactory closure of the issues identified as a prerequisite. This will complete all of the actions under commitment 5.6.1.

10. Commitment 5.6.2 – Develop a plan for and conduct an ISMSV Phase II Review. An ISMSV Phase II Review for Pantex Plant will be conducted prior to September 2000 per the Secretary's commitment. The review will be conducted after completion of the required Phase I Corrective Actions Plans and declaration of readiness by the contractor.

11. Deliverable 5.6.3, #1 – Critical Safety Systems Manual (CSSM) conversion to Technical Safety Requirements (TSR). On June 3, 1999, the Department transmitted a copy of the approved TSR to the DNFSB. The TSR were subsequently revised and the most recent version is included as enclosure #6. On March 13, 2000, MHC submitted a declaration of readiness to operate in accordance with the Master Authorization Agreement for the Pantex Plant. The declaration of readiness and change to the Master AA reflected implementation of the TSR (enclosure #7). The Department has completed the actions associated with deliverable 5.6.3, #1.

12. Deliverable 5.6.3, #2 – Approved Basis for Interim Operation (BIO) and TSR upgrade for lightning hazards. The Department approved the Lightning BIO on April 17, 2000 (enclosure #8). The TSR stemming from the Lightning BIO will be fully implemented by May 11, 2000. The Department has completed the actions associated with deliverable 5.6.3, #2.

13. Deliverable 5.6.3, #3 – Approved BIO and TSR upgrade for transportation hazards. The Department has increased the scope of the transportation module of BIO to include partial weapon configurations. As an interim compensatory measure, the Department incorporated administrative controls on nuclear material storage, handling, shipping, and ramp traffic in the TSR (sections 5.6.8 and 5.6.22). The revised date for completion of the transportation BIO and associated TSR is August 2000. The Department will address the schedule for completion of this deliverable through the impending revision to the IP for Recommendation 98-2.

14. Deliverable 5.6.4, #1 – Re-authorization of the existing W88 process in accordance with the tasks and schedule identified in the IWAP. MHC has resubmitted the W88 HAR and activity based control document (ABCD) for Department approval. The Department will address the schedule for completion of this deliverable through the impending revision to the IP for Recommendation 98-2.

15. Commitments 5.8.1 and 5.8.2 – Complete strength, weaknesses, opportunity, and threat analysis for project management skills. Prepare a long-term project management personnel plan. Strengthen skills and experience level of Pantex team leads. The majority of deliverables and actions under these commitments are complete. The Department will provide an update on the remaining actions in the next status report.

16. Commitment 5.8.4 – Staff authorization basis review positions at AAO and AL. Complete qualification of individuals with the authority to approve authorization basis documents. Qualification standards are established for all AL personnel involved in the review and approval of AB documents. The Department has increased the staff of the AAO to review AB documents. The personnel have achieved varying levels of qualification, dependent upon the amount of time in such positions. AL tracks qualification in accordance with the requirements of DOE Order 360.1. In light of these actions, the Department considers commitment 5.8.4 complete.

If you have any questions, please contact me at (505) 845-6050 or Karen Boardman at (505) 845-6045.

RE Glass

R. E. Glass
Manager

Enclosures

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SEPARATION

PAGE

NWC
TECHNICAL BUSINESS PRACTICE

INTEGRATED SAFETY PROCESS FOR NUCLEAR WEAPONS OPERATIONS AND FACILITIES

CHANGE HISTORY

ISSUE	RELEASE/CHANGE NO.
A	IER20001033

This TBP reflects content formerly described in EP401110. This TBP will be readdressed within six months after implementation.

TABLE OF CONTENTS

ACRONYM AND INITIALISM LIST

ABCD Activity Based Control Document
ALARA.............. As Low As Reasonably Achievable
CHA.................. Conceptual Hazard Analysis
D&I.................... Disassembly and Inspection
D&P Manual...... Development and Production Manual
DA..................... Design Agency
DOE.................. Department of Energy
HAR.................. Hazard Analysis Report
HATT................ Hazard Assessment Task Team
HE..................... High Explosive
INRAD.............. Intrinsic Radiation Report
ISP.................... Integrated Safety Process
NEOP................ Nuclear Explosive Operating Procedure
PAP.................. Personnel Assurance Program
PT..................... Project Team
PTL.................. Project Team Leader
PVT.................. Positive Verification Tryout
PX..................... Pantex
SIP.................... Stockpile Improvement Program
SMT.................. Standing Management Team
TBP.................. Technical Business Practice
TT..................... Task Team
USQ.................. Unresolved Safety Question
WR.................... War Reserve
WSS................. Weapon Safety Specification

PREFACE

This Interagency Technical Business Practice (TBP) reflects the requirements of the Integrated Safety Process (ISP) as defined by DOE in Chapter 11.3 of the Development and Production Manual. The objective of ISP is to systematically integrate safety into management and work practices at all levels. ISP is designed to integrate the identification, analysis and control of hazards and to provide feedback for continuous improvement in work definition, planning and safe performance of work.

ISP applies the following development principles to the key elements of the operating environment, namely, a) weapons status; b) operating procedures; c) layout, tooling and equipment; d) operating facilities; and, e) personnel.

Develop, utilize and maintain an integrated safety basis that includes:

Safety through Design

- Efficient, Comprehensive and Adaptable Process

- Clear Roles and Responsibilities
- Competence Commensurate with Responsibilities
- Balanced Priorities
- Identification of Standards and Requirements
- Hazards Controls Tailored to Work Being Performed
- Line Management Responsibility for Safety

1. POLICY

The Department of Energy (DOE) requires a formal process to ensure that only efficient, effective, and safe nuclear weapon assembly, disassembly, associated testing operations, and facility upgrades/modifications are employed. DOE requires these activities to be based on comprehensive safety basis documentation and analysis. An acceptable process will:

1. Address established, verifiable "Safety Criteria". Safety Criteria topics include, but are not limited to, nuclear explosive safety, occupational safety (i.e., radiation protection, hazardous material protection, and industrial hazards protection) and environmental protection.
2. Ensure a complete integration of weapon, personnel, operating procedure, operating facility, equipment and layout, tooling and safety basis to form a safe, efficient, and effective operating environment.
3. Ensure that the safety basis and documentation are comprehensive resulting in complete integration between facility and operations analysis.
4. Be jointly developed and concurred in by the responsible Design Agencies and Pantex.
5. Be subjected to formal hazard assessments concurrent with process development and result in a final Hazard Analysis Report.

1.1 Purpose

This TBP describes the DOE Complex's preferred process for conducting weapons assembly, disassembly, and associated testing operations, as well as facility upgrades/modifications in which these operations take place. The TBP should be used as GUIDANCE to plan programs that develop weapons processes and for facility upgrades and modifications. It is expected that the Project Team will exercise JUDGMENT in determining how to apply the TBP to best complete the project, while satisfying the intent of the TBP - to develop robust processes for which the safety implications, for both the process and facility, have been considered from the beginning. The objective of each project must be to develop verifiable safety criteria and assembly/disassembly processes that enable operations to be completed safely and predictably.

1.2 Scope

This TBP applies to nuclear weapon assembly, disassembly, associated testing operations and repair performed at the Pantex Plant. These operations include, but are not limited to, those performed during new production, stockpile improvement programs (SIP), disassembly and inspection (D&I) and selected testing for surveillance, builds, rebuilds, and dismantlement activities. This TBP also applies to facility upgrades and modifications.

1.3 Summary of TBP Content by Section

Section 2 is an overview of the ISP. Section 3 describes the documentation generated during each of the five phases. Section 4 describes the individual, networked steps in each of the six phases. Section 5 defines the general safety criteria. Section 6 references where guidance for hazard assessment can be obtained. Section 7 lists references. Appendix A is a safety checklist that provides information to aid in the project development. Appendix B is an example of a form used to document a deliverable's compliance with the established safety criteria.

2. INTEGRATED SAFETY PROCESS

2.1 Process Phases and Milestones

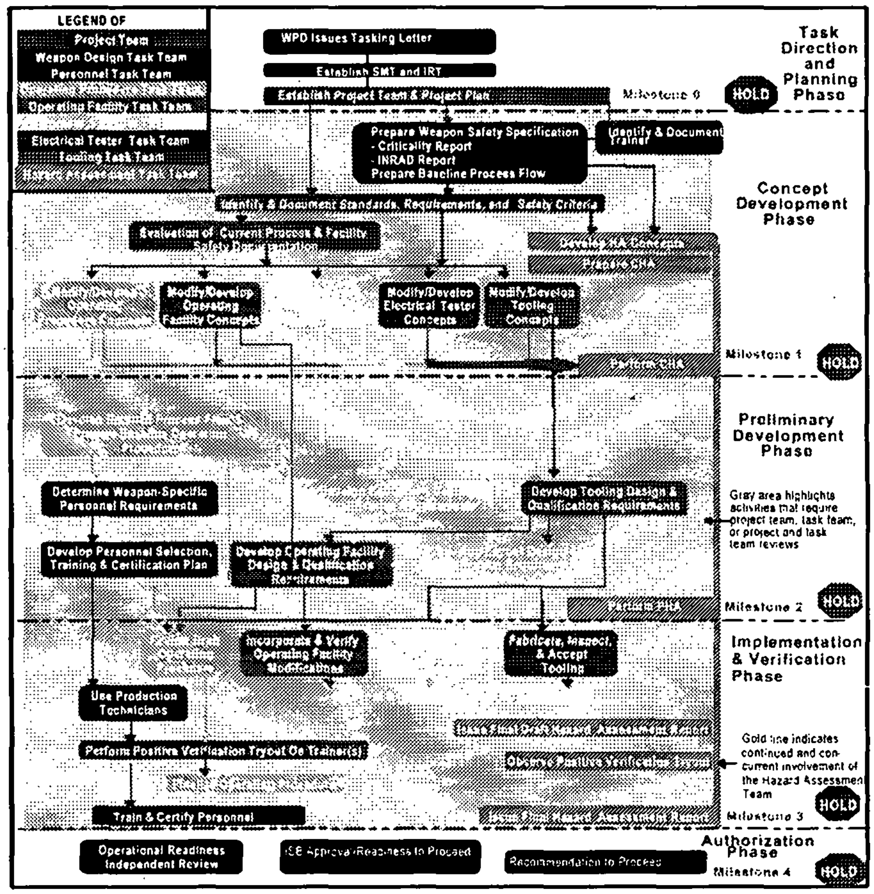
The ISP consists of five contiguous phases, five milestones, and multiple, interdependent, networked steps. It identifies safety criteria that are keyed to the expected process deliverables. It employs Hazard Analyses concurrently with process development.

The ISP requires the establishment of a Project Team (PT) to create an approved plan for, and implement the activities required to meet the objectives for, the program as set forth in the DOE/AL Tasking Letter.

The ISP requires the PT and appropriate Task Teams (TTs), created by the PT Leader, to evaluate the process deliverables so as to positively verify that all of the relevant requirements for the authorization agreement are adequately addressed and documented. It also requires the PT to systematically document all design decisions related to safety and the results of all evaluations, including Hazard Analyses.

As a close-out activity to the Task Direction and Planning, Concept Development, Preliminary Development, Implementation & Verification Phase, and Authorization Phase, the PT shall conduct the Milestone Reviews. If the development and evaluation processes are executed correctly, the desired outcome of the reviews is to confirm the process rather than discover problems. Teamwork between the DOE, Design Agencies, and Pantex is essential to the implementation of the ISP. The developed process, for each weapon-specific application, will ultimately support the readiness of the entire operation.

The conduct of operations and/or facility upgrade or modification projects, using the ISP approach, follows the management structure described in Chapter 11.3 of the Development and Production Manual. Figure 1 is a graphical depiction of the ISP process.



The use of task teams is optional. The PT can do any or all of the work.

FIGURE 1 - INTEGRATED SAFETY PROCESS

2.2 Process Steps

The ISP consists of multiple, interdependent steps. The process phases are described in the D&P Manual, Chapter 11.3, Section 6.0. The interdependencies are illustrated in Figure 1 by the horizontal and vertical lines that network the process steps. The figure emphasizes the need for properly sequenced interaction between activities to assure timely delivery of fully coordinated and optimized deliverables. Although not depicted in the process flow of Figure 1, the ISP requires the use of positive verification steps to ensure that the established safety criteria are addressed. Each process step is directly affected by predecessor and successor steps and indirectly affected by steps running in parallel. The PT and TTs must be aware, to the fullest extent possible, of all predecessor, successor, and parallel steps.

The following example illustrates the interactive and interdependent nature of the process steps. Personnel are trained to use the tooling and equipment, execute the instructions in the operating procedure, understand the capabilities of the facility, including the facility safety basis, and understand the weapon's safety attributes and hazards. At the same time, the tooling and equipment are to be compatible with the capabilities of the facility and personnel, the interfaces of the weapon, and the process flow in the operating procedure.

2.3 Project and Task Teams

The PT consists of representatives from DOE-AL, the cognizant design agencies and Pantex. The PT Leader is accountable to the Pantex contractor management for the success of the program. The Pantex contractor management has the authority and ability to determine the management approach most likely to achieve success. The DOE PT member's role is to convey DOE requirements and monitor progress of the PT, but not to direct the work of the PT. The design agencies PT members provide service to the PT Leader.

The PT Leader may establish and employ TTs (a group of subject matter experts) from appropriate agencies to concurrently engineer ISP deliverables, concurrently qualify the deliverables, and concurrently perform hazards analyses on the deliverables. TT demographics may be comprised of a varying mix of participants who are full-time or part-time members or advisors who are technical resources working with the members on an as needed basis, or observers, who are those having approval or judicial responsibilities that require total objectivity and maintain independence from any stake in the design options. TT participants represent multiple disciplines and are selected by the PT members to address the safety-critical issues. Whenever practical the TTs share participants across other TTs to enable continuity throughout the whole project. The TTs, including the HATT, do not work independently of the PT. With respect to required roles (i.e., member, advisor, or observer) and discipline/expertise, the make up of each TT shall be documented in the project plan. Task Teams report to the PT Leader. Figure 1 illustrates possible TT functions and responsibilities for each phase of the process.

2.4 Process Deliverables

The principal process deliverables are the Weapon Safety Specification, Project Plan, Personnel Plan, Trainer Definition/Requirements, Operating Procedure, Operating Facility Readiness, Equipment & Facility Layout, Tooling, Hazard Assessment, and control basis traceability documentation. References to formal documentation associated with each of these deliverables is contained in information modules. See

Figure 2, Operating Procedure Structure, for a description of the modules. The PT has the responsibility to establish the traceability of controls to their associated basis.

2.5 Activity Based Control Documents

The PT is responsible for preparing the ABCD. ABCD describes the integrated set of controls resulting from combining the facility controls with those controls required for a particular nuclear explosive activity or operation. The ABCD allows the set of controls applicable to an operation to be defined. It is used to combine the appropriate "common" controls (i.e., those that are common to the set of operations that might be performed in a given facility) with the appropriate "unique" controls (i.e., those that are specific to a given operation or set of operation). The two are integrated to describe the set of controls necessary to maintain safety in the operation. The documentation of the controls will be done in the ABCD to facilitate change control and configuration management. The ABCD is not intended to replace the documents that analyze and derive the controls (e.g., BIO/TSR, HAR/NESR) rather to point and reference to these documents to form a complete (integrated) authorization basis for an operation.

For each hazard scenario relevant to each activity identified in the nuclear explosive-specific hazards analysis, the key controls are identified and recorded in the ABCD. The controls for each activity (and each accident scenario) must be relevant, available, and sufficient to prevent or mitigate accident consequences.

Each primary control will be supported by a safety basis statement, and, if applicable, by action statements, mode applicability, and surveillances. In addition, the flow-down of each control, relevant to an activity, to the shop floor must be demonstrated by linkage to the appropriate Plant document (Directive, Standard, Operating Procedure, tooling drawing, etc.). The controls themselves, and the documents that provide the linkage to the shop floor, are configuration controlled through the Unreviewed Safety Question (USQ) Process.

3. PROCESS DOCUMENTATION

When implementing the ISP, the documents listed in Table 1 will be generated. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by authorized personnel, or otherwise authenticated. The table lists by phase each document that may be generated. The PT is responsible for retaining and maintaining the documentation listed in Table 1.

TABLE 1 - INTEGRATED SAFETY PROCESS DOCUMENTATION

PHASE	DOCUMENT
Task Direction and Planning Phase	• Tasking Letter • Schedule • Tasking Letter Responses • Project Plan • Conceptual Hazard Analysis Plan • Identification of Appropriate Facilities and Resources • Milestone 0 Review Documentation • Planning Meeting Minutes • SMT Acknowledgment

Concept Development Phase	• Weapon Safety Specification
	  o Criticality Report
	  o Intrinsic Radiation Report
	  o Use-Control Report
	  o Baseline Process Flow
	• Set of Safety Criteria is complete
	• High Fidelity Trainer Requirements
	• Complete Conceptual Hazard Analysis of Existing Process
	• Modify/Develop operating procedures, tooling, electrical testers, hazard analysis, facility selection, equipment and layout
	• Operate within approved authorization basis (SAR/BIO/TSR combined with HAR/ABCD)
	• Updated Project Plan
	• Milestone 1 Review Documentation
	• SMT Acknowledgment

Preliminary Development Phase	• Preliminary Process Hazard Analysis Report
	• Baseline Operating Procedure
	  • Detailed and Illustrated Process Flow
	  • Weapon-Specific Personnel Requirements
	  • Personnel Selection, Training, and Qualification Plan
	  • Personnel Trainer Requirements
	• Equipment Design and Qualification
	• Tooling Design and Qualification
	• Layout Design and Qualification
	• Operating Facility Design and Qualification
	• Preliminary ABCD
	• Updated Project Plan
	• Milestone 2 Review Documentation
	• SMT Acknowledgment

Implementation & Verification Phase	• Final Hazard Analysis Report • Draft Operating Procedure o Pre-Operation Checklist o Nuclear Explosive Operating Procedure o Module 1 - Facility Maintenance & Control Procedures o Module 2 - Personnel Training, Qualification, & Control o Module 3 - Nuclear Explosive & Component Information Guide o Module 4 - Tooling & Equipment Control Guide o Module 5 - Miscellaneous Information • ABCD • Final Operating Procedure Validated through PVT • Scope of Review Team Activities • Operations Personnel are Trained and Qualified • Updated Project Plan • Milestone 3 Review Documentation • SMT Acknowledgment
Authorization Phase	• SMT Accepts Changes Made by Review Team or Accepts PT Rationale for Disagreement with Review Teams • SMT Members Concur with AL Manager Certifications

4. PROCESS STEPS

The following paragraphs describe the networked, detailed ISP process steps (i.e., steps, activities, or completion). Refer to Figure 1 for a graphical illustration of the process.

4.1 Task Direction and Planning

4.1.1 Establish Customer Requirements

During the Task Direction and Planning Phase, WPD forwards to the Design Agencies (DA) and Pantex Plant a draft weapon-specific tasking letter, which specifies the applicable requirements and schedule. The tasking letter calls for assignment of DA and Pantex representation for the task. Each agency verifies their availability of the manpower, resource, and technological capabilities needed to satisfy the WPD request and documents this information in a response letter. DA's and Pantex Plant must also notify WPD if the new task will impact any existing schedule. It is understood that the DAs and PX cannot identify all schedule impacts until the full scope of the project is ascertained. WPD finalizes the coordinated requirements by revising and reissuing the tasking letter as necessary and, when applicable, by changing and reissuing the PCD.

4.1.2 Establish Project Team and Define Project Scope

During the Task Direction and Planning phase, PX convenes a planning meeting with PT representatives from the appropriate agencies (e.g., DAs, DOE, etc...) and PX. PX management assigns a Project Team Leader (PTL) from Pantex, and defines the project scope. Results from the planning meeting shall be formally documented in meeting minutes and retained by the PT. The PT is responsible for establishing a realistic project plan, project scope, identifying project tasks, establishing necessary task teams, periodically reviewing progress of all task teams, including the HATT, and ensuring that the safety criteria specified in this document are addressed.

4.1.3 Establish Project Plan and Task Teams

The PT establishes a project plan. The project plan is written to formalize the PT's description, the TT's descriptions, their roles and responsibilities, the scope of the project, identifies appropriate facilities and resources for the tasks to be performed, baseline process flow, safety criteria and identifies project tasks. It recapitulates requirements defined in the tasking letter and any schedule requirements, and defines the approach for executing the process steps in the Task Direction and Planning, Concept Development, Preliminary Development, Implementation and Verification, and Authorization phases. The project plan includes project goals, objectives, and timelines with milestones. It is a living document with configuration control applied to each document version.

The PT establishes and employs the TTs necessary to develop, implement, review and verify the following throughout the subsequent phases: 1) the Weapon Safety Specification and the applicable safety criteria, 2) an operating procedure, 3) personnel requirements, 4) an operating facility and its safety basis documentation, 5) equipment and layout 6) trainer definition/requirements, 7) tooling, and 8) a Hazard Analysis Report (HAR).

4.1.4 Conceptual Hazard Analysis Plan

Prepare a Conceptual Hazard Analysis (CHA) Plan to be implemented in the Concept Development Phase after receiving SMT approval at Milestone 0.

4.1.5 Milestone 0, Project Plan Approval

As a post-Task Direction and Planning Phase requirement and a prerequisite to commencing the Concept Development Phase, a Milestone 0 Review shall be conducted by the PT for the SMT review. The PT is responsible for facilitating the appropriate presentations, meeting logistics, and associated action items. This milestone review may be a teleconference or an e-mail discussion instead of an actual meeting.

The purpose of the Milestone 0 Review is to formally start the ISP for the specific weapon system operation and/or facility upgrades/modifications. Items that are to be discussed include:

- Tasking letter and responses
- Resource requirements
- Identification of Appropriate Facilities
- Schedule, resources (loaded for tooling, equipment, TT, facility upgrade, etc...)
- Project Plan
- Conceptual Hazard Analysis Plan
- Path forward

At the conclusion of Milestone 0, it is incumbent on the SMT to raise any issues they have identified (logistics, schedule, resources, and etc..) and assign action items to their respective organizations. The SMT is responsible for formalizing their action items/issues and supplying them to the PT within the time period that was mutually agreed upon by the SMT and PT. The PT is responsible for resolving the SMT action items/issues and presenting the resolution to the SMT within the time period that was mutually agreed upon by the SMT and PT.

All results, including decisions pertaining to the aforementioned shall be reviewed, concurred to, and formally documented. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by the authorized personnel, or otherwise authenticated.

4.2 Concept Development

4.2.1 Review and Update Weapon Safety Specification

The Weapon Design TT, consisting of cognizant design agency (LLNL and SNL/CA or LANL and SNL/NM) representatives, reviews and updates the WSS with Pantex input. The WSS is an evolving document that is required to identify and describe the hazardous materials/components in the weapon system and the designed safety and/or Use-Control features. It should describe the vulnerabilities of the hazards, safety features, and Use-Control features; this should include changes of vulnerability levels as the configuration of the weapon changes during processing. Information sources are the design drawings, Baseline Process Flow, Weapons Development Reports, Archiving Data, Use-Control Reports, Significant Finding Investigation reports, and URs from the stockpile surveillance and evaluation program, Criticality Report, and Intrinsic Radiation Report. Topics include, but are not limited to, process-sensitive operations, nuclear criticality, use-control features, and radiation dose levels. The WSS must be used as the basis for subsequent decisions within the Concept Development, Preliminary Development, Implementation and Verification, and Authorization phases. The WSS is a part of the safety basis authorization documents. See SS458969 (reference) for a sample WSS.

4.2.1.1 Criticality Report

The criticality report is prepared by the physics design agencies and describes credible assembly/disassembly conditions and controls to prevent a nuclear criticality incident.

4.2.1.2 Intrinsic Radiation (INRAD) Report

The INRAD report is prepared by the physics design agencies. The report defines the radiation dose equivalent fields generated by the radioactive components during various levels of weapon assembly/disassembly.

4.2.1.3 Use-Control Report

The Use-Control Report is prepared by the Design Agencies as part of the Final Weapon Development Report. The report summarizes the use-control features of the warhead or bomb consistent with applicable guidelines concerning dissemination of use-control information.

4.2.1.4 Prepare Baseline Process Flow

The Baseline Process Flow allows for the preliminary identification of safety critical steps related to the weapon. The Baseline Process Flow is not a step-by-step assembly/disassembly sequence. The Baseline Process Flow identifies design reasons for the order of assembly/disassembly steps. It also identifies changes in weapon safety status that occur during assembly/disassembly. The Baseline Process Flow enables development of the operating procedure, operating facility, equipment and layout, tooling, and hazard assessment concepts during the Preliminary Development Phase. It should include any safety issues related to the weapon assembly/disassembly configurations and associated testing sequence of the intended process identifying the hazards but excluding any specific Pantex or DA tooling (e.g., work stands, lifting fixtures and/or vacuum fixtures). Specific vulnerabilities should be identified. A Detailed Process Flow is prepared during the Preliminary Development Phase, see Section 4.3.2.

4.2.2 Identify and Document Applicable Safety Criteria

The Project Team in conjunction with the other task teams shall review the safety criteria defined in Section 5 of this document and also refer to Appendix A for related safety checklist guidance information. Safety criteria identified as not applicable to the project shall be documented as such; additional safety criteria may be added as deemed necessary. The applicable safety criteria shall be listed in the Project Plan and become quality requirements to be addressed by the appropriate task teams. Each task team should approach their task with the following in mind: the safety criteria should be documented with a description of the weapon-specific criteria; how the criteria are to be addressed; and a description of the metric that will be used to confirm that the criteria are satisfied. Decisions involving trade-offs in safety-critical issues shall be documented and evaluated by the hazard assessment.

4.2.3 Identify and Document Trainer Requirements

The Weapon Design Task Team identifies the requirements of the war reserve (WR) weapon configuration that must be replicated or simulated in the trainer(s). The defined requirements will assure that the trainers are correctly configured to simulate the WR interfaces and responses (e.g., mass properties, electrical functions, tooling engagement, etc.), will support the process development, and will assure the safety of the process prior to performing the operations on WR units. Demonstration that all electrical tests are reproducible on the trainer is desirable. Due to the various interfaces and responses, multiple trainers may be required to support the activities during the Implementation & Verification Phase and the Authorization Phase. Ultimately, the PT and WPD are responsible for ensuring the availability of the high fidelity trainers.

4.2.4 Assessment of Process

If there is an existing process, the PT along with appropriate TT members will walk-down the existing process using the existing procedures and assess the process against their developed weapon specific safety criteria and against existing facility safety documents. The proposed operation will be within the DOE approved authorization basis (SAR/BIO/TSR combined with HAR/ABCD) or there is an appropriate and achievable plan for obtaining the needed changes to the facility authorization basis.

If this is a new process, procedures will need to be developed. The procedures must be consistent with weapon specific safety criteria and any existing facility safety documents. A HAR/ABCD will be needed if it doesn't already exist.

4.2.5 Complete Conceptual Hazard Analysis of Process

The HATT evaluates the weapon design, the Baseline Process Flow, and the operating facilities and, based on these evaluations, formulates an analysis plan and identifies the techniques they expect to use in the hazard analysis. The team seeks out weapon requirements data, operational requirements data, facility safety documents, and subject matter experts. The task team identifies and communicates requirements for walk through and video taping sessions. Other information sources for the HATT include the Project Plan, the PT, other TTs, the WSS and, Section 6.0 of this document. The output from this step will influence all task teams participating in the Preliminary Development Phase, as well as the scope of the Preliminary and Final Hazard Analysis Reports.

The HATT will participate concurrently with the PT assessment and perform a CHA on the existing or proposed process. The PT assessment along with CHA will form the technical basis on how to transition the process through the subsequent phases of the ISP (reference Figure 1).

4.2.6 Modify/Develop Operating Procedure Concepts

The PT or PT sponsored Operating Procedure TT identifies, exchanges, and captures the ideas and strategies to which the operating procedure will be developed. Source information includes PT input, the project plan requirements, input from the other TTs, the WSS, the Baseline Process Flow, and the Paragraph 5.3 Safety Criteria. As shown in Figure 1, the output from this step will drive development of the Detailed Process Flow, development of the Baseline Operating Procedure, and influence content of the PHA.

4.2.7 Modify/Develop Operating Facility Concepts

The PT or PT sponsored Operating Facility TT identifies the needed facility (or facilities), the expected facility modifications for the specific weapon system, and expected modifications to the facility safety basis documentation and analysis. Source information includes PT input, the Project Plan requirements, input from the other task teams, the WSS, the Safety Criteria listed in Section 5.4 of this document, and existing facility safety documents. As shown in Figure 1, the output from this step will drive development of the facility requirements, and influence content of the PHA.

4.2.8 Modify/Develop Equipment and Layout Concepts

The PT or PT sponsored Equipment and Layout TT identifies, exchanges, and captures the ideas and strategies to which the equipment will be selected, and the tooling and equipment will be laid out. Source information includes PT input, the Project Plan requirements, input from other TTs, the WSS, and the Safety Criteria listed in Section 5.5 of this document. The output from this step will drive development of the equipment selection requirements, development of the layout requirements for a dedicated facility, and influence content of the PHA.

4.2.9 Modify/Develop Electrical Tester Concepts

The PT or PT sponsored Electrical Tester TT identifies, exchanges, and captures the ideas and strategies to which the testers will be developed. By definition, electrical testers are considered equipment, which fall under the jurisdiction of the Equipment and Layout TT. It is recognized however, that due to the unique expertise required for electrical tester design and development that a separate task team may need to be formed to address electrical testers. Source information includes PT input, the Project Plan requirements, input from the other task teams, the WSS, the Safety Criteria listed in Section 5.5 of this document, and the Appendix A Safety Checklist. The design, fabrication, and approval process for electrical testers may occur independent of specific weapon system SS-21 integration. Therefore, the scope of the Electrical Tester TT when dealing with existing processes is to evaluate the existing testers in relation to the weapon specific safety criteria and concentrate on the tester/nuclear explosive interface issues. The output from this step will drive development of the electrical tester requirements, and influence content of the PHA.

4.2.10 Modify/Develop Tooling Concepts

The PT or PT sponsored Tooling TT identifies, exchanges, and captures the ideas and strategies to which the tooling will be developed. Source information includes PT input, the Project Plan requirements, input from the other task teams, the WSS, tooling from other weapon programs and the Safety Criteria described in Section 5.6 of this document. The Production Manager, Program Engineer and PT will determine the number of copies of tooling required. The output from this step will drive development of the tooling design requirements, and influence content of the PHA. See Reference 3 for generic tooling information and the D&P Manual, Chapter 11.3, Section 5.8 for additional information.

4.2.11 Milestone 1, Acceptance of Conceptual Approach

As a post-Concept Development Phase requirement and a prerequisite to commencing the Preliminary Development Phase, a Milestone 1 Review shall be conducted. The PT is responsible for facilitating the appropriate presentations, meeting logistics, and associated action items. The meeting shall be attended by the PT, appropriate TT Leaders and the SMT.

The purpose of the Milestone 1 Review is to address the process development status, schedule status, trade-off issues concerning Safety Criteria, resources, facility safety issues and to confirm, that for this phase, the networked steps have been adequately executed, all Safety Criteria have been adequately addressed, and the operation is within the existing facility safety basis. The following presentations are required along with their corresponding documentation:

- Safety Criteria (Describe what existing criteria is applicable, any additional identified criteria, how the concepts satisfy the criteria and any exceptions)
- Weapon Safety Specification

- Baseline Process Flow (identifying proposed facilities, major processes, and safety critical operations)
- Tooling / Equipment concepts - Assembly/Disassembly (Sketches depicting the process and weapon/tooling interface)
- High Fidelity Trainer Requirements
- Critical Path Schedule
- Estimated Resources required to meet schedule
- Conceptual Hazard Analysis
- Existing Facility Safety Basis
- Latest Issue of the PT's Project Plan (Formal presentation not required)

At the conclusion of Milestone 1, it is incumbent on the SMT to raise any issues they have identified (applicability/adequacy of safety criteria and/or facility safety basis, logistics, schedule, resources, etc.) and assign action items to the PT or their respective organizations. The SMT is responsible for formalizing their action items/issues and supplying them to the PT within the time period that was mutually agreed upon by the SMT and PT. The PT is responsible for resolving the SMT action items/issues and presenting the resolution to the SMT within the time period that was mutually agreed upon by the SMT and PT.

All results, including decisions pertaining to the aforementioned shall be reviewed, concurred to, and formally documented. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by the authorized personnel, or otherwise authenticated. Based on the SMT assessment of the review, they will either concur with the PT's readiness to proceed to the Preliminary Development Phase or stipulate what additional requirements must be satisfied prior to proceeding. All results, including decisions pertaining to safety-critical issues shall be reviewed, concurred to, and formally documented. A response to the issues raised by the SMT will be required from the PT and should be presented at Milestone 2 and documented in the Milestone 2 meeting minutes.

4.3 Preliminary Development Phase

4.3.1 Prepare Preliminary Process Hazard Analysis

The HATT performs a PHA to identify risks that are independent of the details of the assembly or disassembly operation. By example, areas of concern include but are not limited to weapon-specific safety attributes (e.g., hydrogen buildup), facility-induced hazards (e.g., crane failure during lift), external events (e.g., facility response to seismic events), and the relative risk importance of different types of assembly or disassembly process activities (e.g., vacuum fixture lifting of HE). The team will provide documentation of their findings, both positive and negative, with suggestions for risk reduction as an initial input to all task teams participating in the Implementation and Verification Phase. Source information includes PT input, the Project Plan requirements, input from the other task teams, the WSS, the Baseline Process Flow, and the output from the Concept Development Phase activities.

4.3.2 Develop Detailed Process Flow, Illustrated Process Flow, and Prepare Baseline Operating Procedure

This step requires the PT or PT sponsored Operating Procedure TT to fully develop a Detailed Process Flow. It should include the tooling as well as equipment concepts (e.g., operations to be performed in a work stand, lifting fixtures to be used, and vacuum fixtures to be used, etc.) and document any changes to the Baseline Process Flow. Additionally, it should also incorporate the recommendations in the CHA, if applicable, to modify the process if so required. It should also include identification of electrical tests, radiography, leak checks, etc., to be performed. The Detailed Process Flow allows preliminary estimates of time to complete operations and potential radiation doses (early estimates) as well as detailed identification of potential safety critical steps for the process. Source information for the Detailed Process Flow are the WSS, minutes from the Milestone 1 meeting, inputs from the various TTs in the Preliminary Development and Concept Development Phases, and the CHA. An illustrated process flow shall also be created. The Baseline Operating Procedure will incorporate the tooling concepts and reflect operations to be performed in the operating facility (e.g., bay or cell). It will also incorporate the safety critical steps preliminarily identified. The Detailed Process Flow is source information for the Baseline Operating Procedure.

4.3.3 Determine Weapon-Specific Personnel Requirements

The PT or PT sponsored Personnel TT determine requirements for the personnel who will have hands-on or direct supervisory responsibility based on the needs of the specific weapon program. The team identifies the number of Production Technicians needed, physical limitations, and any additional training requirements. Source information for determining personnel requirements are the Baseline Process Flow, minutes from the Milestone 1 meeting, inputs from other task teams during the Preliminary and Concept Development Phases, and the PHA. The team performs an evaluation to ensure the weapon-specific personnel requirements meet the process design criteria and the overall safety criteria, and documents the results.

4.3.4 Develop Personnel Selection, Training, and Qualification Plan

The PT or PT sponsored Personnel TT develops a plan for selecting, training, and qualifying personnel to support specific assembly or disassembly weapon operations. Source information for the personnel plan are the weapon-specific personnel requirements, WSS, and training organization's internal requirements. The team performs an evaluation to ensure that the plan addresses the applicable safety criteria and documents the results.

4.3.5 Develop Equipment Design and Qualification Requirements

The PT or PT sponsored Equipment and Layout TT selects the equipment needed to meet the nuclear weapon assembly or disassembly operation. The equipment definition is documented to include details necessary to qualify the deliverables upon receipt. The team performs an evaluation to ensure the equipment design addresses the applicable safety criteria and documents the results.

4.3.6 Develop Tooling Design and Qualification Requirements

The PT or PT sponsored Tooling TT develops detailed tooling design definition based on the approved tooling concepts. The definition is documented to include details necessary to qualify the tooling upon receipt. Source information for the tooling design are the Detailed Process Flow, WSS, minutes from the Milestone 1 meeting, inputs from other task teams during the Preliminary and Concept Development Phases, and the CHA. The PT performs an evaluation to ensure the tooling design addresses the applicable safety criteria and documents the results.

4.3.7 Develop Layout Design and Qualification Requirements

The PT or PT sponsored Equipment and Layout TT develops the facility layout based on the layout concepts, tooling and equipment designs, operating facility processing areas, and the needs of the specific weapon operations. Source information for the layout design are the Detailed Process Flow, WSS, minutes from the Milestone 1 meeting, inputs from other task teams during the Preliminary and Concept Development Phases, and the CHA. The team performs an evaluation to ensure the layout design addresses the applicable safety criteria and documents the results. Configuration and maintenance requirements must be documented. The facility layout, which includes configuration, tooling, equipment, and the placement of these items into and out of the operating facility, becomes a formal document and an integral portion of the NEOP.

4.3.8 Develop Operating Facility Design and Qualification Requirements

The PT or PT sponsored Operating Facility TT develops the requirements to satisfy the specific weapon operational needs in the facility; i.e., electrical, mechanical, pressure and/or vacuum needs; based on the process design criteria, WSS, tooling design, verified equipment & layout concepts, and updates/integrates with the existing facility safety basis documentation. The team performs a review to ensure that the operating facility design will address the applicable safety criteria, including building Basis for Interim Operations (BIO) requirements, and documents the results.

4.3.9 Milestone 2, Acceptance of Process Flow

As a post-Preliminary Development Phase requirement and a prerequisite to commencing the Implementation and Verification Phase, a Milestone 2 Review shall be conducted. The PT is responsible for facilitating the appropriate presentations, meeting logistics, and associated action items. The meeting shall be attended by the PT, appropriate TT Leaders and the SMT.

The purpose of the Milestone 2 Review is to address the process development status, schedule status, trade-off issues concerning Safety Criteria and resources, and to confirm, that for this phase, the TTs have adequately coordinated and the Safety Criteria have been adequately addressed. The following presentations are required along with their corresponding documentation:

- Status of action items and SMT identified issues generated during Milestone 1
- All Safety Criteria (Highlight changes since Milestone 1)
- WSS (any changes since Milestone 1)

- Detailed Process Flow (identifying proposed facilities, major and minor processes, safety critical operations, and estimated process times)
- Tooling / Equipment design definition - (Tooling drawings and analysis, sketches depicting the entire process and weapon/tooling interface) along with completed Safety Criteria Compliance Forms and Qualification Requirements
- PHA Results
- High Fidelity Trainer Design
- Operating Facility Design Definition and Qualification Requirements
- Facility Layout Design Definition and Qualification Requirements
- Baseline Operating Procedures
- Weapon Specific Personnel Requirements
- Personnel Selection, Training, and Certification Plan
- Critical Path Schedule
- Latest Issue of the PT's Project Plan (Formal presentation not required)
- Resource/logistic issues and earned value
- Draft ABCD

At the conclusion of Milestone 2, it is incumbent on the SMT to raise any issues they have identified (applicability/adequacy and/or implementation of safety criteria, logistics, schedule, resources, etc.) and assign action items to the PT or their respective organizations. The SMT is responsible for formalizing their action items/issues and supplying them to the PT within the time period that was mutually agreed upon by the SMT and PT. The PT is responsible for resolving the SMT action items/issues and presenting the resolution to the SMT within the time period that was mutually agreed upon by the SMT and PT.

All results, including decisions pertaining to the aforementioned shall be reviewed, concurred to, and formally documented. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by the authorized personnel, or otherwise authenticated. Based on the SMT assessment of the review, they will either concur with the PT's readiness to proceed to the Implementation & Verification Phase or stipulate what additional requirements must be satisfied prior to proceeding. All results, including decisions pertaining to safety-critical issues shall be reviewed, concurred to, and formally documented.

A response to the issues raised by the SMT will be required from the PT and should be presented at Milestone 3 and documented in the Milestone 3 Review meeting minutes.

4.4 Implementation and Verification Phase

4.4.1 Issue Final Draft Hazard Analysis Report

During the Implementation and Verification Phase the HATT will convert the PHA to a Final Draft HAR. The Final Draft HAR is based on walk-throughs and discussions with production technicians and engineers. Documented DA weapon responses to HAR scenarios is provided for those that have practicable technical and or probability bases. The team will provide documentation of their findings, both positive and negative, with suggestions for risk reduction as input to all TTs participating in the Implementation and Verification Phase. Source information includes PT input, the Project Plan requirements, input from the other task teams, the WSS, the Detailed Process Flow, and the output from the Preliminary Development Phase activities. Other assessments may be performed at the discretion of the PT.

4.4.2 Review Draft Operating Procedure

The PT or PT sponsored Operating Procedure TT generates an operating procedure draft, including the Pre-Operational Checklist and the Nuclear Explosive Operating Procedure, to support the PVT. Prior to using the operating procedure, the team performs a desktop review. The team verifies and documents that the tooling design, operating facility, required equipment, and certified layout have been implemented correctly into the operating procedure. The safety critical steps should also be identified within the draft operating procedure. All changes to the draft operating procedure must be coordinated through the operating procedure task team. Source information includes output from the Preliminary Development Phase and the PHA.

4.4.3 Incorporate and Verify Operating Facility and Safety Basis Modifications

The PT or PT sponsored Operating Facility TT has the responsibility for incorporating modifications into the operating facility and safety basis documentation. The modifications are based on inputs from the PT and appropriate task teams and are necessary to meet safety criteria. The PT or PT sponsored Operating Facility TT performs a review to ensure the modified operating facility addresses the applicable safety criteria and documents the results.

4.4.4 Modify/Procure, Inspect, and Accept Equipment

The equipment is modified/procured and inspected based on the approved and verified equipment design definition. The PT performs a review to ensure that the procured equipment addresses the applicable safety criteria and documents the results.

4.4.5 Modify/Fabricate, Inspect, and Accept Tooling

The tooling is modified/fabricated, received, and inspected based on the approved and verified tooling design definition. Processing of tooling includes calibration, load testing, and other functional testing as required. The team performs a review to ensure the procured or fabricated tooling design addresses the applicable safety criteria and documents the results.

4.4.6 Layout and Install Equipment and Tooling

The PT or appropriate PT sponsored TTs have the approved and verified tooling and equipment installed in the operating facility as defined by the approved and verified layout. The PT performs a review to ensure the laid out tooling and equipment addresses the applicable safety criteria and document the results.

4.4.7 Use Production Technicians

The production technicians (including training specialists) who were selected during the Concept Development Phase to participate as team members are now used to exercise all the deliverables as part of the Implementation and Verification Phase. Their participation is intended to help identify opportunities for improvement.

4.4.8 Perform Positive Verification Tryout on Trainer(s)

The PT conducts a PVT, which brings together and exercises the high fidelity trainer unit, the PT's final draft of the operating procedure, the production technicians (including training specialist), the operating facility, the final draft of the HAR, and the tooling and equipment laid out in the operating facility. The purpose of the tryout is to positively verify that all requirements, including the applicable safety criteria, have been addressed and satisfied. The output from a successful Tryout shall be a PT Readiness Statement.

4.4.9 Observe Positive Verification Tryout

The HATT attends the PVT to observe the integrated implementation of all the deliverables in their final configuration. It is at this point that the observations from the positive verification tryout are relayed to the PT. These observations may require changes to reduce or eliminate the identified area or areas of concern that affect the safety of the process. Based on the Tryout, the HATT will modify as needed the Final Draft Hazard Analysis Report (HAR).

4.4.10 Finalize Operating Procedure

The PT or PT sponsored task team(s) then finalize the Pre-Operational checklist, Nuclear Explosive Operating Procedures (NEOPs), and five supporting modules to incorporate changes agreed to and documented during the Post Implementation and Verification Phase Review. No changes should be made to these documents that would negate the information in the final HAR. An objective is to utilize these versions of these documents in future readiness reviews.

4.4.11 Issue Final Hazard Analysis Report

The Final HAR is ready for change control use and will be formalized and issued for input into the NESS input documentation. The Final HAR will identify existing and new hazards for the facility and will rank the risks involved for the entire weapon-specific operation at the Pantex Plant under normal environment conditions.

4.4.12 Train and Qualify Personnel

A limited number of production and radiation technicians and others having hands-on or supervisory responsibility are selected from a pool of personnel that meet the weapon-specific requirements for a given operation, and are further trained and Qualified to the final operating procedure. The qualification information for each individual is forwarded for inclusion in Module 2 of the operating procedure. This information serves as positive verification during the pre-operational check that the individuals performing the work are authorized to do so.

4.4.13 Milestone 3, Readiness to Proceed to Independent Review

As an Implementation & Verification Phase requirement and a prerequisite to commencing the Authorization Phase, a Milestone 3 Review shall be conducted. The PT is responsible for facilitating the appropriate presentations, meeting logistics, and associated action items. The meeting shall be attended by the PT, appropriate TT Leaders and the SMT.

The purpose of the Milestone 3 Review is to address the process development status, schedule status, trade-off issues concerning Safety Criteria and resources, and to confirm, that for this phase, the task teams have adequately coordinated and the Safety Criteria have been adequately addressed and implemented. The following presentations are required along with their corresponding documentation:

- Status of action items and SMT identified issues generated during Milestone 2
- How each of the Safety Criterion has been satisfied (Highlight changes since Milestone 2)
- WSS (any changes since Milestone 2)
- Results of the Positive Verification Tryout conducted on the trainer (step by step description of process) to include:
  - Detailed Process Flow (Highlight changes since Milestone 2)
  - Tooling / Equipment design changes (New or modified since Milestone 2)
  - Operating Procedures Validated through PVT
  - Trainer Fidelity, exceptions, and impact to training
- Final HAR peer reviewed and approved by PT
- Operations Personnel are Trained and Qualified
- Authorization Basis Documents Provide Appropriate Coverage and are DOE Approved
- Latest Issue of the PT's Project Plan (Formal presentation not required)
- Schedule
- Resource/logistic issues
- Project Cost/Earned Value
- The Engineering Release (ER) prepared by the DAs per D&P Manual, Chapter 11.4, Paragraph 5.6.

At the conclusion of Milestone 3, it is incumbent on the SMT to raise issues they have identified and assign action items to the PT or their respective organizations. The SMT is responsible for formalizing their action items/issues and supplying them to the PT within the time period that was mutually agreed upon by the SMT and PT. The PT is responsible for resolving the SMT action items/issues and presenting the resolution to the SMT within the time period that was mutually agreed upon by the SMT and PT. Based on the SMT assessment of the review, they will either concur with the PT's readiness to proceed to the Authorization Phase or stipulate what additional requirements must be satisfied prior to proceeding.

All results, including decisions pertaining to safety-critical issues shall be reviewed, concurred to, and formally documented. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by the authorized personnel, or otherwise authenticated.

Within two weeks of the meeting, SMT members can concur with the PT recommendation to the AL Assistant Manager for National Defense Programs that the project is ready to proceed to independent verification.

4.5 Authorization Phase

4.5.1 Operational Readiness Independent Review

Completion of the NESS input document following PVT marks the beginning of the Authorization Phase. During the authorization phase the independent reviews (NESSG, Readiness Review and Safety Basis Review Team) that were initiated during the previous phases (i.e., conceptual and preliminary) will be completed. The reviews will be performed in accordance with DOE Order 452.2A, DOE-STD 3015 and AL SD 452.2A.

4.5.2 Milestone 4, Recommendation to Authorize Operations

The SMT reviews the documentation provided/identified by the Review Team prior to the meeting. With PT input, the SMT concurs with the HAR and the ABCD, positive measures and controls that have been proven to meet the identified applicable criteria, Final Integrated Safety Basis and authorization document, and the PT Readiness to Proceed statement. With PT/Review Team input, the SMT approves updates, revisions and/or recovery plans to the PT Project Plan, Preliminary Review issue/action item closure, and final ISB evaluation finding action plans and/or closures.

SMT members accept changes made to resolve nuclear explosive safety or readiness review concerns, or SMT members accept PT technical rationale for disagreements with the review teams.

All results, including decisions pertaining to safety-critical issues shall be reviewed, concurred to, and formally documented. The documents shall be complete, identifiable, and shall be appropriately stamped, signed and dated by the authorized personnel, or otherwise authenticated.

5. SAFETY CRITERIA

The following paragraphs describe the safety criteria that are to be addressed when employing the ISP. They have been developed to fulfill the purposes identified in Section 1.2. The Safety Criteria are arranged by project team deliverable. See Appendix A for related Safety Checklist Information.

5.1 Weapon Safety Specification

The general requirement is to assure that the safety characteristics and the hazards of the weapon are understood with respect to the operating environment, the effects alterations and modifications have to the nuclear weapon, and the changing states of the nuclear weapon as it undergoes an assembly or disassembly. With respect to the weapon assembly/disassembly, its constituent components, and special materials, the task team shall identify, describe, or define the:

1. Applicable weapon configurations and Alterations (ALTS) and their impact on the weapon assembly/disassembly process.
2. Safety-critical assembly or disassembly operations (e.g., reservoir and valve removal process).
3. Credible deviations (i.e., an identified acceptable alternate) from normal operations and applicable immediate action procedures.
4. Personnel hazards including hazardous materials and high-pressure hazards.
5. Energetic and Electro-sensitive devices, their sensitivities and/or associated hazards.
6. Safety-critical handling requirements.
7. Radiological hazards including radiation field intensities and the potential for contamination.
8. Criticality and one-point safety concerns, as applicable.
9. Changes in safeguards and hazards characteristics as a result of aging effects.
10. Acceptable tritium concentrations for continuance of operations.
11. Assembly and component weights.
12. Positive verification checks (e.g., electrical tests, tritium detection, etc.) which identify the current state or status of critical components.
13. Required special tooling and hardware.
14. Applicable nuclear explosive safety rules.
15. Annual surveillance cycle report data that has identified any safety related issues or any Significant Finding Investigations.
16. Potential changes in the sensitivity of hazardous components due to aging or environmental exposure and precautions required to mitigate those hazards.
17. Critical paths of entry for energy sources and the precautions taken to mitigate unauthorized energy sources.
18. Safety related data generated from the archiving programs by the nuclear laboratory, non-nuclear laboratory, and production agency.

5.2 Personnel

The general requirement is to assure the proper selection, training, qualification, and certification of operating personnel and their reliability in the operational safety process. This includes production technicians and others involved in the hands-on operations or who have direct supervisory responsibilities for the weapon-specific operations.

Specific safety criteria are:

1. Personnel performing work on a nuclear explosive shall be certified in the DOE Personnel Assurance Program (PAP).
2. Personnel performing work on a nuclear explosive shall be trained and qualified for the specific nuclear weapon program before performing the work.

3. The training program shall include performance-based evaluations (including criteria for passage of a written examination).
4. The personnel management process shall provide an identification/qualification methodology of critical personnel for weapon-specific operations.

5.3 Operating Procedure

The general requirement is to assure the technical safety of the operating process through the positively controlled interactions of the weapon, personnel, operating facility, tooling, and equipment. The operating procedure shall establish a repeatable, efficient, and tractable operating process that, when adhered to in sequence and substance, will yield quality results, will implement nuclear explosive safety requirements, is safe for personnel use, and will not adversely affect the facility or environment.

Specific safety criteria are:

1. The operating procedure shall identify safety critical steps.
   - Safety critical steps are operations in the procedures consisting of a single step or series of steps when incorrectly performed or omitted will lead to a Significant Safety Incident. The intent of designating safety critical steps is to call attention to them and prevent incidents that may cause serious injury or abnormal radiation exposure to personnel, initiation of any explosive or pyrotechnic, rupture of a high-pressure vessel, or abnormal release of radiological or toxic contamination. This list is not meant to be all inclusive and reasonable judgment is expected.
   - In SS-21 programs, safety critical steps are determined by the procedures and hazard assessment task teams, based on input from the other task teams and the conceptual and preliminary hazard assessments. The safety critical steps are validated during the final hazard assessment.
2. The operating procedure shall define preventive steps to preclude the release of internal weapon energy.
3. The operating procedure shall address ALARA concepts for both radiation and hazardous substances including concurrence with the technical safety requirements for energetic or hazardous components.
4. The operating procedure shall utilize precautionary notes and warnings to assure that no single-point failure of any controlled parameter can occur, which will allow personnel, facility, or environmental damage or radioactive contamination (i.e., above threshold limits specified in the operating procedures).
5. The operating procedure shall contain contingency plans for credible deviations that are identified as abnormal conditions.
6. All versions of the operating procedure shall be controlled by sign off. Signatories shall be from the design agency or agencies and Pantex.
7. The operating procedure shall describe the entire process performed within a facility and shall be documented in a single set of documents.
8. The operating procedure shall provide for controlled starts, stops, and holds.

9. The operating procedure must define the requirements for removal of hazardous/critical components from the process area during assembly/disassembly operations and positive control of those components during an assembly/disassembly process.
10. When applicable, use-control features shall be incorporated and employed at the earliest practical point in the assembly of a nuclear weapon and removed at the latest practical point in the disassembly.

5.4 Operating Facility

The general requirement is to assure that the operating facility meets the specific safety criteria and that any item entering or exiting the facility, such as materials, nuclear explosives, nuclear explosive components, tooling and equipment, and personnel, are authorized to do so and operations are conducted within the envelope of the facility safety basis documents.

Specific safety criteria are:

1. There shall be a documented pre-operation check of the operating facility layout to assure that all authorized materials, tooling, equipment, nuclear explosive, nuclear explosive components, etc., are present, that they are properly located, and that nothing unauthorized is present.
2. There shall be a documented pre-operation check of the operating facility energy sources to assure all authorized energy sources are present, that they are operational, and that no unauthorized source is present.
3. There shall be a means to verify that the BIO and Review Team reports have been completed and approved for the operating facility prior to the operation.
4. There shall be a means to easily recognize the radiological hazards within the facility during the various levels of nuclear weapon assembly or disassembly.
5. There shall be a verification that all critical safety systems are operational and that maintenance of those systems is up to date and documented.
6. There shall be access control of equipment, tooling, personnel, material, and the weapon.
7. There shall be administrative controls such that the weapon operations will not take place while maintenance operations are being performed in the room with the weapon.
8. There shall be a means to identify the operations authorized by the facility safety basis documentation.

5.5 Equipment and Layout

The general requirement is to design a layout of the operating facility that minimizes the probability of accidents or incidents while controlling the tooling and equipment to maximize the efficiency, effectiveness, and safety in the operating environment. The facility layout is a formally controlled document for the weapon-specific operation and defines all aspects of the operating facility.

Specific safety criteria are:

1. The layout shall facilitate positive verification that all required and only the required tooling and equipment for the operation are present.
2. The layout shall facilitate positive verification that all tooling and equipment are operationally ready.
3. The layout shall support an efficient, effective, predictable, and safe placement and movement of tooling and equipment during all stages of the operation.
4. During operations that involve high explosive (HE) handling, the layout design shall preclude any possibility of unintended contact or striking of the HE with the tooling and equipment, or dropping of the HE.
5. The layout shall mitigate to As Low As Reasonably Achievable (ALARA) levels exposure of personnel to radiation and to other hazards during the operation.
6. All equipment must have at least two independent physical safety features or barriers to assure no common mode-of-failure during critical operations.
7. Equipment applying energy to the weapon during operations must have a fail-safe energy limit.

5.6 Tooling Design

The general requirement is to assure that the tooling is designed to mitigate occupational hazards for the personnel and to prevent insults to the nuclear weapon by addressing criticality, HE safety, radiation safety, factors of safety, and all safety parameters for the tooling/weapon system. With respect to the weapon assembly, its constituent components and special materials, the Tooling Development task team shall assure that:

1. The tooling shall maintain positive control of the weapon and critical components so that no unauthorized or unanalyzed energy is introduced. This includes mechanical, electrical, thermal, Electro-mechanical, and potential/kinetic energy sources.
2. Tooling used in safety-critical operations is designed to contain two independent physical safety features, if practical, with no common mode of failure.
3. Tooling design decisions that address safety issues are formally documented and maintained along with the tooling design drawing package.
4. Alternate tooling is designed for safety-related credible deviations from normal operations.
5. As a goal, the tooling incorporates radiation protection to reduce exposure to less than 500 mrem per worker year.
6. The tooling is designed to the As Low As Reasonably Achievable (ALARA) concept for both radiation exposure and exposure to hazardous components and chemicals and will adhere to OSHA requirements as a minimum.
7. The tooling design has formal documentation (e.g., safety criteria checklist) to demonstrate that the safety criteria are incorporated into the tool. See Appendix B for an example.
8. Tooling is designed to preclude abrasions, free fall dropping, or pinching of the High Explosive (HE).

6. HAZARD ANALYSIS PROCESS

6.1 Hazard Analysis

The Integrated Safety Process requires that hazard assessments be performed concurrent with the Concept Development, Preliminary Development, and Implementation and Verification Phases. See the D&P Manual, Chapter 11.4, Section 4.3 for HAR guidance.

7. REFERENCES

The following documents are referred to in this TBP.

1. U.S. DOE Albuquerque Operations Office, Development and Production (D&P) Manual, AL 56XB.
2. SS458969, W84 Weapon Safety Specification (classified SNL document)
3. 2Y-59370, SS-21 Generic Tooling Report (unclassified LANL document)

APPENDIX A - SAFETY CHECKLIST

The following paragraphs provide guidance information intended to assist the project and task teams as they employ the Integrated Safety Process. They are not requirements, but are useful in stimulating thought about how to address the safety criteria, which are requirements.

Weapon Safety Specification

1. Does the Weapon Safety Specification limit or eliminate electrical tests that were for reliability if the weapon is being disassembled and components are not being reused? All electrical tests related to safety should be stipulated and required in the specification. Delete any redundant tests.
2. Does the Weapon Safety Specification identify changes in internal components if hazards have increased since FPU? Potential topics are oxidation, air-borne contamination during disassembly operations, etc.
3. Does the Weapon Safety Specification stipulate requirements for using electrical shorting plugs during an assembly or disassembly operation and covers as required for other, non-critical, applications?
4. Does the Weapon Safety Specification identify when radiography is required for acceptance/safety considerations and eliminate unnecessary radiography requirements during disassembly?
5. Does the Weapon Safety Specification stipulate humidity requirements for the weapon if increased (or decreased) humidity within the operating facility increases the sensitivity of any hazardous component?
6. Does the Weapon Safety Specification state that access to detonators or detonator cables be kept to a minimum and immediately protected from any/all energy sources when exposed?
7. Does the Weapon Safety Specification identify components that should be immediately packaged and/or removed from the disassembly area due to safety or ALARA concerns?
8. Does the Weapon Safety Specification identify circuits or access points that could be utilized during an assembly or disassembly to increase the safety attributes of the weapon?
9. Does the Weapon Safety Specification identify the lowest threshold Electro-Explosive Device (EED) and limit the energy levels of those external energy sources used in the disassembly or assembly operation based on the lowest EED threshold?
10. Does the Weapon Safety Specification identify all hazardous materials and potential personnel hazards associated with an assembly or disassembly process?
11. Does the Weapon Safety Specification include a full description of the weapon, including all applicable field retrofits and alterations (ALTS)?
12. Does the Weapon Safety Specification include the impact all applicable field retrofits and alterations have on the ability to perform the electrical tests?

13. Does the Weapon Safety Specification identify stop and/or no-stop points, which should be observed during the processing of the weapon if those points identified, affect the safety of the disassembly/assembly process?
14. Does the Weapon Safety Specification identify areas of concern during operations where radioactive gases or materials have the potential of being released (cutting, machining, firing of valves, chemical solvents in solution, etc.)?
15. Does the Weapon Safety Specification identify acceptable radioactive gas monitor levels for weapon-specific critical operations (breaking of seals, etc.)?
16. Does the Weapon Safety Specification identify radioactive material within the weapon system by component, radioactive material, location, and weight?
17. Does the Weapon Safety Specification provide a description of all explosives within the weapon including component name, location, explosive amounts, and whether self-contained or not?
18. Does the Weapon Safety Specification provide electrical bonding requirements including "safe or desired" electrical bonding points on the weapon or fixture?
19. Does the Weapon Safety Specification identify adhesive bonded HE assemblies within the weapon system and state precautions against dependence on any/all aged adhesive bonds?
20. Does the Weapon Safety Specification define the sensitivity and makeup of the HE material within an assembly and state if the material is more or less sensitive than "standard" DOE explosives?
21. Does the Weapon Safety Specification describe potential scenarios in the event of an inadvertent firing of any EED?
22. Does the Weapon Safety Specification identify any potential safety concern with the EED and concerns with any material transfer?
23. Does the Weapon Safety Specification identify all electrostatic sensitive devices (ESDs), their location/designation, and the no fire/all fire characteristics?
24. Does the Weapon Safety Specification identify all toxic/poisonous material within a weapon assembly, its location/designation and applicable precautions?
25. Does the Weapon Safety Specification identify all high pressure hazards within a weapon assembly, their location/designation, precautions, initial fill pressures, and expected end of life pressures?
26. Does the Weapon Safety Specification define any/all aging effects on the nuclear weapon or nuclear weapon components that may potentially effect the safety of an assembly or disassembly operation?
27. Does the Weapon Safety Specification define the nuclear characteristics of the weapon assembly including one point safety, criticality, INRAD levels and dose rate calculations for the various configurations?
28. Does the Weapon Safety Specification integrate and implement ES&H requirements?
29. Does the Weapon Safety Specification identify all potential non-verifiable weapon configurations that have safety significance?
30. Does the Weapon Safety Specification include applicable safety data generated during archiving activities?

31. Does the Weapon Safety Specification identify all safety-related internal components of the weapon and how they are integrated into the weapon system?
32. Does the Weapon Safety Specification identify all possible by-pass measures that affect the safety of the weapon system?
33. Does the Weapon Safety Specification identify the "interruptible" electrical systems that can be used as a safety control during the disassembly or assembly of the weapon?
34. Does the Weapon Safety Specification state that PAL status of the weapon system should be verified prior to any activity on the system?
35. Does the Weapon Safety Specification identify all potential hazards that could be generated as the result of an unlikely functioning of a component during assembly or disassembly operations?
36. Does the Weapon Safety Specification identify all critical interface areas, such as cable interconnects, and the precautions, such as electrical bonding, required to protect the personnel and the nuclear weapon?
37. Does the Weapon Safety Specification identify all safety-critical circuits exposed during an assembly or disassembly operation?
38. Does the Weapon Safety Specification identify circuits or access points that could be utilized during an assembly or disassembly operation to enhance safety attributes of the nuclear weapon?
39. Does the Weapon Safety Specification identify all assembly or disassembly levels where radiation sources should be monitored prior to proceeding with the operation?
40. Does the Weapon Safety Specification identify all hazard-related components in an assembly or subassembly and recommend their removal prior to further disassembly?
41. Does the Weapon Safety Specification identify all safety-related information from the annual surveillance cycle reports, Significant Finding Investigation Reports, or URs?

Personnel

1. Does personnel training include knowledge of potential and kinetic energy sources, the potential consequences, and the required mitigation techniques for potentially hazardous, nuclear weapon assembly or disassembly operations?
2. Does personnel training include knowledge and maintenance requirements, including frequency of maintenance, for the weapon-specific tooling and equipment?
3. Does personnel training include knowledge of the roles and responsibilities of the line management, radiation technology staff, or any other personnel involved in the weapon-specific operations?
4. Does personnel training include knowledge of radiation principles and hazards involved in the weapon-specific operations?
5. Does personnel training allow for sufficient numbers of personnel to be trained/qualified as health physics staff to support ongoing operations at the facility during abnormal situations?

6. Does personnel training familiarize personnel with the use of specific monitoring equipment, including but not limited to handling, placement, determining equipment operational status, switch positions?
7. Does personnel training familiarize personnel in the safe handling of "swipes" or any other specific monitoring techniques where contamination might possibly be spread by contaminated gloves or other methods?
8. Does personnel training address ALARA concerns and precautions for radioactive and all other hazardous components of the assembly? Note: The warnings or cautions should be understood in relation to the defined hazard.
9. Does personnel training include definition of the radiation field around the nuclear weapon assembly or its constituent components so as to address personnel protection?
10. Does personnel training identify, document, and incorporate lessons learned into the general or weapon-specific training classes to assure that repeated anomalies are eliminated?
11. Does personnel training establish and identify the time period requirements (e.g., every 90 days) for weapon-specific or non-specific training validation?
12. Does personnel training provide knowledge about controlling lifetime radiation exposure levels in order for those personnel exposed to radiation to be cognizant of the maximum allowable level?
13. Does personnel training stipulate that all involved personnel understand the critical safety system operations in normal, as well as, abnormal modes?
14. Does personnel training include weapon-specific training for personnel involved in the process to identify all ALARA concerns for radioactive and hazardous components?
15. Does personnel training include requirements for personnel to seek aid when moving objects that may be unstable during movement, thereby requiring the personnel to perform a two-person operation?
16. Does personnel training include instruction on immediate action procedures?
17. Does personnel training include instruction on two-person concept?
18. Does personnel training include instruction on the facility safety basis?
19. Are the personnel knowledgeable enough about the facility safety basis to refer to it and answer questions?

Operating Procedure

1. Does the operating procedure specify that verification of program, serial number, and ALT identification should take place prior to any disassembly on the specific weapon?
2. Does the operating procedure identify operations, such as cutting, machining, firing of valves, cleaning with solvents, etc., where radioactive gases or materials may be released?
3. Does the operating procedure address the explosives within the nuclear weapon by identifying all explosives-containing components, their locations, the amounts of explosive, whether self-contained or not, the electrical bonding requirements, and the recommended electrical bonding points?

4. Does the operating procedure identify the tooling and tooling sequence used in an assembly or disassembly operation?
5. Does the operating procedure have steps to verify that tooling is as designed?
6. Does the operating procedure stipulate precautions and responses for all credible deviations that could become abnormal or emergency situations?
7. Does the operating procedure stipulate emergency recovery procedures for all potential credible deviations where nuclear explosive, personnel, or facility safety is a concern?
8. Does the operating procedure identify personnel protection required such as gloves, respirator, etc., for all personnel such as production technicians, radiation technicians, supervisors, etc., involved in the assembly or disassembly operation?
9. Does the operating procedure state the ALARA concerns and precautions for radioactive as well as all other hazardous components of the assembly?
10. Does the operating procedure specify warnings or cautions in that portion of the procedure that is applicable to the defined hazard?
11. Does the operating procedure identify the radiation field around the assembled weapon or individual component radiation field as required for personnel protection?
12. Does the operating procedure specify that equipment and tooling not be placed in such a position that movement of that material could adversely impact the safety attributes of the nuclear weapon?
13. Does the operating procedure contain all specific nuclear explosive safety rules and immediate action procedures for the weapon system and stipulate that all personnel understand those rules and procedures prior to beginning operations?
14. Does the operating procedure identify critical component packing/unpacking instructions and requirements as applicable?
15. Does the operating procedure identify, as required, weapon-specific in-process contamination checks?
16. Does the operating procedure specify that drop heights be kept to a minimum in those procedures applicable to assisted lifts?

Operating Facility

1. Has the operating facility been configured to allow control and positive verification of the relative humidity in the processing area?
2. Has the operating facility been configured to enable positive verification that the facility and supporting equipment needed to perform radiation checks are present and operational?
3. Has the operating facility been configured to allow, for a given operation, only authorized power sources, to preclude power sources that are not authorized, and to provide positive verification of both cases?
4. Has the operating facility been configured to control and positively verify any maximum or minimum ambient temperature allowed for critical component processing and storage?

22. Has the operating facility been established using a change control process that ensures only authorized changes are incorporated into the operating facility?
23. Has the operating facility been configured to employ consistent physical labeling and supporting documentation for systems critical to the safety of the facility?
24. Has the operating facility been configured to support emergency drill simulations for abnormal conditions?
25. Has the operating facility been configured to control, in a verifiable manner, all calibrated equipment entering and exiting the facility?
26. Has the operating facility been configured to enable periodic verification (e.g., daily, weekly, etc.) of the critical safety systems readiness as a prerequisite for operating facility use?
27. Are there controls identified to prevent all unacceptable consequences?
28. Is there a defined maintenance program for the controls?
29. Have the lightning stand-off requirements been clearly specified?

Equipment and Layout

1. Does the layout identify all power sources (e.g., electrical, pneumatic, hydraulic, etc.) that are authorized for use in the operating area?
2. Does the layout specify marking requirements for all power sources that are authorized for use in the operating area?
3. Does the layout control equipment and tooling to ensure only authorized equipment and tooling enters the operating facility?
4. Does the layout define the locations of personnel safety protection equipment and materials, and enable positive verification that the identified items are present?
5. Does the layout define the locations of authorized processing areas for parts after removal (disassembly) or parts prior to first-time use (assembly)?
6. Does the layout address all hazards, process controls, and personnel protection?
7. Does the layout define equipment locations in the process area when the location affects the overall safety of the operation (e.g., hoist, HE cart locations, tooling locations)?
8. Does the layout define equipment locations and enable verification that all required equipment and tooling are present in the facility, and that no hazards are introduced by the placement of the equipment and tooling in the process area?
9. Has the layout been designed to assure that all equipment and tooling, including portable tooling utilized in one-time operations and tooling that is temporarily placed, does not introduce a tripping or other hazard?
10. Has the layout been defined to preclude any movement of equipment or tooling that could affect the safety attributes of the nuclear explosive?
11. Has the layout been defined to control the location of process materials (i.e., 35 account material) to avoid intermixing substances?
12. Has the layout been defined to identify areas where hazardous operations involving the local exhaust system should take place?

13. Has the layout been defined to identify all specialized equipment (monitors, etc.), specify the effective range for the equipment, and stipulate calibration requirements, as necessary?
14. Has the layout been defined to provide an area for all equipment and tooling, and specified the area that the equipment should be used in?
15. Does the layout define areas for ALARA-related items and verify that a clear ingress/egress path is available for movement of those items?
16. Does the layout define storage areas for HE and HE handling equipment separate from other storage areas and from the weapon process?
17. Does the layout support minimum movement of HE immediately after disassembly or immediately prior to assembly?
18. Does the layout limit combustibles in the work area?

Tooling

1. Has the tooling been designed to employ a configuration control process that enables the user to positively verify that only the authorized tooling is being employed in the specified weapon assembly or disassembly operation?
2. Has the tooling been designed to employ a change control process that ensures only authorized changes are incorporated into tooling and that only authorized tooling is delivered to the user?
3. Has the tooling been designed to include positive features that will preclude use of tooling in an unintended mode? For example, instead of relying just on visual indicators, such as marking "FORWARD" on the tooling, also design the tooling so that it can only be assembled in one direction.
4. Have tooling carts and weapon assembly carts been designed such that the rolling mechanisms can be positively locked in position, and easily and positively verified that they are locked?
5. Have the transportation carts and holding stands been designed so that the worst-case composite center of gravity (CG) of the cart or stand plus nuclear weapon assembly lies inside the effective area of the supporting base?
6. Has the tooling been designed such that all sharp or abrasive tooling surfaces (e.g., knurled handles, edges, corners, screw threads, etc.) that could contact the high explosive (HE) are insulated or otherwise configured to preclude contact?
7. Has the tooling been designed to mitigate potential consequences associated with an object impacting the HE?
8. Has the tooling been designed to mitigate ESD concerns?

Hazard Assessment

1. Does the hazard assessment address all credible weapon states, locations, and configurations?
2. Does the hazard assessment address all credible facility states and configurations?
3. Does the hazard assessment address external events?
4. Does the hazard assessment address facility impacts on the process?
5. Does the hazard assessment address all relevant processes, both normal and contingency?

6. Does the hazard assessment address worker health and safety, public health and safety, facility damage, and environmental impact?
7. Does the hazard assessment address multiple events?
8. Does the hazard assessment systematically address dependencies between events?
9. Does the hazard assessment document the source for all estimates of frequency and consequence?
10. Does the hazard assessment include an analysis of human reliability?
11. Are the accident sequences, and the estimates for event frequency and consequence based on and reviewed by subject matter experts?
12. Is there a documentation trail from final risk estimates back to source documents or expert judgments?
13. Have all hazard assessment issues been addressed and documented?
14. Was the hazard assessment performed consistent with standard industry practices?
15. Were facility and process walk-downs performed as part of the hazard assessment?
16. Has the hazard assessment identified safety-critical tooling and procedural steps?
17. Does the hazard assessment analyze the consequences of the dominant credible accidents?
18. Does the hazard assessment provide sufficient quantitative analysis to demonstrate why potential accident sequences leading to HE detonation or nuclear detonation are deemed incredible?
19. Does the hazard assessment address all hazards from process specific industrial hazards up to and including nuclear detonation?
20. Does the hazard assessment identify safety class/safety significant structure, systems, and components?
21. Does the hazard assessment identify weapon specific operational safety controls (OSC's)?
22. Does the hazard assessment identify safe guards, both preventive and mitigative, designed to minimize dominant risks?
23. Does the hazard assessment address weapon critical safety features that cannot have their configuration verified by non-intrusive means prior to disassembly?
24. Does the hazard assessment identify procedural steps with a potential for significant adverse consequences given a human error or equipment failure?
25. Does the hazard assessment employ human factor data and analysis techniques to determine the likelihood of accident sequences resulting from human error?

APPENDIX B - SAFETY CRITERIA COMPLIANCE FORM

Date:______________________

Task
Team:____

Deliverable:____

Description of Deliverable Function:

____

____

____

____

____

____

____

Description of Safety Criteria	Yes	No	N/A

SEPARATION

PAGE

Enclosure # 2

United States Government Department of Energy

memorandum

RECEIVED
00 MAY -2 PM 1:07
DNF SAFETY BOARD

Albuquerque Operations Office
Amarillo Area Office

DATE: MAR 30 2000

REPLY TO ATTN OF: AAO:ABS:JAF

SUBJECT: FY01 Pantex Safety Analysis Report Development and Implementation Plan

TO: B. J. Pellegrini, General Manager
Mason & Hanger Corporation

The subject fiscal year 2001 Plan is to be completed and submitted to AAO no later than **July 3, 2000.** This date supports fiscal year 2001 Work Authorization Documentation (WAD) preparation as well as commitments supporting DNFSB Recommendation 98-2, *Safety Management at the Pantex Plant*. The resource loaded, integrated project plans will be submitted formally as supporting documentation. The Safety Analysis Report Development and Implementation plan will include current year and fiscal year 2001 project activities at a level of detail commensurate with the currently approved fiscal year 2000 plan. Additionally, out-year activities, all activities required to complete the Facility Authorization Basis Upgrade per DOE Order 5480.23, *Nuclear Safety Analysis Report* for fiscal year 2002 to end of project, will be included. As such, it is expected to act as the "Plan and Schedule for Safety Analysis Reports" per the Order. Project activities for the out-years will understandably be of less detail; however, they will include program logic (interdependencies to other project/weapons program activities and commitments), schedule and cost. To maintain traceability to the baseline, change control documentation will be included as required.

The current individual project plans, which may or may not have been revised as required to support revisions to the Program Plan submitted to DOE on February 11, 2000, will be submitted within one week of receipt of this correspondence.

As an interim step in the preparation of the multi-year plan, MHC will prepare and submit a high level program logic diagram annotating all activities necessary to complete this project. The diagram shall be of sufficient detail to identify weapon program and Facility Authorization Basis activities, interrelations, dependencies and ties necessary to portray a clear picture of the critical path and relation of all activities required to reach the end state. A consensus on this level of planning is crucial to successful completion of the multi-year plan and supporting project plans.

Additionally, evaluate inclusion of thirty and seventy percent DOE interim review milestones for Authorization Basis development projects. Milestones would be defined in the plan by the products to be completed and submitted for DOE review at approximately thirty and seventy percent complete. Milestones would be applied to the Bays, Cells, Transportation and all future projects. These reviews are expected to be accomplished in parallel to the continued development of the Authorization Basis (i.e., project progress will not be stopped to facilitate the reviews) to the greatest extent possible. **This evaluation and the program logic diagram will be available for presentation to DOE on or before April 14, 2000.**

If you have any questions regarding this matter, please contact Don Brunell at extension 3053.

D. E. Glenn
Daniel E. Glenn
Area Manager

SEPARATION

PAGE

Enclosure # 3

MASON & HANGER

BENJAMIN J. PELLEGRINI, Ph.D.
Pantex General Manager
P.O. Box 30020
Amarillo, TX 79120-0020
806/477-6200

RECEIVED
00 MAY -2 PM 1:07
DNF SAFETY BOARD

MAR - 3 2000

Donald G. White, Contracting Officer
Amarillo Area Office
U.S. Department of Energy
Amarillo, Texas

Subject: Impact Analysis for Implementing DOE Technical Business Procedure (TBP) 901/A, "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Dear Mr. White:

In response to Defense Nuclear Facilities Safety Board (DNFSB) 98-2 Project Plan, Deliverables and Milestones Task 5.1.3, it has been determined that implementing TBP 901/A would not have any cost or programmatic impacts on activities currently in place. This TBP supercedes Engineering Procedure, EP401110/C, that was considered to be fully implemented and funded. TBP 901/A is identical to the Albuquerque Development & Production 56XB Chapter 11.3, "Seamless Safety Process". Implementation of this TBP will entail changes in Management Integration & Controls (MIC) S/RID Performance Criteria 1.1.2.a, 1.3.2.a, 1.5.2.a, 1.5.2.b, and 1.6.2.a, converting from EP401110/C to TBP901/A. These changes will be incorporated in MIC S/RID Revision 8.

The Impact Evaluation table is attached that documents the results of Mason & Hanger's (MHC) technical evaluation of the TBP. MHC will maintain its current level of commitments as currently required by the MIC S/RID.

If you have any questions or require further clarification, please contact Mr. P. Selde at extension 4431.

Very truly yours,

Benjamin J. Pellegrini
General Manager

BJP/rec

Attachment: Compliance Evaluation Table
Compliance Evaluation Guidance

cc: w/attachment
R. T. Brock, DOE/AAO, 12-36
M. E. Lamonica, DOE/AAO, 12-36
R. W. Young, DOE/AAO, 12-36

A Subsidiary of
DAY & ZIMMERMANN, INC.

GM00-00406-797

Compliance I[illegible] Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pt	I	Q	N	I	A	R	Ex	
1.1			X														X	Expository statement providing guidance, not requirements.
1.2			X														X	Expository statement providing guidance, not requirements.
1.3			X														X	Expository statement providing guidance, not requirements.
2.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.1.1 a-g ;)
2.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.1.1 a-g ;)
2.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.1.2 a)
2.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.1.2 a)
2.5					X			X						X	X		X	Previously implemented from EP401110 (MIC 3.3.3 a ; Std - 3014)
3				X							X			X	X			MIC criterion 1.5.2a will adopt this requirement.
4.1.1					X						X			X	X		X	Implemented in Std - 7401
4.1.2					X						X			X	X		X	Implemented in Std - 7401
4.1.3					X						X			X	X		X	Implemented in Std - 7401
4.1.4				X				X						X	X			MIC criterion 1.3.1a will adopt this requirement.
4.1.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance I . Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mt	Pt	I	Q	N	I	A	R	Ex	
4.2.1	X																X	This section applies to Design Agencies
4.2.1.1	X																X	This section applies to Design Agencies.
4.2.1.2	X																X	This section applies to Design Agencies.
4.2.1.3	X																X	This section applies to Design Agencies.
4.2.1.4			X														X	Expository statement providing guidance, not requirements.
4.2.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.9					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.2.10					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance Impact Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pt	I	Q	N	I	A	R	Ex	
4.2.11					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.3.9					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance [illegible]ct Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pr	I	Q	N	I	A	R	Ex	
4.4.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.9					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.10					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.11					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.12					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.4.13					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.5.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
4.5.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.1	X																X	This section applies to Design Agencies.
5.1.1	X																X	This section applies to Design Agencies.

Compliance [illegible]ct Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No	NA	P	Ex	R	D	G	M	Pv	Mi	Pt	I	Q	N	I	A	R	Ex	
5.1.2	X																X	This section applies to Design Agencies.
5.1.3	X																X	This section applies to Design Agencies.
5.1.4	X																X	This section applies to Design Agencies
5.1.5	X																X	This section applies to Design Agencies.
5.1.6	X																X	This section applies to Design Agencies.
5.1.7	X																X	This section applies to Design Agencies.
5.1.8	X																X	This section applies to Design Agencies.
5.1.9	X																X	This section applies to Design Agencies.
5.1.10	X																X	This section applies to Design Agencies.
5.1.11	X																X	This section applies to Design Agencies.
5.1.12	X																X	This section applies to Design Agencies.
5.1.13	X																X	This section applies to Design Agencies.
5.1.14	X																X	This section applies to Design Agencies.
5.1.15	X																X	This section applies to Design Agencies.
5.1.16	X																X	This section applies to Design Agencies.
5.1.17	X																X	This section applies to Design Agencies.
5.1.18	X																X	This section applies to Design Agencies.
5.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.2.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance [illegible]ct Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pr	I	Q	N	I	A	R	Ex	
5.2.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.2.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.2.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.3.9					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance Impact Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pr	I	Q	N	I	A	R	Ex	
5.3.10					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.4.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance Impact Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pi	I	Q	N	I	A	R	Ex	
5.5.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.5.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.2					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.3					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.4					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.5					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.6					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
5.6.7					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)

Compliance Evaluation
For
DOE TBP 901/A "Integrated Safety Process for Nuclear Weapons Operations and Facilities"

Statement Identifier	Statement Applicability						Control Attribute						Safety		Value Added		Exempt	Disposition/Discussion
No.	NA	P	Ex	R	D	G	M	Pv	Mi	Pr	I	Q	N	I	A	R	Ex	
5.6.8					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
6.1					X						X			X	X		X	Previously implemented from EP401110 (MIC 1.5.2 a)
7	X																X	Reference section, contains no requirements.

SEPARATION

PAGE

Enclosure #4

United States Government | Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

DATE: APR -3 2000

REPLY TO ATTN OF: AAO:SSTA:RWY

SUBJECT: Integrated Safety Management System Verification Report Corrective Actions

TO: Benjamin J. Pellegrini, General Manager, Mason & Hanger Corporation

The Amarillo Area Office has completed its validation of the revised closure packages for Integrated Safety Management System Verification Report Corrective Actions 1.A.3, 1.A.5, 1.A.10, NE.2-1, NE.2-2, NE.3-1, NE.3-2, NE.7-4, and NE.7-5. The closure packages have been determined to be sufficient to close each of these issues.

The Authorization Basis (AB) Manual, which is an essential element of the corrective actions for 1.A.3, 1.A.5, 1.A.10, NE.2-1, NE.2-2, NE.3-1, NE.3-2, and NE.7-5, is still in need of improvement. Comments identifying our specific areas of concern will be formally provided. However, the current revision of the AB Manual is sufficient to address our previous concerns with regard to scope, as it relates to the hazard analysis and control development for <u>all</u> facets of nuclear explosive operations, as well as roles and responsibilities of those involved in the AB, including those involved in the BIO upgrade for nuclear explosive operations.

If you have any questions, contact Bob Young at extension 3132.

Dennis J. Kelly for
Daniel E. Glenn
Area Manager

cc:
R. T. Brock, SSTA, AAO
D. G. Pellegrino, ISRD, AL
R. W. Keller, Compliance Management, MHC

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Pantex Plant

Integrated Safety Management

Authorization Basis Manual

REV 1

Change 0

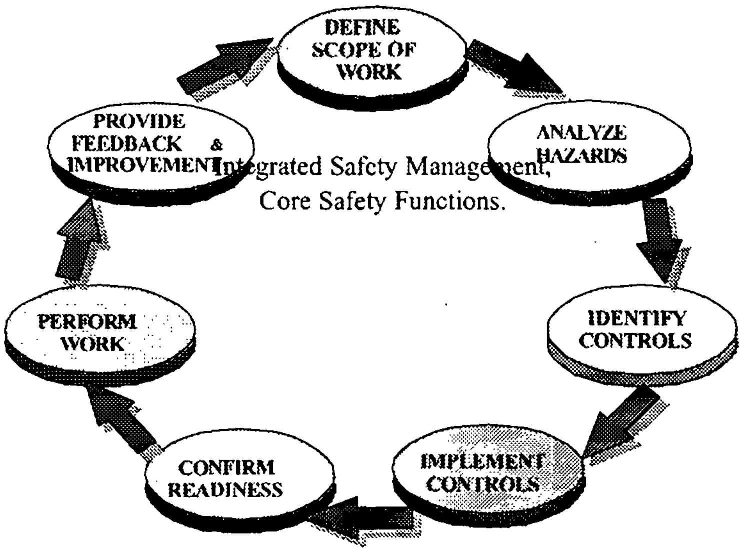
Authorization Basis Development & Management
Mason & Hanger
DOE Pantex Plant, Amarillo, Texas

February 21, 2000

PREFACE

This Manual represents the flow down from the Management Integration & Controls Standards/Requirements Identification Document (MIC-1000) to the implementing operational standards. In addition, this manual incorporates Authorization Basis Task Force recommendations and brings the world of Authorization Basis into the domain of Integrated Safety Management (ISM).

This Manual constitutes the compilation of the Authorization Basis common terms and definitions, roles and responsibilities, and how the Pantex Plant conducts business for the Department of Energy (DOE) following a "licensing" philosophy for mission activities recognized as the Plant Authorization Basis. This Manual is organized primarily in four main sections. Sections one through three provide the scope, introduction, and an overview of the Pantex Plant Authorization Basis and the integration of the Site, Facility, & Nuclear Weapon program's AB. The fourth section provides a high level overview of the AB documentation and the fifth section outlines the AB development process following the ISM Core Safety Functions, as shown below. Finally, the Appendices contain the common terms and definitions, roles and responsibilities, and the "how-to" guidance for those areas of the AB development process that do not have separate proceduralized guidance for use at the Plant.



ISSUE HISTORY & SUMMARY OF CHANGES

Revision No.	Change No.	Submittal Date	Description of Changes
REV 1 *Abmanuali.wpd*	0	02/21/00	Initial Issue.

LIST OF EFFECTED PAGES

Revision No.	Change No.	Submittal Date	Effected Pages
REV 1 *Abmanuali.wpd*	0	02/21/00	All pages

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

A	Anticipated
AB	Authorization Basis
AA	Authorization Agreement
ABCCC	Authorization Basis Change Control Committee
ABCD	Activity Based Controls Document
ABD&M	Authorization Basis Development & Management
AC	Administrative Control
AF&F	Arming Firing & Fuzing
AL	Albuquerque
BEU	Beyond Extremely Unlikely
BDI	Blast Door Interlock
BIO	Basis for Interim Operation
CAM	Continuous Air Monitor
CFR	Code of Federal Regulations
CHE	Conventional High Explosive
CSA	Canned Sub-Assembly
CSSM	Critical Safety Systems Manual
D&P	Development and Production
DOE	Department of Energy
DOE-STD	DOE Standard
DPTRA	Defense Program Transportation Risk Assessment
EG	Evaluation Guidelines
EI	Engineering Instruction
EIS	Environmental Impact Statement
ENDS	Enhanced Nuclear Detonation Safety
ERPG	Emergency Response Planning Guideline
ESD	Electrostatic Discharge or Environmental Sensing Device
EU	Extremely Unlikely
FHA	Fire Hazard Analysis
FMEA	Failure Modes and Effects Analysis
FRP	Fire Resistant Pit
FSAR	Final Safety Analysis Report
GID	General Information Document
HAR	Hazard Analysis Report
HAZOP	Hazard and Operability Analyses
HE	High Explosives
HED/D	High Explosive Detonation/Deflagration

H-gear	Handling Gear
HRA	Human Reliability Analysis
HVAC	Heating, Ventilation, and Air Conditioning
IHE	Insensitive High Explosive
IND	Inadvertent Nuclear Detonation
ISM	Integrated Safety Management
IWAP	Integrated Weapon Activity Plan
JCO	Justification for Continued Operation
LANL	Los Alamos National Laboratory
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
LLNL	Lawrence Livermore National Laboratory
M&TE	Metrology & Test Equipment
MHC	Mason & Hanger Corporation
MIC	Management Integration & Controls
MSAD	Mechanical Safe and Arm Detonator
MSDS	Material Safety Data Sheet
NCR	Non-Conformance Report
NE	Nuclear Explosive
NEA	Nuclear Explosive Area
NEHA	Nuclear Explosive Hazard Assessment
NELA	Nuclear Explosive Like Assembly
NEO	Nuclear Explosive Operation
NEEP	Nuclear Explosive Engineering Procedures
NEOP	Nuclear Explosive Operating Procedure
NES	Nuclear Explosive Safety
NES-MS	Nuclear Explosive Safety - Master Study
NESSG	Nuclear Explosive Safety Study Group
NESR	Nuclear Explosive Safety Rule
NPH	Natural Phenomena Hazards
O&I	Operations and Inspections
OSCs	Operational Safety Controls
OSHA	Occupational Safety and Health Administration
OSR	Operational Safety Requirement
ORR	Operational Readiness Review
PAP	Personal Assurance Program
PM	Preventive Maintenance
PP	Physics Package
PPE	Personnel Protective Equipment

PRA	Probabilistic Risk Assessment
PSO	Program Secretarial Office
PT	Project Team
QA	Quality Assurance
RA	Readiness Assessment
RAM	Radiation Alarm Monitor
SAR	Safety Analysis Report
SBRT	Safety Basis Review Team
SDD	System Design Descriptions
SER	Safety Evaluation Report
Site (S&S)	Site Safeguards & Security
SL	Safety Limit
SMT	Standing Management Team
SNL	Sandia National Laboratory
SSC	Structures, Systems, and Components
SST	Safe Secure Transport
S/RID	Standards/Requirements Identification Document
TLC	Target Level of Controls
TNT	Trinitrotoluene
TSD	Technical Support Document
TSR	Technical Safety Requirement
U	Unlikely
(U)	Unclassified
UOR	Unusual Occurrence Report
UPS	Uninterruptible Power Supply
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
WES	Warhead Electrical System
WSS	Weapons Safety Specification

1. SCOPE

The Pantex Plant Integrated Safety Management Authorization Basis (AB) Manual applies to all projects, programs, and activities across the Plant specifically requiring an Authorization Basis (Hazard Category 2 nuclear operations; facilities, nuclear materials, and nuclear explosive operations) by the DOE. The process for developing Authorization Basis documents, as described in this manual is organized following the philosophy and principles of Integrated Safety Management, as developed at Pantex and promulgated through the Management Integration & Controls Standards/Requirements Identification Document (MIC S/RID). The AB Process, presented in Section 5, is structured according to the seven core safety management functions of Integrated Safety Management (Define Scope of Work, Analyze Hazards, Identify Controls, Implement Controls, Confirm Readiness, Perform Work, and Provide Feedback & Improvement) as they are applied to the Development, Implementation, and Maintenance of AB documents. The Appendices of this manual contain the "how-to" for accomplishing each aspect of the process that requires additional direction.

2. INTRODUCTION

The Pantex Plant is in the process of shifting work practices from expert-based to standards-based. An important factor in this transition is the development of an AB which documents and outlines the operating basis for Nuclear Operations and Nuclear Explosive Operations conducted in Pantex Hazard Category 2 Nuclear Facilities. The purpose of this Manual is to assist AB developers in providing consistent and technically sound documents.

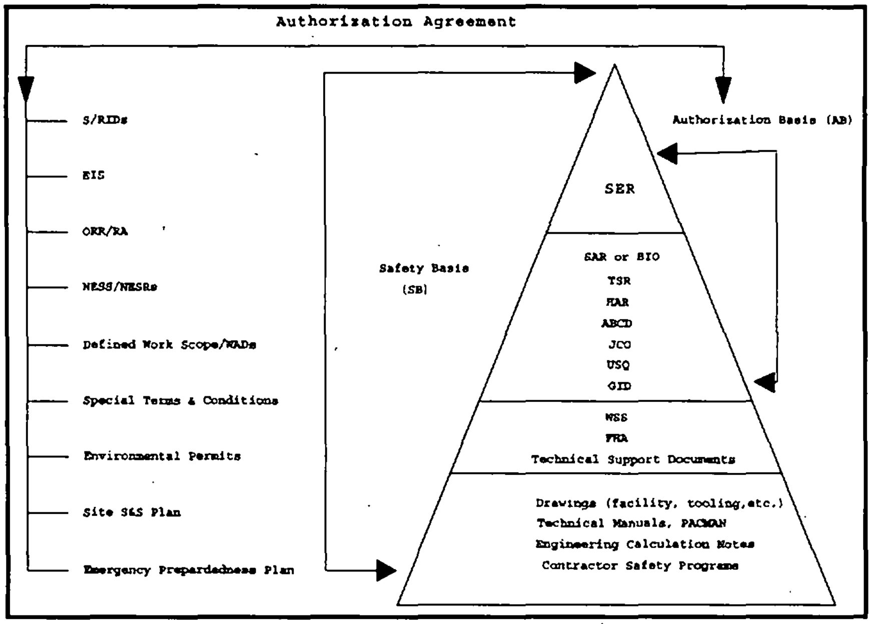


Figure 1: Relationship Between Plant Documents and the AA.

After the AB is developed, it is included in an Authorization Agreement (AA) between DOE and MHC. Figure 1 represents the relationship between the established Safety Basis, Authorization Basis, Plant programs, and Authorization Agreements for facilities and nuclear explosive operations. Authorization Agreements document key terms and conditions (controls and commitments) between DOE and MHC under which work on Hazard Category 2 nuclear weapon programs and nuclear material operations is authorized.

Authorization Agreements for individual covered operations are located in an appendix of the *Master Authorization Agreement for Nuclear Operations*, MNL-258600. This Master agreement was established between MHC and DOE/AL to establish and maintain the basis for authorizing Hazard Category 2 Nuclear Operations at Pantex.

3. AB DEVELOPMENT OVERVIEW AT PANTEX

The Authorization Basis at Pantex is developed at three levels: 1) Site; 2) Facility; and 3) Weapon Program. Each level establishes a specific portion of the complete Plant Authorization Basis. Although interrelated, each level is unique, which enables the AB process to avoid duplication of efforts in developing the complete AB for individual facilities and covered operations. Specific roles and responsibilities for organizations and individuals responsible for developing, implementing, and maintaining AB documents is presented in Appendix B.

Hazards associated with any work activity that have the potential to cause illness, injury or death to personnel or the public, or damage to the environment are systematically and uniformly identified and analyzed so that appropriate controls can be derived commensurate with the work to be performed. Systems to identify and analyze hazards are tailored to the expected risks. All hazards pertinent to the nuclear activities at the plant are identified and evaluated at one of the three levels stated above, as follows;

Site-Level
At the site level, hazards that are common to all nuclear facilities are identified and controls established. For example, the site-level hazard analysis considers external events which include threats from an aircraft crash, fires, and potential impacts from explosions in adjacent operating facilities. The analysis also considers natural phenomena hazards such as lightning, tornadoes, and flooding.

Facility-Level
At the facility level, first, the hazards analysis and controls' selection completed at the site-level is used. As such, all controls identified at the site-level are applicable for the activities conducted at the facility, unless the facility analysis explicitly takes exception to the site-level analysis and establishes alternative controls. At this level, additional analysis focuses on hazards that are specific to the facility. The analysis includes failure of facility systems, hazards associated with specific energy sources found in the facility, and external events that are dependent on facility design (e.g., seismic analysis of the facility and its systems and components).

Weapon Program-Level
At the program-level, first, the hazard analysis and control selection completed at the site-level and facility-level are used. As such, all controls identified at the site-level and facility-level are applicable for the activities conducted at the weapon program-level, unless the weapon program analysis explicitly takes exception to the facility-level or site-level analyses and establishes alternative controls. For individual weapon programs, additional hazard analysis focuses on the weapon/facility interfaces and interactions which represent potential threats or insults to the weapon. Additionally, the specific activities performed and the equipment introduced by the program are evaluated for the introduction of hazards. This evaluation considers equipment failures and personnel error.

4. AB DOCUMENTATION

Hazard analysis results and the associated controls that are derived from those analyses for the Site, Facility, and Weapon Programs are documented and approved by DOE. These documents constitute the Authorization Basis for conducting Nuclear Explosive Operations and Nuclear Material Operations. The Authorization Basis documents, containing the results of the hazard identification and evaluation and control selection at each of the three levels, are comprised of the following:

Site-Level

The Site-Level Authorization Basis is described in the *Pantex Plant Safety Analysis Report General Information Document* (GID), MNL-163944, and *Technical Safety Requirements for Pantex Facilities* (TSR) Document, RPT-SAR-199801. The format for the GID follows DOE-STD-3009-94 for Chapters 1 through 17. The format of the TSR follows DOE Order 5480.22.

Facility-Level

At the facility level, the Authorization Basis is described in Facility Safety Analysis Reports (12-116, *Special Nuclear Material Component Staging Facility Final Safety Analysis Report*, RPT-SAR-210640, and 12-104A, *Pantex Plant Final Safety Analysis Report Building 12-104A [Weapons Special Purpose Bay Replacement Complex]*), the *Basis for Interim Operation for Nuclear Facilities at the Pantex Plant* (BIO), MNL-00076, and the *Technical Safety Requirements for Pantex Facilities*. Facilities are grouped by general facility type including: Nuclear Explosive Cells, Nuclear Explosive Bays, Special Purpose Nuclear Facilities, Zone 12 Staging Facilities, Zone 4 Staging Facilities, and Transportation. The format of the facility BIO follows DOE-STD-3009-94 for Chapters 2 through 5. The technical safety requirements are incorporated in the Site-Level TSR Document.

Weapon Program-Level

Weapon Program Authorization Bases are captured in Hazard Analysis Reports (HARs) and Activity Based Controls Documents (ABCDs). The Authorization Bases for individual weapon programs are developed separately. The format for HAR documentation is provided in Appendix D, of this manual. The format for the ABCD follows the TSR guidance in DOE Order 5480.22.

Based on the frequency and the severity of consequence of identified hazards, hazard controls are classified as Safety-Class, Safety-Significant, or Important to Safety. The Safety-Class and Safety-Significant controls are further developed and established under DOE change control and promulgated at the Plant as the Technical Safety Requirements. The Important to Safety controls are documented in MNL-260121 and maintained under MHC change control. During the process of identifying controls, the defense-in-depth philosophy is applied.

Defense-in-depth is an approach to facility safety that builds in layers of defense against the release of hazardous and radiological material so that no one layer is completely relied upon. To compensate for potential human and mechanical failures, defense-in-depth is based on several layers of protection with successive barriers to prevent the release of hazardous materials to the environment. This approach includes measures to protect the public, site worker, and the environment from harm in case these barriers are not fully effective.

Typical categories for layers of defense include the following:

- Physical barriers to prevent the event. For example: A fire cabinet to prevent flammable liquid fires in the facility.
- Physical barriers to prevent the event from impacting the weapon. For example: The building structure provides a fire barrier to prevent external fires from initiating internal fires.
- Administrative Controls used to prevent the event. For example: Limiting ignition sources in the facility to prevent fires.
- Administrative Controls used to minimize the impact on the weapon from the event. For example: Combustible controls to limit the size and location of fires.
- Emergency procedures are used to lessen the impact of the release by evacuating personnel from the area of the release.

5. AB PROCESS

Following the establishment of mission objectives and resource targets, Organization Managers and Program Managers determine the specific work to be accomplished to meet those missions. Activities are then prioritized to make effective use of available resources.

The AB process begins with the identification of the activity and the location or facility in which the activity will take place. Throughout the analysis and preparation of the safety basis and Authorization Basis, the activities identified in Figure 2 will be systematically completed. These activities will be discussed as they fall in line with the ISM core safety functions in this section. The numbers in the boxes of Figure 2 correspond to the seven core safety functions (i.e., 1 = Define Scope of Work, 2 = Analyze Hazards, 3 = Identify Controls, 4 = Implement Controls, 5 = Confirm Readiness, 6 = Perform Work, 7 = Provide Feedback and Improvement). At the end of each of the core safety function sections, significant issues, required inputs, participants, deliverables, and procedures or guidance, pertinent to the activities in that functional area, are identified. The AB process is made up of activities (with multiple activities per core safety function as shown in Figure 2), each of which provides information that will be used by a later activity or activities. Since the output of one activity is the input of a subsequent activity, the activities will typically be performed in series. Also, many of the blocks are functionally interactive and, to the extent possible, the personnel performing these activities should establish good communications early in the process. Often, the number of iterations can be minimized if both, or all, people are involved early in the decision processes. The application of each block of work will be dependent on the scope of work of the AB development. For a new facility, all of the blocks will generally apply. For a revision to an existing AB, many of the blocks may be omitted. The applicable blocks are identified during the Define Scope of Work activity below.

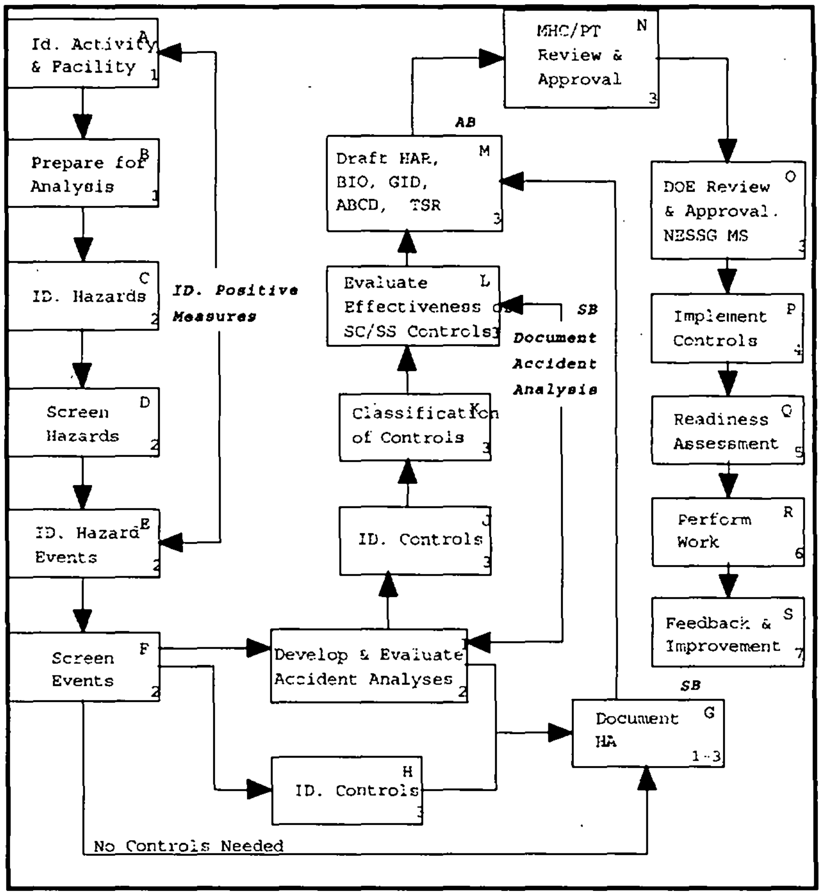


Figure 2: Site, Facility, and Weapon SB and AB Development.

5.1 Define Scope of Work

A comprehensive definition of the full scope of work to be accomplished in the development of AB documents is required to ensure the project manager, the customer, and the analysts fully understand the tasks that must be completed for an activity or facility, and in what sequence they must be accomplished. Figure 2 illustrates the interrelationship of tasks that, when completed, provide the AB Project Team Leader with the necessary information to complete development and implementation of an Authorization Basis. The scope of activities for Define Scope of Work encompasses Blocks A and B in Figure 2.

5.1.1 Identify Activity and Facility (Block A)

5.1.1.1 Site/Facility

At the site and facility level, the scope of work is developed by the AB Project Team Leader. Scope development generally includes an estimate of resources for completion of all the tasks in Figure 2 except blocks R and S. The AB Project Team Leader will review existing documentation for existing facilities and project documentation for new facilities to determine the level of effort that will be required to complete the AB development and implementation. The AB Project Team Leader will determine the number and skill level of the personnel that will be required to complete the defined activities, i.e., the AB Project Team members. Additionally, the AB Project Team Leader must determine if there are any contractor resources required to complete the scope of work. The AB Project Team Leader should consult with each of the AB Project Team members to obtain concurrence of the resource needs to complete the work and the duration of each activity.

5.1.1.2 Weapon Program

At the weapon program level, the scope of work is developed by the AB Project Team Leader in conjunction with the Weapon Program Manager and usually includes all the tasks in Figure 2 except blocks Q, R, and S. This phase of the Authorization Basis development includes establishing the weapon process(es) and the number of procedures that will be analyzed, identifying the chemical and/or radiological inventories to be evaluated, and identification of the location of the operations to be considered. For weapon programs, this is provided by the Program Manager or Program Engineer. Typically, some of this information is located in the weapon safety specification, existing NES studies, and weapon drawings.

The weapon process flow diagrams are generally provided by the Program Engineer based on information requested by the analysts. This is necessary to completely document the scope of the AB development activities.

5.1.2 Prepare for Analysis (Block B)

This scope of this task is to select the AB Project Team and to perform document reviews, conduct training, and to perform walk downs. The purpose of these activities is to familiarize the AB Project Team with the facilities, equipment, etc, and to train the participants on the AB development process including the hazard analysis process to be used.

Another key task is to begin the development of the Safety Basis Document List. This list is the key to successful maintenance of the safety basis and is used to control the safety basis documents. This development must begin at this stage of the AB development process. The Safety Basis Documents List is developed by the AB Project Team Leader and contains a summary listing of safety basis documents. The Safety Basis Document List, at this stage, is comprised of only the summary listing of safety basis documents. Later in the AB development process, the linkage between the supporting engineering calculations and other supporting analyses, the AB document(s) approved by DOE, and the operating procedures containing the controls will be added to the list.

5.1.3 *Significant Issues and Interfaces for Defining Scope of Work*

The following should be considered in defining the scope of work;

- Facility SSC operating history (for existing facilities).
- Coordination of the project activities with other site activities.
- Development and team review of a facility description document that contains all information to be used for performing analyses in support of Authorization Basis development.
- Determination of existing AB or safety basis documents that are to be used and maintained.
- Facility Manager participation including review and approval of facility baseline information to be used.
- Determination of the number and type of safety bases documents that will be required to be completed (e.g., calculations, studies, drawings).

- Estimate of resources and durations for MHC, DOE, and Design Agency reviews.
- Estimate of the resources required to implement the controls, including time and resources to develop documents and perform physical work.
- Changes to the facility or project documents may result in changes to the resources and time required to develop and implement the AB. A change control process is required to ensure proper control of the baseline.
- Operating history, information about Weapon Specific NESRs.
- Identification of Site and Facility AB documents and controls applicable to the weapons.
- Amount of Design laboratory involvement in the AB development process.
- The AB Project Team Leader leads the effort to develop scope and resource requirements, however, at a minimum, the Facility Manager or Weapon Program Manager should review and approve the process baseline information early in the process to ensure agreement with the information.

5.1.4 *Required Input for Defining Scope of Work*

The following information is required to generate the AB development baseline

- Facility or project documents
- Weapon controlled documents (Weapon Safety Specification, etc.)
- Activity definition

5.1.5 *Participants for Defining Scope of Work*

The following participants should be consulted in the development of the scope of the AB development and implementation task:

Facility AB Projects
- AB Project Team Leader
- Project Engineer
- Risk Analysts
- Facility Manager(s)
- Facility Engineers
- Production (Project) Personnel

Weapon AB Projects
- Program Manager
- AB Project Team Leader
- Program Engineer
- Hazard Analysts
- Production Technicians
- Design Agency Personnel

5.1.6 *Deliverables for Defining Scope of Work*

- The AB scope will be documented in an AB Project Plan. For new facilities, the AB Project Plan can be included in the overall facility Project Plan. The AB Project Plan provides the baseline scope, cost, and schedule for all activities to develop, issue, and implement the AB documents.
- List of Safety Basis documents

5.1.7 *Procedures, Guides, and Other Tools for Defining Scope of Work*

- Appendices D & E of this manual for HAR documentation and completeness requirements.
- Interagency Technical Business Practice (TBP) TBP-901/A, Integrated Safety Process for Nuclear Weapons Operations and Facilities, February 7, 2000
- Appendix B of this manual for Roles and Responsibilities in creating AB documents
- Controlled document number E9900000057, *List of Authorization Basis Documents for Pantex Nuclear Facilities and Nuclear Explosive Operations*

5.2 Analyze Hazards

This phase of AB development encompasses blocks C, D, E, F, G, & I as shown in Figure 2. The application of these activities is in accordance with the AB Project Plan. The scope of this activity includes the identification of the hazards and the subsequent evaluation of those hazards.

5.2.1 Identification of Hazards (Block C)

5.2.1.1 Site Level

At the Site Level, the hazards considered are those external events that could result in unacceptable electrical, mechanical, thermal, or chemical impact to the facility and the contained inventory. The facility inventory is considered in determining the unacceptable impacts. The external events evaluated at the site-level are those that impact all facilities without consideration of specific facility design.. External events considered are:

- Tornados and High Winds
- Lightning
- Fire
- Flooding
- Chemical Release
- Aircraft Crash
- External Explosions

5.2.1.2 Facility Level

At the Facility Level, the hazards evaluated are those external to the facility and those that result from energy sources within the facility. Additionally, the specific radiological and chemical inventory in the facility is identified. Types of hazards considered are:

- External Events (Seismic, Tornado, Flood, Lightning, Fire)
- Internal Fire
- Energy sources (electrical, air, vacuum, HVAC, gas, steam,)
- Radiological inventory (type, form, quantity, location)
- Chemical inventory (type, form, quantity, location)
- HE inventory (quantity, form, location)

5.2.1.3 Weapon Program Level

At the weapon program level, the hazards evaluated are those at the interface between the weapon and the facility, those associated with the hazards intrinsic to the weapon, those introduced by the weapon program into the facility, and those associated with the activities performed on the weapon. Types of hazards considered are:

- Facility environments (impact, fire, electrical, chemical, thermal)
- External events (tornado, seismic, flood, fire, lightning)
- Weapon program equipment failure
- Personnel error
- Radiological inventory of weapon (type, quantity, form, location)
- Chemical inventory of weapon (type, quantity, form, location)
- HE inventory of weapon (type, form, quantity, location)
- Combustible and flammable inventory introduced by weapon program (type, quantity, form, location)

5.2.2 Screen Hazards (Block D)

The purpose of this activity is to identify those hazards that require further analysis in the AB process. This screening identifies those hazards that have been previously evaluated and are currently controlled through existing Pantex Plant programs/processes (e.g., Occupational Safety & Health Program, Explosive Safety Program). In addition, hazards that are not of sufficient magnitude to require further evaluation are screened.

Hazards that do not require further evaluation because they are currently controlled through existing programs are documented and the controlling program(s) identified.

5.2.2.1 Facility Level

Hazards that have been evaluated at the Site-level are screened by providing reference to the specific Site-Level evaluation that was performed. Care must be taken to ensure that the referenced evaluation is applicable to the facility specific sensitivity to the hazard.

5.2.2.2 Weapon Level

Hazards that have been evaluated at the Site and Facility levels are screened by providing reference to the specific Site-Level or Facility-Level evaluation that was performed. Care must be taken to ensure that the referenced evaluation is applicable to the weapon-specific sensitivity to the hazard.

5.2.3 Identification of Hazard Events (Block E)

Based on the hazards identified in the previous step, the energy sources present, and the activities to be performed, the hazardous events are identified. Hazardous events identify the method or mechanisms by which hazardous material can be released or how the energy source can be released to an unwanted location and result in a serious personal injury or fatality or an energy input to the weapon or hazardous material.

5.2.3.1 Unmitigated Hazard Analysis

An unmitigated hazard analysis is performed to determine the highest risk that can result from the hazardous events. The unmitigated hazard analysis considers the total material at risk and the maximum available energy. To obtain the highest possible risk from the analysis, the unmitigated hazard analysis does not generally consider the availability of safety features. When it is not practical to exclude a specific safety feature, that feature may be used in the analysis and documented as an initial condition. The initial condition will be developed as a Safety-Class control.

The unmitigated hazard analysis develops a conservative frequency and consequence for the hazardous event. The evaluation is generally qualitative with little or no analysis. The determination of the frequency is generally based on published literature, past operating experience, industry experience, or expert judgement. The frequency is expressed in one of the following bins: Anticipated, Unlikely, Extremely Unlikely, Beyond Extremely Unlikely, or Sufficiently Unlikely.

The consequence for the hazardous event is generally qualitative with little analysis. The consequence is generally categorized as one or more of the following: worker serious injury or fatality, aerosol release of radioactive material, tritium release, Fire with dispersal, High Explosive Detonation/Deflagration with dispersal, or Inadvertent Nuclear Detonation (IND). Specific dispersion quantities can be calculated at this stage of the analysis, but generally dispersion analysis is limited to the accident analysis process.

Events that are evaluated and controlled under a Plant Program or National Code or Standard, are not evaluated during the AB development. The Pantex program or National Code or Standard is identified in lieu of preforming the hazard analysis.

During the hazard identification, hazardous event identification, and unmitigated hazard analysis, positive measures are identified that can later be selected to provide a safety function.

5.2.3.1.1 Facility-Level Unmitigated Hazard Analysis

For hazardous events that have been analyzed at the Site-Level, the event is not re-evaluated at the Facility Level. Care must be taken to ensure that the referenced analysis is applicable to the facility-specific sensitivities.

5.2.3.1.2 Weapon Program Unmitigated Hazard Analysis

For hazardous events that have been analyzed at the Site-Level or Facility-Level, the event is not re-evaluated at the Weapon Program level. Care must be taken to ensure that the referenced analysis is applicable to the weapon-specific sensitivities.

5.2.4 Screen Hazard Events (Block F)

This step in the AB process screens events based upon estimates of the frequency and consequence of event occurrences. This screening provides one of three conclusions:

- The risk of the event is low enough so as to not require identifying controls (continue at Block G, Section 5.2.5),
- Specific controls are identified based on the unmitigated hazard analysis (continue at Block H, section 5.3.1), or
- The event must be further developed and analyzed in an accident analysis (continue at Block I, section 5.2.6).

5.2.5 Document Hazard Analysis (Block G)

The Hazard Analysis, Engineering Calculations, and other supporting documents will be documented and maintained as safety basis documents. For Weapon Programs, the hazard analysis is captured in a Technical Support Document. The hazard analysis must include the following:

- List of hazards identified.
- Results of hazard screening process.
- Hazard tables that identify all hazardous events evaluated with the unmitigated frequency and consequence, identification of screened hazards with reference to a Pantex program, National Consensus code or standard for screened events.
- Referenced site or facility hazardous event, as applicable, for events that are not evaluated but are referenced to previously performed analyses.
- Identification of positive measures for each event.

5.2.6 Develop Accident Analyses (Block I)

For the events to be further developed, accident scenarios are generated. More than one hazardous event can be evaluated under an accident scenario. Each accident scenario provides sufficient information to identify the initiating condition(s), any enabling conditions that occur during the progression of the accident, and all consequences that can result from the accident. The accident scenario must provide sufficient information to allow the reader to understand how the accident occurs. Additionally, the scenario must provide sufficient information to support the development of the frequency of the accident and to develop controls to prevent or mitigate the accident. The unmitigated frequency and consequence of the accident is determined. Generally, the analytical bases developed for the accident analysis is considerably more comprehensive than the evaluation performed for the hazardous event analysis. This detailed evaluation will generally result in a less conservative result than that developed for the hazard analysis.

The unmitigated accident analysis results in one of two conclusions:

- The risk of the accident is low enough so as to not require identifying controls (continue at Block G, Section 5.2.5)

- Specific controls must be identified (continue at Block J, Section 5.3.1)

5.2.7 *Significant Issues and Interfaces for Analyzing Hazards*

- The information used to identify and evaluate the hazards must be documented and those documents must be under change control.
- The facility or program manager should be involved in the activities to better ensure acceptance of the results.
- Care must be taken to not make assumptions or to inadvertently credit controls (initial conditions). Assumptions and Initial Conditions must be developed as Critical Safety Controls.

5.2.8 *Required Input for Analyzing Hazards*

The following are required to perform the Hazard Evaluation scope of work:

- Site, Facility, or Weapon Program documents
- AB Project Plan

5.2.9 *Participants for Analyzing Hazards*

- AB Project Team Leader
- Hazard and Accident Analysts
- Facility or Program Manager
- Design Agencies, as required

5.2.10 *Deliverables for Analyzing Hazards*

- Hazard Analysis Document
- Accident Analysis Documents, if applicable. For accident analyses, separate documents may be issued or the analyses can be included in the AB document.

5.2.11 *Procedures, Guides, and Other Tools for Analyzing Hazards*

- Appendix C of this manual for site/facility/weapon hazard/accident analysis.
- Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, *Nuclear Safety Analysis Reports*, DOE-STD-1027-92, U.S. Department of Energy, Washington, DC, December 1992
- DOE-STD-3009, *Preparation Guide for U.S. Department of Energy Non-reactor Nuclear Facility Safety Analysis Reports*, U.S. Department of Energy, Washington, DC.

- American Institute of Chemical Engineers, *Guidelines for Hazard Evaluation Procedures*, 1992

5.3 Identify Controls

5.3.1 Identify Controls (Blocks H and J)

Based on the hazard and accident analyses, controls are derived to prevent or mitigate the events. The controls will generally be selected from the positive measures that were identified during the hazardous event development. If positive measures do not exist, new controls are developed.

There are two types of controls: engineered features and administrative controls. Engineered features may be passive or active. Administrative controls may be specific or programmatic. The following priority shall be considered in the identification of controls:

- Preventive controls over mitigative controls
- Engineered features over administrative controls
- Passive engineered features over active engineered features
- Specific administrative controls over programmatic controls

When administrative controls are selected, the control shall be tied to a Pantex program (e.g., Training, Explosive Safety Program, etc.).

5.3.2 Classification of Controls (Block K)

Based on the unmitigated analysis and the derived controls, the controls are classified. Controls classification is based upon event frequency and consequence using the following:

Safety-Class is applied to controls that:

- Prevent or mitigate the results of an event with a consequence greater than 25 rem offsite for events with a frequency greater than 1E-6.
- Prevent an IND for events with a frequency greater than 1E-8.

Safety-Significant is applied to controls that:

- Prevent or mitigate the results of an event with a consequence greater than 100 rem onsite for events with a frequency greater than 1E-6.
- Prevent or mitigate the results of an HED/D for events with a frequency greater than 1E-7.
- Prevent an event that results in a serious worker injury or fatality.
- Prevent or mitigate the results of an event with a consequence greater than ERPG-2 for events with a frequency greater than 1E-6.
- Are evaluated, subjectively, to provide a significant contribution to Defense-in-Depth for events that do not exceed the above criteria. No frequency or consequence evaluation is required.

Important to Safety is applied to controls that do not provide a Safety-Class or Safety-Significant function but are considered to provide sufficient benefit to warrant the cost of capturing the control in the configuration management program.

5.3.3 Evaluate Effectiveness of SC and SS Controls (Block L)

All Safety-Class and Safety-Significant controls are required to be further defined in terms of functionality, reliability, and availability to establish the effectiveness of the control. The effectiveness of the SC and SS controls are determined to ensure the application of the control to the event provides a sufficient reduction in risk.

5.3.3.1 Functionality

Assuming the control is completely reliable and always available, the control must be able to prevent or mitigate the event under all conditions. If there are some conditions for which the control will not provide the required function, then it is not considered a control. Either the positive measure may be enhanced or one or more positive measures may be combined to provide the required control under all conditions.

5.3.3.2 Reliability

Assuming the control provides the function and is always available, the degree (conditional probability) that the control will not fail when required to provide the safety function is evaluated. The reliability of the control is generally based on the design of the control for engineered features, and the level of operator intervention required for administrative controls. Reliability can be expressed numerically or qualitatively described. Reliability of engineered features can be increased by performing design changes and through more frequent surveillance, preventive maintenance, etc. Reliability of administrative controls can be increased by training, verification of the activity, more frequent surveillance, etc.

5.3.3.3 Availability

Assuming the control provides the function and is completely reliable, the percentage of time that the control will be on-line is evaluated. The availability of the control is generally based on the design, maintenance, and inspection for engineered features and the level of operator intervention required for administrative controls. Availability for engineered features can be increased by limiting the time that the control is taken out of service, providing installed redundancy, etc. Availability for administrative controls can be increased by providing more resources.

5.3.3.4 Residual Risk

The evaluation of the effectiveness is incorporated into the hazard and accident analyses to determine the residual risk considering the control is in place. If the controls selected effectively prevents or mitigates the event to an acceptably low residual risk, no additional controls are required. If the effectiveness is not sufficient, additional controls are selected, and the process continues at Section 5.3.

After the development of te effectiveness of the controls has been completed, the residual risk on operations, considering controls, is assessed. The residual risk is compared to either (or both) the frequency/consequence criteria of the EGs or the Target Level of Controls (Ref. D&P Manual Chapter 11.5). Both of these are treated as goals and are not an indication of an acceptable risk. For IND events, the goal is to select at least two controls. However, they are used as a benchmark to demonstrate the level of residual risk under the controlled operation.

5.3.4 Development of Controls

For each SC and SS engineered feature, the following shall be developed:

- Safety function
- Functional Requirements
- Critical Characteristics

For each administrative control and Important to Safety Controls, the safety function shall be identified.

5.3.4.1 Safety Function

Based on the analyses, the safety function of the control is identified. The safety function provides a description of what the control must do and under what conditions it must function. The safety function includes either prevent or mitigate in the wording. Examples of safety functions are:

- Prevent a tornado missile from impacting the nuclear explosive.
- Mitigate the release from an HED/D by containing the hazardous material following the explosion.

5.3.4.2 Functional Requirements

Based on the Safety Function and analyses, the functional requirements are established. The functional requirements provide measurable parameters. Examples of functional requirements are:

- Stop a 2 x 4 of 10 pounds traveling at 100 mph from penetrating the facility
- Limit the release of radioactive material to less than 25 rem at the site boundary following a high explosive detonation of 25 pounds of HE.

5.3.4.3 Critical Characteristics

Based on the Functional Requirements, the specific engineered feature, and the analyses, the required parameters are identified. Examples of critical characteristics are:

- The walls are designed of 2000 psi concrete at least 12 inches thick, the doors are at least 0.25 inches thick SA-36 steel.
- The total leak area of the facility is less than 24 square inches

5.3.5 Draft AB Documents (Block M)

During this phase of AB development, in addition to drafting the AB documents for eventual DOE approval, the AB Project Team Leader will draft an AB Document Implementation Plan to accompany the AB documents through their review and approval process.

5.3.5.1 Site Level

At the site level, the results of the AB development process is documented in the GID and the TSR. The GID is developed in accordance with the guidance provided in DOE-STD-3009-94, specifically formatted in accordance with Chapters 1 through 17 of the DOE standard. The TSR is developed in accordance with the guidance in DOE Order 5480.22..

5.3.5.2 Facility Level

At the facility level, the results of the AB development process is documented in the BIO or a SAR, and the TSR. The BIO is developed in accordance with the guidance provided in DOE-STD-3009-94 as delineated in Chapters 2 through 5. The TSR information is developed in accordance with DOE Order 5480.22 and is added to the TSR developed at the site level. For facilities that have a stand-alone SAR and TSR, the SAR is developed in accordance with DOE-STD-3009-94 and the TSR is developed in accordance with DOE Order 5480.22.

5.3.5.3 Weapon Program Level

At the weapon program level, the results of the AB development are documented in a HAR and an ABCD. The HAR is developed in accordance with the format and content guidance provided in Appendix D of this manual. The ABCD information is developed in accordance with DOE Order 5480.22 and is added, as an appendix, to the Site TSR.

5.3.6 MHC and PT Review and Approval (Block N)

After the AB document is generated and signed by the originator(s), it is reviewed and approved by MHC and the Project Team (Weapon Program) prior to being submitted to DOE. The following reviews are to take place:

5.3.6.1 Peer Review

The AB document is first reviewed by the person(s) qualified to create the document, but who did not participate in the development. This review is to ensure the document is technically accurate and complete.

5.3.6.2 Manager Review and Approval

Following a peer review, the originator's manager reviews the document to verify that it meets the quality requirements of the organization.

5.3.6.3 Technical Review and End User Review

The AB document is reviewed by personnel required to ensure the document has adequately incorporated all information and that all controls can be implemented as described. This review is conducted under the centralized review process. The review will include engineering, facility manager, program manager, Explosive Safety, Nuclear Safety, and Nuclear Explosive Safety at a minimum. The review comments and responses must be documented.

5.3.6.4 Project Team Review

For weapon program AB documents, a review by the Project Team is required to ensure the document has adequately incorporated all information. The review is lead by the Program Manager. The review may be formal with documented comments and responses, or the review may be performed informally. The Program Manager shall determine the formality of the review.

5.3.6.5 Senior Technical Advisor Review

The AB documents are reviewed by the MHC's Senior Technical Advisor for technical accuracy and completeness, and to ensure the document meets MHC criteria for a quality document. The review comments and responses must be documented The Senior Technical Advisor Review is part of the Technical Review process.

5.3.6.6 ABCCC Approval

Following the Technical Review and End User Review, AB documents are presented to the Authorization Basis Change Control Committee for approval. The ABCCC has representatives from all organizations that may be impacted by the AB. The purpose of the ABCCC approval is to verify that all organizations have participated in reviewing the documents and that all comments are resolved.

5.3.6.7 MHC Approval

Following approval by the ABCCC, AB documents are routed for General Manager approval. The routing includes the Senior Technical Advisor and the General Manager.

5.3.7 DOE Review and Approval (Block O)

AB documents are submitted to DOE AAO for review and approval. It is anticipated that there may be comments received the first time these documents are submitted. These documents are generally reviewed by a Safety Basis Review Team (SBRT) comprised of DOE employees and subcontractors.

Formal comments received from DOE and the responses to the comments are formally documented and transmitted back to DOE.

AB document comments received from DOE that require revisions to the document must be processed through the MHC Review and Approval process identified above in Section 5.3.6. To expedite comment resolution, the personnel that originally reviewed the document(s) should be included in the resolution process. AB document comment and resolution forms should be used to conduct these MHC reviews, as this will focus the review on AB document changes only.

DOE approval of AB documents may include conditions of approval (COA). These conditions of approval are included in the Safety Evaluation Report (SER) provided by DOE. Depending on the conditions and requirements included in the SER, the comments may be resolved without additional approval by DOE, or the documents may have to be resubmitted following resolution of the conditions of approval.

After the AB has been approved by DOE, all changes to the facility or program must be reviewed for potential changes to the AB that would require DOE approval. The USQ process is used to determine if the change to the safety basis would result in a change that would require DOE approval.

5.3.8 *Significant Issues and Interfaces for Identifying Controls*

- Control selection should include input from the facility manager/program manager.
- All input information must be in configuration controlled documents.
- The classification of controls is a functional classification and does NOT infer specific design criteria. However, past DOE practices had used an approach similar to the NRC of establishing a predetermined set of design requirements so that deterministic analysis could be used and the controls could be assumed to have a reliability and availability of unity. In a probabilistic approach, the assumption of unity is not applicable, therefore, the pre-defined design requirements are not necessarily applicable. Care must be taken to demonstrate that the control selected will perform to the required reliability and availability documented.

5.3.9 *Required Inputs for Identifying Controls*

The following input documents are required to identify controls:

- Unmitigated hazard and accident analyses
- Identification of controls already credited for the event
- Facility or Weapon design documents
- Description of Pantex programs
- Positive Measures

5.3.10 *Participants for Identifying Controls*

- AB Project Team Leader
- Facilities/Program Engineer
- Hazard and Accident Analysts
- Facility or Program Manager

5.3.11 *Deliverables for Identifying Controls*

- For Weapon Programs, an ABCD to Append to the Site TSRs.
- For Weapon Programs, a completed and DOE approved Hazard Analysis Report.
- Updates to Safety Basis Document List, as required.
- Implementation Plan, (identifying activities required to implement controls).
- For Site or Facility AB controls, revision to the Site TSRs.

5.3.12 *Procedures, Guides, and Other Tools for Identifying Controls*

- Plant Standard STD-0143, *Technical Procedures System*
- Appendix D of this manual for weapon hazard analysis form and content.
- Appendix E of this manual for HAR completeness criteria.
- Plant Standard STD-0148, *Integrated Processes for Seamless Safety (SS-21)*
- U.S. Department of Energy Standard, *Hazard Analysis Reports for Nuclear Explosive Operations*, DOE-DP-STD-3016-99, Washington D.C., February 1999
- Plant Standard STD-3073, *Implementation of Authorization Basis Changes*
- MNL-00054, *Configuration Management Conduct of Operations*

5.4 Implementation Controls (Block P)

AB controls are implemented based on the type of control, engineered or administrative, and are implemented in work processes through programs and procedures. Complete implementation generally requires developing documentation, performing physical modifications, and conducting training, as appropriate.

5.4.1 Developing Documents

Engineered features must be captured in configuration controlled documents. The engineering document that captures the physical configuration of SSCs is developed, or revised, to ensure that any proposed changes to SSCs do not impact the safety function. For SC and SS controls, a Facility Design Description (FDD) or System Design Description (SDD) is used to capture the physical configuration. Additional engineering documents (drawings) may be used. In addition to the physical configuration for engineered features, either surveillance requirements or in-service inspection requirements must be documented. For SC and SS controls, the surveillance and in-service inspection requirements are documented in the TSR/ABCD. Procedures must be in place to ensure the activities are performed. Additionally, there may be training requirements for the personnel that are going to perform the activities.

Administrative controls must be captured in controlled documents. Administrative controls are generally documented in Facility Standards, Nuclear Explosive Operating Procedures, or Plant Standards. Other methods or documents may also be used. Generally, for administrative controls, some level of training is required.

5.4.2 Safety Basis Document List

A key to successful implementation of the AB controls is to provide the assurance that each control has been properly flowed down to the shop floor via operating procedures, training, drawings, etc. Additionally, there must be a mechanism to review changes that might defeat the controls. The Safety Basis Document List is the tool used to facilitate the flow down of controls. The specific project safety basis document list was begun early in the AB development process and now, at this stage, is completed with the association of the hazardous event or accident scenario to the control and to the document(s) which implement the control.

5.4.2.1 Safety Basis Document List Development

The AB Project Team Leader is responsible for the development of the Safety Basis Document List. The list contains a compilation of technical calculations and supporting analyses, controls, (engineered and administrative), implementing documents, (Facility, Safety, NEOPs, NEEPs, EIs, IOPs, Standing Orders, Drawings, etc.), linkage to the supporting hazard analysis events for each AB control, and process procedures which supports AB reviews.

Supporting design documents to be included in the list must be clearly identified with the document title and the document date or revision number. Safety Basis documents for each control must identify the boundary of the SSC that provides the safety function and be included in the configuration management program.

Administrative controls are listed along with their corresponding implementing procedure(s). These procedures, with the effective date or revision number, are added to the Safety Basis Document List.

5.4.2.2 Safety Basis Document List Documentation

The Pantex Safety Basis Document List control's flow down to the procedures are currently in an assortment of individual Pantex Manuals which were created for specific weapon programs and the lightning JCO implementation. An example flow down (partial) from the lightning JCO controls is shown in Table 1.

Table 1: Example Listing of Controls Flow Down.

Shop Floor Document	Control	Shop Floor Document Page, and Paragraph or Step Number	Analysis Scenario Reference
STD-3161, Issue 2, 12/20/99	LCO: Lightning Detection and Warning System	Page 10, Step 5.2	Lightning JCO Scenario Reference JCO-99-002: 3.3.2.3, 3.3.2.4, 3.3.2.6, 3.3.2.7, 3.3.2.8, 3.3.2.9, 3.3.2.12, 3.3.2.15
STD-3161, Issue 2, 12/20/99	SR: Visual verification of the Lightning Detection and Warning System on a shiftly basis	Page 10, Step 5.3	Lightning JCO Scenario Reference JCO-99-002: 3.3.2.3, 3.3.2.4, 3.3.2.6, 3.3.2.7, 3.3.2.8, 3.3.2.9, 3.3.2.12

5.4.2.3 Safety Basis Document List Control

The Safety Basis Document List is controlled and maintained by the ABD&M Department. This Department is responsible for processing all changes/additions/deletions to the list.

5.4.3 *Significant Issues and Interfaces for Implementing Controls*

- Ensure implementing documents for controls are marked.
- Ensure a complete list of all operating procedures are maintained as part of SB/AB configuration control.
- Ensure accurate translation of the AB controls from the approved AB documents to the operating procedures.

5.4.4 *Required Inputs for Implementing Controls*

- Implementation Plan
- Documents implementing AB controls
- Completed and approved AB documents listing all the engineered and administrative controls

5.4.5 *Participants for Implementing Controls*

- AB Project Team Leader
- Project Engineer
- Facility Manager
- Facilities Organization Personnel
- Training Organization Personnel
- Weapon Engineering Organization Personnel
- Other affected Organizations

5.4.6 *Deliverables for Implementing Controls*

- Updated Safety Basis Documents List.
- New or revised safety basis documents.

5.4.7 *Procedures, Guides, and Other Tools for Implementing Controls*

- Plant Standard STD-0143, *Technical Procedures System*
- Plant Standard STD-3073, *Implementation of Authorization Basis Changes*
- MNL-00054, *Configuration Management Conduct of Operations*

5.5 Confirm Readiness (Block Q)

Once the controls have been fully implemented and all other activities required to become operational have been completed, a declaration of readiness is made by the Facility Manager or Program Manager. It should be noted that the AB development and implementation is just a part of the overall activities to become ready to operate.

The declaration of readiness is the start of the confirm readiness process. Generally, for a facility or program with a new AB or an AB that has been significantly revised, a Readiness Assessment is performed. The confirm readiness process consists of up to three separate activities: Technical Assist (Review), Contractor Readiness Assessment, and DOE Readiness Assessment.

The first step in the confirm readiness process is for the Weapon Program Manager or the Facility Manager to create a Plan of Action containing the scope of the pending readiness assessment, prerequisites for the readiness assessment, and designation of the startup authority. These Managers will also deliver to the General Manager a declaration of readiness letter indicating that the project is prepared for a review.

5.5.1 Technical Assist

The second step of the confirm readiness process is to perform a Technical Assist. The Technical Assist is used to provide independent verification that the facility or program is ready. The formality of the Technical Assist can be tailored to meet the individual needs of the operation. At a minimum, a Technical Assist Plan is issued and a final report is issued. Formal comments with responses may be issued, but are not required.

5.5.2 Contractor Readiness Assessment

The third step of the confirm readiness process is the Contractor Readiness Assessment (CRA). The CRA is performed by an independent team of people. The CRA is a formal process with documented findings and observations and documented closure of findings. Findings are classified as pre-start items or post-start items. All pre-start items must be closed prior to proceeding to the next step. Post-start items must have a closure plan developed prior to progressing to the next step.

A Readiness Assessment Report is issued, documenting all observations, pre-start findings, and post-start findings. Following closure of the pre-start items and the CRA Team's approval of the post-start action plans, the Facility Manager or Program Manager develops a "Readiness to Proceed" letter to be issued by the MHC General Manager to DOE.

Changes to the facility, program, or associated documents must be reviewed for potential changes to the AB documents. This review is performed under the USQ process.

5.5.3 DOE Readiness Assessment

DOE determines if a readiness assessment is required. If required, DOE conducts a readiness assessment. All findings from the assessment are documented and provided to MHC for resolution. Pre-start findings must be closed prior to commencing operations. Post-start findings must have an action plan developed and approved by DOE.

Any changes to the facility, program or associated documents must be reviewed for potential changes to the AB documents. This review is performed under the USQ process.

5.5.4 *Significant Issues and Interfaces for Confirming Readiness*

- Provide objective evidence for closure of the RA findings.
- CRA lessons learned for use by future Projects.

5.5.5 *Required Inputs for Confirming Readiness*

- AB Documents approved and issued.
- Updated Safety Basis Document List.
- Implementing SB documents.
- Training records for impacted personnel.

5.5.6 *Participants for Confirming Readiness*

- AB Project Team Leader
- Applicable Subject Matter Experts
- CRA Team Leader
- CRA Assistant Team Leader
- TA Team Leader

5.5.7 *Deliverables for Confirming Readiness*

- Plan of Action containing the scope of the pending readiness assessment, prerequisites for the RA, and designation of the startup authority.
- Declaration of readiness to conduct a readiness assessment delivered to the General Manager.
- Technical Assist report including documentation of all findings.
- Readiness Assessment Final Report containing; 1) Form 1, *Record of Review*; 2) Form 2, *Deficiencies* (pre-start, post-start, observations); 3) Lessons Learned; and 4) Recommendation to the Start up Authority

5.5.8 *Procedures, Guides, and Other Tools for Confirming Readiness*

- Development and Production (D&P) Manual, Chapter 3.7, *Weapon Assembly/Disassembly Safety Evaluation*
- Plant Standard STD-7301, *Management Declaration of Operational Readiness*
- Plant Standard STD-7302, *Operational Readiness Review (ORR)*
- Plant Standard STD-7303, *Readiness Assessment (RA) Procedure*
- Plant Standard STD-3366, *Nuclear Explosive Safety Reviews*
- Plant Standard STD-7306, *Startup & Restart of Pantex Activities*

5.6 Perform Work (Block R)

Work is performed at the plant in accordance with the standards and procedures. If during the performance of work, it is discovered that a TSR control was not properly implemented, the appropriate occurrence report is issued and the appropriate corrective actions are identified and implemented.

5.6.1 *Significant Issues and Interfaces for Performing Work*

- The safety culture must be integrated in the Plant procedures and instilled in the Plant work force
- Ensure the production technicians endeavor to achieve verbatim compliance with operating procedures
- Try to obtain transparent implementation of AB controls so that operations within the controlled environment remain safe
- Report anomalies in a prompt manner such that lessons learned can be distributed
- Promptly incorporate changes at the shop floor level

5.6.2 *Required Inputs for Performing Work*

- Approved Procedures and Tooling

5.6.3 *Participants for Performing Work*

- Facility Managers
- Operations Managers
- Production Technicians

5.6.4 *Deliverables for Performing Work*

- Completed Production

5.6.5 *Procedures, Guides, and Other Tools for Performing Work*

- Plant Standard STD-2777, *Personnel Selection, Qualification. & Certification*
- Plant Standard STD-0265, *Weapons Training and Qualification*
- MNL-00078, *Manufacturing Administrative Manual*
- MNL-00068, *Personnel Immediate Response Procedures*
- MNL-00040, *Pantex Plant Conduct of Operations Manual*
- IOP B-0006, *Manufacturing Division Guidelines for Formal Conduct of Operations*
- IOP B-0019, *Manufacturing Division Guidelines for Personnel Selection, Qualification, & Certification*

5.7 Provide Feedback and Continuous Improvement (Block S)

5.7.1 Proposed Improvements in Operation

When improvements are identified in the operations, proposed changes are developed. These proposed changes are evaluated for their impact on the safety of the operations. If, based on an engineering evaluation, it is determined that the proposed activity is safe, the proposed change is evaluated under the USQ program to determine if the change requires DOE approval.

5.7.2 New Information

If during operations, new information is identified that suggests the safety analysis used to generate the AB is inadequate, an evaluation is made. If, based on an engineering evaluation, it is determined that there is an inadequacy in the safety analysis (i.e., a discovery of inadequacy) the inadequacy is then evaluated to determine if there is a resulting inadequacy in the Authorization Basis. This evaluation is conducted by imposing the USQ process. If the information in the Authorization Basis is inadequate (i.e., a discovery exists), operations must stop and a change to the AB must be processed. For cases where the final determination of inadequacy cannot be made quickly, and there is sufficient information to determine continued operation may not be safe, a Potential Inadequacy in Safety Analysis is processed under the USQ process and operations are stopped until compensatory measures are implemented or until the analysis is complete. Compensatory measures are implemented by use of a Justification for Continued Operation. The JCO is approved by DOE prior to commencing operations. When the evaluation cannot be completed quickly and there is sufficient reason to believe that the continued operations can be conducted safely, the New Information is documented and tracked until the analysis is completed. In this case, operations continue without imposing compensatory measures.

After the technical evaluation is completed, required changes are processed through the normal AB change control process starting with Section 5.1 above.

5.7.3 As-Found Conditions Inconsistent with AB

If during operations, a condition is found where the as-found condition is not consistent with the AB documentation, a Non-Conformance report must be processed. If the physical condition is to be maintained, a change to the AB is processed. The change process begins at Section 5.1 above.

5.7.4 Proposed Changes in Scope

When changes to the evaluated scope of operations are proposed, these changes are evaluated for possible impacts on the AB prior to implementing the change. The activities required to address the proposed changes in scope are the same as for developing a new AB. The process starts at Section 5.1 above. The USQ process is used to determine if the proposed change would require DOE approval. One USQ evaluation can be performed for the entire change regardless of the number of new or revised safety basis documents that are required to be processed. The USQ process can stop at any time if it is decided to not implement the change.

5.7.5 *Significant Issues and Interfaces for Providing Feedback*

- All proposed activities must be evaluated through the USQ Process.

5.7.6 *Required Inputs for Providing Feedback*

- Work Packages for proposed facility modifications.
- Proposed changes to Engineered Controls.
- Proposed wording changes for written procedures.
- New information (changes in Vender's information, etc.)

5.7.7 *Participants for Providing Feedback*

- AB Custodians
- Engineers
- Facility Managers
- Program Managers
- USQ Evaluators

5.7.8 *Deliverables for Providing Feedback*

- Analysis of "As-Found Conditions"
- Completed safety analyses to support the proposed changes
- Supporting Safety Analyses
- Updated Safety Basis Document List
- Completed USQE form 2630, as required

5.7.9 *Procedures, Guides, and Other Tools for Providing Feedback*

- Plant Standard STD-3014, *Nuclear Facility and Nuclear Explosive Operation Unreviewed Safety Question*
- Manual MNL-207300, *Unreviewed Safety Question (USQ) Process*
- Plant Standard STD-0140, *Preparation, Revision and Review of Policy Directives and Plant Standards*
- Plant Standard STD-0143, *Technical Procedures System*
- Plant Standard STD-3075, *Authorization Basis Document Change Control*
- Plant Standard STD-9045, *Change Control for Facility Critical Safety, Safety Class/Safety Significant-Systems*

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31. Plant Standard STD-3075, *Authorization Basis Document Change Control*
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33. Plant Standard STD-3298, *Nuclear Safety Program*
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36. Plant Standard STD-7302, *Operational Readiness Review (ORR)*
37. Plant Standard STD-7303, *Readiness Assessment (RA) Procedure*
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7. APPENDICES

APPENDIX A

A. DEFINITIONS

NOTE: *Information presented in italic format in the following definitions is Pantex specific and not directly adopted from the referenced DOE directives.*

Accident. An accident is an unplanned sequence of events that results in undesirable consequences. [DOE-STD-3009-94]

Accident Analysis. Accident analysis is the central activity in the hazards analysis (HA) process focusing on the development and evaluation of a comprehensive spectrum of potential accident scenarios. For each step, activity, or task associated with a nuclear explosive operation, appropriately structured methods are used to identify operational deviations, potential consequences, positive measures in place, additional controls, and to conduct an evaluation of control effectiveness. **Note:** This definition differs from that contained in DOE O 5480.23 and DOE-STD-3009-94. [DOE-DP-STD-3016-99]

Accident Scenario Characterization. These characterizations document the results of the accident analysis. It will necessitate the complete decomposition of an accident scenario including the delineation of all assumptions and initial conditions, a description of the uncontrolled scenario specifying the initiating and enabling event(s), the uncontrolled frequency(s), the critical safety controls with their defined effectiveness, associated residual risk, a discussion of the adequacy of the control set, and the linkage from the scenario to the HA.

Accident Sequence. An accident sequence is an unplanned sequence of events that results in a specific undesirable consequence. [DOE-DP-STD-3016-99]

Activity Based Controls Document. The Activity Based Control Document contains the technical safety requirements (TSRs) specific to the nuclear explosive program.

Administrative Controls (AC). Administrative Controls are the provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure the safe operation of a facility.
[DOE-STD-3009-94, DOE 5480.23]

Administrative Control (AC) Specific Requirements. AC Specific Requirements are those specific elements of an AC program that are relied on in a hazard or accident analysis to prevent or mitigate the event or accident.

Administrative Control (AC) Programmatic Requirements. AC Programmatic Requirements are those general elements of an AC program that are relied on to improve the reliability and availability of engineered features and AC Specific Requirements.

Anticipated (A). Anticipated is the frequency associated with accidents that may occur several times during the lifetime of the facility (incidents that commonly occur). The estimated annual frequency of occurrence is 10^{-0} to 10^{-2}.

Authorization Agreement (AA). An AA documents the agreement with the DOE on key terms and conditions (commitments) under which Mason & Hanger Corporation (MHC) is authorized to perform work within Hazard Category 2 nuclear facilities on nuclear explosive programs and nuclear material operations. The Master Authorization Agreement integrates both common and specific terms and conditions for Hazard Category 2 Nuclear Operations into one document readily accessible to line managers and support staff while providing the DOE reasonable assurance regarding the adequacy and effectiveness of the overall system of safety management at Pantex.

Authorization Basis. Those aspects of the facility design basis and operational requirements relied upon by DOE to authorize operation. These aspects are considered to be important to the safety of the facility operations: The Authorization Basis is described in documents such as the facility Safety Analysis Report (SAR) and other safety analysis; Hazard Classification Documents; and the Technical Safety Requirements, DOE-issued safety evaluation reports (SERs), and facility-specific commitments made in order to comply with DOE Orders or policies. [DOE 5480.23]

The AB is that part of the safety basis which is approved or issued by the DOE.

Authorization Basis Change Control Committee (ABCCC). A group which acts on behalf of MHC Senior Management and recommends disposition of AB documents prior to their submittal to DOE for review and approval.

Basis for Interim Operation. The BIO may be part of a facilities' Authorization Basis document. The BIO provides summary information and references previous analyses and some DOE approved documents that define the operating requirements and limits that the Plant follows during operations. At Pantex, the BIO is developed in accordance with the guidance provided in DOE-STD-3009-94.

Beyond Extremely Unlikely (BEU). BEU is the frequency associated with accidents that are not expected to occur during multiple full life cycles of the facility/operation. The estimated annual frequency of occurrence is $10^{-8}<p\leq 10^{-6}$.

Bounding Accident. A hypothetical accident that represents several hazardous events with similar initiating events and with the same or lesser postulated consequences.

Compensatory Measures. Temporary controls which are implemented to provide for safe operations. Compensatory Measures may be needed in response to a Discovery Issue or when a TSR control is intentionally taken out of service and is not available during a mode for which the control has been credited in an Activity Based Control Document (ABCD) or Technical Safety Requirements (TSR). Compensatory Measures are approved by DOE.

Contractor. Any person under contract with the DOE with responsibility to perform activities in connection with a nuclear facility. [DOE 5480.22, DOE 5480.23]

Controls. Engineered Features or Administrative Controls which are derived during the evaluation of hazards and implemented to reduce the risk of those hazards associated with planned operations. Controls are classified as Safety-Class, Safety-Significant, or Important to Safety.

Control Set. One or more combined controls which, when implemented as defined, have the required functionality to control the frequency and consequences of an accident.

Critical Safety Controls. Critical Safety Controls are the combination of Safety-Significant and Safety-Class controls.

Critical Safety Systems Manual (CSSM). The CSSM is the Pantex Plant facility Authorization Basis document for interim operation during the development of the facility Technical Safety Requirements (TSR). The CSSM identifies the facility Critical Safety Controls.

Design Basis Accident (DBA). Those accidents that are considered credible enough to be postulated for the purpose of establishing design and performance requirements for critical safety structures, systems, and components, and administrative controls.

Design Feature. A design feature is an active or passive engineered feature of the structure, system, or component which, if altered or modified without proper safety review, could have a significant effect on safe operations. Design features do not have conditions of operability, however, they may require maintenance to ensure their effectiveness and in-service inspection to ensure the continued safety function.

Engineered Feature. A facility's structure, system, or component (SSC), or program's tooling or equipment that performs an intended design function. When used as controls, engineered features will be developed as design features or will have identified conditions of operability with associated Limited Conditions of Operability (LCOs).

Evaluation Guidelines. These guidelines pertain to hazardous material dose/exposure values used during the safety analysis for the classification of controls. The intention is that theoretical individual doses/exposures exceeding the EGs should not occur at a given point, unlike other values, such as emergency planning thresholds. Off-site EGs are established for the purpose of identifying and evaluating safety class structures, systems, and components. On-site EGs are not required for adequate documentation of a safety basis utilizing the overall process of this standard. [DOE-STD-3009-94]

The Radiological Evaluation Guideline is 25 Rem committed effective dose equivalent at the site boundary. [DOE-STD-3009-94, Appendix A]

> *The evaluation guidelines at Pantex are 25 Rem off-site, 100 Rem on-site, and ERPG-2 for both off-site and on-site. Based on the relationship to the Evaluation Guidelines, the classification of a control as safety-class (off-site ≥ 25 Rem) and safety-significant (on-site ≥ 100 Rem, on-site or off-site ≥ ERPG-2) is made.*

Extremely Unlikely (EU). EU is the frequency associated with accidents that will probably not occur during the full life cycle of the facility/operation. Typically, this class in the facility analyses will include design basis accidents. The estimated annual frequency of occurrence is $10^{-6}<p\leq10^{-4}$.

Facility. A facility is any equipment, structure, system, process, or activity that fulfills a specific purpose. [DOE O 452.2A, DOE-STD-3009-94]

Fissile Material Dispersal. The aerosolization and transport of fissile material by a driving force such as fire, high explosive deflagration, or high explosive detonation. [DOE-DP-STD-3016-99]

Hazard. A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to an operation or to the environment (without regard for the frequency or credibility of accident scenarios or consequence mitigation). [DOE 5480.23]

Hazard Analysis. The determination of material, system, process, and plant characteristics that can produce undesirable consequences, followed by the assessment of hazardous situations associated with a process or activity. Largely qualitative techniques are used to pinpoint weaknesses in design or operation of the facility that could lead to accidents. The SAR HA examines the complete spectrum of potential accidents that could expose members of the public, on-site workers, facility workers, and the environment to hazardous materials. [DOE-STD-3009-94]

Hazard Analysis Report. A report that documents the systematic evaluation of hazards to workers, the public, and the environment for a specific nuclear explosive operation and its associated activities including information on controls which establish the safety basis for the operation. [adapted from [DOE O 452.2A], [DOE-DP-STD-3016-99]

Hazardous Materials. Any solid, liquid, or gaseous material that is toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. Oil is excluded from this definition. [DOE 5480.22], [DOE 5480.23]

Heuristic. Of or relating to a usually speculative formulation serving as a guide in the investigation or solution of a problem.

High Explosive Deflagration. A rapid chemical reaction in which the output of heat is sufficient for the reaction to proceed and be accelerated without input of heat from another source. Deflagration is a surface phenomenon with the reaction products flowing away from the unreacted material along the surface at subsonic velocity. The effect of a true deflagration under confinement is an explosion. Confinement of the reaction increases pressure, rate of reaction and temperature, and may cause transition into detonation. [DOE Manual 440.1-1], [DOE-DP-STD-3016-99]

High Explosive Detonation. A violent chemical reaction within a chemical compound or mechanical mixture evolving heat and pressure. A detonation is a reaction that proceeds through the reacted material toward the unreacted material at a supersonic velocity. The result of the chemical reaction is exertion of extremely high pressure on the surrounding medium, forming a propagating shock wave that is originally of supersonic velocity. [DOE Manual 440.1-1], [DOE-DP-STD-3016-99]

Human Reliability Analysis (HRA). A family of analytic techniques that assesses the frequency that specified human actions, steps, or tasks will be completed successfully. [DOE-DP-STD-3016-99]

Important to Safety Controls. Includes any equipment whose function can impact safety either directly or indirectly. This includes safety related equipment, equipment relied upon for safe shutdown, and in some instance, balance of Plant equipment. [DOE 5480.21]

At Pantex, Important to Safety controls are those sufficiently important to the safety of the plant such that MHC will maintain their configuration. These Important to Safety controls are not approved by the DOE under the TSRs, but are documented in the Authorization Basis and are reviewed under the USQ change control process.

Justification for Continued Operation (JCO). The purpose of a JCO process is to provide a means for a contractor to obtain DOE approval of operations of a facility on a temporary basis when the current requirements cannot be fully met. In effect, a JCO is a request for approval to operate temporarily beyond the current AB. JCOs can be developed for any situation where compliance cannot be achieved. [NE-70, Attachment 2]

Limiting Condition for Operation (LCO). LCOs are the lowest functional capability or performance level of safety-related structures, systems, components, and their support systems required for normal, safe operation of the facility. [DOE 5480.22, section 9.e.3.b], [DOE-STD-3009-94]

Limiting Control Setting (LCS). LCSs are settings on safety-related structures, systems, and components that control process variables to prevent exceeding safety limits (SLs). [DOE 5480.22, section 9.e.3.a], [DOE-STD-3009-94]

Mitigative Features. Any structure, system, or component, that serves to mitigate the consequences of a release of hazardous materials in an accident scenario. [DOE-STD-1027-92], [DOE-STD-3009-94]

The specific feature or characteristic (functional requirement) of a control (SSC or AC) that is depended upon to lessen or reduce the consequences of an accident scenario.

Non-reactor Nuclear Facility. A facility where operations involve radioactive materials in such form and quantity that a significant nuclear hazard potentially exists to the employees or the general public as defined by DOE STD-1027.

Nuclear Detonation. An energy release through a nuclear process during a period of time on the order of one microsecond in an amount equivalent to the energy released by detonating four or more pounds of trinitrotoluene (TNT). [DOE O 452.2A]

This term is referred to in the Orders and Standards as nuclear detonation (ND) or Inadvertent Nuclear Detonation (IND). Both terms are acceptable for nuclear operations purposes.

Nuclear Explosive. An assembly containing fissionable and/or fusionable materials and main charge high explosive parts or propellants capable of producing a nuclear detonation (e.g., a nuclear explosive or nuclear test device). [DOE O 452.2A]

Nuclear Explosive Area (NEA). Any area that contains a nuclear explosive or collocated pit and main charge high explosive parts. [DOE O 452.2A]

Nuclear Explosive Hazards Assessment (NEHA). A systematic evaluation of hazards that lead to nuclear detonation, high explosive detonation or deflagration, or fire resulting in fissile material dispersion in nuclear explosive areas (NEAs).

Nuclear Explosive Like Assembly (NELA). A NELA is a regular test unit that is not an nuclear explosive. A NELA will contain a pit with mock high explosives, a mock pit with live high explosives, a mock pit with mock high explosives, or no pit with mock or live high explosives.

Nuclear Explosive Operation. Any activity involving a nuclear explosive, including activities in which main charge high explosive parts and pit are collocated. [DOE O 452.2A]

Nuclear Explosive Operation-Associated Activities. Activities directly associated with a specific nuclear explosive operation such as work on a bomb nose or tail subassembly even when physically separated from the bomb's nuclear explosive subassembly. [DOE O 452.2A]

Nuclear Explosive Operation Evaluation Guidelines (NEO-EG). The objective of the NEO-EG is to identify accidents with potentially significant consequences to the worker, the public, or the environment. The NEO-EGs are;

- Inadvertent nuclear detonation,
- High explosive detonation/deflagration,
- Fire leading to plutonium dispersal,
- Death or serious worker injury resulting from non-standard industrial hazards, and
- Uncontrolled release of radioactive material from the facility

[DOE AL Development & Production (D&P) Manual, AL56XB, Rev.1, Change 27]

Nuclear Explosive Operating Procedure (NEOP). The weapon specific operating procedures which delineate the step-by-step process followed during assembly and disassembly activities on nuclear explosives.

Nuclear Explosive Safety (NES). The application of positive measures to control or mitigate the possibility of unintended or unauthorized nuclear detonation, high-explosive detonation or deflagration, or fire in an nuclear explosive area. [DOE O 452.2A], [DOE O 452.1A], [SD AL 452.2]

Nuclear Explosive Safety Rules (NESR). SLs, operating limits, surveillance requirements, safety boundaries, and management and administrative controls that significantly contribute to minimizing the possibility of nuclear detonation, high-explosive detonation or deflagration, or fire in nuclear explosive operations. [DOE O 452.2A]

Mandatory requirements, identified by the Nuclear Explosive Safety Study Group, that provide the foundation for nuclear explosive safety. NESRs include general and supplemental requirements. General NESRs are applied to all nuclear explosive operations. Supplemental NESRs provide requirements for specific nuclear explosive systems, tests, or operations.

Nuclear Explosive Safety Study (NESS). A formal evaluation of the adequacy of positive measures to meet the DOE Nuclear Explosive Safety Standards.

Nuclear Explosive Safety Study Group (NESSG). Team of nuclear explosive safety specialists which conducts a formal evaluation of the adequacy of positive measures to meet the DOE Nuclear Explosive Safety Standards. The Nuclear Explosive Safety Standards are found in DOE O 452.2A.

Positive Measures. Engineered Features or Administrative Controls identified during the hazards analysis process which may be later selected as controls.

Preventive Features. Any structure, system, or component that serves to reduce the frequency of the release of hazardous material in an accident scenario. [DOE-STD-1027-92], [DOE-STD-3009-94]

The specific feature or characteristic (functional requirement) of a control (Structure, System. or Component or Administrative Control) that is depended upon to lessen or reduce the frequency of an accident scenario.

Preventive Maintenance. Systematically and typically recurring, planned, and scheduled actions and activities performed for the purpose of preventing equipment, system or facility failure. Preventive maintenance includes the use of predictive maintenance techniques (vibration analysis, infrared-scanning, oil analysis).

Proposed Activity. A planned change, test, or experiment at site facilities.

Programmatic. Reference to facility-specific programs or site-wide programs necessary to ensure the safe operation of a facility. Radiation protection, hazardous material protection. quality assurance (QA), training, document control. and emergency preparedness are examples of programs that provide programmatic controls to ensure safe operations. [DOE-STD-3009-94]

Public. All individuals outside the DOE Site boundary. [DOE-STD-3009-94]

Qualitative Risk Analysis. The systematic evaluation of a process to estimate the frequency and consequence of a potential accident sequence. The evaluation may be based upon expert elicitation or engineering judgement. This process sometimes employs non-rigorous mathematical techniques also referred to as "back of the envelope" calculations.

Quantitative Risk Analysis. The systematic development of numerical estimates of the expected frequency and consequence of potential accidents associated with a facility operations. The evaluation is based on engineering evaluation and mathematical techniques.

Residual Risk. That risk to the safety and health of the public and workers that remains after the requisite TSRs (nuclear explosive-specific and facility) have been identified and implemented.

Risk. The quantitative or qualitative expression of possible loss that considers both the probability that an event will occur and the consequences of that event. [DOE 5480.23], [DOE-STD-3009-94]

Safety Analysis. A documented process: (1) to provide systematic identification of hazards within a given DOE operation; (2) to describe and analyze the adequacy of the measures taken to eliminate, control, or mitigate identified hazards; and (3) to analyze and evaluate potential accidents and their associated risks. [DOE 5480.23], [DOE O 452.2A], [DOE-STD-3009-94]

Safety Analysis Report. A report that documents the adequacy of safety analysis to ensure that a facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations. [DOE 5480.23], [DOE O 452.2A], [DOE-STD-3009-94]

Safety Basis. The combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely. [DOE 5480.23], [DOE O 452.2A], [DOE-STD-3009-94]

> *The Pantex Safety Basis encompasses the collection of information involving the identification and evaluation of hazards and the identification, selection, evaluation, and implementation of controls to prevent or mitigate the hazards. The Safety Basis is comprised of the Authorization Basis and those documents which provide the technical foundation for the AB.*

Safety Basis Document List. This is a Pantex Plant list which records all the safety basis documents supporting the development of the AB. The Safety Basis Document List also records the linkage from the Accident Analyses to the control's implementing procedures. Where possible, this will include the procedure revision, page, and step number for the control execution to ensure preservation of safety commitments at all times.

Safety Class Structures, Systems, and Components. Systems, Structures, and Components including primary environmental monitors and portions of process systems whose failure could adversely affect the environment, or safety and health of the public as identified by safety analyses. [DOE 5480.30]

> *For application at Pantex, the phrase "adversely affect" means off-site radiological Evaluation Guidelines are exceeded. Safety Class controls are structures, systems, components, or administrative controls whose preventive or mitigative function is necessary to keep radiological material exposure to the public below the off-site EGs.*
>
> *Controls that are credited to reduce the frequency or consequences of a nuclear detonation from between 1E-6/yr and 1E-8/yr to < 1E-8/yr are classified as Safety Class.*

Safety Commitments. Those actions, measures, controls, and programs established to implement and manage facility-wide programs, policies, and procedures to ensure the safe performance of an activity or operation. [DOE-DP-STD-3016-99]

Safety Limits. Limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility functions and which are found to be required to guard against the uncontrolled release of radioactivity and other hazardous materials (this includes releases into the complex and/or the community). [DOE 5480.22, section 9.e.2], [DOE-STD-3009-94]

Safety Significant Structures, Systems, and/or Components. SSCs not designated as Safety Class but whose preventive or mitigative function is a major contributor to defense-in-depth (i.e., prevention of uncontrolled material releases) and/or worker safety as determined from the hazards analysis.

As a general rule of thumb, safety significant SSC designations based on worker safety are limited to those SSCs whose failure is estimated to result in an acute worker fatality or serious injuries to workers. Serious injuries, as used in this definition, refers to medical treatment for immediately life threatening or permanently disabling injuries (e.g., loss of eye, loss of limb) from other than standard industrial hazards. It specifically excludes potential latent effects (e.g., potential carcinogenic effects of radiological exposure or uptake).

The general rule of thumb cited above is not an Evaluation Guideline. It is a lower threshold of concern for which safety significant SSC designation may be warranted, not a quantitative criteria. Estimates of worker consequences for the purpose of safety significant SSC designation are not intended to require detailed analytical modeling. Considerations shall be based on engineering judgement of possible effects and the potential added value of safety significant SSC designation. [DOE-STD-3009-94]

At Pantex, controls that are credited to reduce the frequency or consequences of an event with a conservatively estimated consequence that challenges the On-site Evaluation Guideline of 100 Rem for events more frequent than 1E-6/yr are classified as Safety-Significant.

Controls that are credited to reduce the frequency or consequences of an event with a conservatively estimated consequence that challenges the Evaluation Guideline of Emergency Response Planning Guidelines (ERPG) -2 to the public or worker for events more frequent than 1E-6/yr are classified as Safety-Significant.

Controls that are credited to reduce the frequency of HED with dispersion events from between 1E-6/yr and 1E-7/yr to < 1E-7/yr are classified as Safety Significant. These controls are considered to provide a significant contribution to Defense-in-Depth based on the potential high consequences of the High Explosive Detonation/Dispersion with dispersion event.

Controls that are identified to provide a significant contribution to defense-in-depth for events with an off-site consequence less than 25 Rem or an on-site consequence less than 100 Rem are classified as safety-significant. These controls are evaluated on a case-by-case basis considering the event frequency, safety-class, and safety significant controls already credited, and the available defense-in-depth controls.

Site Boundary. The DOE Site boundary is a geographic boundary within which public access is controlled and activities are governed by DOE and its contractors, and not by local authorities. A Public road traversing a DOE site is considered to be within the DOE site boundary if, when necessary, DOE or the site contractor has the capability to control the road during accident or emergency conditions. [DOE-STD-3009-94]

Standard Industrial Hazards. Hazards that are routinely encountered in general industry and construction for which national consensus codes and/or standards (e.g., OSHA, transportation safety) exist to guide safe design and operation without the need for special analysis to define safe design and/or operational parameters. [DOE-STD-3009-94], [DOE-DP-STD-3016-99]

Standing Management Team (SMT). The SMT includes experienced line/program managers from appropriate DOE, National Design Laboratory, and the Pantex Plant organizations. The SMT provides advice to DOE line managers, and institutional commitments on behalf of weapon design agencies and the Pantex operating contractor. [AL SD 56XB, Chapter 11.3]

Sufficiently Unlikely. This term is used in the D&P Manual, Chapter 11.4, as related to accident scenarios. A sufficiently unlikely scenario is one that is controlled to a frequency less than 10^{-8} for an Inadvertent Nuclear Detonation (IND) consequence, 10^{-7} for an High Explosive Detonation/Deflagration (HED/D), 10^{-6} for a fire leading to fissile material dispersal, a severe worker injury, or an uncontrolled release of radiological materials.

Surveillance Requirements. Requirements relating to test, calibration, or inspection to ensure that the necessary operability and quality of safety-related structures, systems, components, and their support systems required for safe operation of the facility are maintained. This section of the Technical Safety Requirements shall contain the requirements necessary to maintain operation of the facility within the SLs, LCSs, and LCOs. In the event that Surveillance Requirements are not successfully completed or accomplished within their required frequency, the systems or components involved shall be assumed to be inoperative and actions defined by the LCO or LCS shall be taken until the systems or components can be shown to be operable. [DOE 5480.22, section 9.e.4]

Tailored Approach. The intent behind applying the concept of a "Tailored Approach" is that competing resources will be used more efficiently and produce maximum benefit. As a result, SARs for complex, higher-hazard facilities would be expected to use more resources in meeting the requirements than SARs for simple, lower-hazard facilities. The expectation of the greater expenditure of resources for SARs for complicated higher-hazard facilities is not meant to imply that a lower level of safety or attentiveness is acceptable for simple lower-hazard facilities. Regardless of the hazard and complexity of a facility, adequate safety analysis, evaluation, and supporting documentation, must be provided. The tailored approach shall be used to eliminate unproductive or unnecessary features or activities which add to the costs of implementation, narrow the envelope of permissible operation, or make the facility management unnecessarily ponderous or burdensome. It does not relieve the contractor, the responsible manager, or the PSO from the obligation to maintain and operate the facility safely and efficiently. Requirements which conflict with this responsibility shall be brought to the attention of the appropriate DOE management. [adapted from DOE-STD-1027-92]

At Pantex, the above applies equally to the development of HARs.

Target Level of Controls (TLCs). The TLC establishes guidance for the number and type(s) of controls to be implemented for a given nuclear explosive operation based on the frequency of an accident scenario and the resulting consequences. It should be noted that this guidance only addresses nuclear detonation and fissile material dispersal. Additional worker safety consequences will continue to be managed by other means. The TLC is intended to be a guide and a tool, not a legalistic set of requirements that must be accepted without question and should only be used with proper training. [DOE AL Development & Production (D&P) Manual, AL56XB, Rev.1, Change 27]

Technical Safety Requirements. Those requirements that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public, the environment, and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. A TSR consists of SLs, operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof. TSRs were formerly known as OSRs for non-reactor nuclear facilities and Technical Specifications for reactor facilities. [DOE 5480.22]

Technical Support Documents (TSDs). Documents that represent the technical justification for the conclusions of the hazards analysis presented in the weapon specific Hazard Analysis Report (HARs). TSDs are comprised of data from the design laboratories, etc. which are compiled and kept with the HAR. These documents qualify as a part of the safety basis for the specific nuclear explosive operation evaluated and must be kept under configuration management for formal review of changes.

Uncontrolled Accident Scenarios. The uncontrolled accident scenario is a means of establishing bounding frequency and consequence estimates under the artificial circumstance that controls are nonexistent. Although the uncontrolled scenario should be defined in a manner that is physically possible, it is not expected that the consequences would actually occur, since the scenario assumes the absence of controls which, in reality, are present. Uncontrolled scenarios are to be used in conjunction with the control selection process. The need for the control will be determined and the uncontrolled scenario will be used in the classification of the controls (e.g., safety-class, safety-significant, important to safety).

Unlikely. Accidents that are not anticipated to occur during the lifetime of the facility. Typically, this class of frequency, in facility analyses, will include natural phenomena such as earthquakes, maximum wind gusts, lightning, etc. The estimated annual frequency of occurrence is $10^{-4}<p\leq10^{-2}$.

Unreviewed Safety Questions (USQ). A determination made by examining the following circumstances:

- Temporary or permanent changes in the facility as described in existing safety analyses; [DOE Order 5480.21, 10.b.(1)]
- Temporary or permanent changes in the procedures as derived from existing safety analyses; and [DOE Order 5480.21, 10.b.(2)]
- Tests or experiments not described in existing safety analyses. [DOE Order 5480.21, 10.b.(3)]

On identification of any of the above circumstances, a USQ exists if one or more of the following conditions result:

- The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the facility safety analyses could be increased; [DOE Order 5480.21, 10.c.(1)]
- The possibility for an accident or malfunction of a different type than any evaluated previously in the facility safety analyses could be created; and [DOE Order 5480.21, 10.c.(2)]
- Any margin of safety as defined in the bases of the Technical Safety Requirements could be reduced. [DOE Order 5480.21, 10.c.(3)]

Use and Application. This section of the Technical Safety Requirements shall contain the basic instructions for using and applying the safety restriction contained in the Technical Safety Requirements. Definitions of terms, operating modes, frequency notations, and actions to be taken in the event of violation of Technical

Safety Requirements operating limits or surveillance requirements are to be included in the Use and Application section. [DOE Order 5480.22, 9.e.(1)]

APPENDIX B

B. ROLES & RESPONSIBILITIES

The roles and responsibilities for developing Safety Basis and Authorization Basis are organized in this section by Plant Organization (i.e., Program Management, Operations, Site Management, Authorization Basis Development & Management). Within each Organization, the roles & responsibilities are delineated to satisfy the core safety functional areas beginning with defining scope of work and ending with providing feedback & improvements.

At the top level, Policy Directive 0001 establishes the roles and responsibilities for the management and operation of the Pantex Plant.

From an Authorization Basis perspective, the Critical Safety Controls and their supporting analysis must be controlled and maintained by the document owners. The analysis supporting the derivation of controls is documented in safety basis documents and is summarized in the GID (site-level), BIO (facility-level), SAR (facility level), and HAR (weapon program). The Critical Safety Controls are developed and documented in the TSR (site and facility levels), and Activity Based Control Document (weapon program). The controls are derived and proposed by the AB Project Team and approved by the document owner and end users. For the GID, the document owner is the ABD&M Manager. For the BIO, the document owner is the respective facility manager(s); and for the weapon program, the document owner is the Operations Manager. The end users are all organizations that must implement the controls.

B.1 Organizational Managers (Generic Responsibilities)

The responsibilities of the organizational managers are to:

- Provide resources to support the development of the Safety Bases and Authorization Basis in accordance with the AB Project Plan
- Provide resources to support the review and approval process for AB documents
- Provide resources to implement the controls identified in the AB (generate documents, perform physical modifications, perform training)

B.2 Operations

The responsibilities of the Operations Organization are to:

- Provide Production Technicians, Facility Managers, and Production Managers to support the AB Team, in accordance with the AB Project Plan
- Provide resources, as required, to review and approve the AB documents
- Provide training to the operations in support of AB implementation

The responsibilities of the Facility Managers are to:

- Approve the SAR/BIO and TSRs for their respective facility
- Develop a Readiness Assessment Plan (when required); supports the readiness assessment
- Revise procedures to implement administrative controls

- Performs AB controls training to support AB implementation
- Ensures work is performed within the established AB
- Initiates or ensures completion of the necessary change control paperwork (i.e., USQE) to ensure changes to their facility are reviewed through the AB change control process.
- Manage the implementation of the controls.
- Ensures the establishment of surveillance requirements for facility SSCs, as required
- Ensures the establishment of In-service inspection requirements facility SSCs identified as design features
- Ensures the establishment of critical characteristics for facility SSC design features to ensure the critical safety function is preserved
- Ensures the development of engineering documents to capture the Critical Safety and Important to Safety tooling
- Ensures the physical modifications are completed, as required, for the facility systems
- Initiates or ensures completion of the necessary change control paperwork (i.e., USQE) to ensure changes to the weapon process (NEOPs, NEEPs, EIs, Standing Orders) and tooling are reviewed through the AB change control process.

B.3 Operations, Weapon Engineering

The responsibilities of the Weapon Engineering Manager are:

- Provide resources to support the AB Project Team in the development of the hazard analysis and the Hazard Analysis Report (weapon program), BIO (Facility), and GID (Site) in accordance with the AB Project Plan
- Provide resources, as required, to support the AB Team in the identification of controls in accordance with the AB Project Plan
- Revises engineering procedures to implement administrative controls and perform associated training
- Establishes surveillance requirements for tooling and weapon-specific equipment with limiting conditions of operation, as required
- Establishes In-service inspection requirements for the tooling and weapon-specific equipment identified as design features
- Establishes critical characteristics for tooling and weapon-specific equipment design features to ensure the critical safety function is preserved
- Develops engineering documents to capture the Critical Safety and Important to Safety tooling
- Makes physical modifications, as required, to tooling and weapon specific equipment
- Initiates or ensures completion of the necessary change control paperwork (i.e., USQE) to ensure changes to the weapon process (NEOPs, NEEPs, EIs, Standing Orders) and tooling are reviewed through the AB change control process.

B.4 Authorization Basis Development & Management

ABD&M Manager

The responsibilities of the Authorization Basis Development & Management Department Manager are to:

- Ensure the preparation of the AB documents is performed by qualified personnel
- Assign the AB Project Team Leader for developing new, or revising existing, AB documents
- Assigns an AB Custodian for each AB document

AB Project Team Leader (Facility)
The responsibilities of the AB Project Team Leader are to:

- Develop the AB Project Plan
- Execute the AB project plan consistent with the project scope, schedule, and resources budgeted
- Appoints the Project Engineer and, consistent with the project scope and resources budgeted, arranges for the manpower to support the hazard and accident analysis effort
- Provides coordination between the document owner/end users and the AB Project Team for comment resolution concerning the identification of proposed controls
- Develop an implementation plan, when required, for the activities required to implement the controls identified in the AB document(s)

AB Project Team Leader (Weapon Programs)
The AB Project Team is comprised of an assortment of subject matter experts (e.g., Design Agency Personnel, Hazard Analysts, Production Technicians, Technical Writers, etc.). The "AB Project Team" is synonymous with the "HATT" defined in the D&P Manual. The responsibilities of the AB Project Team Manager are to:

- Develop te AB Project Plan
- Leads efforts to develop and document the hazards and accident analysis, the HAR, and the ABCD, within the approved scope, schedule, and cost baselines
- Coordinate between the AB Project Team and the Program Project Team for comment resolution concerning the identification of proposed controls, for the HAR and ABCD origination, and the necessary resources to accomplish the tasks
- Develop an implementation plan, when required, for the activities required to implement the controls identified in the AB document(s)
- Includes coordination with the AB Project Team

AB Custodian
The responsibilities of the AB Custodian are to:

- Maintain the Safety Basis Document list that identifies all the safety basis documents, the accident analysis to controls linkage, and the associated implementation documents
- Develop a revision to the Important to Safety Manual to incorporate controls
- Evaluate changes to the AB as requested by the AB owner
- Schedule AB updates in accordance with DOE established guidelines and provide updated change pages to the AB configuration control section for dissemination to controlled document holders

AB Change Control Group
The responsibilities of the AB Change Control Group are to:

- Provide peer review of USQ screening and evaluations to establish the approval authority with respect to the approved AB
- Support preparation of AB change documents

B.5 Programs Management

Program Manager (weapon program)

- Approve the AB Project Plan
- Provide resources in accordance with the AB Project Plan
- Provides all required input documents to the AB Project Team Leader
- Lead the Weapon Program Project Team and serve as the primary Program Project Team point of contact for the DOE, the Design Agencies, and MHC entities during the project execution
- Leads the Program Project Team in the review and approval of the selected controls
- Obtains review and approval of the HAR and ABCD through MHC and DOE
- Approves the HAR and ABCD
- Ensures the necessary procedure revisions are completed before administrative controls implementation and associated training is performed
- Manage the implementation of the controls, when requested by the facility and operations managers
- For HAR and ABCD implementation, develops a Readiness Assessment Plan (when required); supports the readiness assessment

B.6 Site Management

The Facilities Organization is responsible for the following roles in AB development:

Facilities Engineering
- Establishes surveillance requirements for SSCs with limiting conditions of operation, as required
- Establishes In-service inspection requirements for the SSCs identified as design features
- Establishes critical characteristics for design features to ensure the critical safety function is preserved
- Develops engineering documents to capture the Critical Safety and Important to Safety SSCs
- Initiates or ensures completion of the necessary change control paperwork (i.e., USQE) to ensure changes to the facilities and systems are reviewed through the AB change control process

Facilities Maintenance
- Creates procedures to implement controls assigned surveillance and in-service inspection requirements
- Revises procedures to implement administrative controls and performs associated training
- Performs assigned surveillance and in-service inspection requirements
- Makes physical modifications, as required, to the facilities
- Initiates or ensures completion of the necessary change control paperwork (i.e., USQE) to ensure changes to the facilities and systems are reviewed through the AB change control process

B.7 Program Project Team (Weapon Program)

The Program Project Team member's roles & responsibilities are as defined in the US DOE AL Appendix 56XB, Development and Production Manual, Chapter 11.1 *Standing Management Team*. The Program Project Team's support of the AB Project Team's AB development, although not all inclusive, includes the following:

- Review and approve the controls proposed by the AB Project Team. If changes to the controls are requested by the Program Project team, the AB Project Team will resolve the differences.
- Present the controls documented in the HAR and ABCD to the Standing Management Team (SMT) for their approval.
- Coordinate all necessary Design Agency reviews and comment resolution for HAR and ABCD issues prior to final DOE approval

APPENDIX C

C. ANALYZE HAZARDS

This Appendix of the *Pantex Plant ISM Authorization Basis Manual* provides guidance for analyzing hazards at the Plant in conjunction with the nuclear facilities and nuclear explosive operations.

C.1 Prerequisites

Prior to beginning the analytical effort, a number of documents and other data need to be assembled, made available to the AB Project Team, and thoroughly reviewed. The prerequisites, for conducting hazard analyses, include as applicable:

- Current Authorization Basis for the site, applicable facility(ies), and weapon programs
- Lessons learned from other, pertinent, site analyses
- Prior design and analyses for similar systems or processes
- Weapon Safety Specification (WSS)
- Process action flow diagrams, operating procedures, and process videos
- Applicable archiving videos and data
- Lessons learned from the current or other, pertinent, weapons programs
- Weapon response screening criteria (provided by the Design Agency)

C.1.1 Training

Training is required on the hazards analysis methodology to be employed and the AB Project Team member's specific roles and responsibilities in the overall process. Additionally, training on the scope of the hazard analysis should be conducted.

C.1.2 System Familiarization

The purpose of system familiarization is to gain sufficient understanding and knowledge of the nuclear explosive, the nuclear explosive operations, and the facility environments in which the operation will be conducted. The purpose of familiarization is to identify all potential hazards, process deviations, and identify positive measures. Information gathering, is used to: define the boundaries of the operation, from an analytical viewpoint; understand the nuclear explosive operation and associated activities and facilities; and develop an understanding of the facility and process hazards, and the vulnerabilities of the nuclear explosive.

Existing safety, design, and test documentation and standards, as well as occurrence and incident reports are reviewed. Pertinent studies, analyses, and controls that constitute the established Authorization Basis, and lessons learned from operational events or internal/external audits and assessments shall be used as much as possible. Examples of many sources of hazard information are shown in Figure C-1.

Existing process hazards analyses, fire hazards analyses, explosive safety analyses, and institutional health and safety plans (safety management programs) are also reviewed for applicable information. If the information used in the hazards analysis has not been appropriately reviewed and approved, or is not readily available in the open literature, it will need to be included in the hazard analysis document for review and approval.

Nuclear explosive and weapon design source data is provided by the Design Laboratories. Source data may consist of a listing of hazardous materials and energy sources associated with the nuclear explosive, including: quantities and locations, high pressure vessels, electrical energy sources, and explosive devices. The data may also contain a characterization of the high explosive (including test descriptions and data), weapon vulnerabilities as known during various states of assembly/disassembly, functional descriptions of weapon design, relevant development test information for both normal and abnormal environments, and relevant surveillance data.

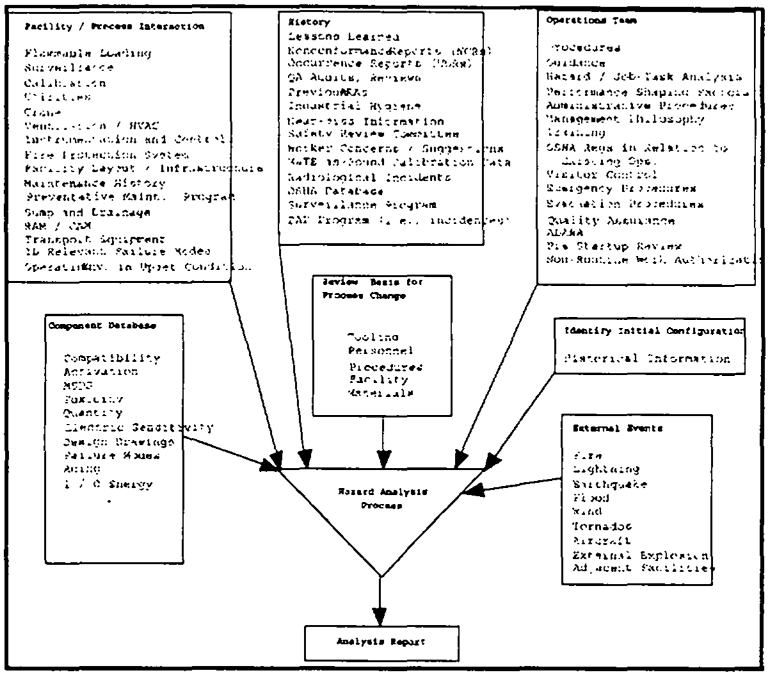

Figure C-1: Sources of Hazard Information.

The results of system familiarization will provide the definition of the initial conditions and boundaries of the operation to be evaluated; intrinsic weapon hazards; equipment, and tooling used; the location where the process is conducted; and the facilities involved. This information is recorded and discussed in retrievable documents that are available for the remainder of the hazard assessment to support the development and review of the AB and change control activities.

C.2 Scope

The hazards analysis covers the full range of events that can occur, without regard to their frequency, such as those initiated by natural phenomenon events, external events, system failure, human error, etc. The largely qualitative techniques used for hazard evaluations can range from simple checklists or "What-If" analyses to a systematic examination of deviations such as Hazard and Operability Analyses (HAZOPs). These analysis techniques are described in many standard industrial hazards analysis texts.

The responsibility for conducting the hazards analysis and documenting the results will be assigned to an experienced AB Project Team. The size and composition of the team depends on the combination, magnitude, and type of hazards involved, the resources available, and the complexity of the issue being evaluated. To be effective, the AB Project Team must include a combination of safety analysis and subject matter experts familiar with the issue being evaluated.

C.2.1 Scope of the analysis for Weapon Programs

Figure C-2 illustrates key elements that are addressed in scoping the analysis for each weapon program. The scoping elements represent fundamental aspects of an analysis that dramatically influence both the effort involved in performing the analysis and the results that can be achieved.

Figure C-2 represents a sample yes/no checklist of elements considered for incorporation in a given analysis. Also shown in the figure is the impact or analytical approach to be followed in tailoring the analysis for each management decision/option. This checklist serves to establish the specific scope for the intended analytical effort. Most of the elements are self-explanatory. That is, if "no" is checked, then the opposite of the element occurs such as no Laboratory support for the Hazards Analysis. However, some of the elements are not self-evident and deserve mention. For example, the issue of multiple task teams versus a single task team. One alternative is that instead of having multiple task teams as established under the SS-21 process, a single AB Project Team would perform the work. Similarly, the element entitled "Satellite Operations Analysis" could be tailored to limit the scope of new analysis to only evaluating a single satellite operation and use existing analyses for other operations.

Scoping Element	Included In Hazards Analysis		
	YES	NO	Impact/Strategy
HA Lab Support			No HA Lab Support
Step-By-Step Analysis			Task Analysis
New or Modified Procedure Evaluation			Existing Procedures
New or Modified Tooling Evaluation			Existing Tooling
Multiple Task Teams Parallel Evaluations			Single Task Team
Interactive Walkdown			Videos And Procedures Only
Tooling FMEAs			Apply Existing Analyses &/or Conservative Controls
Fire Hazard Analysis			Apply Existing Analyses &/or Conservative Controls
ESD Analysis			Apply Existing Analyses &/ or Conservative Controls
NPH Analysis			Apply Existing Analyses &/or Conservative Controls
Electrical Tester Study			Apply Existing Analyses &/ or Conservative Controls
Multiple Unit Analysis			Single Unit Analysis
Satelite Operations Analysis			Limited Satellite Operations Analysis
Transportation Analysis			Apply Existing Analyses &/ or Conservative Controls
Criticality Analysis			Apply Existing Analyses &/ or Conservative Controls
Staging Analysis			Apply Existing Analyses &/ or Conservative Controls
Human Reliability Analysis			Apply Standard Failure Probabilities
Nuclear Detonation Analysis			Rely Upon Weapon Response Estimates
Develop Defense In-depth Controls			Develop TSRs
Deterministic and/or Probabilitic Analysis			Qualititative Analysis

Figure C-2: Tailored Analysis Scoping Tool.

C.3 Hazards Identification

The hazards analysis process formally begins with hazards identification, which is the identification (type, form, quantity, location) of all hazardous materials, potential process deviations, and energy sources (in terms of quantity, form, and location) associated with the scope of work.

C.3.1 Process Tooling

Process tooling (including testers) to be included in the hazards analysis is determined based upon a review of existing and historical tooling requirements for the specific program. Production Technicians should be utilized during this process. Depending on the scope, the evaluation can/will focus on an upgrade of the nuclear explosive operations tooling to meet SS-21 criteria. If the tooling is conceptual (i.e., in development), a detailed design packet is required to complete the analysis.

The evaluation of tooling will concentrate on specific design features that mitigate or prevent insults to the nuclear explosive and enable the production technician(s) to perform the task safely. The tooling design improves mechanical advantage, controls motion, controls position, and mitigates accidents caused by misinterpretation of procedures or incorrect handling. For example, during safety critical operations, the tooling must incorporate fail-safe designs such that a failure cannot occur that compromises safety.

During the evaluation, necessary nuclear explosive operation tooling changes that impact nuclear explosive safety, will be identified and recommended to the Program Project Team for disposition.

C.3.2 Procedure Screening for Weapon Program evaluations

Prior to beginning the hazards analysis, the AB Project Team applies a screening process for all procedures associated with the operations. The objective of this effort is to reduce the number of procedures requiring in-depth analysis (specifically, those procedures that do not involve operations on nuclear explosives) to a minimum. Procedures for operations on weapon components that do not contain hazardous material are an example of procedures that typically may not present hazards with the potential to meet or exceed the Nuclear Explosive Operation Evaluation Guidelines. After the first screening, all remaining procedures would be associated with nuclear explosive operations that may result in hazards that could exceed Nuclear Explosive Operations Evaluation Guidelines. Next, the remaining procedures are generally organized, based on the experience and judgement of the analysts, into one of three bins: 1) Bay Procedures, 2) Cell procedures, and 3) General Use Processing procedures: LINAC, Staging, Transportation, etc., and Other procedures: nuclear explosive component processing, which could possibly introduce hazards and require full analysis. The screening process is depicted in Figure C-3, "Decision Path for Procedure Disposition."

For those procedures which do not pose any nuclear explosive operation hazards, the appropriate AB Project Team will prepare a written summary, with justification, to be included in the TSD and HAR. The Bay, Cell, and Other procedures, which require further in-depth analysis, will be assigned to the appropriate analytical team.

C.3.3 Comparison Analysis

The procedures will be compared to previous analyses in order to determine if any process-specific hazards, associated with the current weapon program, exist. This comparison analysis will result in one of three conclusions: 1) no nuclear explosive operation hazards of concern are present, 2) weapon specific uncontrolled hazards are present, or 3) weapon common hazards are present which are already evaluated and controlled, and the controls are documented in the existing AB. These results will be documented and added to the hazards analysis in the TSD and HAR. In the first case, if there are no hazards which could meet or exceed Nuclear Explosive Operation Evaluation Guidelines, this will be documented. For the second case, if there are unique hazards for the current program, an evaluation will be performed and documented and the appropriate Accident Scenario Characterization will be developed and documented in the ABCD. In the third case, two possible conditions exist. If the event is evaluated in a Site or Facility AB document, a reference to the existing analysis will be provided in the hazards analysis as documented in the TSD and HAR. The existing controls will be adopted by the current program. If the analysis is in an existing weapon program HAR, the analysis will be copied into the TSD and HAR and the controls will be copied into the HAR and ABCD.

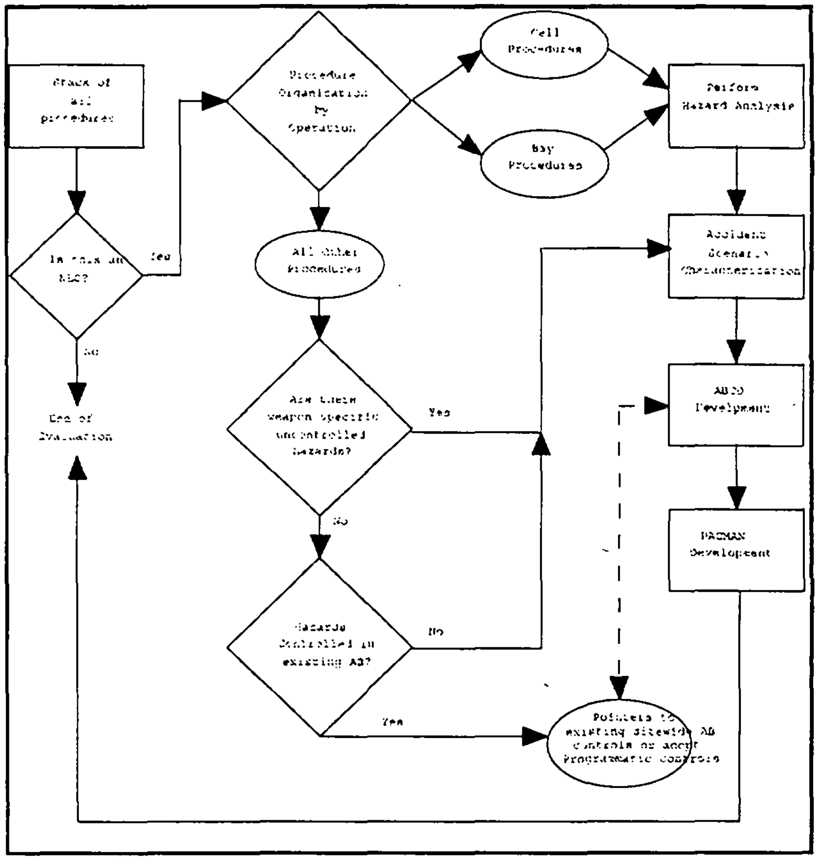

Figure C-3: Decision Path for Procedure Disposition.

This comparison provides the opportunity to use existing analyses to decrease the amount of time and cost required to establish the necessary controls. The comparison analysis will focus primarily on satellite activities, activities that are common to other weapon programs, and hazards associated with events initiated outside of the facilities. Examples include:

- Radiography Operations
- Cased Sub-Assembly (CSA) Leak Testing
- Separation Testing
- Mass Properties
- Purge & Backfill Operations
- Zone 4 to Zone 12 Transport
- Ramp Transport in the Shipping Configuration
- Staging Operations
- Tornados, External Explosions, External Fires

C.4 Positive Measure Identification

The identification of positive measures is an integral part of the hazards analysis process, beginning during hazard identification and continuing throughout the analysis. During the hazards identification process, positive measures are typically identified for each hazard.

Positive measures are all engineered features or administrative controls that could be selected to prevent or mitigate the hazard.

The terms "positive measures" and "controls" are used to distinguish those engineered features and administrative controls that are available from those that are actually selected. All positive measures are not required to be formally developed in the AB (i.e., do not have their bases; safety function, functional requirements, and performance criteria developed). The term "positive measures" indicates potential controls as distinguished from the "controls," which are documented in the AB. As such, most positive measures are taken at face value and are not documented in the AB unless selected as a control. The positive measures are documented in the Hazards Analysis Matrix in the hazard analysis document. Controls are derived during the hazards analysis.

Several methods can be employed to identify positive measures, such as asking the following questions:

- Can the hazard be eliminated?
- Can the event be prevented?
- What will reduce the frequency of the event?
- What will limit or eliminate the damage caused by the event?

Hazard analysts list the positive measures on the Hazards Matrix to aid in the later identification of controls. There is no implied performance level for positive measures not selected as controls.

C.4.1 Hazards Identification for Weapon Programs

The presence of hazards and the vulnerabilities of the nuclear explosive are generally dependent on the particular configuration of the weapon and the energy sources that can insult the weapon (mechanical, electrical, thermal, chemical). Therefore, it is important that hazards are identified in a systematic way to ensure that the presence or absence of hazards at each point in the nuclear explosive operation are identified and understood.

In order to determine what insults constitute a hazard to the nuclear explosive, it is necessary to understand the vulnerability of the nuclear explosive to electrical, mechanical, thermal, radiological, and chemical insults for each configuration of nuclear explosive. Initial information on the intrinsic hazards and vulnerabilities associated with a nuclear explosive is provided in the Weapon Safety Specification (WSS). This specification is jointly prepared by the Design Agencies and provides a succinct, yet complete, description of the nuclear explosive, its hazardous components, safety features, known limits, and an overview of the operation to be conducted.

Facility hazards shall also be categorized by type or energy source. Table C-1, presents an example of the results of a facility hazards identification effort. This type of information would normally be available in facility SARs/BIOs.

Table C-1: Example of Facility Hazards Summary

Facilities Hazard Summary for Building XX					
Facility Internal Item	**System Function**	**Chem./ Rad.**	**Mech. Energy**	**Elect. Energy**	**Therm. Energy**
Emergency Power System	The UPS is located in the building electrical equipment rooms and provides backup power (emergency lights, RAMS, and BDI).			X	
*Emergency Lighting System (ELS)	The ELS is powered by the UPS and provides lighting for egress and halting hazardous operations upon the loss of normal and auxiliary electrical power for 90 minutes.			X	

Facilities Hazard Summary for Building XX					
Facility Internal Item	**System Function**	**Chem./ Rad.**	**Mech. Energy**	**Elect. Energy**	**Therm. Energy**
Crane/Hoist	Provides for lifting heavy equipment and the weapon assembly in the bay.		X		
HVAC System	Provides heating, ventilation, and air conditioning (HVAC) (i.e., temperature and humidity control) for the bay.		X	X	
Compressed Air System	Supplies the bay with compressed air for equipment connections and overhead crane operation.		X		
Vacuum System	Supplies the vacuum to equipment connections within the bay.		X		
Electrical Distribution System	Provides electrical power for lights, receptacles, pumps, manifold stations, and other equipment in bay.			X	
Tracer Gas and Purge & Backfill Manifold Systems	Provides means for evacuating and filling weapon assemblies with specific gases.	X	X	X	
Vacuum Chamber System	Provides an evacuated chamber environment for the weapon assemblies for leak test purposes			X	
Pumps	There are several pumps associated with the Vacuum Chambers and the Manifold Stations. The Vacuum Chamber pumps evacuate and remove water vapor from the vacuum chambers. The Manifold pumps evacuate the weapon assemblies for gas purge purposes.		X	X	
SX200	Part of the residual gas analyzer system that determines the leak rate of a weapon assembly in the vacuum chamber.		X	X	
Combustibles	Various materials used in the bays (e.g., gloves as personal protective equipment, paper for documents in binders, spill response supplies, lubricants, etc.) are combustible.				X
Chemicals and Compressed Gases	Materials needed to conduct bay operations. Most of the chemicals are for cleaning purposes. The compressed gases are for leak test and fill purposes.	X	X		X
Tables and Carts	Tables are located within the bay to hold small tools and procedures in the work areas. Carts are used to transport and stage weapon assemblies in the bay and provide a stand for the weapon assembly during manifold operations.		X		

Additional tables can be used to list external events that could be initiating events for process related hazardous events and for describing the external event hazards.

Human reliability is an important element in nuclear explosive safety and needs to be considered in both the hazards analysis and the development of controls. Nuclear explosive operations primarily entail hands-on tasks involving direct work with the nuclear explosive. As a result, the potential for human error must be considered in the development of accident scenarios. There are classes of human error or breakdown in administrative controls that could be very important to nuclear explosive safety and must be addressed. Many of these type errors are predominant contributors to residual risk. Examples include:

- Mis-identification of the modified or altered nuclear explosive
- Failure to anticipate alterations performed (or not performed) by the military
- Failure to correctly identify the state and condition of the incoming nuclear explosive
- Erroneous use of an inappropriate or appropriate NEOP
- Possible inappropriate use of applicable tooling or testers
- Inappropriate Production Technician judgements on what conditions warrant a "stop work"

- Inadvertent skipping of NEOP sections or big blocks of NEOP steps
- Inappropriate carry-over of training from other programs to the program of interest

Hazard identification is accomplished by completing the Hazards Matrix (an example is shown in Table C-2). This form provides a record of what hazards were identified and how they were disposed. For more information about completing this matrix, see Appendix D.

Table C-2: Example of a Hazards Matrix.

<table>
<tr><th colspan="13">(Nuclear Explosive Identifier, i.e., W88) Hazards Identification and Evaluation Matrix</th></tr>
<tr><th rowspan="2">Procedure Step Nos.</th><th rowspan="2">Initial Conditions and Assumptions</th><th rowspan="2">Config</th><th rowspan="2">Hazard Type

Electrical, Thermal, Mechanical, Chemical Radiological</th><th rowspan="2">Scenario</th><th colspan="6">Consequence</th><th rowspan="2">Disposition/ Identified Accident Scenario, Control, or Screening Criteria</th><th rowspan="2">Positive Measures/ Comments</th></tr>
<tr><th>IND</th><th>HED/D</th><th>FIRE</th><th>WS</th><th>RAD</th><th>NONE</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

C.5 Hazardous Event Identification

The hazards analysis must examine the bounding conditions that could arise as a result of potential release of the hazards. Where hazardous material inventories are controlled by administrative limits (e.g., plutonium limits), these limits shall be used in the hazards analysis as initial conditions and are preserved as Critical Safety controls.

Situations may arise where the worst consequences result from smaller, rather than larger, assumed quantities of hazardous material. For example, smaller quantities of high explosives (HE) in a cell than permitted by the facility limit, when reacted, could result in greater hazardous material release to the environment as a result of depressurization through unfiltered penetrations. Care shall be taken to identify such cases, and when they arise, develop scenarios based on considering multiple sets of assumptions concerning hazardous material quantities. All assumptions must be fully documented and any implicit controls captured on the hazard tables for preservation.

Once the hazards have been identified, consequences are postulated. The consequences are those from the Nuclear Explosive Operation Evaluation Guidelines, i.e., Inadvertent Nuclear Detonation (IND), High Explosive Detonation/Deflagration (HED/D), fire resulting in fissile material dispersal, worker fatality or serious injury, uncontrolled release of radioactive material from a facility. Hazards that have one or more potential consequences are considered for further evaluation or control selection.

C.6 Develop Event Frequencies

The assessment of an event frequency includes the initiator frequency and subsequent conditional probability of enabling events (i.e., subsequent equipment response and operator actions). Event frequency estimation in the hazards analysis is expected to be largely qualitative; however, at the analyst's discretion, and as necessary to support control selection initiatives, quantitative evaluations may be used. Whichever method is used, sufficient documentation is provided to demonstrate the rationale for the frequency determination. To aid in understanding an accident progression and determining a frequency assessment, an event is be broken down into its constituent parts and assessed in a sufficiently structured manner that allows the event to be conservatively assigned to a frequency bin of either anticipated "A", unlikely "U", extremely unlikely "EU", beyond extremely unlikely "BEU", sufficiently unlikely "<< BEU" as shown in Table C-3.

Table C-3: Qualitative Frequencies Defined.

Note: The estimated annual frequency listed on this table represent the frequency per year that the event will occur, they take into account the number of times the operation can be performed in a year.

Frequency Bin	**Estimated Annual Frequency**	**Description**
A (Anticipated)	$10^{0} \geq p \geq 10^{-2}$	Incidents that may occur several times during the operational lifetime of the facility/operation. (Incidents that commonly occur)
U (Unlikely)	$10^{-2} > p \geq 10^{-4}$	Accidents that are not anticipated to occur during the operational lifetime of the facility/operation.
EU (Extremely Unlikely)	$10^{-4} > p \geq 10^{-6}$	Accidents that will probably not occur during the full life cycle of the facility/operation.
BEU (Beyond Extremely Unlikely)	$10^{-6} > p \geq 10^{-8}$	Accidents that will probably not occur during multiple full life cycles of the facility/operation.
<< BEU (Sufficiently Unlikely)	$10^{-8} > p$	Accidents that are considered implausible and therefore, sufficiently unlikely.

To aid in the classification of controls, an uncontrolled event frequency estimate is used. The uncontrolled event is a means of establishing bounding frequency and consequence estimates under the artificial circumstance that all critical safety controls are nonexistent.

A degree of ambiguity may arise in developing uncontrolled events and assessing their frequency, since the event may be physically impossible to occur given the presence of SSCs inherently required to perform the work. This will make it difficult at times to postulate the absence of certain engineered safety features, such as facility structures. To ensure that analyzed event are physically possible, while also presenting a calculation that is useful for control selection, uncontrolled scenario developers are provided the following explicit guidance:

- Identify and assume the existence of engineered features that are assessed to survive accident conditions, however, these features will be identified as critical safety controls
- Assume the existence of engineered features that are identified as TSR controls. Note: On a facility or weapon program basis the analysts can elect to not use the TSR controls and may instead evaluate the accident and develop facility or weapon program specific alternative controls

- Assume the existence of administrative controls that are identified as TSR controls. Note: On a facility or weapon program basis the analysts can elect to not use the TSR controls and may instead evaluate the accident and develop facility or weapon program specific alternative controls
- Assume the absence of specific engineered features that will be challenged by the accident conditions

Once the evaluation is complete, an uncontrolled risk matrix, which summarizes the uncontrolled frequencies for the events, can be completed. As shown in Figure C-4, sample scenarios S1 through S6 are listed in the appropriate risk block.

UNCONTROLLED RISK

Frequency of Uncontrolled Scenarios

ND		II	S1	S2	
HEDD		S6	ZONE	ZONE	III
FIRE	ZONE	I	II	S4	S5
Worker Injury			S3	II	
Uncon. Release		.		II	II
	<<BEU	BEU	EU	U	A

Figure C-4: Scenario Risk Matrix.

NOTE: During the development of an event, assumptions or initial conditions may have been considered. These assumptions and initial conditions must be documented as critical safety controls. In such cases, it is necessary to recognize the importance of these controls, and to preserve the assumed safety functions of the controls.

C.7 Hazards and Accident Analysis Documentation

The results of the hazards analysis shall be documented and maintained as a safety basis document. At a minimum, the documentation shall provide a demonstration that:

- Hazardous materials and energy sources have been identified
- Hazards have been fully identified and evaluated
- Uncontrolled hazard consequences and frequencies have been conservatively estimated
- Initial conditions and assumptions used to develop frequencies and consequences have been identified for inclusion as Critical Safety controls

Hazard evaluation is accomplished and documentation completed, an example is the Hazards Matrix shown in Table C-4. This form provides a record of what hazards events were identified and how they were disposed.

Table C-4: Example Hazards Evaluation Table documentation.

Hazard Event Evaluation Table															
Event No.	Event Category	Postulated Event Description	Causes	Consequence						Positive Measures				Frequency Level & Source	Comments
										Preventive Features		Mitigative Features			
				IND	HED/D	FIRE	WS	RAD	NONE	DESIGN	ADMIN	DESIGN	ADMIN		

C.8 Develop Accident Scenario Characterizations

The accident scenario development starts with the identification of representative accident scenarios from the hazards analysis results. Each accident can represent one or more hazards that have common initiators and consequences. All unscreened hazards (including chemical and radioactive) that have consequences identified in the Hazards Matrix must be represented by an accident scenario. In this step of the analysis process, accident scenarios are developed in terms of initiators and enabling events that lead to a consequence of concern. As indicated earlier, for the purposes of the nuclear explosive operations, the consequences of concern are IND, HED/D, fire leading to fissile material dispersal, severe worker injury, and the uncontrolled release of radioactive material from the facility. Given an initiator, there is generally some uncertainty concerning the functional responses of equipment, the response of personnel, and the response of the nuclear explosive. As a result, a single initiating event could lead to a number of outcomes, depending on the various subsequent events. In order to gain an understanding of the vulnerabilities of the operation, and to gain a perspective on the risk, it is necessary to characterize both the frequency and consequences of the accident scenarios, along with the ability of controls to prevent or mitigate each accident sequence.

Each accident scenario can be characterized as a sequence of events leading to a consequence, as depicted in Figure C-5. An initiating event coupled with an identified hazard(s) and followed by a set of intermediate events and/or "enabling conditions" defines a hostile environment that has the potential to impact the nuclear explosive. The response of the nuclear explosive defines the consequences of concern. Nuclear explosive response is provided by Design Agency specialists. This information is critical to determining the consequence and frequency of an accident scenario. Because the weapon response data for specific accidents is not always readily available, Design Agency response to inquiries may be delayed. When this happens, the analyst may assign a conditional probability of one that the weapon adversely responds and continue with the analysis.

It is not sufficient, however, to only analyze the nuclear explosive operation for design basis external events. The concern is, if a nuclear explosive operation is vulnerable to an event at the design basis level, then it may be vulnerable to an event with impacts less than the design basis. For example, if ceiling material falls on bare high explosive (HE) during a design basis earthquake and results in a response, the question arises whether a more frequent earthquake of smaller magnitude can also cause a response. In general, understanding the threshold of concern for the magnitude of the insult is necessary to characterize the accident scenario for that particular type of event. This may impact the identification of controls. In addition, protecting a nuclear explosive operation from design basis events does not necessarily protect it from larger insults resulting from beyond design basis events. The hazard analyst shall take an heuristic view of insults beyond those expected at the design basis level to make sure there is no limit or boundary beyond which there may be consequences of concern. That is, there is a margin of safety in response to design basis events.

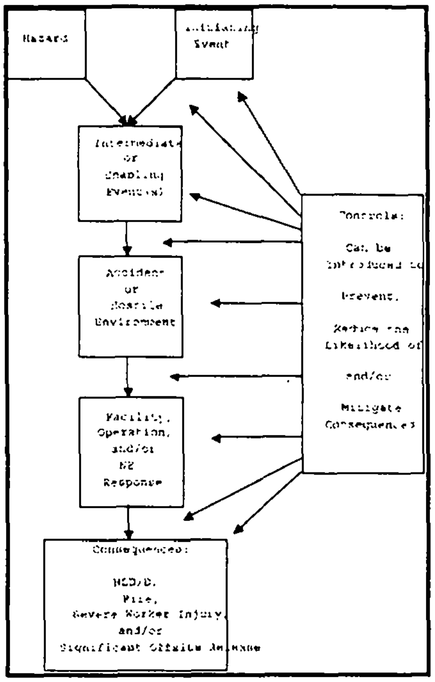

Figure C-5: Accident Scenarios and Controls.

The expectation is that the hazard analyst, in collaboration with nuclear explosive response specialists, will evaluate the response of the nuclear explosive and/or its components (high explosive, Bottles, Spin Rocket Motors, etc.) to the facility external event accident environments and assess the effectiveness of facility controls to address identified accident scenarios.

APPENDIX D

D. WEAPON PROGRAM HAR FORM & CONTENT

D.1 Weapon Program Hazards Analysis Report Form & Content

This section presents the recommended-standardized format and content for documenting hazards analysis results, including the derivation of controls, for nuclear explosive operations. The main body of the Hazards Analysis Report (HAR) must provide a complete description of the analysis, in terms of the following: 1) objective, 2) scope, 3) requirements, assumptions & limitations, 4) methodology, 5) process description, including process action flow diagrams,6) description of the nuclear explosive, including its intrinsic hazards, 7) description of the facilities where the operation will be conducted, including any pertinent hazards, 8) analytical results, including a summary of Accident Scenario Characterizations, 9) supporting references used in the analysis, and 10) additional supporting information in Appendices to the HAR, as appropriate.

In addition to the main body of information, documented in the hazards analysis report, the HAR must be prefaced by the following:

- Title Page
- Statement of Sufficiency
- Revision History or Change Control Record
- List of Effected Pages
- Table of Contents
- Lists of Figures, Tables, and Acronyms
- Definitions
- Executive Summary

D.2 Title Page

Figure D-1 identifies information required on the Title Page, and the relative location of that information. Additional information required on the title page for a classified document is also shown.

(Highest Level & Category)
(Date of Origination) (Office of Origin)

Title (Classification of Title)
(e.g. **Wxy Hazard Analysis Report (U)**)

(Handling Requirements)

(Classification Category Statement) Classifier: ADC
Derived from: Classification Guide Title

(Highest Level & Category)

Figure D-1: Information Required on a Classified HAR Title Page.

D.3 Statement of Sufficiency

This statement is an acknowledgment by the PT via their signatures, that the analysis and controls documented in the HAR are sufficient to approve and control operations. An example is shown in Figure D-2.

(Located on page one of the HAR)
Statement of Sufficiency: The Wxy PT asserts that this Hazards Analysis Report adequately summarizes the identified hazards associated with the Wxy (operations, i.e., assembly, disassembly, dismantlement, etc.). The PT further asserts that each linked control is authentic, and sufficiently effective, and reliable for its intended purpose.

(Followed by Signatures of all PT Members)

Figure D-2: Example for a Statement of Sufficiency.

D.4 Revision History

The Revision History provides a means to document changes to the HAR. This section provides a revision number, a change number or letter, the date the change or revision was submitted, and a brief description of the revisions to the document. An example of a revision history is shown below in Table D-1.

Table D-1: Example of Document Revision History

ISSUE HISTORY & SUMMARY OF CHANGES			
Revision No.	**Change No.**	**Submittal Date**	**Description of Changes**
0	0	08/09/1999	Initial DRAFT Outline
0	1	08/31/1999	Changed some of the wording in section 3.1 and 3.2 Completed the text for the outline in section 3.3 Changed the outline and completed the text for the derivation of controls in Appendix A
1	0	09/01/1999	Expanded the table of contents Changed the title of the document

D.5 List of Effected Pages

The list of effected pages, combined with the issue history, provides a means for the user to ensure they have access to the most current copy. An example of a List of Effected Pages is shown below in Table D-2.

Table D-2: Example List of Effected Pages

LIST OF EFFECTED PAGES			
Revision	**Issue**	**Date**	**Effected Pages**
0	0	08/09/1999	All
0	1	09/31/1999	4,5,6,A-2, A-3
1	0	01/09/2000	All

D.6 HAR Table of Contents

The Table of Contents is generally limited to two or three levels (i.e., 2.1, 2.1.1)

HAR Table of Contents (Continued)

HAR Table of Contents (Continued)

D.6.1 List of Figures

The List of Figures provides a means to readily locate each specific figure in the HAR. This section provides a figure number and descriptive title for all the figures in the document. An example of a List of Figures is shown below.

SAMPLE LIST OF FIGURES

D.6.2 List of Tables

The List of Tables provides a means to readily locate each specific table in the HAR. This section provides a table identifier number and descriptive title for all the tables in the document. An example of a List of Tables is shown below.

SAMPLE LIST OF TABLES

D.6.3 List of Acronyms

The List of Acronyms provides a means to readily interrupt terminology used in developing the HAR. This section provides an alphabetical listing of all acronyms and their proper names. The acronyms list in the front of this manual provides a complete listing of all common acronyms.

D.6.4 Definitions

The Definitions section must contain those terms necessary for the HAR to clearly communicate to the reader. The List of Definitions provides a means to readily interrupt and fully understand all terminology used in developing the HAR. This section provides an alphabetical listing of all Definitions along with a description of their generally accepted or historical meaning. The Definitions list in Appendix A of this manual provides a complete listing of all common Definitions.

D.6.5 HAR Executive Summary

The purpose of the executive summary is to convey to the reader a thorough and reasonable understanding of the hazards associated with the operation, relevant accident scenarios and consequences, and the controls necessary to prevent or mitigate hazardous consequences. Typical executive summaries are two to five pages, depending on the complexity of the analysis.

The Executive Summary should be written for the senior manager or general reader who may be relatively unfamiliar with the subject matter. It should contain only information discussed in the report, but should not include the facts and analyses in their entirety.

The Executive Summary must provide a concise overview and a brief account of:

- Depth and breadth of the analysis sufficient to demonstrate overall scope and rigor.
- Summary of Accident scenarios and consequences (total number by consequence, type, etc.).
- Acceptability of the safety basis relative to NES safety standards.
- Conclusions regarding residual risk and assertions of safety.
- Qualifications and experience of the analysts who performed te analysis.

If recommendations are presented, they must reference specific conclusions that prompted the recommendation. Also, pertinent safety issues must be presented. Finally, figures displaying the uncontrolled and controlled frequencies for the Accident Scenario Characterizations shall be provided as shown in Figure D-3 and Figure D-4.

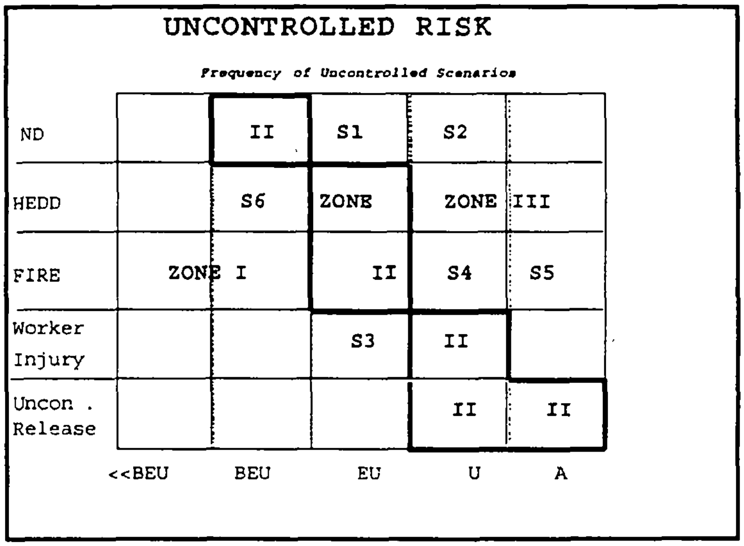

Figure D-3: Summary of Frequencies for Uncontrolled Scenarios.

The relative risk will be demonstrated through the development of these two charts, in combination with the uncertainties associated with the analysis. The first Table shows the risk of the operations as determined by the Accident Scenario Characterizations without controls in place, as shown in Figure D-3. The second chart shows the risk of the operations under the conditions of the same Accident Scenario Characterizations with controls in place, as shown in Figure -D4. These discussions of residual risk should include the inherent process or control uncertainties, as appropriate.

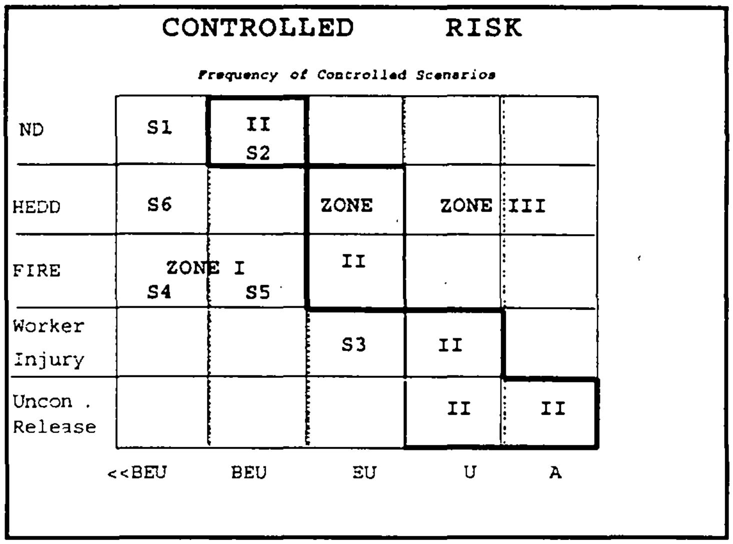

Figure D-4: Summary of Frequencies for Completely Controlled Scenarios.

D.6.6 HAR Section 1.0, Introduction

The HAR introduction discusses the subject of the report and provides: a discussion of the objectives of the report; the scope of the analysis including, the nuclear explosive, type of operation (i.e., disassembly, assembly, surveillance, on-site transportation and staging, etc.) and the range of operations (i.e., receipt, through dismantlement, modification, alteration, etc.); a discussion of the assumptions and limitations of the Hazards Analysis, and a general roadmap for the remainder of the HAR. An example discussion of limitations and assumptions is shown in Table D-3.

Table D-3: Example - Assumptions and Limitations for Hazards Analysis.

ASSUMPTIONS AND LIMITATIONS
During the performance of the Wxy Hazards Analysis, a number of key assumptions were made. These assumptions were grouped into the following three categories: 1) Limitations in Scope, 2) Human factors and Worker safety, and 3) Weapon configuration/response.
Limitations in HA Scope
o Similar sequences of events were combined into single-representative scenarios that enveloped the frequencies and consequences associated with the individual event sequences. For example, the probabilities of a pit fracture and a pit tube failure were lumped together and, in the scenario descriptions, referred to as pit tube failures.
o The impact of security actions on process activities were not specifically addressed. For instance, the analysis did not consider the possible discharge of a firearm as a result of a security action that required armed personnel to enter a bay or cell. The events are covered under the Safeguard and Security Master Study.
o Sabotage or intentional actions were not considered in the analysis; Deliberate Unauthorized Acts are considered in the Site Safeguards and Security Master Study.
Human Factors Worker Safety Considerations.
o The use of, improper use of, or failure to use personal protective equipment (PPE) and the resulting consequences were not addressed. That is, it was assumed, for analysis purpose, that all PPE was employed and functioned as intended.
o Lifting criteria were developed based on human factor design requirements to provide a basis for the identification and inclusion of worker hazards associated with tooling and component lifts.
Weapon Configuration/Response Considerations.
o Based on limited test and qualification data, and the review of the detonator design, it was assumed that detonator XYZ was not

Table D-3: Example - Assumptions and Limitations for Hazards Analysis.

ASSUMPTIONS AND LIMITATIONS	
	sensitive to Electro Static Discharge and that an Electro Static Discharge induced detonation was not credible. Further discussion of this assumption and references are given in the appendix.
o	It was assumed that the nuclear explosives presented for disassembly were in normal condition. That is, it was assumed that no unauthorized modifications had been made to the nuclear explosive before its return for disassembly and that the internal components had not suffered significant environmental or age-related degradation.

HA Methodology

HA Methodology refers to describing the methodology used to conduct/perform the Hazards Analysis, and to derive the controls and their implementation requirements. This discussion must summarize the methods and techniques (e.g., task analysis, preliminary hazards analysis, what-if analysis, etc.) employed to: 1) identify hazardous material, process deviations and energy sources; 2) identify and develop accident scenarios (including representative scenarios); 3) identify existing positive measures; 4) evaluate the accident scenarios including the determination of nuclear explosive response, scenario frequency, and consequences; and 5) assess the effectiveness of Critical Safety Controls. A discussion of the methodology should summarize all methods employed in the conduct of the analysis and the derivation of controls and include reference to standard techniques, as applicable.

D.6.7 HAR Section 2.0, Description of The Nuclear Explosive Process

This section presents a discussion of the scope of work to be authorized by the DOE, including a discussion of On-site transportation and in-process staging requirements. Specifically, the Description details each authorized operation (e.g., assembly, disassembly, nuclear explosive work, etc.), including satellite facility operations such as, leak check, mass properties, release assembly testing, etc. This includes a concise discussion of the operational boundaries, facility(ies) SSCs, and equipment and tooling used in the operation. As appropriate, the discussion should reference other relevant documentation, such as Site AB Documents, facility AB, other program HARs, etc.

Further discussion points include limitations or restrictions on the facility(ies) or location(s) where operations are authorized (e.g., High Explosive limitation) and provide the basis for understanding the hazards identified (e.g., lift heights, co-located pressurized piping). The discussion must also include any generic facility Critical Safety Controls utilized during the operation, including their "at rest" or "stowed" condition and/or location. Critical Safety Controls must correspond to those already identified in existing AB documentation, such as the SAR, BIO, or TSR.

Process action flow diagrams, developed in support of the analysis, are described to indicate the complete set of operations and activities that are conducted or may be expected, including contingency operations. These process action flow diagrams should be annotated to list applicable procedures pertinent to each activity (e.g., Nuclear Explosive Operating Procedures (NEOPs), operating and inspection (O&I) standards, etc.) Examples of process action flow diagrams are shown in Figures D-5 and D-6. Multiple process action flow diagrams would be required to describe complex operations.

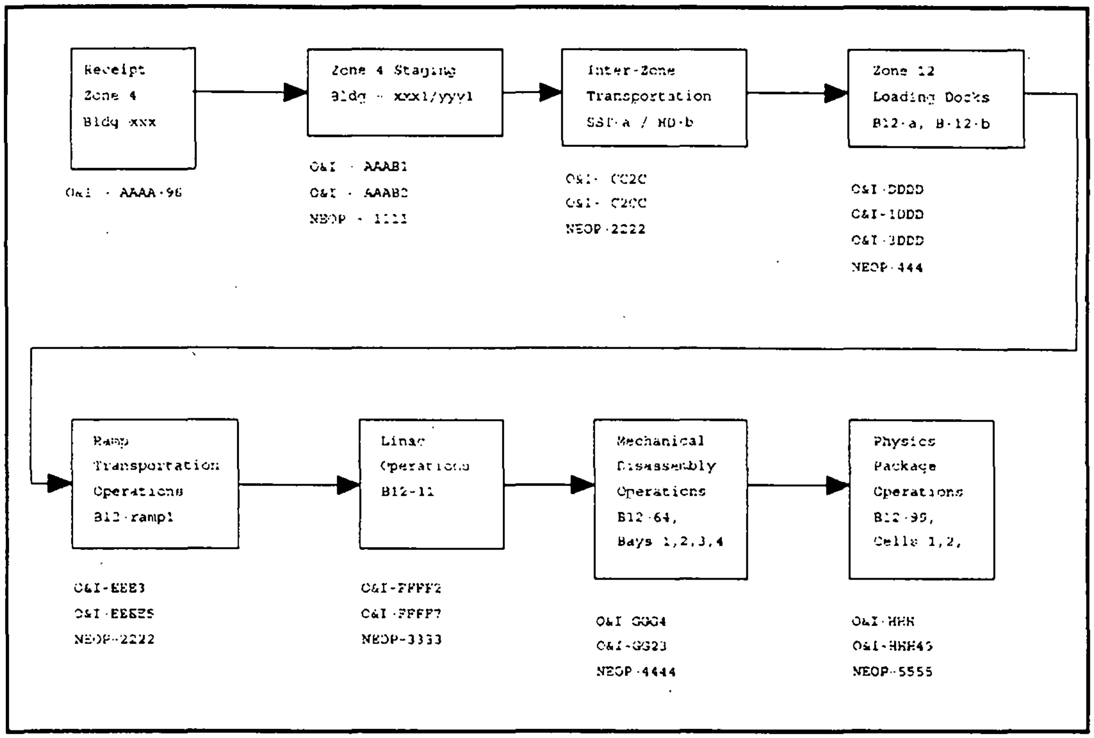

Figure D-5: Example of Nuclear Explosive Operations Process Action Flow Diagrams.

Process Action Flow Diagraming requires a complete description of the overall operation, followed by a concise description of each activity involved in the nuclear explosive process (i.e., Zone 4 activities, on-site transportation, etc.). Within the description of each part of the operation, the configuration or change in configuration of the nuclear explosive shall be noted. Table D-4 presents an example listing of nuclear explosive configurations.

Descriptions of the operations must be consistent with the order in which the operations are conducted. The following provides a suggested order for describing the major elements of a disassembly operation by defining the configuration of each assembly. The objective is to associate an acronym of the configuration such that it is readily apparent when there is a change in operational hazards, however, the descriptions of the various weapon configurations and associated acronyms must be consistent with the design agency drawings. An example would be the acronym RBNAF&F to indicate that the **R**eentry **B**ody is **N**ot attached to the **AF&F**

Table D-4: Example of Nuclear Explosive Configuration Descriptions

Configuration Designation	Configuration Description
ASA	Aft Shell Assembly alone without any nuclear components.
TC	Transportation Cart
PP	Physics Package (PP)
BW	Bench work (Seal Cover Prep, 3T Mount Pad Fixture, etc.)
WS	Warhead Subassembly (PP installed in the AFT Shell Assembly).
WSAS	Warhead Subassembly on Assembly Stand
WSSC	Warhead Subassembly with Seal Cover Installed
BWAF&F	Bench work on the AF&F

D.6.8 HAR Section 3.0, Hazard Identification

This section contains a concise description of the hazards associated with the Nuclear Explosive, the Facilities, the associated Transportation activities, and the proposed weapon process.

<u>Nuclear Explosive</u>
The discussion is intended to provide a general overview of the nuclear explosive that was evaluated, along with its associated intrinsic hazards. The overview should be brief and reference corresponding Weapon Safety Specification (WSS) for further detailed descriptions. Additionally, discussions of the Nuclear Explosive's history, including modifications, and a brief description of its field use (reference WSS) must be included.

This section of the HAR must also present a brief discussion of the major components and quantities of hazardous materials in the Nuclear Explosive. Hazardous material and response thresholds shall be summarized when available. The components to be considered include, but are not limited to: type of high explosive (e.g., conventional high explosives (CHE), insensitive high explosive (IHE)); pit material; other radiological material; nuclear explosive electrical systems; other unique energy sources for the nuclear explosive (spin rockets, parachutes, etc.); Radioisotopic Thermal-electric Generators (RTGs), reservoirs; etc.
This section must also provide a brief description of the Nuclear Explosive Safety Theme (e.g., barriers, mechanical safe and arming devices (MSAD), strong link, weak links, environmental sensing devices (ESDs), HE, fire resistant pit (FRP), and enhanced nuclear detonation safety [ENDS]) associated with the nuclear explosive. The discussion shall address the safety benefit these features provide as the nuclear explosive progresses through the various stages of the operation. The objective is to provide a familiarization with the weapon such that the analysts, along with current and future document users, have a complete picture of the weapon system safety. The discussion of safety features that are designed into the weapon must include an acknowledgment that they are not relied upon for process safety except for HE properties and physical properties of the components.

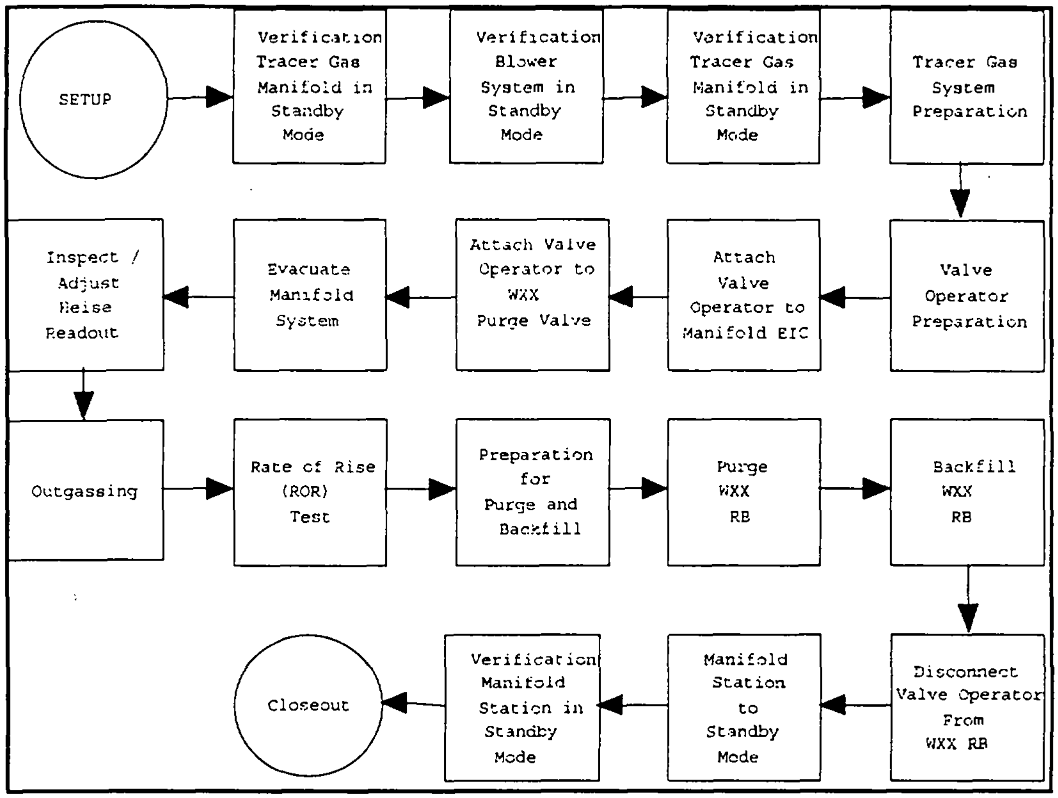

Figure D-6: Example Action Flow Diagram for a Nuclear Explosive Operation.

Facilities

A description of the facilities necessary to conduct the nuclear explosive operations must identify the specific Cell(s), Bay(s), and Special Purpose facilities. Also, the hazards associated with facility, structures, systems, components, equipment, and tooling used in the operation must be described. The discussion and descriptions presented shall provide an overview and summary that gives a basic understanding of facility and activity hazards. The discussion shall reference the pertinent documents (such as the Site BIO, facility SAR, etc.) for further details.

The discussion of facilities must also include any limitations or restrictions on the facilities or locations where operations will be conducted (i.e., HE limitation) and provide the basis for understanding the hazards identified (e.g., lift heights, co-located pressurized piping, etc.). The discussion must also identify facility Critical Safety Controls relied upon for safe operation, including their operational requirements for the process.

Bays

This section describes all mechanical component operations conducted in the bay(s) and the configuration of the nuclear explosive as the operation progresses. Each bay facility shall be described, separately (for example, by number - Building 12-xy). Summarize the logic employed in the selection of this facility for the proposed operation. Discuss any unique attributes of the facility that are required to conduct the operation. All structures, systems, components, equipment, and tooling necessary for mechanical component processes conducted in the bay, and located within these facilities, shall be described, as each has the potential for affecting safe operation.

Include a description of those permanent bay systems which are not necessary, including their required storage or "at rest" condition/location, and all associated Critical Safety Controls relied upon to ensure systems remain inactive or "at rest."

Cells

This section describes all physics package operations conducted in cells and/or bays, and the configuration of the nuclear explosive as the operation progresses. The description must demonstrate the logic employed in the selection process, and include unique attributes required to conduct the operation safely. Each cell and/or bay facility shall be described, separately. All structures, systems, components, equipment, and tooling necessary for physics package operations, and located within these facilities, shall be briefly described, as each has the potential for affecting safe operation. Also, include a description of permanent systems which are not necessary, including their required storage or "at rest" condition/location, and all associated Critical Safety Controls used to ensure systems remain inactive or "at rest."

Special Purpose Facilities

Operations to be conducted in Special Purpose Facilities is described separately. This discussion includes a description of each special purpose operation and the configuration of the nuclear explosive during the special purpose operation. All structures, systems, components, equipment, and tooling necessary for the processes, and located within these facilities, shall be briefly described because each has the potential for affecting safe operation. Similar to the discussion of Bays and Cells, also include a description of permanent systems which are not necessary, including their required storage or "at rest" condition/location, and all associated Critical Safety Controls used to ensure systems remain inactive or "at rest."

Transportation and Staging

This section describes the Nuclear Explosive's shipping configurations and activities, including the shipping container(s) and staging container(s) (if different) used, with references to applicable safety analyses. This section must include a discussion of any in-process temporary staging. In addition, this section must document the analysis of the transportation activities pertinent to the nuclear explosive while in-process at Pantex: this includes Inter-Zone and Ramp transportation of the nuclear explosive and its components. This will require a determination of the common and unique hazards associated with transportation activities. Hazards common to all Nuclear Explosives, controlled under existing Authorization Basis documents, must be referenced to the appropriate Authorization Basis document.

A description of ramp and inter-zone transportation operations must also be included that identifies the configurations of the nuclear explosive while being transported, and indicate the specific routes to be used to transport nuclear explosives. The discussion must clearly identify the specific routes and ramps to be used to transport nuclear explosives or nuclear explosive components. The discussion must also describe any special transport restrictions; such as, include one-way traffic, vehicles in emergency response, and interfaces with other concurrent transportation activities along with alternate ramp transportation routes (which might be used) to facilitate temporary staging during the operation. The description of the ramps shall include associated utilities and components that have the potential to affect the Nuclear Explosive, individually or as a result of an abnormal environment (e.g., during a seismic or lightning event). Consideration and subsequent discussion must also include forklifts and H-gear (powered hand trucks, for example) used to move Nuclear Explosives or nuclear explosive components within the ramps and include other transportation equipment (such as roadables, H-gear, etc.) that physically interface with the Nuclear Explosive/component.

D.6.9 HAR Section 4.0, Accident Scenario Characterization Summaries

Accident Sequence Characterizations document the analytical results of all accident scenarios requiring controls. Documentation of each characterization must include a discussion of the following:

- Assumptions and initial conditions.
- Uncontrolled scenario description.
- TSD references.
- Uncontrolled frequencies for all the event sequences with supporting engineering logic.
- Controls selected for the scenario.
- Justification of TSR control effectiveness (functionality, reliability, and availability).
- Residual risk of the scenario (the combination of the completely controlled frequency and control effectiveness).
- Adequacy of the control set selected.
- Linkage to locations in the process where the hazard is present.

This section of the HAR presents a summary of the results of the detailed characterizations which are documented on Accident Scenario Characterization sheets (Appendix A of the HAR). For convenience, a brief summary organized by Activity (Zone 4, Transportation, Staging, Cell Activities, Bay Activities, & Special Purpose Facility Activities), Residual Risk Zone (Zones II, & III), and Consequence (IND, HED/D, Fire leading to fissile material dispersal, Severe Worker Injury, Uncontrolled Radiological Release Outside the Facility) with the bounding frequency as compared to the total number of scenarios in the respective accident type category as shown in Table D-5.

Table D-5: Example Accident Scenario Characterization Summary Organization.

Activity (Cell)
Zone III Scenarios (Residual Risk Matrix)
IND Scenarios (Hazard Characterizations in Appendix A) e.g., Number of scenarios with the range of controlled frequencies. What controls are being employed. A brief description of residual risk. Characterization numbers of scenarios.
HED/D Scenarios (Hazard Characterizations in Appendix A) e.g., Number of scenarios with the range of controlled frequencies. What controls are being employed. A brief description of residual risk. Characterization numbers of scenarios.
Fire Leading to Rad. Release Scenarios (Hazard Characterizations in Appendix A) e.g., Number of scenarios with the range of controlled frequencies. What controls are being employed. A brief description of residual risk. Characterization numbers of scenarios.
Worker Safety Scenarios (Hazard Characterizations in Appendix A) e.g., Number of scenarios with the range of controlled frequencies. What controls are being employed. A brief description of residual risk. Characterization numbers of scenarios.
Uncontrolled Rad. Release Scenarios (Hazard Characterizations in Appendix A) e.g., Number of scenarios with the range of controlled frequencies. What controls are being employed. A brief description of residual risk. Characterization numbers of scenarios.

For Zone II & III scenarios in the residual risk matrix, the HAR should explain why additional controls could not be developed to further reduce the risk. If process re-design would be required, (i.e., new tooling), this should be noted in the HAR to serve as input for follow-on SS-21 activities.

D.6.10 HAR Section 5.0, References

This section must contain all references used to support the conclusions and rationalizations of the Hazards Analysis.

D.6.11 HAR Appendix A (Example ASC)

EXAMPLE Accident Scenario Characterization

Accident Scenario Characterization Title and identifier (i.e., BS-1)

Assumptions and Initial Conditions
This section documents the assumptions and initial conditions necessary for this scenario. These must be controlled to ensure they remain in place and they can not be duplicated (double counted) as controls listed in Table D-6 and credited to control this scenario. This shall include 1) the configuration of the weapon (e.g., unit in shipping container). 2) operations being performed (e.g., cleaning operations with isopropyl alcohol), 3) physical configuration of the operations (e.g. single unit on a work stand in a cell with combustible materials immediately adjacent or in close proximity), and 4) existing TSR facility controls that are considered in place for scenario frequency and TLC calculations.

Uncontrolled Scenario Description & Summary
This is a complete description of the scenario beginning with the initiating event and describing the complete event sequence(s) with the potential to result in the postulated consequence. This shall include the necessary enabling events such that a realistic scenario is described. For events evaluated in Site or facility AB documents, this section simply references the event in the respective document.

The following Scenario Summary Table (Table D-6) contains; 1) column 1 contains row identifiers, 2) the second column contains a description of the operation or task when the scenario is applicable, 3) column 3 contains the consequences postulated for this scenario, along with the uncontrolled bounding frequency and fully controlled frequency as determined for the scenario. If there are multiple event sequences described, only the bounding frequency is listed here, 4) this column presents the number and type of controls recommended as per the TLC guidance in the D&P Manual Chapter 11.5, and 5) the fifth and sixth columns contain all of the controls selected for the scenario. These controls will be differentiated between those which are from the TSR and those that are specific to the weapon.

TSD References
This section will document any reference documents which are part of the technical support documents and used in the calculations or determinations of this characterization.

Example Accident Scenario Characterization Title and identifier (i.e., BS-1) *(Continued)*

Table D-6: Uncontrolled Scenario Summary.

	Operation	Risk	TLC	Proposed Technical Safety Requirements: Facility/Site	Proposed Technical Safety Requirements: Wxy Programmatic
Uncontrolled	Task description, i.e., when performing hoisting operations	Maximum Consequence IND Bounding Frequency BEU	2 A C	Facility TSR controls already in place that are selected to control this scenario.	
Controlled		Maximum Consequence IND Bounding Frequency BEU		New Facility TSR controls selected to control this scenario.	Weapon specific TSR controls selected to control this scenario.

Example Accident Scenario Characterization Title and identifier (i.e., BS-1) *(Continued)*

Uncontrolled Frequency for all the event sequences
This section will document the development of all accident sequences (including initiating and necessary enabling events) for the uncontrolled accident scenario with the supporting engineering logic for the frequency determinations. The bounding uncontrolled qualitative frequency will then be documented in Table D-6. Also, the weapon response frequency obtained from the Design Agencies will be discussed in this section if used in the control selection. If weapon response data is unavailable, an Anticipated frequency will be assigned to the weapon response for determining the frequency of the event sequence(s).

In accordance with DOE-STD-3009-94 and DOE-DP-STD-3016-99, due to the uncertainty associated with accident scenario frequencies, qualitative estimates are sufficient for accident scenario frequencies. However, the analyst shall provide the basis, other than heuristic information, for the assigned frequency. It is important to keep in mind the defensibility for the number when providing this justification. With little data, it might be more prudent to calculate the event sequence frequency as the product of the initiating event and the weapon response frequencys, ignoring the enabling events that are described in this section. While this is acceptable, it is still important to accurately describe all the enabling events for each event sequence.

Selected Controls for the Wxy Program (Includes ABCD controls, TSR controls, and Important to Safety Controls) In accordance with DOE-STD-3009-94 and DOE-DP-STD-3016-99, due to the large uncertainty associated with accident scenario frequencys discussed in the last section, the selection of controls shall use safety-conservative expert judgement. In addition, this section will include the controls necessary to preserve any assumptions or initial conditions that reduce the consequences below EGs or that prevent the accident from progressing. The control title must be listed, followed by identification of its safety classification (i.e., Safety Class, Safety Significant, Important to Safety). For each weapon specific control, list the following:

1) For "Each Weapon Specific Control Title"

Effectiveness of control
The control effectiveness is a conclusion based on the functionality, reliability, and availability of the control documented in this section. When describing each critical safety control's effectiveness, provide a basic summation of the information known about the control, including reference to the system design description, industry standards (ASME, IEEE, IE, etc.) and applicable drawings. Summarize pertinent aspects of the manufacturer's specifications. Pertinent aspects are considered to be those that directly relate to the critical safety function as opposed to general industrial equipment specifications that fall outside what is needed to fulfill the safety function.

Thus, if a lift is conducted, load test or stress/strain metrics are an important descriptive parameter. If, on the other hand, puncture is of concern, the attributes of the safety control that resist particular shapes, sizes and weights may be more appropriate.

Example Accident Scenario Characterization Title and identifier (i.e., BS-1) *(Continued)*

Functionality: Describe the functional elements, attributes, and limitations of the control in relation to the scenario. (How the control prevents or mitigates the accident sequences) Identify any SSCs, equipment, and tooling whose failure would result in the critical safety control losing the ability to perform its required safety function. These SSCs, equipment, and tooling need to be considered critical safety controls for the specific accident conditions for which the safety control designation was originally intended.

Reliability: Provide a defensible case the identified conditional probability that the control will function to prevent or mitigate the scenario when it is needed. Include discussions of preventive maintenance (PM) required by the system Engineers to maintain the control's reliability.

Availability: Demonstrate how it will be assured that the control will be there (available) when it is needed to prevent or mitigate the scenario. This would include the necessary surveillances to ensure availability. Identify the conditional probability that it will not be available.

2) For "Each Facility TSR Control"

For those controls that are already delineated in AB documents, document the linkage to that AB document for the supporting effectiveness in this section. Do not create new information for controls in current AB documents.

Residual Risk
This section contains the completely controlled qualitative frequency of the scenario. Document the acceptability of resulting set of controls based on the frequency or TLC. If TLC is used, compare the total set of controls to the TLC criteria. If frequency is used, this assertion shall be based on the uncontrolled qualitative frequency and the conditional probability the controls implemented to prevent the scenario or mitigate the consequences. This shall include the engineering logic for the controlled scenario and shall include a discussion of other Important to Safety controls (although not deemed necessary to be included as ABCD controls for this scenario) which do provide additional layers of protection. All additional controls listed here will be captured in the Safety Basis Document List and Important to Safety Manual and be maintained via the MHC change control system.

Linkage to the HA
This section must provide the linkage from this characterization to the HA tables.

D.6.12 Hazard Analysis Example Matrix

August 24, 1999 (9:10AM)

Example Hazard Matrix

Working Draft (xx)
(Procedure Number)

(Nuclear Explosive Identifier, i.e., W88) Hazards Matrix

Step/Task No.	Initial Conditions and Assumptions	Config	Hazard Type Electrical, Thermal, Mechanical, Chemical/ Radiological	Scenario	Consequence						Disposition/ Identified Accident Scenario, Control, or Screening Criteria	Positive Measures/ Comments
					IND	UEDD	FIRE	WS	RAD	NONF		

The Hazard Matrix is used to document the hazards and corresponding accident scenarios identified during the analysis and will reside in the TSD. The matrix documentation will maintain the association of the hazard to the particular procedural steps or tasks for change control, or procedure and tooling modifications. The specific columns, from left to right, will contain the following information:

- **Step/Task No.** - The procedure step number(s).
- **Initial Conditions or Assumptions** - Those conditions must be identified since they may be required controls.
- **Config.** - The acronym for the configuration of the unit. These acronyms will be identified in the matrix footer for reference.
- **Hazard Type** - This is the type of hazard identified and will be documented as an E for Electrical, T for Thermal, M for Mechanical, C/R for Chemical, or R Radiological. An example would be a scenario of dropping a large piece of tooling on the nuclear explosive assembly. This would be documented as a Mechanical hazard.
- **Scenario** - This is the detailed description of the accident sequence. The level of detail must be sufficient to enable the weapons response specialists at the Design Agencies to analyze the impacts to the nuclear explosive or components. Information such as drop heights, component or tooling weights, impact velocities, and a succinct description of the events necessary to enable the scenario are necessary.
- **Consequence** - This is the postulated consequence(s) to result if any of the event sequences identified take place.
- **Disposition/Identifier** - This column will typically contain one of three identifiers. First, if the hazard has been screened based on first principles or expert opinion that the weapon response is sufficiently unlikely, there will be a screening number entered here to link the scenario to the screening documentation. There may be multiple Laboratories screening the same scenario, depending on which parts or components of the weapon are involved. Second, if the scenario can not be screened by the design agencies, then it will be developed as an accident and the identifier of the ASC will be entered here to maintain the linkage between the procedure and the characterization. Last, if there is some other supporting justification for not requiring controls for the scenario, that information will be identified here or a pointer to the location of the justification in the technical supporting documents. (e.g., common industrial hazards controlled under OSHA section of the Hazards Control S/RID, HC-2300)
- **Positive Measures/Comments** - This column will contain positive measures identified in the hazards analysis and would also capture questions raised during the analysis which will provide clarification to the reviewer or require further attention by the analysis team.

Once this analysis is documented on the matrix, the ASCs are completed in accordance with the example.
Configuration Acronyms identified in the footer of the Hazard Matrix tables.

APPENDIX E

E. CRITERIA FOR HAZARDS ANALYSIS COMPLETENESS

This section presents a consolidation of the criteria or requirements from DOE Orders which define an acceptable Hazard Analysis Report Documentation.

E.1 Criteria Documents

Hazard identification, along with an understanding of the operation, facility, and Site provide the basis for the development of potential accident scenarios. Scenario development, and the identification and evaluation of controls, provides the means to ensure that the final set of engineered and administrative controls is technically adequate to support decisions regarding safe conduct of the operation.

Current DOE guidance establishes the criteria by which the HAR can be assessed. The documents examined for these criteria were:

- U.S. Department of Energy Order, *Safety of Nuclear Explosive Operations*, DOE O 452.2A, Washington, D.C., January 1997,
- U.S. Department of Energy Albuquerque Operations Office, AL Appendix 56XB, Development and Production Manual, Chapter 11.4, *Authorization Basis for Pantex Plant Nuclear Explosive Operations*, Revision 1, Change 27, Albuquerque, NM, dated April 15, 1999,
- U.S. Department of Energy Standard, *Hazard Analysis Reports for Nuclear Explosive Operations*, DOE-DP-STD-3016-99, Washington, D.C., February 1999,
- Summary of the Residual Risk Meeting, Pantex Plant, Mason & Hanger Corporation, Amarillo, TX, June 9, 1999, and
- Attachment 4 of SMT Minutes 98-5 & 6, IWAP Scope Adjustments, Version 2.

The following criteria establish requirements that a HAR must meet. They are dependent on the scope established and agreed to prior to beginning the project.

E.2 Hazard Analysis

E.2.1 Process Description

A concise process description and basic process action flow diagrams <u>shall</u> be included to aid in the understanding of the HA. [Att 4 of SMT Minutes 98-5&6 page 2, ¶ I.D; D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, Item 1; DOE-DP-STD-3016-99 Section 7, page 7, ¶ 7.d]

E.2.2 Hazard Identification

The text of the HAR shall provide a convincing case that all hazards have been identified. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ I.A; D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, Item 2, DOE O 452.2A, Page 7, Fig 1]

These hazards include those posed by the weapon and its components, by the process (e.g., tooling, testers), the facility (e.g., fire, electrical energy), and natural phenomena (e.g., lightning, seismic). [Att 4 of SMT Minutes 98-5&6; page 2, ¶ I.C D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, Item 2, DOE-DP-STD-3016-99 Section 7, page 7, ¶ 7.f]

- The HA shall consider hazards specific to the operation, including failure of equipment, tooling, support systems, and human actions. [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 3]
- The HA shall also address hazards external to the facility where the operations are conducted (e.g., natural phenomena, transportation accidents, explosions or accidents at neighboring facilities). [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 3]
- The HA shall also address hazards internal to the facility but external to the operation (e.g., fires and floods). [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 3]
- The potential for human error must be considered in the development of accident scenarios. [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 4]
- The HA must consider the operational processes, equipment, facility or facilities, operation-unique activities related to movements within or between facilities, and the specific locations where the activities are to be conducted. [DOE-DP-STD-3016-99 Section 5.1, page3, ¶ 2]
- The HA must address on-site transportation. [DOE-DP-STD-3016-99 Section 5.1, page 3, last ¶]
- The HA is **NOT** required to address deliberate unauthorized acts which are addressed under the provisions of DOE O 452.4, "Security and Control of Nuclear Explosives and Nuclear Weapons." [DOE-DP-STD-3016-99 Section 5.1, page 4, second ¶]
  - The HA should address situations where security and use control positive measures might adversely impact nuclear explosive safety so that they can be addressed in an appropriate manner. [DOE-DP-STD-3016-99 Section 5.1, page 4, second ¶]
- Compliance with Environmental Protection Agency rules and OSHA regulations are not within the scope of the HA. [DOE-DP-STD-3016-99 Section 5.1, page 4, first ¶]

Where practicable, accidents shall be grouped into common scenarios (e.g., drops, minor strikes, fires, etc.) where the nuclear explosive is in the same configuration (or has the same vulnerability) and the same controls for prevention or mitigation apply. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 3]

The HAR shall include the identification of a bounding set of scenarios resulting in nuclear explosive consequences (IND, HED/D, HE fires leading to fissile material dispersal, severe worker injury, and uncontrolled release of radioactive material from the facility). [Att 4 of SMT Minutes 98-5&6, page 2, ¶II.A]

- A representative set of accident scenarios resulting in consequences of concern shall be identified. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ I.A.1]

Hazards identification shall be accomplished by reviewing prior analyses (e.g., WSS, SAR), coupled with a process walk-down (and process videos) and additional efforts necessary to identify hazards not previously analyzed. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, Item 2]

- Where prior analyses are relied upon, the HAR shall include a synopsis of the results and relevance to the proposed nuclear explosive operation. Within the text of the HAR, a specific citation to the prior analysis shall be made and a comprehensive list of references shall be included at the end of the document. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 6]

- For facilities or operations lacking an approved SAR, the expectation is that operation-specific Hazards Analyses would include the safety analysis of those facilities and activities in support of the proposed nuclear explosive operation comparable to the level of analysis required by DOE O 5480.23, DOE-STD-3009-94, or DOE-STD-3011-94. [DOE-DP-STD-3016, Section 5.0, page 2, last ¶ and page 3, first ¶]

E.2.3 Consequence Assessment

The HAR shall focus on consequences that meet or exceed the nuclear explosive operation EGs. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4. first ¶ of the Section]

While quantitative uncertainty analysis is not required, the magnitude of the uncertainties and the potential impact of large uncertainties on the results should be discussed and documented in qualitative terms. [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 5]

Additional deterministic and probabilistic calculations should be employed to provide a better understanding of the largest consequence accident scenarios. [DOE-DP-STD-3016-99 Section 6.0, page 6, ¶ 5]

The HAR is not required to include a quantitative consequence assessment of all accidents. However, some qualitative consequence assessments may be required to support evaluation of facility safety basis issues. [DOE-DP-STD-3016-99 Section 5.1, page 3, ¶ 4]

E.2.4 Selection of Events

Justification for the disposition of all identified hazards and accident scenarios (i.e., those determined to require further analysis and those determined not to pose a safety concern. [DOE-DP-STD-3016-99 Section 3.0, page2, ¶ 3.b.(4) and Section 7.0, page 7, ¶ 7.g]

- Explanation shall be provided for accident scenarios that do not require controls due to benign consequences or because the scenarios are determined to be sufficiently unlikely. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4 and 11.4-5, Item 2]

Assumptions employed in the conduct of the HA will be discussed, including justification of the screening criteria used in the selection of accident scenarios and controls. [DOE-DP-STD-3016-99 Section 3.0, page 2, ¶ 3.b.(7) and Section 7.0, page 7, ¶ 7.b]

E.2.5 Selection of Events Analytical Techniques

Those aspects of the operation-specific hazards analysis that involve nuclear detonation, high-explosive detonation and deflagration, and fire shall be assessed using a systematic accident sequence analysis and documented in a HAR or NEHA. [DOE O 452.2A, page 8, ¶ 4.c.(1)(d)4; DOE G 452.2A-1A, page 10, ¶ 2.3.(1)(a)]

- The HA shall include a systematic evaluation of the operation to identify hazards and develop potential accident scenarios. [DOE-DP-STD-3016-99 Section 6.0, page 6, first ¶]

The Project Team will demonstrate that the analytical techniques applied were the appropriate techniques required for the assessment and were correctly implemented. [Att 4 of SMT Minutes 98-5&6 page 2, ¶ II.B; DOE-DP-STD-3016-99 Section 7.0, page 7, ¶ 7.e]

- The HAR shall describe the analytical technique used to analyze hazards and present results. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 3; DOE-DP-STD-3016-99 Section 7.0, page 7, ¶ 7.e]

E.2.6 Analyst Training

Analysis of a comprehensive set of potential accident initiators and event sequences potentially resulting in consequences that meet or exceed the nuclear operation EGs shall be identified and developed by trained and experienced analysts. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 3; DOE-DP-STD-3016-99 Section 6.0, page 5, fourth ¶]

- To be effective, the team must include a combination of safety analysts and subject matter experts familiar with the specific nuclear explosive operation being analyzed. [DOE-DP-STD-3016-99 Section 6.0, page 5, fourth ¶]

E.3 Selection of Controls within the HAR

Demonstrate the proposed control set which, if effectively implemented, will ensure operations are conducted within an understood risk envelope. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ III.A; Section 4.3, page 11.4-5, Item 6; and DOE-DP-STD-3016-99 Section 7.0, page 8, ¶ 7.h]

The Project Team will perform an evaluation of the adequacy and effectiveness of controls in order to prevent or mitigate accidents. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ II.C; Section 4.3, page 11.4-5, Item 7; and

DOE-DP-STD-3016-99 Section 7.0, page 8, ¶ 7.h] The HAR will include an analysis of how the proposed set of controls compares to the TLC targets. The linkage of the hazards to the applicable controls shall be clearly presented (i.e., through the accident scenario description). [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 4; Att 4 of SMT Minutes 98-5&6; page 2, ¶ II.C]

- Derivation of controls (identifying the need and providing linkage to the hazards) shall be summarized in the HAR. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ II.C.1]

- DOE does not use the HAR to evaluate the adequacy of the site institutional safety programs (i.e., assessments), as other means exist to accomplish these evaluations. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, first ¶ of the Section]

The HAR may consider the TLC guidance (D&P Manual Chapter 11.5) as a tool for the initial scoping of the control set. The guidance specified in DOE-STD-3009 may also be used when applicable to the type of control set needed. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 5]

The Hazards Analysis must identify the safety control requirements and bases required for nuclear explosive operation. For these control requirements, the HAR should include supporting analysis and documentation prepared in accordance with DOE O 5480.22 and its supporting standards. [DOE-DP-STD-3016-99 Section 6.0, page7, ¶ 1, and Section 7.0, page 8, ¶ 7.h]

Implementation of a layered defense philosophy will likely include controls that enhance safety in addition to those specified in the TSR/ABCD. The Pantex Plant contractor is expected to clearly identify and manage these controls. [D&P Manual Chapter 11.4, Section 4.8.3, page 11.4-8]

E.4 Adequacy of HAR/ABCD and BIO/TSR Controls

Demonstrate the combination of BIO/TSR and HAR/ABCD provides complete coverage for the operation. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ III; D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 6; DOE-DP-STD-3016-99 Section 7.0, page 8, ¶ 7.h]

The HAR shall demonstrate that the combined safety envelopes of the BIO/TSR(CSSM) and HAR/ABCD are complete. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ III.A; DOE O 452.2A, page 8, ¶ 4.c.(1)(d)3]

The HAR text shall provide the DOE approval authority sufficient information to enable an assessment of the adequacy of identified controls. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 7]

The HAR text shall provide the senior manager with an understanding of the residual risk the DOE is accepting if the operation is authorized based upon the hazards, potential accidents and controls. [Att 4 of SMT Minutes 98-5&6; page 2, ¶ III.B; and D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 7]

- Residual Risk: That risk to the safety and health of the public and workers that remains after the requisite TSRs (nuclear explosive-specific and Site-wide) have been identified and implemented, as a result of performing specific mission work. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 1, Discussion Section second ¶]

- An overall residual risk matrix will be reported in the Executive Summary of the HAR and residual risk will be reported for each rolled up scenario. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 1, Discussion Section, third ¶]

  - The scenarios reflected on this matrix are those which meet or exceed the nuclear explosive operation evaluation guidelines. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 1, Discussion Section 1st bullet]

  - The rolled up scenarios which fall in Zone II or Zone III will be addressed in the executive summary of the HAR. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 1, Discussion Section 2nd bullet]

  - Those scenarios which end up in Zone I will not be addressed in the executive summary of the HAR. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 2, 1st bullet]

  - Scenario characterizations will document the engineering logic to support residual risk bins for scenarios placed in Zone II and Zone III. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 2, 2nd bullet]

  - All rolled-up scenarios (uncontrolled) identified as having the potential to meet or exceed nuclear explosive operation evaluation guidelines are characterized. Characterizations will include a discussion of the following items: [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, first ¶]

    - Assumptions (includes the weapons configuration). [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, 1st bullet]

    - Initial conditions (e.g., facility type). [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, second bullet]

    - Unmitigated scenario description (i.e., initiating event, enabling events considered and consequences). [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, third bullet]

    - Weapons response information. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, fourth bullet]

    - Recommended TSRs. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, fifth bullet]

  - Discussion of control effectiveness in terms of: [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, sixth bullet; DOE-DP-STD-3016, Section 7.0, page 8, ¶ 7.h]

    - Functionality - How well will the control work?

- Reliability - Will the control perform when necessary?

- Availability - Is the control there when needed (because it is implemented)?

- Case for Safety (Residual Risk bin and the engineering logic for controlled scenarios). [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, seventh bullet]

- Residual Risk: completely controlled frequency and any uncertainties noted during the analysis. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, eighth bullet]

- Adequacy of the Control Set. [Summary of the Residual Risk Meeting, Pantex Plant, June 9, 1999, page 3, ninth bullet]

Implementation of a requirement to prevent or mitigate one hazard shall be assessed to ensure that the frequency of a significant safety incident involving another hazard is not increased. If any such instance is identified, alternative methods shall be investigated to attempt to implement the requirement without increasing the risk associated with the other hazards. [DOE O 452.2A, page 2, ¶ 4.a.(4)]

Guidelines, best management practices, or other nonmandatory implementation guidance shall be similarly assessed for potential impact on another hazard before being implemented. [DOE O 452.2A, page 3, ¶ 4.a.(4)]

E.5 Minimum HAR Contents

The HAR shall include a NEHA. [DOE O 452.2A, page 6, ¶ 4.c.(1)(b)]

As a minimum, the HAR shall include: [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 2]

- An executive summary that provides an overview of the HAR and its main conclusions. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.a]

- An introduction that provides a discussion of: objectives, scope of the analysis, the operations conducted, and the limitations and assumptions in the Hazards Analysis. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.b]

- A description of the nuclear explosive and its intrinsic hazards. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.c]

- A description of the nuclear explosive operation and the facility(ies) where the operation is to be conducted. The discussion should focus on the facility and the nuclear explosive configurations and processes including equipment and tooling. The discussion should also include interfaces between the operation and facility having safety implications. Generic safety controls utilized during the operations should be discussed. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.d]

- A discussion of the methodology used to conduct the HA and derive the safety controls and safety requirements. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.e]

- A summary of the identification of hazards and potential accident scenarios under normal and abnormal conditions considering both internal and external environments for each step in the nuclear explosive operation. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7 f]

- A discussion of the development, characterization, and evaluation of the accident scenarios that could lead to IND, HED/D, fire, severe worker injury, damage to the environment, or other significant off-site consequences. This evaluation shall support the identification of safety controls, the establishment of their functional requirements, performance criteria, and the basis for the derivation of safety requirements for the operation. The justification for the disposition of all identified hazards and accident scenarios including basis for nuclear explosive response assumptions, criteria for screening hazards scenarios, and the use of nuclear explosive response thresholds should be well documented. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.g]

- A summary listing of safety controls required to safely conduct the described nuclear explosive operation including their description, safety function, bases functional requirement, and performance criteria. This discussion should address the effectiveness and reliability of identified controls and interfaces with the site/facility-level programs. This discussion should also demonstrate the institutional safety commitments and address operational hazards and accidents. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.h]

- A listing of the requirements that ensure the safety controls are in place, properly configured, and maintained. These requirements include facility and process-specific TSRs, process-specific administrative controls, process-specific requirements for facility safety management programs, and process-specific requirements to implement TSRs. [DOE-DP-STD-3016, Section 7.0, page 7, ¶ 7.i]

- NESRs and any process-specific safety requirements necessary to implement the NESR must be documented in the HAR. [DOE-DP-STD-3016-99, Section 5.2, page 5, ¶ 4]

- A comprehensive list of references shall be included at the end of the document. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-5, Item 6]

The focus of the HAR shall be placed on conclusions of the analysis, not the analysis itself. Details of the supporting analysis shall not be included in the report, but provided as backup by reference and shall be readily available to the reviewers. [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, 2nd ¶]

E.6 Documentation Supporting the NESS

The HAR should provide sufficient information to support the NESSG evaluation of the proposed nuclear explosive operation to ensure there are adequate positive measures to minimize the possibility of unintended nuclear detonations, high-explosive detonation or deflagration, or fire leading to fissile material dispersal from the pit, thus ensuring that the three NES safety standards in DOE O 452.2A are met. [DOE-DP-STD-3016, Section 5.2, page 4, last ¶]

Note: D&P Manual Chapter 11.4 states "DOE-DP-STD-3016 should be used as guidance in the development of the weapon-specific HAR." [D&P Manual Chapter 11.4, Section 4.3, page 11.4-4, 2nd ¶]

E.7 General & Specific NESRs

There are general, supplemental, and nuclear explosive specific nuclear explosive safety rules (NESRs) which are important to safety of the nuclear explosive operations and are maintained at the plant. The general NESRs are delineated in headquarters DOE orders. Supplemental NESRs are delineated in the Albuquerque Supplemental Directives. The nuclear explosive specific NESRs are identified by the NESSG and documented in the NESS Review. All these NESRs shall be identified in this document to complete the set of controls depended upon to authorize and perform safety nuclear explosive operations for a specific nuclear explosive.

E.7.1 DOE NES Safety Standards DOE O 452.2A

- Minimize the possibility of accidents inadvertent acts, or authorized activities that could lead to fire, high-explosive deflagration, or unintended high explosive detonation;

- Minimize the possibility of fire, high explosive deflagration, or high explosive detonation given accidents or inadvertent acts; and

- Minimize the possibility of deliberate unauthorized acts that could lead to high explosive deflagration, or high explosive detonation.

E.7.2 General NESRs DOE O 452.2A

- Nuclear explosive operations shall not be performed until a NES study or survey is approved, and pre-start recommendations have been closed.

- Operations on nuclear explosives or collocated main charge high explosive and pit shall be performed in accordance with approved written procedures.

- Operations involving an nuclear explosive not known to be one-point safe shall be conducted only at the Nevada Test site.

- Production plant operations shall not be started on an nuclear explosive until it is certified by the design laboratory to be one-point safe.

- If it is determined that an nuclear explosive no longer meets the one-point safety criteria, all production plant operations and off-site transportation with that nuclear explosive shall be discontinued. Before operations can be resumed with that nuclear explosive, a NES study shall be conducted and approved.

E.7.3 General NESRs DOE AL 452.2A

- All nuclear explosive operations shall be performed in accordance with approved written procedures or released. Changes to approved procedures or drawings shall be processed through a system designated for that purpose. Any proposed changes that would affect matters already considered by a NES Study shall be reviewed for nuclear explosive safety implications by personnel assigned nuclear explosive safety responsibilities.

- Any nuclear explosive returned to DOE because of an abnormality or for repair shall not be precessed by the production agency until written instructions have been received from the Design Agency and coordinated with the Weapon Programs Organization. These instructions shall be coordinated with the Design Agency nuclear explosive safety organization and with AL's Weapon Surety Division/Nuclear Explosive Safety Program prior to implementation by the production agency. Only procedures authorized in an approved NESS or approved by a NES review shall be used on an nuclear explosive that has an abnormality or that is to be repaired.

- Electrical testing of nuclear explosives shall be kept to a minimum. NEs shall not be subjected to redundant electrical tests. Electrical troubleshooting shall not be performed on nuclear explosives; that is, to confirm the existence of a fault or to aid in fault isolation. Any proposed deviations from this general NESR shall be referred to the Design Agency nuclear explosive safety organization and to WSD/NESP for appropriate action prior to implementation.

- Slippery high explosive shall not be handled manually.

- No unauthorized energy sources shall be available in an nuclear explosive area during nuclear explosive operations.

- Combustible and flammable material quantities in NEAs shall be minimized, justified, and documented; reviewed by fire protection personnel; and approved by line management. Ignition sources in NEAs shall be identified and eliminated where possible.

E.7.4 Supplemental NESRs DOE O 452.2A

- Additional safety rules shall be developed as needed to supplement the general NESRs for specific operations or to address specific characteristics of an individual design of a nuclear explosive, a specific test, or an operation.

E.7.5 Supplemental NESRs DOE AL 452.2A

- Program specific NESRs are published under separate cover by WSD (*Specific NESRs for the Pantex Plant*). Specific NESRs together with the general NESRs support the nuclear explosive safety standards.

SEPARATION

PAGE

Enclosure #5

United States Government Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

RECEIVED
00 MAY -2 PM 1:09
DNF SAFETY BOARD

DATE: APR 25 2000

REPLY TO ATTN OF: AAO:SSTA:RTB

SUBJECT: Pantex Plant Phase I Integrated Safety Management System Verification (ISMSV) Review - Final Report

TO: R. E. Glass, Manager, AL

The subject report is attached for your information and use. The review was conducted April 3-13, 2000. The review identified thirty-three (33) specific issues organized into five (5) opportunities for improvement (OFI). Three of the OFIs are specific to Mason & Hanger Corporation (MHC), one OFI is specific to Amarillo Area Office (AAO) and one OFI warrants action by both MHC and the Department of Energy. At the conclusion of the review, the team briefed senior management within MHC and AAO on the results.

The following is a summary of the OFI and the team recommendation associated with each.

1. The MHC ISM system description needs improvement to achieve completeness.

   The team recommends the AL Manager approve the MHC ISM system description upon MHC resolution of the issues identified under OFI #1 and AL validation of closure.

2. The MHC ISM system description needs improvement to achieve consistency.

   The team recommends the AL Manager task MHC to resolve the issues identified under OFI #2 prior to declaring readiness for a Phase II ISMSV review. The Phase II ISMSV review team should be tasked to validate closure of these issues.

3. The MHC ISM system description should be enhanced to improve clarity.

   The team recommends the AL Manager task MHC to develop a corrective action plan (CAP) to address the issues identified under OFI #3. The AL Manager should approve the CAP given the need for continued improvement in the MHC ISM system description.

4. DOE should work jointly with MHC to further define and strengthen formal mechanisms to integrate design laboratory support into Pantex Plant operations.

   The team recommends AL lead development of a CAP to address the issues identified under OFI #4.

5. The AAO system description needs improvement.

   The team recommends the AL Manager task AAO to address the issues under OFI #5 prior to performance of Phase II ISMSV review. The Phase II ISMSV Review Team should be tasked to validate closure of these issues.

If you have any questions concerning the attached report, please contact me at (806) 477-6150.

R. T. Brock

R. T. Brock
Review Team Leader
Pantex Plant Phase I ISMSV

Attachment

cc w/attachment:
B. Pellegrini, General Manager, MHC
J. McConnell, DNFSB
C. Longenbaugh, ISRD, AL
D. Pellegrino, ISRD, AL
S. Erhart, SASD, AL
L. Roybal, SPD
A. MacDougall, KAO
E. Morrow, DP
K. Jamali, DP
J. Hassenfeldt, EH

4. DOE should work jointly with MHC to further define and strengthen formal mechanisms to integrate design laboratory support into Pantex Plant operations.

   The team recommends AL lead development of a CAP to address the issues identified under OFI #4.

5. The AAO system description needs improvement.

   The team recommends the AL Manager task AAO to address the issues under OFI #5 prior to performance of Phase II ISMSV review. The Phase II ISMSV Review Team should be tasked to validate closure of these issues.

If you have any questions concerning the attached report, please contact me at (806) 477-6150.

R. T. Brock

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Pantex Plant Phase I ISMSV

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Pantex Plant

Phase I

Integrated Safety Management Verification

Final Report

April 2000

Phase 1 Integrated Safety Management System Verification Team

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Table of Contents

EXECUTIVE SUMMARY

The Department of Energy (DOE) is committed to conducting work efficiently and in a manner that ensures protection of workers, the public and the environment. It is DOE policy that safety management systems shall be used to systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment (DOE P 450.4). Contractors responsible for management and operation of DOE sites are required to describe the integrated safety management system used to achieve this objective, including the identification of applicable laws, regulations and DOE directives (DEAR, 48 CFR 970.5204-2 and 970.5204-78).

This report documents the results of the review conducted to verify the Pantex Plant's Integrated Safety Management Description (PLN-93, Revision 5) developed by Mason and Hanger Corporation (MHC) and supporting plant documents conform to the requirements and guidance provided by DOE. The review was also conducted to verify the Amarillo Area Office (AAO) has documented safety management responsibilities and processes integrated with those of MHC. The review was conducted consistent with the guidance contained in the following: (1) the Under Secretary's Memorandum of March 1997, *Protocol for Review and Approval of Documented Safety Management System Descriptions Associated with Defense Nuclear Facilities*; (2) the *Integrated Safety Management System Description Guide* (DOE G 450.4-1); and (3) the *Integrated Safety Management System (ISMS) Verification Team Leader's Handbook* (DOE-HDBK-3027-99).

The team was organized into five functional areas consistent with the core functions of integrated safety management: Define Scope of Work; Analyze the Hazards; Develop and Implement Hazard Controls; Perform Work within Controls; and Provide Feedback and Continuous Improvement. The team conducted their review April 3-14, 2000 at the Pantex Plant. The review was conducted using Criteria Review Approach Documents based on the core functions and guiding principles of the DOE policy, associated guide and handbook. Summaries of the review are contained in Appendix A.

RESULTS

The team found the MHC ISM system description (PLN-93, Revision 5) responsive to the requirements of DOE P 450.4, the DEAR, and guidance from the contracting officer. The MHC ISM system description provides an adequate "roadmap" to the mechanisms used to implement the core functions and guiding principles of integrated safety management. The team found the system description to be relatively comprehensive and complete, with some limited exceptions (see opportunity for improvement number 1).

Due to a recent organizational change within MHC, some implementing mechanisms do not reflect associated changes in roles and responsibilities. The team found the extent of the organizational change had minor impact on previously established roles and responsibilities of MHC line management. The MHC changes could best be characterized as a re-alignment to clarify business functions along organizational lines. Through a self-assessment, MHC developed a list of affected documents and has a prioritized schedule to complete their update by May 31, 2000. In addition to these changes, the team identified some inconsistencies between documents within the MHC system (see opportunity for improvement number 2).

Although the team found the MHC system to be relatively comprehensive and complete, the structure of the ISM system description and the document hierarchy used to form the foundation of the system warrant further improvement. The team found the MHC ISM system description to be a good roadmap to identify the variety of mechanisms used to implement each of the core functions and guiding principles. However, the team found key mechanisms used to achieve integration of processes and requirements were difficult to identify. The team believes long-term improvements could be achieved by altering the current document hierarchy in some cases to achieve consolidation of related procedures, standards, etc. into "manuals of practice." Consolidations in document hierarchy could in-turn lead to simplification of the structure of the ISM system description. Coupled with a complementary method of identifying the key mechanisms used to achieve integration, the MHC ISM system description could be significantly enhanced. The team perceives such enhancements to the system description would make it more conducive to management and personnel understanding (see opportunity for improvement number 3).

The team found several requirements and mechanisms to ensure design laboratories interface with MHC to support the safety of Pantex Plant operations. However, the team identified a number of instances where no formal mechanism exists, or the level of detail and formality could be improved. Since no contractual relationship exists between the design laboratories and MHC, the team considers DOE should lead improvements in this area (see opportunity for improvement number 4).

Based upon a review of both the MHC ISM system description and the AAO ISM system description, DOE processes are adequately integrated with those of the contractor. The team found some processes, roles, and responsibilities are not defined, require expansion, or warrant clarification in AAO procedures (see opportunity for improvement number 5).

In summary, the team identified thirty-three (33) issues that were translated into five (5) opportunities for improvement. Nineteen (19) issues and three (3) opportunities for improvement are specifically related to the MHC ISM system description. Eight (8) issues and one opportunity for improvement are specific to the AAO ISM system description. Six (6) issues and one opportunity for improvement are related to interface issues between DOE, MHC, and the nuclear weapon design laboratories. The team identified four (4) noteworthy practices by MHC:

1. The structure and use of a Master Authorization Agreement,
2. The model used to determine the relative priority for internal independent assessments,
3. The hazard identification team (HIT) process used to perform facility walkthroughs to identify hazards and safety issues, and
4. The self-assessment and documentation packages compiled by MHC to support the review.

CONCLUSIONS

The team recommends the following actions be taken:

1. The Albuquerque Operations Office (AL) Manager approve the MHC ISMS Description (PLN-93) upon MHC resolution of the issues identified under opportunity for improvement (OFI) #1 and AL validation of closure.

2. The AL Manager task MHC to resolve the issues identified under OFI #2 prior to declaring readiness for a Phase II ISMSV review. The Phase II ISMSV Review Team should be tasked to validate closure of these issues.

3. The AL Manager task MHC to develop and submit a corrective action plan (CAP) to address the issues identified under OFI #3. The AL Manager should approve the CAP given the need for continued improvement in the MHC System Description.

4. AL lead development of a CAP to address the issues under OFI #4.

5. The AL Manager task AAO to address the issues under OFI #5 prior to performance of a Phase II ISMSV review. The Phase II ISMSV Review Team should be tasked to validate closure of these issues.

NOTEWORTHY PRACTICES

The verification team identified the following Noteworthy Practices: .

Mason and Hanger Corporation

Noteworthy Practice C3.1
The use of a Master Authorization Agreement provides additional flexibility and less administrative burden while ensuring the rigor of the document is maintained. The document is properly "tailored" for the Pantex site.

Noteworthy Practice C5.1
A common problem seen in any prioritization activity is the lack of a systematic process that is repeatable. The model utilized to determine priority regarding independent assessments to be conducted is outstanding. It involves assigning weighted scores to some objective factors (time since last assessment, Occurrence Reporting and Processing System (ORPS) and Price-Anderson Amendments Act incidence) as well as a reasonable approach to some more subjective factors (customer satisfaction) in order to arrive at a listing organized by priority.

Noteworthy Practice C5.2
MHC Hazard Identified Team Manual (MNL-00053) describes a process by which DOE/AAO and MHC personnel work together to perform facility walkthroughs to cover the entire plant each quarter. Hazards are identified, assigned to the responsible facility manager, and corrective actions are tracked in the Self-Assessment Facility Evaluation database.

Noteworthy Practice C5.3
To assist the ISM Verification Team, MHC conducted a self-assessment using the performance objectives and criteria, review and approach documents contained in the review plan. MHC provided a matrix to the team that delineated any areas where problems were found to exist. MHC also developed packages containing applicable plant standards or documents deemed to satisfy each performance objective. This effort is considered noteworthy and should be employed for any future reviews of a similar nature.

OPPORTUNITIES FOR IMPROVEMENT

The following opportunities for improvement (OFI) were derived from a roll-up of individual issues. Section 2 of the report contains the issues corresponding to each OFI. Appendix A contains the supporting details.

Mason and Hanger Corporation

OFI #1 - The MHC ISM System Description needs improvement to achieve completeness.

OFI #2 – The MHC ISM System Description needs improvement to achieve consistency.

OFI #3 – The MHC ISM System Description should be enhanced to improve clarity.

DOE/Mason and Hanger Corporation

OFI #4 – DOE should work jointly with MHC to further define and strengthen formal mechanisms to integrate design laboratory support into Pantex Plant operations.

Amarillo Area Office

OFI #5 – The AAO ISM System Description needs improvement.

1.0 INTRODUCTION

Safety Management System policy (DOE P 450.4) defines the expectations that DOE facilities be operated in accordance with an Integrated Safety Management System (ISMS). The DEAR, 48 CFR 970.5204-2 requires that the contracting officer (Albuquerque Operations Office Manager) provide guidance to a management and operating contractor as to the expectations for the ISMS Description. The DEAR also requires the ISMS Description submitted by a management and operating contractor be reviewed and approved by the contracting officer.

The Albuquerque Operations Office (AL) Manager guidance and expectations were provided to the Pantex Plant management and operating contractor, Mason and Hanger Corporation (MHC), in a memorandum dated April 27, 1998. MHC submitted the ISMS Description in the form of the MHC ISM Program Plan (ISMPP), Revision 2, to the DOE on July 15, 1998. At the request of the contracting officer, DOE personnel conducted a combined Phase I and Phase II integrated safety management system verification (ISMSV) review on July 27-31 and August 17-28, 1998. The review was conducted in accordance with the Pantex Plant ISMSV Strategy approved by the AL Manager on April 30, 1998. Phase I focused on the adequacy of the ISM Program Plan and supporting documents. Phase II evaluated a sampling of activities and facilities to assess the adequacy of implementation.

Overall, the 1998 ISMSV review concluded MHC was generally achieving DOE objectives for ISM and identified specific areas where improvement was needed. Opportunities for improvement identified through the 1998 Phase I and II review were; institutionalization of the ISMS processes; clarification of roles and responsibilities; DOE process guidance for nuclear explosive operations; and AAO roles and responsibilities, and processes. Refer to Appendix B for the specific recommendations.

The ISMSV team recommended that the Manager, AL approve the MHC ISMS Description contingent upon correction of the deficiencies identified, and successful results from a follow-up verification of the MHC ISMS Description.

On September 30, 1998, the Defense Nuclear Facilities Safety Board (DNFSB) transmitted Recommendation 98-2 to the Secretary of Energy. DNFSB Recommendation 98-2 dealt with safety management at the Pantex Plant. The DNFSB recommended changes in both process requirements and in organizational roles and responsibilities. Portions of DNFSB Recommendation 98-2 closely paralleled issues identified during the ISMSV. On November 30, 1998, DOE formally accepted DNFSB Recommendation 98-2, and submitted an Implementation Plan in April 1999.

In executing the corrective actions identified in the Implementation Plan for DNFSB Recommendation 98-2, DOE made a number of process changes. The changes included further definition and detail in both requirements and implementing guidance for nuclear explosive operations as promulgated through DOE directives, AL supplemental directives, and inter-agency procedures with the design laboratories, MHC, and DOE. The changes also included some important changes in organizational roles and responsibilities. For example, MHC was assigned the leadership role for project teams to develop nuclear explosive assembly and disassembly processes used at the

Pantex Plant. The scope of this responsibility includes hazard analyses, derivation of operational controls for safety, and preparation of all aspects of the process to achieve operational readiness. Due to the extent of changes made to processes and organizational roles and responsibilities, a significant amount of time was required for implementation.

On September 9, 1999, the AL Manager appointed a Team Leader for the Phase 1 ISMSV for the Pantex Plant. In the appointment memorandum, the AL Manager also approved a Review Plan defining the scope, prerequisites, approach, and process for conducting the verification.

On March 6, 2000, MHC submitted a letter to the AL Manager declaring their readiness to undergo a repeat Phase I ISMSV. The Phase 1 ISMSV Team conducted an orientation and planning for the verification on March 8-9, 2000, at the Pantex Plant. The Review Plan was revised in March 2000 to reflect the members of the verification team and any changes made to the criteria review and approach documents (CRAD). All corrective actions in response to the 1998 verification were completed prior to the start of this review.

The Verification Team was composed of 10 members. Members were from AAO, other AL offices, the Office of the Departmental Representative to the Defense Nuclear Facilities Safety Board (S-3.1), and the Office of Defense Programs (DP). The team was organized into five areas consistent with the five core functions of integrated safety management: (1) Define the Scope of Work; (2) Analyze the Hazards; (3) Develop and Implement Hazard Controls; (4) Perform Work within Controls; and (5) Provide Feedback and Continuous Improvement.

1.1 Purpose

The purpose of the verification was to evaluate whether the MHC ISMS Description and associated plant standards, manuals, and procedures adequately reflect core functions and guiding principles for ISM, as required by DOE policies and regulations. In assessing the adequacy of the MHC ISMS Description, the team considered supporting plant documents and results of the self-assessment provided by MHC.

1.2 Scope

The scope of the Phase I ISMSV included all Pantex Plant activities managed and operated by MHC under contract number DE-AC04-91AL65030. As part of the scope, the team also examined applicability of the MHC ISM system description to collocated entities at the Pantex Plant not under the direct cognizance of MHC (e.g., the weapons evaluation and test laboratory operated by Sandia National Laboratories).

The Pantex Plant is located in Carson County, 17 miles northeast of downtown Amarillo, Texas. The Pantex Plant site consists of 10,177 acres owned by the Department of Energy (DOE), including 9,100 acres in the main plant area and 1,077 acres around Pantex Lake, approximately 2.4 miles northeast of the main plant area. An additional 5,800 acres of land south of the main plant is leased from Texas Tech University for use a safety and security buffer zone. The Pantex Plant was first used by the U.S. Army for production of conventional ordnance from 1942 to 1945. In 1951, the Atomic Energy Commission chose the site for expansion of its nuclear weapons assembly facilities.

The Pantex Plant is composed of several functional areas referred to as zones. These zones include a weapons assembly and disassembly area (Zone 12), a weapons staging area (Zone 4), an area for experimental explosive development (Zone 11), a domestic water treatment plant (Zone 15), a sanitary wastewater treatment facility (Zone 13), and vehicle maintenance and administrative areas (Zone 16). Other functional areas include an explosive test-firing facility, a burning ground for explosive materials, an area for storage (Zone 10), and area of landfills north of Zone 10.

The following is a general summary of the types of operations or activities performed at the Pantex Plant:

- Assembly of nuclear weapons
- Disassembly of nuclear weapons
- Modification and maintenance of nuclear weapons
- Quality assurance testing of weapon components (surveillance)
- Research and production of high explosives (HE) and weapon components
- Storage of plutonium components (pits) from dismantled nuclear weapons
- Transport for nuclear weapons and components to Department of Defense and other DOE sites (e.g., tritium reservoirs to the Savannah River Site)
- Demilitarization and sanitation of components, including burning of HE and HE-contaminated wastes
- Environmental restoration activities including site characterization to determine the nature and extent of contamination
- Waste management
- Maintenance of site infrastructure including security, utilities, roads, receipt and transport of equipment and bulk materials, landscaping

Pantex Plant operations involve the following hazards (or potential hazards):

- Nuclear explosives
- High explosives
- Radioactive material
- Fissile material (criticality)
- Hazardous chemicals
- Firearms
- Standard industrial (natural gas, steam, electrical energy, rotating machinery, heavy equipment, etc.)
- Natural phenomena (tornado, earthquake, lightning)
- External events (aircraft crashes, fire)

1.3 Approach

The adequacy of the MHC ISM system description was evaluated against the expectations of the AL Manager, the DEAR requirements, and other DOE guidance related to ISM. Documentation was reviewed to determine whether or not the principles and requirements of ISM are reflected in plant standards, manuals, and procedures. The verification focused on the adequacy of formal mechanisms established through the MHC ISM system description (and implementing procedures and standards) to satisfy each of the core safety functions and guiding principles defined in DOE P 450.4. Personnel interviews and briefings were used to assist the verification team in understanding ISM processes, roles and responsibilities of MHC and DOE.

Roles, responsibilities, and interfaces necessary for the institutionalization of the ISMS process were examined on a plant-wide basis. This included interface between MHC, national laboratories (weapon design agencies), and DOE required to safely perform work assigned to the Pantex Plant. The verification included an examination of MHC processes and their effectiveness in achieving integration both from an "upward" site perspective, as well as "downward" (i.e., a vertical slice) to the facility and activity level. The verification examined the extent of internal integration within AAO and MHC, and how well the two organizations are integrated to form a seamless site management system.

As described above, the verification initially focused at the site level, where the MHC ISMS Description establishes requirements and mechanisms that are "general" (i.e., applicable to all site operations.) The verification then examined the specific requirements and mechanisms established for the varying levels of hazards associated with Pantex Plant operation. These include "high" (i.e., nuclear material and nuclear explosive operations), "moderate" (e.g., high explosive operations), and "low" hazard activities (e.g., standard industrial hazards). The level of review applied to the ISMS requirements and mechanisms for these activities was graded commensurate with the hazards.

2.0 Results

This section presents the Opportunities for Improvement (OFI) and the corresponding issues related to each. For further clarification of any issue, see Appendix A.

OFI #1 - The MHC ISM System Description needs improvement to achieve completeness.

<u>Issue C1.2</u>

MHC Directive (DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*) defines the scope of responsibilities assigned to various organizational elements, principally at the directorate level. No formal mechanisms (as defined by the MHC ISMS Description document hierarchy) exist that further define roles and responsibilities for selected portions of the organization down to the worker and activity level (e.g., waste management). These roles and responsibilities may be indirectly defined within a number of other documents, but have not been consolidated consistent with the approach for other organizational elements. (Acceptance Criterion C1.5)

<u>Issue C1.3</u>

The Chief Financial Officer (CFO) budget call instructions are cited in STD-7308, *Integrated Plant Project Priorities* as an important mechanism to achieve site-wide integration and consistency in annual budget development. The CFO budget call instructions are not formally included within the MHC ISMS Description document hierarchy and are not a controlled document. (Acceptance Criterion C1.5.2)

Issue C1.6

The MHC ISMS Description does not identify the formal mechanism(s) used to ensure collocated activities performed at the Pantex Plant which are not under the direct cognizance of MHC comply with the requirements established by the system description (e.g., Tri-laboratory and Weapons Evaluation Test Facility). (Acceptance Criterion C1.14)

Issue C 2.1

The MIC S/RID and associated S/RID flowdown matrixes do not identify a connection between the emergency hazard assessment (EHA) and the facility-level hazard analysis performed as part of the OSHA process hazard analysis. As a result, the MHC system description does not have a mechanism to ensure that information vital to each of these programs is incorporated into both the facility/activity documents and in the site-wide emergency planning documents. (Acceptance Criterion C2.1-Low Hazard Operations)

Issue C 2.2

The MHC system description does not define a mechanism to periodically compare the combined facility chemical inventory to the appropriate EPA and OSHA limits to ensure that the facility/activity does not exceed the authorized facility operating envelop. (Acceptance Criterion C2.2-Low Hazard Operations)

Issue C2.3

The MHC system description adopts limited portions (radiological facilities) of standard DOE-EM-STD-5502-94, Hazard Baseline Documentation. As a result, the MHC system description does not establish a formal mechanism describing a site-wide facility-level hazard categorization process. (DOE P 450.4, *Component 3*, requires hazards to be identified, analyzed and categorized and *Component 4* requires directives on identifying and analyzing hazards and performing safety analysis.) (Acceptance Criterion C2.1-High Explosives)

Issue C3.3

Section 7.2 of the Master Authorization Agreement defines a process for making minor changes to the authorization agreement without formal DOE approval, provided a set of rigorous pre-conditions are met. However, the MHC system description does not include a mechanism for making such changes (MHC plant standard STD-0154, *Authorization Agreements*, contains no such provision). (Acceptance Criterion C3.19)

Issue C4.5

The MHC ISM system description defines plant standard STD-2777, *Personnel Selection, Qualification, and Certification* as a key mechanism related to training. However, STD-2777 does not include direct reports to the Pantex Plant Manager. (Acceptance Criterion C4.2)

OFI #2 - The MHC ISM System Description needs improvement to achieve consistency.

Issue C1.4

A number of plant standards that serve as formal mechanisms to define management processes, roles and responsibilities are inconsistent with the current organization as defined in the MHC system description and MHC Directive, DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant.* (Reference MHC's matrix list on standards dated April 3, 2000). (Acceptance Criterion C1.5.3)

Issue C1.7

The MHC ISM system description does not clearly and consistently distinguish between line management and support roles and responsibilities. Inconsistent terminology is used to define the roles and responsibilities of line management. (MHC STD-7403, Operations Directorate) (Acceptance Criterion C1.14)

Issue C2.4

The MHC ISM system description defines an approval process for authorization basis documentation for non-nuclear facilities (page 18) that is inconsistent with the memorandum dated September 17, 1999, "Department of Energy Concurrence for Proposed Safety Basis Operations of a Non-Nuclear Explosives Facilities." (Acceptance Criterion C2.2-High Explosives)

Issue C2.6

The MHC ISM system description does not identify IOP-729, *Mission Programs Division Project Plan Development* as a formal mechanism for defining roles and responsibilities related to design laboratory interface, although it provides some detail related to operations involving special nuclear material (SNM). (Acceptance Criterion C2.1-Nuclear Explosive Operations)

Issue C3.1

The MHC ISM system description defines two formal mechanisms related to work control that are inconsistent. MHC plant standard, STD-5016, *Maintenance Work Control System* defines a process for initiating work under emergency conditions before completion of a planned work order. The personnel who have authority to approve this process are clearly defined. However, the process does not consider the potential need for interim compensatory measures and that a return to normal work practices must be done as soon as the situation has stabilized (i.e., use of formal procedures). The process does not adequately address the need to use approved procedures as far as practicable. MHC plant standard, STD-0150, *Procedure Adherence*, does not discuss emergency work conditions and contains no provision for the performance of work without an approved procedure. (Acceptance Criterion C3.2)

Issue C4.1

The MHC ISM system description does not accurately reflect who is responsible for the Operational Readiness Program. MHC plant standard STD-7403, *Manufacturing Operations*, reflects the program manager directorate rather than the Readiness Review Program Manager. (Acceptance Criterion C4.1)

Issue C4.3

There are inconsistencies between the MHC ISM system description and MHC plant standard STD-0154, *Authorization Agreements* on what types of activities or facilities require an authorization agreement. (Acceptance Criterion C4.1)

Issue C4.6

The MHC ISM system description does not include several key mechanism used to define processes, roles, and responsibilities of the Program Management Directorate. (IOP-707, IOP-718, IOP-729, and STD-7012 define mechanisms, but are not identified as part of the MHC system.) (Acceptance Criterion C4.3)

Issue C5.3

The MHC ISM system describes three levels of feedback and improvement with various mechanisms functioning at one or more different levels. The interfaces and relationships between the different mechanisms can eventually be derived from the implementing standards and manuals. However, the MHC ISM system description does not adequately define how the individual mechanisms are integrated, and how the information derived from the different inputs and analyses actually result in continuous improvement. (Acceptance Criterion C5.7)

OFI #3 - The MHC ISM System Description should be enhanced to improve clarity.

Issue C1.5

The hierarchy and inter-relation between documents defining mechanisms, roles, and responsibility in common functional areas should be clarified. For example, a number of standards exist related to the functional area of "training." All of the standards occupy the same stature within the document hierarchy defined by the MHC ISM system description. However, some of the standards are clearly subservient to others, and this relationship is not consistently described or defined. (Acceptance Criterion C1.13)

Issue C1.8

The MHC ISM system description and MIC S/RID define implementing mechanisms to establish an integrated safety management system. However, the complexity of the system description structure is not conducive for management and worker understanding. Further simplification in the structure of the system description, or additional discussion in the overview is warranted. (Acceptance Criterion C1.14)

OFI #4 - DOE should work jointly with MHC to further define and strengthen formal mechanisms to integrate design laboratory support into Pantex Plant operations.

Issue C1.9

The Memoranda of Agreement and Memoranda of Understanding with the design agencies should be updated to reflect ISM principles and be included as part of the MHC ISM system description and implementing documents.

Issue C2.5
Additional detail should be provided in MHC ISM system description on roles and responsibilities of the design laboratories. Especially as related to safety analyses and resolution of technical issues arising out of operations that have potential safety implications. (Acceptance Criterion C2.1-Nuclear Explosive Operations)

Issue C2.8
DOE should develop a formal mechanism to ensure design laboratory interface with MHC extends beyond participating in initial hazard analyses. A formal mechanism is warranted to ensure new data is furnished to MHC, so that implications on the safety of Pantex Plant operations can be evaluated. (Acceptance Criterion C2.5)

Issue C4.7
The MHC ISM system description does not establish a formal mechanism (process) to ensure design laboratory involvement for resolution of problems subsequent to an abnormal nuclear operational event (i.e., technical or safety problem with a nuclear explosive or component). (Acceptance Criterion C4.6)

Issue C4.8
The AAO ISM system description does not establish a formal mechanism to invoke design laboratory involvement for resolution of problems subsequent to an abnormal nuclear operational event, other than emergency situations. (Acceptance Criterion C4.6)

Issue C5.4
There is no mechanism by which the DOE ensures new design laboratory information is factored into MHC operations. (Acceptance Criterion C5.18)

OFI #5 – The Amarillo Area Office System Description needs improvement.

Issue C1.1
The AAO system description (AAO Procedure 103.1.0) and Functions, Responsibilities, and Authorities Manual (FRAM) (AAO Procedures 103.4.0) do not clearly identify line management at organizational levels below the Area Manager. (Acceptance Criteria C1.1-C1.4)

Issue C2.7
The AAO system description (AAO procedure 103.1.0) does not define the mechanisms for development of hazard analyses and a safety basis for non-nuclear facilities or operations. The AAO system description does not define organizational roles and responsibilities, and the required resources for review, approval, maintenance, and implementation of controls associated with these facilities or operations. (Acceptance Criterion C2.5)

Issue C3.2
DOE is required to clearly define roles and responsibilities for personnel assigned to oversee, review and approve controls associated with facilities and operations. Based upon feedback from personnel interviews, AAO Procedure 103.4, *AAO Functions,*

Responsibilities and Authorities Manual should be revised to reflect the actual review process used. Currently, AAO Procedure 103.9, paragraph (9)(f)(1) implies that the Assistant Manager for Weapon Operations "authorizes" Authorization Agreements. (Acceptance Criterion C3.10)

Issue C3.4
Section 7.2 of the Master Authorization Agreement defines a process for making minor changes to the authorization agreement without formal DOE approval, provided a set of rigorous pre-conditions are met. However, the AAO system description does not include a mechanism for making such changes (AAO procedure 103.2, Authorization Agreements contains no such provision). (Acceptance Criterion C3.19)

Issue C4.2
The AAO ISM system description (AAO Procedure 103.1.0) does not clearly define line management responsibilities for confirmation of readiness. (Acceptance Criterion C4.1)

Issue C4.4
There are inconsistencies between the AAO ISM system description, section 4.2 and the AAO Procedure 103.2.0, *Authorization Agreements* on what types of activities or facilities require an authorization agreement. (Acceptance Criterion C4.1)

Issue C5.1
The AAO ISM system description does not identify a mechanism to develop corrective action plans in accordance with DOE O 414.1A *Quality Assurance*, Appendix 2. (Acceptance Criterion C5.5)

Issue C5.2
The AAO ISM system description does not include mechanisms to address "lessons learned." (Acceptance Criterion C5.5)

3.0 Lessons Learned

To assist the ISM Verification Team in the conduct this verification, MHC conducted a self-assessment using the performance objectives and criteria, review and approach documents identified in the review plan. MHC presented a matrix to the team that delineated where problems or gaps were found to exist. MHC also prepared packages containing plant standards and supporting documents responding to each performance objective. This effort is considered noteworthy and should be employed for any future reviews of a similar nature.

Due to the recent reorganization of MHC, many lower level procedures were not updated to reflect the current organization. Although MHC presented the team with a list of standards requiring clarification, it may have been beneficial to conduct the verification after all procedures had been updated.

Appendix A

Integrated Safety Management Phase I Verification

Assessment Forms

ISMS Verification Assessment Form

Functional Area:	**Objective Number:** C-1
Define Scope of Work	**Date:** 4/10/00

OBJECTIVE

DOE and contractor processes ensure missions are translated into work, performance expectations are established, tasks are identified and prioritized, and resources are allocated. Resources are allocated to address safety, programmatic, and operational considerations and mechanisms exist to ensure balanced priorities. Roles and responsibilities for work scope definition and execution are clearly established. Mechanisms exist to ensure personnel who define the scope of work and allocate resources have competence commensurate with assigned responsibilities.

Criteria

C1.1 DOE guidance for translating mission into work includes delineating its plan of work. This means the scope, schedule, and funding allocations for each fiscal year. [BBC.1.1]

C1.2 DOE guidance for setting expectations for the contractor is established through contracts and regulations. These contracts and regulations provide guidance on expected performance, set goals and priorities, and allocate resources. [BBC.1.2]

C1.3 DOE roles and responsibilities are clearly delineated to ensure a satisfactory level of safety, accountability, and authority to define the scope of work. [BBC.1.3]

C1.4 DOE procedures ensure that the contractor adequately prioritizes work so that, when the Integrated Safety Management System (ISMS) is implemented, mission and safety expectations are met within available budget and resources. DOE procedures require performance objectives and related goals and priorities are reviewed and approved. [BBC.1.4]

C1.5 Contractor procedures translate mission expectations from DOE into tasks that permit identification of resource requirements, relative prioritization, and performance measures that are established consistent with DOE requirements (DEAR 970.5204-4, DOE P 450.5). [BBC.1.5]

C1.6 DOE and contractor procedures provide for DOE approval of proposed tasks and prioritization. Work planning procedures provide for feedback and continuous improvement. [BBC.1.6]

C1.7 DOE and contractor procedures provide for change control of approved tasks, prioritization, and identification of resources. [BBC.1.7]

C1.8 Contractor procedures provide for flow-down of DEAR 970.5204-2, "Integration of Environment, Safety and Health into Work Planning and Execution," requirements into subcontracts involving complex or hazardous work. [BBC.1.8]

C1.9 The prioritization and allocation process clearly addresses both ES&H and programmatic needs. The process involves line management input and approval of the results. [BBC.2.1]

C1.10 Priorities include commitments and agreements to DOE as well as stakeholders. [BBC.2.2]

C1.11 The incentive and performance fee structures promote balanced priorities. [BBC.2.6]

C1.12 DOE procedures for defining the scope of work ensure balanced priorities. [BBC.2.7]

C1.13 Contractor procedures ensure that the personnel including line management who define, prioritize, and approve the scope of work and allocate resources have competence commensurate with assigned responsibilities. [BBC.3.1]

C1.14 The ISMS Description is consistent and responsive to DOE Policies 450.4, 450.5, and 450.6; the DEAR; and the direction to the contractor from the Approval Authority. [MG.1.1]

C1.15 Contractor ISMS defines clear roles and responsibilities of all personnel to ensure safety is maintained at all levels. The ISMS procedures and implementing mechanisms specify that line management is responsible for safety. [MG.2.1]

C1.16 DOE procedures and practices assure that personnel who define the scope of work or oversee the contractor practices for defining the scope of work have competence commensurate with assigned responsibilities.

C1.17 The ISMS describes how the contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the ISMS.

C1.18 DOE and the contractor have mechanisms to ensure changes to work scope requirements requested or established by the design agencies are evaluated for impacts.

C1.19 DOE and the contractor have mechanisms to ensure the scope of design agency support for Pantex activities is identified, including resource requirements, deliverables, and schedules.

Approach

These criteria were evaluated by conducting a review of applicable sections of the contract, Mason and Hanger Corporation (MHC) and U. S. Department of Energy (DOE) procedures and documents, and interviews with key MHC and Amarillo Area Office managers.

Record Review

1. MHC Integrated Safety Management Description (ISMD), Plan 93, Revision 5, issued March 31, 2000
2. DIR-0001, Roles and Responsibilities for the Management and Operation of Pantex Plant, dated March 24, 2000
3. ISMS Verification Phase I & II Final Report for Pantex Plant - Volume I, dated October 1998
4. Pantex Plant ISMS Phase I Review Plan - Revision 1, dated March 2000
5. TBP 901, Integrated Safety Process for Nuclear Weapons Operations and Facilities - Issue A, dated February 7, 2000
6. MHC AT-IOP-80075, Process Safety Management, dated October 21, 1999
7. MHC AT-IOP-80079, Applied Technology Operations, dated March 30, 2000
8. MHC IOP B-0006 Manufacturing Divisions Guidelines for Formal Conduct of Operations, dated March 9, 2000

9. MHC IOP-FO-1001 Facilities Division Responsibilities and Authorities, dated August 3, 1998
10. Management Self-Assessment Finding Matrix provided to ISM Team, dated March 31, 2000
11. MHC Organizational Chart, Revision 21, dated March 20, 2000
12. Matrix Provided to ISM Team: List of Standards - Implementing Roles and Responsibilities for Pantex Personnel, dated April 4, 2000
13. MHC STD-0107, Independent Assessments and Self-Assessments, dated October 10, 1999
14. MHC STD-0129, Trend Analysis of Plant Issues, dated January 25, 2000
15. MHC STD-0139, Engineering and Design, dated May 7, 1998
16. MHC STD-1045, Work Authorization Directives (WADs) Change Control Process, dated March 6, 2000
17. MHC STD-0148, Integrated Processes for Seamless Safety (SS-21), dated March 22, 2000
18. MHC STD-1046, Work Authorization Directives (WADs) Cost Management Program, dated February 3, 1999
19. MHC STD-0265, Weapon Training & Qualification, dated February 16, 2000
20. MHC STD-0270, Internal Audit, dated November 3, 1999
21. MHC STD-0282, Compliance Management, dated March 27, 2000
22. MHC STD-2533, 5480.20A Position Classification Process, dated September 14, 1999
23. MHC STD-2770, Training, dated January 18, 2000
24. MHC STD-2777, Personnel Selection, Qualification, and Certification, dated December 21, 1999
25. MHC STD-2785, Training Evaluation, dated October 19, 1999
26. MHC STD-2787, Training Implementation, dated October 19, 1999
27. MHC STD-2788, Training Analysis & Design, dated February 1, 2000
28. MHC STD-3008, Annual Safety & Health Program Evaluation, dated January 6, 1999
29. MHC STD-3013, Centralized Review System, dated October 10, 1998
30. MHC STD-3014, Nuclear Facility and Nuclear Explosive Operation Unreviewed Safety Questions, dated October 15, 1999
31. MHC STD-3071, Authorization Basis, dated October 2, 1998
32. MHC STD-3182, Executive Safety Committee for Safety and Health Activities, dated September 28, 1998
33. MHC STD-3366, Nuclear Explosive Safety reviews, dated March 15, 2000
34. MHC STD Self-Assessment Program for Security & Emergency Management Operations Division, dated January 3, 2000
35. MHC STD-5016, Maintenance Work Control System, dated November 24, 1999
36. MHC STD-5100, Maintenance Management, dated October 8, 1999
37. MHC STD-6028, Performance Measurement System, dated November 11, 1999
38. MHC STD-6216, Lessons Learned Program, dated August 24, 1998
39. MHC STD-7000, Conduct of Operation Implementation, dated December 1, 1994
40. MHC STD-7012, Functions of Weapon Program Managers, dated March 31, 2000
41. MHC STD-7308, Integrated Plant Projects Priorities, dated March 31, 2000
42. MHC STD-7401, Weapons Program Project Team, dated March 28, 2000
43. MHC STD-7403, Operations Directorate, dated March 31, 2000
44. MHC STD-9045, Change Control for Class 1 Facility Related Systems, Structures & Components, dated November 23, 1999

45. MHC STD-9114, Training Requirement for Hazardous Material Employees, dated September 6, 1998
46. MHC STD-9550, Performance of Process Hazard Analysis for Process Safety Management, dated November 22, 1999
47. MHC STD-9620, Nuclear Criticality Safety Program, dated January 12, 2000
48. MHC STD-9027, Facility Project Requests, dated April 7, 1999
49. MHC STD-9030, Site Planning, dated October 21, 1997
50. MHC Qualification Card for Facility Managers and Assistant FMS, Revision 6, dated October 31, 1998
51. MHC Qualification Card for Production Managers, dated February 18, 1998
52. MHC Qualification Card for Program Manager - Revision 1, dated March 2000
53. Pantex Budget Instructions - A Guide To FY2002 Budget Call: Budget Preparation for FY2001/2002
54. MHC FY2000 Priority Decrement List Revision 6a, dated January 5, 2000
55. DOE/MHC - Pantex Contract Modification Number M130 to Contract No. DE-AC04-91AL65030, Clause H.6 - Performance Direction
56. MHC Procurement Manual MNL-133747 Issue 2 Integration of Environment, Safety, and Health, dated August 12, 1999
57. MHC Internal Procurement Training Tool for Integrated Safety Management, not dated
58. MHC PX-200STC-1 - Additional Terms and Conditions for Access to Pantex Plant, dated December 15, 1998
59. DOE Development & Production Manual AL56XB, Revision 1 - Change 32, Chapter 11.3 - Seamless Safety for Assembly and Disassembly of Nuclear Weapons at the Pantex Plant, dated June 3, 1999
60. Memorandum of Understanding with Lawrence Livermore National Laboratory, dated July 24, 1997
61. MHC letter, Weinreich to Burick regarding Tri-Laboratory (three design Agencies) relationship with MHC concerning Pantex operational activities, dated April 18, 1994
62. Mission for MHC and Sandia National Laboratories Materials Management and Control Partnership, dated April 9, 1996
63. Memorandum of Agreement between Amarillo Area Office (AAO), Kirtland Area Office (KAO), MHC, and Sandia Corporation regarding the Sandia Weapons Evaluation Test Laboratory, dated October 1, 1999
64. MHC ISM Authorization Basis Manual - MNL254543, dated February 21, 2000
65. MHC/DOE FY00 Business Performance Based Management Plan, dated August 1999
66. MHC/DOE FY99 Business Performance Based Management Plan, dated September 30, 1998
67. MHC Business Performance Based Management Plan FY99 Self-Assessment, date issued October 1999
68. DOE-AL Report for MHC - Business Management Oversight Review, dated September 9, 1999
69. AAO Organizational Chart, dated March 27, 2000
70. AAO FY00 Operational Plan, dated December 15, 1999
71. DOE/AL FY00 Performance Evaluation Management Plan, dated January 21, 2000
72. AAO ISM System Description, Revision 0, dated March 30, 2000
73. Integrated Weapons Activity Plan (IWAP), dated December 17, 1999

74. AAO Procedure 103.1.0 Pantex Integrated Safety Management System Description, Source Requirements Identification Documents, and Directives Review Management Program, dated April 26, 1 999
75. AAO Procedure 102.1.0, Revision 1, Qualification and Training Program, dated June 8, 1999
76. AAO Procedure 103.4.0, AAO Functions, Responsibilities and Authorities Manual, dated December 27, 1999
77. AAO Procedure 110.1.1, Construction Project Safety and Health Oversight, dated March 31, 1999
78. AAO Procedure 407.1.1, Work Authorization Directive Change Control Procedure, Prime Contract No. DE-AC011-91AL65030
79. AAO Procedure 407.2.1, Workload Planing and Budget Formulation Procedure, Prime Contract No. DE-AC011-91AL65030, dated April 19, 1999

Interviews

1. MHC Operations Director
2. MHC Program Management Director
3. MHC Chief Financial Officer
4. MHC ESH&Q Director
5. MHC Weapons Programs Managers – (2)
6. MHC Weapons Operations (Business Group) Production Managers – (2)
7. MHC Procurement Manager
8. AAO Senior Scientific Technical Advisor
9. AAO AAM for Business Management & Security
10. AAO Business/Budget Specialist

Discussion of Results

Acceptance Criteria C1.1, C1.2, C1.3 and C1.4

The Pantex Plant management and operating contract, coupled with the AAO ISM system description, identifies the DOE directives and implementing procedures for translating mission into work and how to delineate this work into scope and schedule based on multi-fiscal year funding allocations. The AAO system description identifies the DOE processes used to set balanced ISM contractor expectations to achieve DOE goals and priorities. The AAO Operational Plan translates Pantex work priorities from higher authority departmental strategic planning objectives and identifies resources necessary to accomplish these initiatives. AAO Procedure 103.4.1, *AAO Functions, Responsibilities and Authorities Manual* defines the functional roles and responsibilities for area office personnel. AAO Procedure 407.2.1, *Workload Planning and Budget Formulation Procedure Prime Contract Number DE-AC011-91AL65030* defines how DOE personnel document the workload planning and budget formulation process regarding establishment of priority work at Pantex. AAO Procedure 407.2.1 further defines the DOE process used to measure contractor performance through defined expectations, measures, and deliverables within allotted resources.

Acceptance Criteria C1.5, C1.6 and C1.7

The management and operating contract coupled with the MHC ISM system description provides a broad-brush mechanism for the translation of DOE mission expectations to the performance of work activities. The Management Integration Control (MIC) Standard Requirement Identification Document (S/RID) identifies the DOE-approved standards needed to accomplish tasks within regulatory compliance. MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant* defines the roles and responsibilities and delineates the scope of work for each directorate and the general manager's staff. The MHC Chief Financial Officer publishes a budget call for both the upcoming fiscal year (FY+1) and the following fiscal year (FY+2), alerting all managers to develop program/project plans for Pantex tasks. MHC implementing STD-7308 defines the iterative process to develop a balanced priority decrement list (PDL) that defines the project tasks mutually agreed to by the DOE. The "final" PDL is used to develop the work authorization directives that are approved by DOE. The work authorization directives define the scope, cost, schedule, and deliverables for the most important tasks that can be accomplished within the available resources. MHC implementing STD-1045, *Work Authorization Directives (WADs) Change Control Process* establishes the process for DOE approval of changes to the work authorization directives. MHC STD-1046, *Work Authorization Directives (WADs) Cost Management Program* is also an essential element because it establishes the cost management program process that monitors and evaluates expenditure of resources in support of the WAD. MHC STD-0282, *Compliance Management* establishes the process to ensure compliance with laws, regulations and DOE directives for all Pantex Plant activities.

Acceptance Criterion C1.8

The contractor has defined DEAR 970.5204-2 flowdown requirements for inclusion of ISM work planning into subcontracts. MHC has defined ISMS environment, safety and health (ES&H) requirements in their procurement manual (MNL-133747). The procurement manual requirements apply to sub-contracted projects such as construction and environmental restoration activities.

Acceptance Criteria C1.9 and C1.10

See the response developed for C1.5 through C1.7

Acceptance Criteria C1.11 and C1.12

The management and operating contract for the Pantex Plant provides the necessary contract clauses (and subsequent modifications) to establish performance direction. The AAO ISM system description defines the DOE process to establish the structure of fees for performance, to define the budget year and future fiscal year scope of work, and to achieve balanced priorities. The Albuquerque Operations Office (AL) Annual Performance Evaluation Management Plan (PEMP), an extension of the contract, defines the performance fee structure for both incentive and award fee funding. The PEMP is based on a DOE and MHC-negotiated priority decrement list as described in the AAO ISM system description and is implemented through work authorization directives that are an extension of the contract.

Acceptance Criterion C1.13

The MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant* defines the functional roles and responsibilities for program and project managers responsible for the defining, prioritizing, and approving work scope. MHC has a formal process for position classification (STD-2533, *5480.20A Position Classification Process*), recruitment and selection (STD-2777, *Personnel Selection, Qualification, and Certification*), training (STD-2770, *Training*), and evaluation (STD-2785, *Training Evaluation*). MHC has established a training program utilizing a performance-based training methodology (STD-2787, *Training Implementation*). MHC has numerous procedures defining specific training requirements (e.g., STD-0265, *Weapons Training & Qualification*, STD-9114, *Training Requirements for Hazardous Material Employees*.) Qualification requirements and qualification cards are defined for key program and project managers. MHC has established a process for analyzing job performance and determining when training is need, what topics to include in the training, and how to design the training based on position requirements in STD-2788, *Training Analysis and Design*.

Acceptance Criteria C1.14 and C1.15

The MHC ISM system description identifies implementing documents for the five core functions consistent with the requirements in DOE P 450.4, 450.5, and 450.6, the DEAR, and the direction to the contractor from the approval authority. Both the AAO and MHC system descriptions describe the processes used to implement integrated safety management. The MHC and AAO system descriptions delineate the processes and mechanisms used to manage and oversee implementation of ISM. The method used to define scope of work and translate DOE mission to contractor work activities is defined and implemented through several previously discussed DOE procedures and MHC Standards. The AAO and MHC systems ensure that assigned workers are qualified for the scope of work planned, that the hazards involved are understood, and that controls are in place to mitigate the hazards. Implementing processes exist to ensure that hazards are analyzed for the site, facility, and activity level for both the DOE and MHC. For example, the contractor has processes in place to evaluate nuclear facility, weapon and special nuclear material operations, and high explosive facility and operations. There are mechanisms in place that control what facilities/operations are reviewed for safety impact (e.g., STD-3014, *Nuclear Facility and Nuclear Explosive Operation Unreviewed Safety Questions*). MHC has processes to implement hazard controls that include mechanisms to ensure worker involvement in the development of the controls (e.g., STD-5016, *Maintenance Work Control System*). The contractor has developed processes to ensure the performance of work is within these defined controls. Examples of site-wide controls established are the annual safety and health program evaluation (STD-3008, *Annual Safety and Health Program Evaluation*) and Hazard Identification Teams. The contractor has several mechanisms implemented to improve the ISMS and ES&H programs through feedback and continuous improvement (STD-0107, *Independent Assessments and Self-Assessments*, STD-6028, *Performance Measurement System*). The contractor has memoranda of understanding (MOU) and memoranda of agreement (MOA) with the weapon design laboratories (i.e., Sandia National Laboratories, Lawrence Livermore National Laboratories, and Los Alamos National Laboratories). However, the MOU and MOA are not current and are not formally identified as part of the MHC ISM system description.

Acceptance Criterion C1.16

The AAO ISM system description describes the DOE processes to recruit, hire, retain and train federal staff. These processes are centralized functions within AL. Senior AAO managers are required to meet senior technical safety manager qualification requirements. AAO Procedure 407.2.1, *Workload Planning and Budget Formulation Procedure for Prime Contract Number DE-AC011-91AL65030* describes the roles and responsibilities for senior management personnel as part of the annual work scope development. AAO Procedure 103.4.0, *AAO Functions, Responsibilities and Authorities Manual* defines the functional roles and responsibilities for each senior AAO manager.

Acceptance Criterion C1.17

The contractor has established documented processes to implement safety performance objectives and measures while maintaining the integrity of the ISM system. For example, the contractor utilizes STD-6028, *Performance Measurement System*, which covers performance metrics at three tier levels, site-wide, programs, and individuals/activities.

Acceptance Criteria C1.18 and C1.19

The contractor and DOE have implementing mechanisms in place that ensure changes to work scope requirements are evaluated for impacts. Implementing mechanisms include, but are not limited to: STD-7308, *Integrated Plant Projects Priorities*; STD-0148, *Integrated Process for Seamless Safety (SS-21)*; STD-1045, *Work Authorization Directives (WADs) Change Control Process*; the Integrated Weapons Activity Plan (IWAP); and, AAO Procedure 407.2.1, *Work Authorization Directives (WADs) Change Control Procedure for Prime Contract Number DE-AC011-91AL65030*. However, these mechanisms were not exclusively developed for changes introduced by the design agencies. These changes are addressed as part of the routine process to evaluate scope change, establish balanced priorities, and identify funding to accomplish the work.
The contractor has mechanisms to ensure inclusion of work scope and changes from the design agencies for programs as discussed in STD-7401, *Weapons Program Project Team* and TBP 901, *Integrated Safety Process for Nuclear Weapons Operations and Facilities*. The MHC Standing Management Team member must obtain agreement from the AL Standing Management Team chair (or co-chair) for changes affecting approved project plans. MHC weapon program managers are responsible for leading the weapon program project teams and the success of the project. The project team leader is responsible for obtaining written assurance from the design laboratories to provide weapon program project plan support. It is important to note that the weapon project team leader does not control the funding for work scope activities external to the Pantex Plant, such as tasks requiring design laboratory support. Project team leaders do, however, have the flexibility to appeal issues to the Standing Management Team if there are issues related to the level of program support provided by a design laboratory.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria were met. However, nine issues were identified.

Issue C1.1

The AAO ISM system description (AAO Procedure 103.1.0) and Functions, Responsibilities, and Authorities Manual (FRAM) (AAO Procedures 103.4.0) do not clearly identify line management at organizational levels below the Area Manager. (Acceptance Criteria C1.1-C1.4)

Issue C1.2

MHC Directive (DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*) defines the scope of responsibilities assigned to various organizational elements, principally at the directorate level. No formal mechanisms (as defined by the MHC system description document hierarchy) exist that further define roles and responsibilities for selected portions of the organization down to the worker and activity level (e.g., waste management). These roles and responsibilities may be indirectly defined within a number of other documents, but have not been consolidated consistent with the approach for other organizational elements. (Acceptance Criterion C1.5.)

Issue C1.3

The Chief Financial Officer (CFO) budget call instructions are cited in STD-7308, *Integrated Plant Project Priorities,* as an important mechanism to achieve site-wide integration and consistency in annual budget development. The CFO budget call instructions are not formally included within the MHC system description document hierarchy and are not a controlled document. (Acceptance Criterion C1.5.2)

Issue C1.4

A number of plant standards that serve as formal mechanisms to define management processes, roles and responsibilities are inconsistent with the current organization as defined in the MHC system description and MHC Directive, DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant.* (Reference: MHC list of affected standards dated April 3, 2000). (Acceptance Criterion C1.5.3)

Issue C1.5

The hierarchy and inter-relation between documents defining mechanisms, roles, and responsibilities in common functional areas should be clarified. For example, a number of standards exist related to the functional area of "training." All of the standards occupy the same stature within the document hierarchy defined by the MHC system description. However, some of the standards are clearly subservient to others, and this relationship is not consistently described or defined. (Acceptance Criterion C1.13)

Issue C1.6

The MHC system description does not identify the formal mechanism(s) used to ensure collocated activities performed at the Pantex Plant which are not under the direct cognizance of MHC comply with the requirements established by the system description (e.g., Tri-laboratory and Weapons Evaluation Test Facility). (Acceptance Criterion C1.14)

Issue C1.7

The MHC system description does not clearly and consistently distinguish between line management and support roles and responsibilities. Inconsistent terminology is used to define the roles and responsibilities of line management. (e.g., MHC STD-7403, *Operations Directorate*) (Acceptance Criterion C1.14)

Issue C1.8

The MHC system description and MIC S/RID define implementing mechanisms to establish an integrated safety management system. However, the complexity of the system description structure is not conducive to management and worker understanding. Further simplification in the structure of the system description, or additional discussion in the overview is warranted. (Acceptance Criterion C1.14)

Issue C1.9

The Memoranda of Agreement and Memoranda of Understanding with the design agencies should be updated to reflect ISM principles and be included as part of the MHC system description and implementing documents.. (Acceptance Criterion C1.19)

ISMS Verification Assessment Form

Functional Area:	**Objective Number:** C-2
Analyze the Hazards - Low Hazard Operations	**Date:** 4/7/00

OBJECTIVE

Hazards associated with the work are identified, analyzed, and categorized. Applicable standards and requirements are identified and agreed upon. Contractor and DOE procedures ensure roles and responsibilities for preparing, reviewing and approving hazard analyses are clearly defined. Contractor and DOE procedures ensure personnel responsible for preparing, reviewing and approving hazard analyses have competence commensurate with assigned responsibilities. Mechanisms exist to ensure worker involvement in the identification of hazards. Line management is responsible for ensuring the adequacy of hazard analyses.

Applicability - Low hazard operations (e.g., radiological work, maintenance, construction, etc.).

Criteria

C2.1 Contractor procedures require identification, analysis, and categorization of all hazards associated with activities/facilities/site. Hazards that are considered include chemical, industrial or others applicable to the work being considered. Contractor procedures for analysis of hazards reflect accepted rigor and methodology. [HAZ 1.1, 1.2]

C2.2 Contractor procedures utilize accepted methodologies to identify adequate hazard control standards at the site or corporate level and at the facility level to protect the public, worker, and environment. Controls at the corporate level appear in the contract while those at the facility level are reflected in the authorization basis documentation Selection of standards included in the contract as List A/List B takes into account the hazards associated with operations at the site. [HAZ 1.1, 2.1]

C2.3 Contractor procedures/policies have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the analysis of hazards associated with facilities and activities and ensure that workers are actively involved in the identification of hazards. Contractor procedures require that personnel responsible for analyzing hazards have competence that is commensurate with their responsibilities. Contractor procedures provide adequate resources to perform, review, approve, and maintain hazards analyses associated with the work being planned and hold line management directly responsible for this analysis. [BBC 2.3, HAZ 3.1, HAZ 3.2]

Approach:

A document review was performed to determine if there is a system to identify, analyze, and categorize hazards to the worker at the activity level. The system was evaluated to determine if the high-level requirements for hazard identification and analysis contained in the MHC system description, the Management Integration & Control (MIC) Standards/Requirements Identification Document (S/RID), and other S/RID, flow down into implementing plant standards and procedures. Selected interviews were conducted to validate the conclusions resulting from the document review.

1. Pantex Plant Integrated Safety Management Description (ISMD), ISMD Plan 93, Revision 5, dated March 31, 2000
2. Management Integration and Controls (MIC) S/RID, Issue 7, dated November 9, 1999
3. MIC S/RID Flowdown Matrix, dated November 9, 1999
4. DOE O 440.1A, Worker Safety, dated March 27, 1998
5. DOE O 420.1, Facility Safety, dated October 13, 1995
6. Fire Protection Flowdown Matrix, HC-2100, Issue 3, April 21, 1999
7. STD-4007, Fire Protection Program, Issue 5, February 17, 2000
8. STD-4321, Fire Protection Assessments, Issue 4, October 26, 1999
9. STD-4322, Fire Hazard Analysis, Issue 2, August 26, 1999
10. Occupational Safety & Health Flowdown Matrix, HC-2300, Issue 1, 7/16/98
11. STD-3138, Hazard Abatement Program, Issue 4, February 22, 2000
12. STD-3116, Job Safety and Health Analysis, Issue 3, September 2, 1999
13. STD-3190, Safety Surveys of Facilities, Issue 18, February 3, 1997
14. STD-3022, Construction Safety Program, Issue 12, March 2, 2000
15. STD-3118, Lockout/Tagout Program, Issue 7, October 8, 1999
16. STD-3312, Pressure Safety Guidelines, Issue 12, April 16, 1999
17. STD-3333, Hoisting and Rigging, Issue 3, April 21, 1999
18. STD-3352, Heat Stress, Issue 4, December 22, 1998
19. STD-3336, Work Force Electrical Safety, Issue 2, March 21, 2000
20. STD-3021, Confined Space Entry, Issue 11, August 14, 1997
21. STD-3024, Machine Guarding, Issue 3, August 7, 1997
22. STD-3290, Local Exhaust Ventilation Systems, Issue 4, November 9, 1998
23. STD-6241, Suspect/Counterfeit Fasteners, Issue 2, November 25, 1996
24. STD-9550, Performance of Process Hazard Analysis for Process Safety Management, Issue 3, November 22, 1999
25. Onsite Packaging and Transportation S/RID Flowdown Document, HC-2600, Issue 00, Change 1, February 18, 2000.
26. STD-3260, Pantex Written Hazard Communication Program, Issue 5, January 7, 1999
27. STD-3262, Pantex Hazardous Chemical Labeling System, Issue 6, August 23, 1999
28. Facility Engineering & Construction Flowdown Matrix, MS-3210, Issue 3, Change 1, January 25, 1999
29. STD-3071, Authorization Basis, Issue 22, October 2, 1998
30. Maintenance Flowdown Matrix, MS-3300, Issue 1, May 4, 1999
31. STD-5016, Maintenance Work Control System, Issue 13, November 24, 1999
32. STD-5100, Maintenance Management, Issue 2, October 8, 1999
33. Environmental Management Flowdown Matrix, MS-3400, Issue 4, May 25, 1999
34. STD-3062, Preparation of Documentation for Compliance with National Environmental Protection Act, Issue 6, September 9, 1999
35. IOP-D6701, Internal Operating Procedure (IOP) OS&H Department, Review of Operational Procedures, Issue 3, February 29, 2000

36. MNL-00053, Hazard Identification Team (HIT) Manual, Issue 3, August 14, 1998
37. Pantex Plant Emergency Hazards Assessment, Revision 0, March 1998
38. STD-2777, Personnel Selection, Qualification, and Certification, dated December 21, 1999
39. STD-1070, Employee Suggestion Program, Issue 11, April 30, 1999
40. STD-3061, Employee Safety and/or Health Complaints, Issue 9, May 27, 1999
41. STD-3008, Annual Safety & Health Program Evaluation, Issue 4, March 21, 2000
42. STD-3190, Safety Surveys of Facilities, Issue 18, February 3, 1997

Interviews

1. Department Manager, Authorization Basis Department, Operations Division
2. Operations Support Group Leader, System Design & Analysis Department, Applied Technology Division
3. Department Manager, Occupational Safety & Health (OS&H) Department, Environment, Safety, Health and Quality (ESHQ) Division
4. Director, Operations Division

Discussion of Results

The MHC S/RID flowdown documents are arranged around the following functional areas:

- Radiation Protection
- Occupational Safety and Health (OSH)
- Construction Safety
- Facility Engineering
- Environmental Management
- Maintenance Management
- Fire Protection
- Hazardous Material Control
- Emergency Management

Acceptance Criterion C2.1

Facility and activity level hazards are categorized and analyzed using the functional areas listed above. Each functional area includes a S/RID that addresses specific criteria and identifies the related management control(s) used to address the criteria, such as a plant standard. The following is a discussion of the flowdown in each functional area listed above.

Radiation Protection

Facilities with radiological work are evaluated using the guidance in EM-STD-5502-94, *Hazard Baseline Documentation*, and implementing requirements are identified and documented in STD-3210, *Occupational Radiation Protection*.

Occupational Safety and Health (OSH), Construction Safety, Maintenance Management

Activity-level hazards are primarily identified through the job safety hazard analysis (JSHA) process for maintenance and operational tasks (STD-3116, *Job Safety and Health Analysis*). The maintenance work control system incorporates the JSHA process (STD-5016, *Maintenance Work Control System*). The OSH Department reviews new procedures and periodically review existing procedures to ensure that all hazards are identified (IOP-D6701, *Review of Operational Procedures*). These processes meet the requirements of DOE O 440.1, Contractor Requirements Document #9.

OSH personnel are required to review construction safety plans and inspectors are required to review in-process work to ensure that hazards are identified (STD-3022, *Construction Safety Program*). The safety department is required to conduct safety surveys of facilities on a periodic basis and multidisciplinary hazard identification teams (MNL-00053, *Hazard Identification Team (HIT) Manual*) are required to conduct quarterly building surveys (STD-3190, *Safety Surveys of Facilities*).

Environmental Management/Hazardous Material Control

MS-3400, *Environmental Management Flowdown Matrix* establishes the basis for the identification, analysis and control of environmental work activities. STD-3062, *Preparation of Documentation for Compliance with National Environmental Policy Act* requires the impact of proposed activities to be evaluated using the National Environmental Policy Act (NEPA) process. STD-3260, *Pantex Written Hazard Communication Program* defines the hazard communication program and STD-3262, *Pantex Hazardous Chemical Labeling System* defines the chemical inventory and labeling program. HC-2600, *Onsite Packaging and Transportation Flowdown Document* defines the requirements for handling hazardous materials.

Fire Protection

Fire protection department personnel are required to perform fire protection assessments (STD-4321, *Fire Protection Assessments*).

Emergency Management

The Pantex Plant Emergency Hazards Assessment (EHA) includes the requirement to perform a comprehensive site-wide hazard survey to determine the location and quantity of hazardous material. The survey uses defined thresholds in various Code of Federal Regulations to determine if further hazard analysis is required. Hazardous materials (both radiological and non-radiological) are identified and analyzed to determine the basis for appropriate controls for emergency planning purposes. The EHA lists two facilities, Building 15-29 (chlorinator building) and Building 13-47 (wastewater treatment control building) which contain chlorine gas and sulfuric acid above the Environmental Protection Agency threshold planning quantity. The EHA includes a Failure Modes and Effects Analysis for the chlorine gas; however, these buildings are not classified as non-nuclear moderate or high hazard facilities.

The MHC ISM system description, the MIC S/RID, and the associated flowdown S/RIDs provide a framework for the identification and evaluation of low hazard work at the activity levels. MHC incorporated the appropriate requirements such as DOE O 420.1, DOE O 440.1A, and 29 CFR 1910.119 into the implementing processes and standards.

Some inconsistencies or gaps were noted between the MHC ISM system description, the MIC S/RID, other S/RID, and various implementing documents. Review team personnel provided MHC with a two-page listing of the inconsistencies or gaps identified, as related to "analyze hazards."

<u>Acceptance Criterion C2.2</u>

Protection of the Public

Low hazard activities, by definition, do not have the ability to affect the public. Therefore, there are no public protection controls identified for low hazard work.

Protection of the Environment

MS-3400, *Environmental Management S/RID* and the associated flow-down matrix identify the potential hazards to the environment and the applicable management controls used to minimize the risk to the environment. MS-3400 identifies the adopted standards and MHC controls to address the potential environmental hazards. The environmental concerns are divided into the areas covered by the National Environmental Policy Act (NEPA): air, water, land, biological environment, noise, and waste. A control is identified for each area, such as permits for air and water, plant standards for storage and disposal of wastes, and training for hazardous waste operators.

MHC STD-3265, *Chemical Control Program*, provides the framework for the tracking and control of chemical use at the Pantex Plant. The Pantex EHA identifies chemicals that may impact the environment and/or on-site workers and the need to evaluate these chemicals from the standpoint of emergency preparedness. Controls are identified in EPP-1000, *Pantex Plant Emergency Action Levels* to protect the environment or workers. However, a process to ensure that the combined chemical inventory is compared to the Environmental Protection Agency (EPA) threshold values and the process safety management (PSM) rule reportable quantities was not identified

Protection of Workers

The protection of workers is provided through the implementation of various programs defined in DOE O 440.1 and 29 CFR 1910.119. The Hazard Control S/RID provides a detailed crosswalk between each criteria in 29 CFR 1910.119 and the MHC standard used to comply with the requirement. Selected standards were reviewed including STD-024, *Machine Guarding*; STD-8118, *Lockout/Tagout Program*; STD-3336, *Work Force Electrical Safety*; STD-3020, *Safety Work Permits*; and STD-3290, *Local Exhaust Ventilation Systems,* to determine if they addressed implementation of the designated controls. There was an established flow-down of required controls from the governing documents into the implementing standards.

Worker hazards identified during periodic assessments and scheduled reviews are documented and categorized using the OSHA Risk Assessment Code (RAC) method. Deficiencies assigned the higher RAC numbers are corrected promptly and the lower RAC findings are corrected based on available resources. These processes are appropriately described in implementing procedures such as STD-3138, *Hazard Abatement*, and OSH Department Internal Operating Procedure IOP-D3527, *Safety Assessment/Facility Evaluation Process*.

The reviewer concluded that the MHC ISM system description, the MIC S/RID, and the associated flowdown S/RIDs provided a framework for the flowdown of hazard controls resulting from associated hazard analysis to protect the environment and worker. MHC incorporated appropriate requirements such as DOE O 420.1, DOE O 440.1A, and 29 CFR 1910.119 into the implementing processes and standards.

Some inconsistencies were noted between the various documents. These inconsistencies are noted in section Attachment A to C2.

Acceptance Criterion C2.3

Worker Involvement

The MIC S/RID and associated flowdown S/RIDs specifically identify worker involvement in the identification and control of worker hazards. Implementing STD-1070, *Employee Suggestion Program*; STD-3061, *Employee Safety and/or Health Complaints*; STD-3008, *Annual Safety & Health Program Evaluation*; and MLN-00053, *Hazard Identification Team Manual*, adequately define the processes used to ensure worker involvement in the identification and correction of worker hazards.

Competence of Personnel Performing Hazard Analysis

For low hazard facilities/activities, it was verified that there was a clear requirement regarding the training and qualifications of personnel performing *Fire Hazard Analysis* (STD-4322), *Job Safety Health Analysis* (STD-3116), *Personal Protective Equipment Analysis* (STD-3010), *Maintenance Work Order Safety Review* (STD-5100), and *Local Exhaust Ventilation System* (STD-3290) assessments.

MHC STD-4322 specifically identifies the requirements for performing fire hazard analyses (FHA). The qualification requirement for performing a FHA is a flow-down from a specific requirement of DOE O 420.1A, *Facility Safety*. No specific references in the other standards define the minimum training requirements for performing JSHAs and other job site hazard evaluations.

Section 3.3.1(a) of MHC STD-2777, *Personnel Selection*, for subject matter experts states "conduct analysis to determine what specific training is needed for a function or position." The JSHA standard and other standards requiring subject matter expert safety review of procedures and processes should reference plant STD-2777.

Adequate Resources

The MHC STD-3138, *Hazard Abatement,* includes a prioritization system to focus limited resources on the higher priority safety issues. The maintenance system has a similar system for prioritization of work orders to focus resources on higher priority deficiencies. The JSHA standard does not include a prioritization system for updating existing JSHAs and performing new JSHAs. MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant* requires the various Directors to carry out responsibilities in the identification, analysis, and control of hazards.

Line Management Responsibilities

The MHC ISM system description and the various implementing standards identify the roles and responsibilities of line managers regarding the identification, analysis, and control of worker hazards. Some of these responsibilities are not included in MHC DIR-0001 or the ISM system description. For example, the MHC ISM system description states that the building or facility manager is responsible for integrating worker hazards at the facility level. However, the MHC ISM system description does not clearly address the interfaces and control of interfaces between the site, facility, and activity level with respect to the identification and control of hazards.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria C2.1, C2.2, and C2.3 for Low Hazard Operations were met. However, two issues were identified.

Issue C 2.1

The MIC S/RID and associated S/RID flowdown matrixes do not identify a connection between the emergency hazard assessment (EHA) and the facility-level hazard analysis performed as part of the OSHA process hazard analysis.. As a result, the MHC system description does not have a mechanism to ensure that information vital to each of these programs is incorporated into both the facility/activity documents and in the site-wide emergency planning documents. (Acceptance Criterion C2.1-Low Hazard Operations)

Issue C 2.2

The MHC system description does not define a mechanism to periodically compare the combined facility chemical inventory to the appropriate EPA and OSHA limits to ensure that the facility/activity does not exceed the authorized facility operating envelop. (Acceptance Criterion C2.2-Low Hazard Operations)

ISMS Verification Assessment Form

Functional Area:	**Objective Number:** C-2
Analyze the Hazards - High Explosives	**Date:** 4/7/00

OBJECTIVE

Hazards associated with the work are identified, analyzed, and categorized. Applicable standards and requirements are identified and agreed upon. Contractor and DOE procedures ensure roles and responsibilities for preparing, reviewing and approving hazard analyses are clearly defined. Contractor and DOE procedures ensure personnel responsible for preparing, reviewing and approving hazard analyses have competence commensurate with assigned responsibilities. Mechanisms exist to ensure worker involvement in the identification of hazards. Line management is responsible for ensuring the adequacy of hazard analyses.

Applicability - Moderate hazard facility/operations (e.g., high explosive operations) and special nuclear material (SNM) non-reactor nuclear facilities

Criteria

C2.1 Contractor procedures require identification, analysis, and categorization of all hazards associated with activities/facilities/site. Hazards that are considered include nuclear, chemical, industrial or others applicable to the work being considered. Contractor procedures for analysis of hazards reflect accepted rigor and methodology. Contractor mechanisms ensure design agency input is included in the identification of hazards involving nuclear explosive components or assemblies. [HAZ 1.1, 1.2]

C2.2 Contractor procedures utilize accepted methodologies to identify adequate hazard control standards at the site or corporate level and at the facility level to protect the public, worker, and environment. Controls at the corporate level appear in the contract while those at the facility level are reflected in the authorization basis documentation. Selection of standards included in the contract as List A/List B takes into account the hazards associated with operations at the site. [HAZ 1.1, 2.1]

C2.3 Contractor procedures/policies have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the analysis of hazards associated with facilities and activities and ensure that workers are actively involved in the identification of hazards. Contractor procedures require that personnel responsible for analyzing hazards have competence that is commensurate with their responsibilities. Contractor procedures provide adequate resources to perform, review, approve, and maintain hazards analyses associated with the work being planned and hold line management directly responsible for this analysis. [BBC 2.3, HAZ 3.1, HAZ 3.2]

Approach:

The MHC ISM system description and associated appendices were reviewed. Additionally, selective implementing documents listed in Appendix C of the Management Integration and Controls (MIC) Standards/Requirements Identification Document (S/RID) Flowdown Matrix, were reviewed along with the Hazards Control S/RID and Mission Support S/RID. Interviews were conducted to gather additional information.

Record Review

1. Pantex Plant Integrated Safety Management Description, Revision 5, dated March 2000
2. Appendix A, Management Integration & Controls S/RID, Issue 7, dated November 9, 1999
3. Appendix B, Policy Directive, DIR-0001, Roles and Responsibilities for the Management and Operation of Pantex Plant, Issue 6, dated March 24, 2000
4. Appendix C, MIC S/RID, Flowdown Matrix, Issue 7, dated November 9, 1999
5. Appendix D, MIC S/RID, DOE Directives - Dispositions, Exceptions & Justifications
6. Hazards Control S/RID (HG-2100)
7. Mission Support S/RID (MS-3210)
8. Internal Operating Procedure, AT-80075, Process Safety Management, Issue 2, dated March 4, 2000
9. Plant Standard, STD-9550, Performance of Process Hazard Analysis for Process Safety Management, Issue 3, dated November 22, 1999
10. Plant Standard, STD-9555, Management of Facility or Process Change in Non-Nuclear Facilities, Issue 1, dated January 6, 2000
11. PHA Schedule, dated April 4, 2000
12. Memorandum, Subject: Department of Energy (DOE) Concurrence for Proposed Safety Basis of Operation of Non-Nuclear Explosive Facilities, from John M. Bernier to W. A. Weinreich, dated September 17, 1999
13. Memorandum, Subject: Department of Energy Standards for Operation of Hazardous Facilities, from John Bernier to W. A. Weinreich, dated January 12, 2000
14. DOE G 440.1-1, Worker Protection Management for DOE Federal and Contractor Employees Guide for use with DOE Order 440.1, dated July 10, 1997
15. Process Hazards Analysis of Building 11-20, Explosive Pressing Operations, dated March 2000
16. Safety Basis Document for Building 12-19 East Explosives Formulation Facility, dated March 2000
17. Plant Standard, STD-3116, Job Safety and Health Analysis, Issue 3, dated September 1999
18. Plant Standard, STD-3138, Hazard Abatement Program, Issue 4, dated February 2000

Interviews

1. Process Safety Management Program Manager, System Analysis and Design Department, Applied Technology
2. Technical Advisor/Authorization Basis Program Director
3. Occupational Safety & Health Department Manager
4. Weapon Explosives & Components, Team Leader, AAO

Discussion of Results

Acceptance Criterion C2.1

DOE G 450.4-1A, Volume 1, Chapter II, section 3, Core Function 2, Analyze Hazards, identifies DOE directives (Policies, Orders, Notices, Standards, and Guides) that may be used for hazard analysis and categorization. A discussion following the listing in DOE G 450.4-1A (page 36), addresses how activity hazard analyses should be integrated with site- and facility-level analyses ("...each analysis should depend and build upon the others"). It also states that categorization of facilities will aid "in tailoring DOE requirements and expectations" (including level of DOE review/approval required) to the work and hazards.

The requirement for hazard identification, analysis, and categorization at the activity, facility and site level is recognized in the MHC ISM system description in section 3.2.2, "Analyze ES&H Hazards/Impacts." The MIC S/RID, section 1.2.1.b, "Facility Hazards Categorization", provides the following criteria: "The potential hazards associated with operations and associated facilities are evaluated to classify the consequences and provide appropriate facility hazards categorizations." Standards listed for this criterion include the following:

- 29 CFR 1910.119
- 29 CFR 1910.120
- DOE EM-STD-5502-94, Section 5.2 (Radiological Facilities)
- DOE-STD-1027-92 (Nuclear Facilities)
- Hazard Control S/RID (HG-2100)
- Mission Support S/RID (MS-3210)
- DOE Order 5480.28 & DOE O 420.1

DOE-STD-1027-92 is the only standard listed which provides a facility-level hazard categorization process; however, the standard applies only to nuclear facilities. DOE EM-STD-5502-94 describes a facility-level hazard categorization process for all types of hazardous facilities, but only section 5.2 is identified as applicable to meet the criteria of MIC S/RID, section 1.2.1.b. The MIC S/RID Flowdown Matrix, section 1.2.1.a-c, *Hazards Identification, Facility Hazard Categorization, and Hazards Analysis*, provides a listing of implementing documents (plant standards). None of the implementing documents listed defines a site-wide facility-level hazard categorization process.

While a requirement to perform hazard analyses and categorization at the facility-level is recognized, there are no contractor procedures that define a site-wide facility-level hazard categorization process.

Hazard analysis is the second core safety function of the Pantex ISMD and is applicable at the activity, facility and site level. (Hazard analysis begins with hazard identification followed by an evaluation of potential accidents.) The contractor has defined processes in implementing documents (plant standards, manuals, and internal operating procedures) that address hazard identification and analysis for nuclear, explosives, chemicals, and industrial hazards. Procedures addressing hazard analyses, such as MHC STD-9550, *Performance of Process Hazard Analysis for Process Safety Management* define a comprehensive hazard analysis process that provides an excellent systematic approach to the evaluation of hazards associated with non-nuclear explosive facilities. However, the development of a site-wide facility-level hazard categorization process has not been documented in implementing documents. A facility-level hazard categorization (typically based on defined threshold quantities) provides a method for focusing the safety basis effort on those hazards identified.

Acceptance Criterion C2.2

The MHC ISM system description in section 3.3.1, *Scope of Work*, states that DOE has approval authority for chemical hazard facility safety analysis, which are historically classified as moderate or high hazard class. AAO does not approve safety analysis or authorization basis documents for non-nuclear facilities, as agreed to in the memorandum, dated Sept. 17, 1999, Subject: Department of Energy (DOE) Concurrence for Proposed Safety Basis of Operations of Non-Nuclear Explosive Facilities, from John M. Bernier to W. A. Weinreich. This agreement should be reflected in the MHC ISM system description. The MHC Internal Operating Procedure AT-80075, *Process Safety Management* implicitly reflects this agreement.

In addition to the change in DOE approval requirements, the requirement for what constitutes authorization basis documentation for non-nuclear facilities has changed. The authorization basis for non-nuclear facilities is the MIC S/RID as agreed to in the referenced AAO memorandum rather than a safety basis document. This process should be described in the MHC ISM system description in terms of clarifying the authorization basis process and associated approval levels for various types of hazardous facilities.

Through the MIC S/RID and associated Hazards Control S/RID and Mission Support S/RID, the contractor has a process that begins with the analysis of hazards and leads to methods for the selection of controls commensurate with the hazard. The Hazards Control S/RID identifies institutional hazard controls for fire protection, radiation protection, criticality safety, occupational safety and health, off-site packaging and transportation and on-site packaging and transportation.

Accepted standards are identified for implementation in these institutional functional areas. Controls at the facility level are identified; however, the authorization basis documentation requirements for non-nuclear facilities have changed such that a safety basis document identifying facility-level controls is not necessarily produced. In these instances, facility-level controls are captured in the activity-level hazard analysis process (e.g., process hazard analysis performed per 29 CFR 1910.119, Process Safety Management). While this approach has been accepted by AAO, it has not been captured in the Pantex ISMD (refer to above issue). It is concluded that the selection of standards included in the contract has taken into account the hazards associated with operations at the site.

Acceptance Criterion C2.3

The MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant* establishes contractor roles and responsibilities in implementing the safety management core safety functions. Responsibilities under the Director of Applied Technology include establishing and maintaining a hazards analysis and controls program that supports explosives and waste operations/programs/facilities. Lower tier documents such as Internal Operating Procedure, AT-80075, *Process Safety Management* and plant standards, STD-9550, *Performance of Process Hazard Analysis for Process Safety Management* and STD-9555, *Management of Facility or Process Change in Non-Nuclear Facilities* further define roles and responsibilities for hazard analysis. Specifically, AT-80075, Section 4, "Responsibilities", defines oversight, review, and approve requirements for Process Hazards Analysis (PHAs) associated with explosive facilities. Employee participation is specifically described in AT-80075 and STD-9550. STD-9550 specifically requires divisions having processes or facilities requiring a PHA to assemble a PHA Team. Further, the Facility Manager is identified as being required to communicate and inform employees involved of the results of the PHA and resolution of any actions or recommendations.

MHC Directorates having facilities or processes requiring a PHA, assemble a PHA Team to perform a hazard analysis. The PHA Team is described as consisting of a minimum of three employees but should not exceed seven personnel. The team selection includes at least one engineer or scientist and at least one operator or technician with the experience and knowledge specific to the process being analyzed. The Team Leader must have familiarity with the analysis methodology used. Subject matter experts from institutional organizations (e.g., Occupational Safety & Health) participate as needed. Resource requirements for performing PHAs are clearly defined for MHC line organizations in STD-9550. Training requirements are defined in AT-80075 (reference is made to STD-2777, *Personnel Selection*). These requirements include training documentation requirements and refresher training requirements.

MHC policies and procedures clearly describe roles and responsibilities for personnel assigned to oversee, review, and approve PHAs associated with explosive facilities. Plant standards such as STD-9550 clearly define the resources required to perform, review, approve, and maintain PHAs. Additionally, training requirements are discussed in AT-80075. Line divisions are recognized as being responsible for assembling the PHA Teams.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria C2.1, C.2.2, and C2.3 for High Explosives were met. However, two issues were identified.

Issue C2.3

The MHC system description does not establish a formal mechanism describing a site-wide facility-level hazard categorization process. (The MHC system description adopts only that portion of standard DOE-EM-STD-5502-94, *Hazard Baseline Documentation* applicable to radiological facilities.) (Acceptance Criterion C2.1-High Explosives)

Issue C2.4

The MHC system description defines an approval process for authorization basis documentation for non-nuclear facilities that is inconsistent with memorandum dated September 17, 1999, "Department of Energy Concurrence for Proposed Safety Basis of Operations of Non-Nuclear Explosives Facilities," from John M. Bernier to W. A. Weinreich). (Acceptance Criterion C2.2-High Explosives)

ISMS Verification Assessment Form

Functional Area:	**Objective Number:** C-2
Analyze the Hazards - Nuclear Explosive Operations	**Date:** 4/7/00

OBJECTIVE

Hazards associated with the work are identified, analyzed, and categorized. Applicable standards and requirements are identified and agreed upon. Contractor and DOE procedures ensure roles and responsibilities for preparing, reviewing and approving hazard analyses are clearly defined. Contractor and DOE procedures ensure personnel responsible for preparing, reviewing and approving hazard analyses have competence commensurate with assigned responsibilities. Mechanisms exist to ensure worker involvement in the identification of hazards. Line management is responsible for ensuring the adequacy of hazard analyses.

Applicability - Nuclear Explosive Operations

Criteria

C2.1 Contractor procedures require identification, analysis, and categorization of all hazards associated with activities/facilities/site. Hazards that are considered include nuclear, chemical, industrial or others applicable to the work being considered. Contractor procedures for analysis of hazards reflect accepted rigor and methodology. Contractor mechanisms ensure design agency input is included in the identification of hazards involving nuclear explosive components or assemblies. [HAZ 1.1, 1.2]

C2.2 Contractor procedures utilize accepted methodologies to identify adequate hazard control standards at the site or corporate level and at the facility level to protect the public, worker, and environment. Controls at the corporate level appear in the contract while those at the facility level are reflected in the authorization basis documentation. Selection of standards included in the contract as List A/List B takes into account the hazards associated with operations at the site. [HAZ 1.1, 2.1]

C2.3 Contractor procedures/policies have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the analysis of hazards associated with facilities and activities and ensure that workers are actively involved in the identification of hazards. Contractor procedures require that personnel responsible for analyzing hazards have competence that is commensurate with their responsibilities. Contractor procedures provide adequate resources to perform, review, approve, and maintain hazards analyses associated with the work being planned and hold line management directly responsible for this analysis. [BBC 2.3, HAZ 3.1, HAZ 3.2]

Approach:

The review included the MHC Management Integration and Control (MIC) Standard and Requirements Identification Document (S/RID)(in both general and nuclear weapon sections) and implementing documents in the area of hazard analysis. A sampling of other pertinent (lower-tier) site documents were also reviewed. Interviews were used to clarify the written material.

Record Review

1. Pantex Plant Integrated Safety Management Description (ISMD), ISMD Plan 93, Revision 5, dated March 31, 2000
2. DOE Order 452.2A, Safety of Nuclear Explosive Operations, dated January 17, 1997
3. AL SD 452.2, Safety of Nuclear Explosive Operations, dated January 15, 1999
4. AL 56XB, Chapter 11.3, Seamless Safety (SS-21) for Assembly and Disassembly of Nuclear Weapons at the Pantex Plant, dated June 30, 1999
5. AL 56XB, Chapter 11.4, Authorization Basis for Pantex Plant Nuclear Explosive Operations, dated April 15, 1999
6. MNL-254543, Pantex Plant Integrated Safety Management Authorization Basis Manual, Draft
7. DIR-0001, Roles and Responsibilities for the Management and Operation of the Pantex Plant, dated March 24, 2000
8. STD-0143, Technical Procedures System, dated March 23, 2000
9. STD-0148, Integrated Processes for Seamless Safety (SS-21), dated March 22, 2000
10. STD-3014, Unreviewed Safety Question Process, dated March 27, 2000
11. STD-3071, Authorization Basis, dated October 2, 1998
12. STD-3073, Implementation of Authorization Basis Changes, dated March 30, 2000
13. STD-3075, Authorization Basis Change Control, dated March 30, 2000
14. MNL-00053, Pantex Plant Hazard Identification Team Manual, dated August14, 1998
15. IOP-D-2600, Preparation of Safety Analysis Reports,
16. STD-2777, Personnel Selection, Qualification, and Certification dated December 21, 1999
17. STD-2785, Training Evaluation, dated October 19, 1999
18. STD-2787, Training Implementation, dated October 19, 1999
19. STD-7401, Weapons Program Project Team, dated March 28, 2000
20. STD-7403, Operations Directorate, dated March 31, 2000
21. DOE P 450.4, Safety Management System Policy, dated October 15, 1996
22. DEAR Clause 970.5204-2, Integration of ES&H into work Planning and Execution

Interviews

1. Director, Operations
2. Senior Technical Advisor, Authorization Basis
3. MHC S/RID Coordinator

Discussion of Results

Acceptance Criterion 2.1

Adequate mechanisms exist that require identification, analysis, and categorization of all hazards associated with nuclear explosive operations. MNL-254543, *Pantex Plant Integrated Safety Management Authorization Basis Manual*, define an acceptable hazard analysis methodology and describes a process for preparation, review and issuance of authorization basis documents. Appendix C of the manual requires hazards related to electrical, mechanical, thermal, radiological, and chemical insults for each configuration of the nuclear explosive to be analyzed. Once the hazards have been identified, consequences are postulated. The consequences evaluated include those from the Nuclear Explosive Operation Evaluation Guidelines (i.e., inadvertent nuclear detonation; high explosive detonation or deflagration; fire resulting in fissile material dispersal; worker fatality or serious injury; or, uncontrolled release of radioactive material from a facility. Scenarios that may result in one or more of the potential consequences are considered for further evaluation or control selection. Although AAO has identified needed improvements to this manual, they have approved it and transmitted comments to the contractor for incorporation in the next revision. Several procedures were reviewed that discuss roles and responsibilities for preparing, reviewing and approving hazard analyses. Although two were inconsistent with the current organization, the requirements were adequate for nuclear explosive operations.

The combination of the narrative contained in the MHC ISM system description (i.e., 23 page overview) and DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*, do not clearly describe the roles and responsibilities and requirements for analyzing hazards in nuclear explosive operations. Other parts of the MHC ISM system description in the form of plant standards, IOP's, etc. that are lower in the system hierarchy are required to gain an overall understanding of the process. For example, STD-7401. *Weapons Program Project Team* defines the role of the Project Team and line management in the hazard analysis development process. STD-7401 does not discuss in any detail the role of the design laboratories in the process. IOP-729, *Mission Programs Division Project Plan Development* (which is not listed as a system mechanism) is the document that defines the interface for design laboratory support.

Although appropriate requirement and standards exist, the system does not appear to establish and consistently apply a plant document hierarchy where higher level standards and requirements describe important ISM processes, such as hazard analysis, while lower level documents provide the detail. For example, MNL-254543, *Authorization Basis Manual*, is the key mechanism for defining the site process requirements for all authorization basis documentation (including hazards analysis), yet figure 6 in the system description document identifies manuals as among the lowest documents in the hierarchy (along with booklets and brochures).

Although several documents in the MHC ISM system description reference design laboratory interaction in the hazard analysis process, roles and responsibilities between MHC and design laboratories needs to be better defined in both MHC and DOE directives to ensure actual involvement. For example, STD-7401, *Weapons Program Project Team* does not specify the role of the design laboratories on the project teams. Interface requirements for design laboratory support are better defined in lower level standards (IOP-729) that are not part of the system description. AL

Supplemental Directive 56XB, *Development & Production Manual*, Chapter 11.4, defines expectations for a design laboratory, but only in the context of issuing the final engineering release for a nuclear explosive operation. More detail should be provided in MHC requirements and standards on appropriate roles and responsibilities of the labs throughout the process, especially in the area of providing weapon response information to support Hazard Analysis Reports (HAR), Safety Analysis Reports (SAR), or the Basis for Interim Operations (BIO). These weaknesses don't constitute deficiencies in the system description, but should be viewed as enhancements to the system to improve efficiency and clarity.

Acceptance Criterion C2.2

The S/RID is an accepted methodology for identifying adequate hazard analysis standards for use in nuclear explosive operations. The S/RID general and nuclear sections were reviewed and found to contain an adequate set of requirements. Applicable sections of the contract were reviewed to ensure that the S/RID are properly invoked. The S/RID establishes requirements for corporate-level controls.

Requirement documentation, most notably, MNL-254543, *Pantex Plant Integrated Safety Management Authorization Basis Manual*, requires all hazards that could be associated with operations at Pantex be accounted for in the DOE-approved hazard analysis. Appendix C of the manual requires hazards related to electrical, mechanical, thermal, radiological, and chemical insults for each configuration of the nuclear explosive to be analyzed.

Acceptance Criterion C2.3

MNL-254543, *Pantex Plant Integrated Safety Management Authorization Basis Manual*, DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*, STD-7403, *Operations Directorate*, STD-7401, *Weapons Program Project Team*, and STD-0148, *Integrated Processes for Seamless Safety (SS-21)* adequately describe the roles and responsibilities associated with producing, owning, overseeing, reviewing and maintaining hazard analyses associated with nuclear explosive operations. These documents identify that, although supported by authorization basis experts, the line management organizations are required to own the authorization basis for operations and facilities under their management.

The training standards STD-2777, *Personnel Selection, Qualification, and Certification*, STD-2785, *Training Evaluation*, and STD-2787, *Training Implementation* (although not listed under the "analyze hazards" section of the S/RID) are adequate to ensure authorization basis personnel are trained and qualified.

EP401110, *Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons* requires (Table-1, team participant matrix) the involvement of workers (production technicians and other specialists in various safety disciplines) in the preparation and validation of the nuclear explosive hazard analyses as members of the Hazard Analysis Task Team.

There were a few inconsistencies noted in the MHC ISM system description that warrant correction. For instance, STD-3071, *Authorization Basis*, requires updating to reflect recent changes in MHC organization. The MHC ISM system description contains conflicting requirements until STD-3071 is updated. Also, IOP-D-2600, *Preparation of Safety Analysis Reports*, is very outdated but is still listed as a requirement in the S/RID. MHC should consider deleting IOP-D-2600 from the ISM system description.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria C2.1, C2.2, and C2.3 for Nuclear Explosive Operations were met. However, two issues were identified.

Issue C2.5

Additional detail should be provided in MHC system description on roles and responsibilities of the design laboratories. Especially as related to safety analyses and resolution of technical issues arising out of operations that have potential safety implications. (Acceptance Criterion C2.1-Nuclear Explosive Operations)

Issue C2.6

The MHC system description does not identify IOP-729, *Mission Program Division Project Plan Development,* as a formal mechanism for defining roles and responsibilities related to design laboratory interface, although it provides some detail related to operations involving special nuclear material (SNM). (Acceptance Criterion C2.1-Nuclear Explosive Operations)

Observation C2.1

Documents containing site standards/requirements that are important ISM mechanisms should be higher within the hierarchy in order to emphasize the importance of consistency in implementation and integration of lower level requirements. Such an approach in the hierarchy and relationship of the documents composing the MHC ISM system description can ensure changes to lower level requirements are gauged against the upper-level process descriptions. In this manner, changes to the ISM system description can be controlled and understood.

ISMS Verification Assessment Form

Functional Area: Analyze the Hazards - DOE	**Objective Number:** C-2
	Date: 4/10/00

OBJECTIVE

Hazards associated with the work are identified, analyzed, and categorized. Applicable standards and requirements are identified and agreed upon. Contractor and DOE procedures ensure roles and responsibilities for preparing, reviewing and approving hazard analyses are clearly defined. Contractor and DOE procedures ensure personnel responsible for preparing, reviewing and approving hazard analyses have competence commensurate with assigned responsibilities. Mechanisms exist to ensure worker involvement in the identification of hazards. Line management is responsible for ensuring the adequacy of hazard analyses.

Criteria

C2.4 DOE procedures have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the hazard analyses associated with facilities and activities, and ensure that adequate resources are provided. DOE procedures require that personnel responsible for approving hazard analyses have competence that is commensurate with their responsibilities. [HAZ 3.3, 3.4]

C2.5 DOE procedures require identification, analysis, and categorization of all hazards associated with the site. DOE mechanisms ensure design agency input is included in the identification of hazards involving nuclear explosive components or assemblies. DOE procedures specify the appropriate review and approval process for the hazard controls and safety standards and requirements. DOE procedures require that applicable standards are reviewed, agreed upon, and provide for verification of standards selection. [HAZ 1.1]

Approach:

Record Review

1. AAO Procedure 102.1.0, Training and Qualification Program, dated June 8, 1999
2. AAO Authorization Basis Safety Analyst Qualification Manual, AL SASD Safety Analysis Qualification
3. AAO, Integrated Safety Management System Description, dated March 30, 2000
4. AAO 2000 Operational Plan, dated December 15, 1999
5. Memorandum from W. A. Weinreich to R. E. Glass, Subject: Integrated Weapon Activity Plan (Issue F), dated December 17, 1999
6. AL and AAO Self-Assessment Plan – Nuclear Explosives Authorization Basis Document Review and Approval, dated March 13, 1999

7. AL and AAO Self-Assessment Report – Pantex Nuclear Explosives Authorization Basis Document Review and Approval, dated March 13, 1999
8. DP/HQ Assessment of AL/AAO Authorization Basis Approval (Viewgraphs), dated April 4, 1999
9. Memorandum D. Brunell to Distribution, Subject: Corrective Action Plan (CAP) – AL/AAO Self-Assessment of the Pantex Nuclear Explosive Facility/Operation Authorization Basis Document Review and Approval Program, dated May 25, 1999
10. Memorandum R. E. Glass to W. S. Goodrum, Subject: Approval Authority for Nuclear Explosive Facility/Operations Authorization Basis Documents, dated May 26, 1999
11. Memorandum R. E. Glass to W. S. Goodrum, Subject: Approval Authority for Nuclear Facility/Operations Authorization Basis Documents, dated May 28, 1999
12. Memorandum R. E. Glass to D. E. Glenn, Subject: Approval Authority Delegation of Nuclear Operations Authorization Basis Documents, dated March 9, 2000
13. AL Fiscal Year 2000 Strategic/Performance Plan, not dated
14. AAO Procedure 103.1.0, Revision 1, Pantex Integrated Safety Management System Description, Source Requirements Identification Documents, and Directives Review Management Program, approved April 26, 1999
15. DOE and Pantex Plant Work Authorization Directives FY 2000, Revision 1
16. Pantex Plant – FY 2000 Program Priorities/Decrement List, Revision 6A, Final Draft, dated January 5, 2000
17. AAO Procedure 105.2.0, Nuclear Explosive Safety, approved August 4, 1999
18. AAO Procedure 106.1.0, Authorization Basis Documentation Review, approved June 25, 1999
19. AAO Procedure 407.2.1, Workload Planning and Budget Formulation Procedure, Prime Contractor No. DE-AC011-91AL65030, approved April 19, 1999
20. AL Development and Production Manual, Chapter 11.3, Seamless Safety (SS-21) for Assembly and Disassembly of Nuclear Weapons at the Pantex Plant, dated June 30, 1999
21. AL Development and Production Manual, Chapter 11.4, Authorization Basis for Pantex Plant Nuclear Explosive Operations, dated April 15, 1999
22. Five-Year Resource Plan (FY 1999 through FY 2003), U. S. DOE Albuquerque Operations Office, not dated
23. Informal Memorandum from D. Brunell to D. Glenn, dated March 23, 2000
24. Memorandum R. E. Glass to W. A. Weinreich, Subject: Concerns in the Execution of the Integrated Weapons Activity Plan (IWAP) and the directed workload requirements, dated July 20, 1999
25. Memorandum R. E. Glass to W. A. Weinreich, Subject: Award and Incentive Fees for FY99, dated December 2, 1999
26. Memorandum D. G. White to W. A. Weinreich, Subject: Incentive Fee for FY98, dated December 2, 1998
27. Memorandum B. G. Twining to W. A. Weinreich, Subject: Award Fee for FY98, dated November 20, 1998
28. Memorandum D. G. Glenn to B. J. Pellegrini, Subject: FY00 Performance Evaluation and Management Plan (PEMP)
29. MHC Process Hazard Analysis – Building 12-19 East, Drun Dryer/Mixing of Explosives/Mock Process, dated February 1998

30. MHC Pantex Plant Basis for Interim Operations Upgrade Program Plan, Revision 1, dated February 9, 2000
31. AL Functions, Responsibilities, and Authorities, Revision 2, dated October 1998
32. AAO Procedure 110.1.4, Oversight of Contractor Training Program, approved November 17, 1997
33. AAO Procedure 110.2.1, Revision 2, Amarillo Area Office Assessment Program, approved January 25, 1999
34. AAO Procedure 103.2.0, Revision 1, Authorization Agreements, approved March 14, 2000
35. AAO Procedure 511.1.0, Revision 2, Facility representative Program Manual, approved August 12, 1998
36. AAO Procedure 511.1.1, Revision 4, Facility representative Routine, approved August 12, 998
37. Program Control Document for W-87, Version 43, December 20, 2000
38. Memorandum from J. W. Angelo and G. E. Pool to K. Boardman on FY00 Pantex Plant Production Plan for March, dated March 7, 2000

Interviews

1. AAO Assistant Area Manager for Engineering & Environmental Management
2. AAO Area Manager for Weapons Operations
3. AAO Area Manager for Business Management & Security
4. AAO Assistant Area Manager for Nuclear Materials Operations
5. AAO Area Office Authorization Basis Staff Manager
6. AAO Senior Scientific Technical Advisor
7. AAO IWAP Manager

Discussion of Results

Acceptance Criterion C2.4

The first sub-element of this criterion relates to the second guiding principle of ISM in DOE P 450.4, of Clear Roles and Responsibilities. AAO roles, responsibilities, and authorities are established by DOE and AL Directives, by AL 1120, AL Functions, Responsibilities and Authorities Manual (FRAM), the AAO ISM System Description, and the AAO FRAM. While some roles and responsibilities related to approval authority for nuclear explosive operations require updating, the review of AAO roles, responsibilities and authorities did not identify any major issues. The overall structure and the process for defining clear roles, responsibilities and authorities is good, based on the referenced documents.

A few issues of minor concern were identified. Based upon personnel interviews, AAO Procedure 103.4.0, *AAO Functions, Responsibilities, and Authorities Manual (FRAM)* should be revised to reflect actual roles, responsibilities and authorities. For example, the Authorization Basis Staff in AAO review or perform confirmatory analysis of authorization basis documents and make recommendations of approval or non-approval to the line organizations. AAO line management concur (or non-concur) in the recommendation, and implement authorization basis controls or provisions upon approval. The Authorization Basis Staff do not "develop list of facilities requiring authorization basis documentation," but rather they review and recommend approval of such a list that is developed by the contractor and submitted to the AAO line organization. Such inconsistencies in AAO procedure language are numerous. A few examples from the FRAM include:

1. Page 24, item (5)(b) [authorization basis staff do not "develop Safety Analysis Report" and do not "develop or implement Technical Safety Requirements"];
2. Page 25, item (c) [ISM implementation for authorization basis staff?];
3. Page 26, item 3) [authorization basis staff cannot both "review and concur" on authorization basis documentation - roles, responsibilities and authorities with other AAO offices is duplicated];
4. Page 47, item 6) [Review and concur is repeated here for AAMNMO, which is the same language used for Authorization Basis Staff];
5. Page 47, item 11) [provide core expertise for nuclear safety and safety basis]:
6. Page 62, item 40 ["review and approve" Hazard Analysis Report. This is an ABS function, with only concurrence reserved for the line management.]; and,
7. A number of stated roles, responsibilities and authorities are insufficiently described. (It is not clear whether the actual function of the organization is "review", "approval", "concurrence", "technical support", etc.)

Another sub-element under this criterion is related to ensuring that adequate resources are provided for analysis of hazards. This is required by the fourth guiding principle for ISM, Balanced Priorities, calling for ensuring effective allocation of resources, in DOE P 450.4. This requirement can be broken into two parts. First is that the DOE procedures ensure that contractor resources are adequate, and the second is that DOE resources are adequate.

DOE has taken steps to strengthen the contractor funding and human resource allocations through a number of mechanisms such as the AAO Operational Plan, Integrated Weapon Activity Plan (IWAP), Work Authorization Directives (WADs), Program Priorities/Decrement List, and the structure of the Performance Evaluation and Management Plan for FY00.

The Performance Evaluation Management Plan for FY2000 has safety related activities at the highest levels of priorities among the top performance objectives in the performance area of Core Mission. The Basis for Interim Operations Upgrade program is integrated within the IWAP (which also includes explicit dates for completion of HAR and Activity Based Control Documents tied to the contractor's total award fees).

DOE has worked with MHC to establish an organizational structure with better defined roles and responsibilities for authorization basis documents. DOE has also taken steps to influence the contractor's practices with respect to hiring, training, and retention of qualified authorization basis staff.

The approval authority for Hazard Analysis Reports (for nuclear explosive operations) has been delegated to AAO. The required number of authorization basis personnel will be determined at the conclusion of an ongoing work-scope analysis (approximate due date of April 30, 2000). The current estimate is 5 additional personnel will be needed.

AAO has not taken steps to adequately identify authorization basis needs in non-nuclear facilities or activities. Currently, the definition of what should constitute an authorization basis for an explosive or a chemical facility is lacking in AAO procedures. Even though process hazard analyses (PHA) are required for explosive facilities, there is a lack of requirements to identify the subject facilities and the components of an authorization basis (see Issue C2.3). In the absence of such definition, AAO does not have a listing of Pantex Plant non-nuclear facilities that could be considered hazardous enough to require authorization basis documents (i.e., equivalent to a hazard category 2 or 1 nuclear facility). AAO procedures do not reflect roles, responsibilities, and authorities or resource requirements for review, approval, maintenance, and implementation of authorization basis documents for non-nuclear facilities.

A third sub-element of this criterion relates to ensuring DOE personnel have competence commensurate with their responsibilities for hazard analyses based on the third guiding principle for ISM in DOE P 450.4. For AAO, main competency requirements in this area rest with the Offices of the Senior Scientific and Technical Advisor and the Authorization Basis Staff. There is a rigorous training and qualifications program in place to ensure qualifications and competencies are maintained and enhanced over time. Plans to augment the Authorization Basis Staff with additional qualified staff will improve AAO capabilities in this area. .

Acceptance Criterion 2.5

The first sub-element of this criterion relates to adequate DOE procedures for analysis of all hazards, based on the second core function for ISM (DOE P 450.4). The AAO ISM system description (AAO Procedure 103.1.0), AAO Procedure 110.1.1, *Construction Project Safety and Health Oversight*, AAO Procedure 105.2.0, *Nuclear Explosive Safety*, AAO Procedure 105.5.2, *Radiation Protection of the Public and the Environment*, AAO Procedure 110.1.6, *Oversight of Pantex Plant Contractor's Packaging. Container. and Transportation Program.* and other AAO procedures cover a range of requirements for analysis of hazards. AAO Procedure 106.1.0, *Authorization Basis Documentation Program* is only applicable to nuclear facilities, without stating so explicitly. There is a need for additional guidance. AAO should establish procedures for defining hazard classification for non-nuclear facilities; defining the elements of an authorization basis for non-nuclear facilities; defining roles, responsibilities, and authorities for review, approval, maintenance, and implementation of associated controls for non-nuclear facilities; and, determining staffing needs to perform such functions. The S/RID process calls for development of local standards for cases when such standards are not available from elsewhere. [A good starting point may be the relevant OSHA and EPA rules.]

The second sub-element under this criterion is related to DOE procedures to ensure design laboratory input in all facets related to analysis of hazards. A thorough and defendable analysis of hazards is required by DOE-STD-3009-94, *Preparation Guide for DOE Non-Reactor Nuclear Facilities* and DOE-STD-3016-99, *Hazard Analysis Reports for Nuclear Explosive Operations*. A number of AL and AAO documents also address this requirement (e.g., AL Supplemental Directive 56XB, *Development and Production Manual*, Chapters 11.3 and 11.4, and AAO Procedure 106.1.0, *Authorization Basis Documentation Program*). Design laboratory involvement and input is dictated by the nature of hazards posed in nuclear weapon activities.

However, all of these documents focus on hazard analyses related to specific nuclear explosive operations or facility-level hazard analyses, rather than the need to establish a formal protocol for on-going design laboratory interface with DOE and MHC. Such an interface is needed, because the design laboratories perform research and reach new findings on a continuous basis. The findings of these efforts are often not related to any one weapon system or operation, and may not get laboratory wide coverage, but have potential implications on work performed at Pantex. Thus, design laboratory involvement on weapon-specific or facility-specific hazard analyses may not trigger the disclosure of new safety information, even though there is design lab participation in the process. The lack of a formal mechanism to ensure new information discovered by a design laboratory is provided to MHC and DOE is also noted as an issue under Feedback and Improvement (see Issue C5.4).

The third sub-element of this criterion is related to appropriate DOE review and approval process for hazard analyses. This is required under the first guiding principle of ISM (DOE P 450.4), for effective discharge of "line management responsibility for safety." This requirement is addressed in AAO Procedure 106.1.0, *Authorization Basis Documentation Program,* which in turn references a large number of other documents from DOE HQ, AL, etc. AAO Procedure 106.1.0 is substantially complete with certain minor exceptions. It fails to recognize the need to define authorization basis (or the lack thereof) for non-nuclear facilities and the discussions of Activity Based Control Document (ABCD) and Nuclear Explosive Hazard Analysis (NEHA) are outdated. It should state the intent, format, and content of an ABCD is the same as Technical Safety Requirements (TSR). The discussion of the USQ process (on page 18 b) implies that the USQ process would not be initiated otherwise, which is not the case. AAO Procedure 106.1.0 should emphasize the importance and define the process for getting input from design laboratories, facility representatives and workers in the hazard analysis process (hazard analysis performance, review, implementation). This is from the perspective of ensuring the quality and fidelity of the hazard analysis. Finally, AAO Procedure 106.1.0 should emphasize the importance of ensuring that hazard analysis is integrated with process design from the outset. These issues are noted as opportunities for improvement of the document.

The fourth element under this criterion calls for ensuring that DOE procedures require that applicable standards (for hazard analysis) be reviewed, agreed upon, and provide for verification of standards selection. This is required under the fifth guiding principle of ISM, "identification of safety standards and requirements." The document addressing this attribute is AAO Procedure 103.1.0, *AAO Integrated Safety Management System, Standards Requirements Identification Documents, and Directives Review Management Program.* AAO Procedure 103.1.0 establishes AAO responsibilities and processes for establishing the S/RIDs for all hazards, ensuring their adequacy, maintenance, review process, implementation, impact analysis, administration and performance validation of contractor operations, non-compliance resolutions, corrective actions, and exemptions. It also includes forms as attachments to expedite these activities.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria C2.4 and C2.5 were met with respect to DOE. However, two issues were identified

Issue 2.7

The AAO system description (AAO procedure 103.1.0) does not define the mechanisms for development of hazard analyses and a safety basis for non-nuclear facilities or operations. The AAO system description does not define organizational roles and responsibilities, and the required resources for review, approval, maintenance, and implementation of controls associated with these facilities or operations. (Acceptance Criterion 2.5)

Issue 2.8

DOE should develop a formal mechanism to ensure design laboratory interface with MHC extends beyond participating in initial hazard analyses. A formal mechanism is warranted to ensure new data is furnished to MHC, so that implications on the safety of Pantex Plant operations can be evaluated. (Acceptance Criterion 2.5)

ISMS Verification Assessment Form

Functional Area: Develop and Implement Hazard Controls	**Objective Number:** C-3 **Date:** 4/10/00

OBJECTIVE

Controls tailored to the hazards are developed and implemented. Roles and responsibilities for hazard control development, approval, and implementation are clearly defined. Personnel have competence commensurate with assigned responsibilities. Line management is responsible for ensuring adequate hazard controls have been developed and implemented. Mechanisms exist to ensure worker involvement in the development of hazard controls.

Criteria

C3.1 Contractor procedures for allocating resources include provisions for implementation of hazard controls for tasks being funded. [BBC.2.4]

C3.2 Resource allocations reflect the tailored hazard controls. [BBC.2.5]

C3.3 Contractor procedures ensure controls are tailored to the hazards associated with the work or operations to be authorized. [HAZ.2.2]

C3.4 Contractor procedures ensure the identified controls, standards, and requirements are agreed upon and approved prior to the commencement of the operations or work being authorized. [HAZ.2.3]

C3.5 Contractor procedures utilize accepted and structured methods and processes to identify, select, gain approval for, periodically review, and maintain safety standards and requirements. [HAZ.2.4]

C3.6 DOE procedures specify an appropriate review and approval process for the hazard controls and safety standards and requirements. [HAZ.2.5]

C3.7 DOE contracting procedures require that the requirements of applicable Federal, State, and local regulations (List A) and the requirements of Department of Energy directives (List B) be appended to the contract. [HAZ.2.6]

C3.8 Contractor procedures have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the hazard controls associated with facilities and activities. [HAZ.3.1]

C3.9 Contractor procedures require that personnel responsible for the identification of adequate hazard controls have competence that is commensurate with their responsibilities. [HAZ.3.2]

C3.10 DOE procedures have clearly defined roles and responsibilities for personnel assigned to oversee, review, and approve the controls associated with facilities and activities. [HAZ.3.3]

C3.11 DOE procedures require that personnel responsible for approving hazard controls have competence that is commensurate with their responsibilities. [HAZ.3.4]

C3.12 Contractor procedures identify line management as responsible for ensuring that the implementation of hazard controls is adequate to ensure that work is planned, approved, and conducted safely. Procedures require that line managers are responsible for the verification of adequate implementation of controls o mitigate hazards prior to authorizing work to commence. [MG.2.2]

C3.13 Contractor procedures identify line management as responsible for ensuring that hazard controls remain in effect so long as hazards are present. [MG.2.3]

C3.14 Contractor procedures for individual processes or maintenance actions ensure that controls are implemented prior to commencing work and that these controls remain in effect so long as the hazard is present. [MG.4.1]

C3.15 Contractor procedures for individual disciplines ensure that individual processes or maintenance actions include adequate controls associated with the individual discipline prior to commencing work and that the controls remain in effect so long as the hazard is present. [MG.4.2]

C3.16 Contractor procedures and policies are in place to ensure that workers are actively involved in the development and implementation of controls.

C3.17 Contractor ISM procedures ensure that controls are tailored to the hazards associated with the work or operations to be authorized.

C3.18 Contractor work planning procedures and practices for resource allocation include provisions for the implementation of hazard controls.

C3.19 The facility authorization envelope defines a set of controls that are tailored to, and adequate for, the identified hazards.

C3.20 Contractor ISM procedures ensure that the basis for the safe performance of work is clearly defined and maintained through effective configuration control.

C3.21 DOE and the contractor have mechanisms to ensure design agency input is obtained in the development of controls to prevent or mitigate hazards associated with nuclear explosive components or assemblies.

Approach:

Record Review

1. Pantex Plant Integrated Safety Management Description (ISMD) Revision 5, dated March 31, 2000
2. DIR-0001, Roles and Responsibilities for the Management and Operation of Pantex Plant, Issue 6, dated March 24, 2000
3. STD-0139, Engineering and Design, dated May 7, 1998
4. STD-0140, Preparation, Revision & Review of Policy Directives & Plant Standards, dated March 23, 2000
5. STD-0143, Technical Procedure System, dated March 23, 2000
6. STD-0144, Periodic Document Review, dated February 10, 1998
7. STD-0148, Integrated Processes for Seamless Safety (SS-21), dated March 22, 2000
8. STD-0154, Authorization Agreements
9. STD-0150, Procedure Adherence, dated October 21, 1999
10. STD-0280, Document Control System, dated March 30, 2000
11. STD-0282, DOE Requirement Document Review, dated March 27, 2000
12. STD-3013, Centralized Review System, dated December 10, 1998
13. STD-3014, Nuclear Facility & Nuclear Explosive Operation Unreviewed Safety Question, dated March 27, 2000

14. STD-3022, Construction Safety Program, dated March 2, 2000
15. STD-3030, Explosives, Nuclear Material and Personnel Limits, dated November1,1999
16. STD-3071, Authorization Basis, dated October 2, 1998
17. STD-3073, Implementation of Authorization Basis Changes, dated October 29, 1999
18. STD-3138, Hazard Abatement Program, dated February 22, 2000
19. STD-3116, Job Safety and Health Analysis, dated September 2, 1999
20. STD-3125, On-Site Explosive Hazards Classification, dated January 20, 2000
21. STD-3219, Radiological Work Practices, dated February 21, 2000
22. STD-3298, Nuclear Safety Program, dated March 30, 1998
23. STD-3363, Nuclear Explosive Safety Standards, Rules & Implementation Action Procedures, dated March 15, 2000
24. STD-3366, Nuclear Explosive Reviews, dated March 15, 2000
25. STD-3480, Suspension of Activities and Operations, dated October 9, 1998
26. STD-5016, Maintenance Work Control System, dated November 24, 1999
27. STD-7000, Conduct of Operations, dated December 1, 1994
28. STD-7301, Management Declaration of Operational Readiness, dated November 3, 1995
29. STD-7302, Operational Readiness Review (ORR), dated September 30, 1999
30. STD-7303, Readiness Assessment (RA) Procedure, dated March 31, 2000
31. STD-7306, Startup and Restart of Pantex Activities, dated March 31, 2000
32. STD-7308, Integrated Plant Project Priorities, dated March 31, 2000
33. STD-7403, Manufacturing Operations, dated March 21, 2000
34. STD-9027, Facility Project Requests, dated April 7, 1999
35. STD-9045, Change Control for Facility Critical Safety, Safety Class/Safety Significant Systems, dated November 23, 1999
36. IOP B-0006, Manufacturing Division Guidelines for Formal Conduct of Operations, dated August 27, 1999
37. MNL-000053, Pantex Plant Hazard Identification Team Manual, dated August 14, 2000
38. MNL-000054, Facilities Configuration Management Conduct of Operations, dated September 27, 1999
39. ABC-258600, Master Authorization Agreement, dated March 13, 2000
40. AAO Procedure 103.2, Authorization Agreements, dated March 14, 2000
41. AAO Procedure 103.4, AAO Functions, Responsibilities and Authorities Manual, dated December 22, 1999
42. AAO Procedure 106.1.0, Authorization Basis Documentation Program, dated June 25, 1999
43. AAO Procedure 110.1.4, Oversight of Contractor Training Program, dated January 25, 1999
44. MHC Qualification Cards (4)

Interviews

1. MHC Technical Advisor
2. MHC, Manager, Readiness Review and Assessment Group
3. MHC, Director, Program Management
4. MHC, Director, Operations
5. MHC, Director, Authorization Basis Department
6. MHC, Director, Support Services
7. MHC, Director, Environmental, Health, Safety and Quality

8. MHC, Director, Facility Operations
9. Production Managers (2)
10. Facility Managers (2)
11. Technical Writer (1)
12. AAO Deputy Area Manager
13. AAO Senior Scientific Technical Advisor
14. AAO Assistant Area Manager for Weapons Operations
15. AAO Facility Representative (1)

Discussion of Results

A review of the MHC ISM system description, applicable AAO procedures, and interviews with key MHC and DOE personnel indicated that MHC has mechanisms in place that adequately address CRADs 3.1, 3.3, 3.5, 3.12, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18, 3.20 and 3.21. DOE procedures adequately address CRADs 3.6, 3.7 and 3.11.

MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant* adequately addresses roles and responsibilities for the identification of hazards and implementation of hazard controls. The roles and responsibilities were found to flow down to lower tier documents such as STD-0154, *Authorization Agreements*, STD-3116, *Job Safety and Health Analysis*, and STD-5016, *Maintenance Work Control System*. Review of plant standards such as, STD-3022, *Construction Safety Program*, and STD-3138, *Hazard Abatement Program* indicate processes are in place to ensure the proper prioritization of hazards. Competence commensurate with responsibilities was determined by a review of selected qualification cards. Line management responsibility for the identification and implementation of controls was traced from MHC DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*, to lower tier documents such as STD-0148, *Seamless Safety Process (SS-21)* and MNL-000054, *Facilities Configuration Management Conduct of Operations*. AAO Procedure 103.4, *AAO Functions, Responsibilities and Authorities Manual*, and AAO Procedure 106.1, *Authorization Basis Documentation*, as well as interviews, were used to determine that the criteria for CRADs 3.6, 3.7 and 3.11 were met.

An appraisal of applicable standards and manuals indicated that MHC has developed processes to identify appropriate measures to mitigate the consequences of identified hazards and has mechanisms in place to properly implement controls and establish correct priorities. However, the magnitude of the paper associated with the current system makes it difficult to follow the process from higher to lower tier documents. A review of training records, qualification cards, and selected interviews indicated that personnel responsible for the identification and implementation of controls have the competence commensurate to their responsibilities. Line management involvement in the identification and implementation of controls was evident, but it was difficult to make that determination from the written documents alone.

Conclusion

Based on the documents reviewed and interviews conducted, the objective and acceptance criteria were met. However, four issues were identified.

Issue C3.1

The MHC system description defines two formal mechanisms related to work control that are inconsistent. MHC STD-5016, *Maintenance Work Control System* defines a process for initiating work under emergency conditions before completion of a planned work order. The personnel who have authority to approve this process are clearly defined. However, the process does not consider the potential need for interim compensatory measures and that a return to normal work practices must be done as soon as the situation has stabilized (i.e., use of formal procedures). The process does not adequately address the need to use approved procedures as far as practicable. MHC STD-0150, *Procedure Adherence*, does not discuss emergency work conditions and contains no provision for the performance of work without an approved procedure. (Acceptance Criterion 3.2)

Issue C3.2

DOE is required to clearly define roles and responsibilities for personnel assigned to oversee, review and approve controls associated with facilities and operations. Based upon feedback from personnel interviews, AAO Procedure 103.4.0, *AAO Functions, Responsibilities and Authorities Manual* should be revised to reflect the actual review process used. Currently, AAO Procedure 103.9, paragraph (9)(f)(1) implies that the Assistant Manager for Weapon Operations "authorizes" Authorization Agreements. (Acceptance Criterion 3.10)

Issue C3.3

Section 7.2 of the Master Authorization Agreement defines a process for making minor changes to the authorization agreement without formal DOE approval, provided a set of rigorous pre-conditions are met. However, the MHC system description does not include a mechanism for making such changes (MHC plant standard STD-0154, *Authorization Agreements*, contains no such provision). (Acceptance Criterion 3.19)

Issue C3.4

Section 7.2 of the Master Authorization Agreement defines a process for making minor changes to the authorization agreement without formal DOE approval, provided a set of rigorous pre-conditions are met. However, the AAO system description does not include a mechanism for making such changes (AAO procedure 103.2, *Authorization Agreements*, contains no such provision). (Acceptance Criterion 3.19)

Observation C3.1

It appears that STD-0148, *Integrated Processes for Seamless Safety (SS-21),* could be streamlined by the elimination of one peer review. The value-added benefit from conducting two peer reviews, as opposed to one peer review at the end of the process, should be reviewed.

Observation C3.2

ISM principles require that personnel have competence commensurate with their responsibilities for the identification and implementation of hazard controls. Qualification cards require update. A review of qualification cards revealed that some cards do not contain any requirement for knowledge of Integrated Safety Management. Most cards reviewed require checkouts or approvals from offices not listed in the current MHC organization. Some of the qualification cards referred to superseded documents and some qualification cards listed requirements as "to be determined."

Noteworthy Practice C3.1

The use of a Master Authorization Agreement provides additional flexibility and less administrative burden while ensuring the rigor of the document is maintained. The document is properly "tailored" for the Pantex site.

ISMS Verification Assessment Form

Functional Area:	Objective Number: C-4
Perform Work within Controls	**Date:** 4/7/00

Objective

Line management ensures readiness is confirmed and work is performed safely. DOE and contractor procedures ensure before work is performed, hazards have been analyzed; safety standards and requirements identified, agreed upon, and implemented; and hazard controls implemented. Personnel assigned to perform or oversee work have competence commensurate with assigned responsibilities.

Criteria

C4.1 Contractor and DOE Line Management procedures specify who has responsibility to ensure that work is performed within controls. [DOE.1.1, DOE.1.2; MG.4.4]

C4.2 Contractor and DOE procedures ensure: that personnel who review or oversee the performance of work have competence commensurate with the responsibilities to which they are assigned; that priorities are balanced so that work is performed within controls; and that readiness be properly verified and authorized before work commences [DOE.1.3, DOE.1.4; DOE.1.5; MG.2.4; MG.3.4]

C4.3 Contractor and DOE procedures define the processes for the development, approval, and maintenance of documentation addressing the establishment of authorization protocols and authorization agreements. [HAZ.2.7; MG.4.3]

C4.4 Contractor procedures provide for regulatory compliance and enforcement as required by rules, laws, and permits such as PAAA, NEPA, RCRA, CERCLA, etc., and require line and independent oversight or assessment activities at all levels. [MG.3.7]

C4.5 Contractor procedures for the approval of work ensure that the assigned workers are qualified for the scope of work planned, understand the hazards involved, and controls are in place to mitigate those hazards. Oversight and assessment activities verify that work is performed within agreed upon controls [MG.4.5, MG.3.4]

C4.6 DOE and the contractor have mechanisms to ensure periodic review by design agency personnel of work performed at Pantex in accordance with requirements established by the design agencies.

Approach

An adequacy review of the Pantex Plant ISMD (including implementing documentation as referenced above) and interviews with key MHC Managers were conducted.

Record Review

1. Pantex Plant Integrated Safety Management Description (ISMD), ISMD Plan 93, Revision 5, dated March 31, 2000
2. DIR-0001, Roles and Responsibilities for the Management and Operation of Pantex Plant, dated March 24, 2000
3. DOE Order 452, Safety of Nuclear Explosive Operations, dated January 17, 1999
4. AL Development and Production Manual, AL56XB Chapter 11.4, dated April 15, 1999
5. AL SD452.1A, Startup and Restart of AL Activities, dated August 31, 2000
6. DOE Order 414.1A, Quality Assurance, dated September 29, 1999
7. STD-7306, Startup and Restart of Pantex Activities, dated March 31, 2000
8. Matrix Provided to ISM Team: List of Standards Implementing Roles and Responsibilities for Pantex Personnel, dated April 4, 2000
9. Management Self-Assessment Findings Matrix provided to ISM Team, dated March 31, 2000
10. MHC Org Chart, Rev 21, dated March 20, 2000
11. MHC Memo: General Manager to Amarillo Area Manager dated February 4, 2000 Readiness Review Board Membership
12. STD-0154, Authorization Agreements, dated March 21, 2000
13. STD-0127, Price-Anderson Amendment Act Compliance Program Noncompliance, dated December 16, 1999
14. STD-7403, Operations Directorate, dated March 31, 2000
15. STD-0282, Compliance Management, dated March 27, 2000
16. STD-3033, Air Quality Management Requirements, dated September 4, 1998
17. STD-2777, Personnel Selection Qualification Certification, dated December 21, 1999
18. STD-2533, 5480.20A Position Classification Progress, dated September 14, 1999
19. STD-2788, Training Analysis and Design, dated February 1, 2000
20. STD-2770, Training, dated January 18, 2000
21. STD-2540, Job Description, Job Review & Evaluation, dated August 16, 1999
22. STD-2785, Training Evaluation, dated October 19, 1999
23. STD-2787, Training Implementation, dated October 19, 1999
24. STD-0265, Weapons Training & Qualification, dated February 16, 2000
25. IOP AT-80027, Applied Technology Division Guidelines for Personnel Selection and Qualification
26. IOP 729, Mission Programs Division Project Plan Development, dated February 9, 2000
27. STD-0148, Integrated Process for Seamless Safety (SS-21), dated March 22, 2000
28. STD-7401, Weapons Program Project Team, dated March 28, 2000
29. STD-7301, Management Declaration of Operational Readiness, dated November 3, 1995
30. STD-7302, Operational Readiness Review (ORR), dated November 3, 1995
31. STD-7303, Readiness Assessment (RA) Procedure, dated March 31, 2000
32. IOP AT-8151, Applied Technology Division Guidelines for Formal Conduct of Operations, dated August 27, 1999
33. IOP B-0006, Manufacturing Division Guidelines for Formal Conduct of Operations, dated March 9, 2000
34. IOP B-0019, Manufacturing Division Guidelines for Personnel Selection and Qualification, dated February 4, 2000
35. STD-0150, Procedures Adherence, dated October 21, 1999

36. STD-4530, Daily Administrative Checks, dated March 20, 1998
37. MNL00040, Pantex Plant Conduct of Operations Manual, Revision 5, dated January 1999
38. MS-3300, Mission Control S/RID (including MS-3100, Emergency Management dated August 14, 1998
39. MS-3210 Facility Engineering & Construction dated January 25, 1999
40. MS-3300, Maintenance dated July 14, 1998
41. MS-3400, Environmental Management dated March 12, 1999
42. STD-5100, Maintenance Management, dated October 8, 1999
43. STD-5011, Facility Transfer, dated March 24, 2000
44. STD-7012, Functions of Weapon Program Managers, dated March 31, 2000
45. STD-0107, Independent Assessment and Self-Assessments, dated November 10, 1999
46. IOP-707, Mission Programs Division Achieving Readiness for Weapon Programs, dated January 21, 2000
47. IOP-718, Mission Programs Division Performance Based Review for Weapon Programs, dated January 20, 2000
48. MNL00078, The Manufacturing Administration Manual, Chapter 5 Conduct of Operations Improvement Program, dated September 1999
49. STD-7403, Manufacturing Operations, dated November 22, 1999
50. IOP AT-80079, Applied Technology Operations, dated March 30, 2000
51. IOP-FO-1001, Facilities Division Responsibilities and Authorities, dated August 3, 1998
52. IOP D0063, Environment, Safety, Health & Quality Directorate Roles and Responsibilities, dated March 29, 2000
53. AAO Procedure 110.2.1, Revision 2, Amarillo Area Office Assessment Program, dated January 25, 1999
54. AAO Procedure 102.1.0, Revision 1, Training and Qualification Program, dated June 8, 1999
55. AAO Procedure 103.2.0, Revision 1, Authorization Agreements, dated March 14, 2000
56. AAO Procedure 115.1.0, Revision 1, Startup and Restart of Pantex Plant Activities, dated March 22, 2000
57. AAO Procedure 106.5.0, Revision 2, AAO Project Management System, dated March 31, 1999
58. AAO ISM System Description, Revision 0, dated March 30, 2000
59. AAO Functions, Responsibilities and Authorities Manual, dated December 27, 1999
60. AAO Procedure 407.1.1, Work Authorization Directive Change Control Procedure, Prime Contract No. DE-AC011-91AL65030, dated June 24, 1999
61. MHC STD-3061, Employee Safety & Health Complaints, dated May 27, 1999
62. MHC STD-0143, Technical Procedures System, dated March 23, 2000
63. MHC STD-0265, Weapons Training and Qualification, dated February 16, 2000
64. MHC STD-3357, Nuclear Explosive Training, dated January 12, 1998
65. MHC STD-4525, Safeguards Training Requirements, dated January 15, 1999
66. IOP AT-80027, Applied Technology Division Guidelines for Personnel Selection & Qualification, dated November 20, 1998
67. MHC STD 3140 Event Investigation, Critique Process & Occurrence Reporting, dated March 8, 2000
68. AAO 112.1.0, Emergency Management Oversight Program, dated May 21, 1999
69. AAO 123.1.0, Duty Officer, dated May 1, 1998
70. AAO 511.1.0, Facility Representative Program Manual, dated August 12, 1998

Interviews

1 MHC Director, Operations
2 MHC Readiness and Assessment Manager
3 MHC Director, Program Management
4 AAO Senior Technical Safety Advisor
5 AAO Assistant Manager
6 MHC SNM Program Manager

Discussion of Results

A review of MHC mechanisms for ensuring regulatory compliance and enforcement required by rules, laws, and permits was conducted. The Environmental Management S/RID defines the regulatory requirements for NEPA, air, environmental restoration, waste management, and preservation of cultural and natural resources. Adopted standards and implementing documents were sampled to assess if adequate mechanisms for ensuring compliance exist. MHC STD-0282, *Compliance Management*, defines the process for conducting compliance evaluations of regulatory and contractual requirements. MHC STD-0127, *PAAA Compliance Program Noncompliances,* defines the process for identifying noncompliances to nuclear safety requirements (e.g., 10 CFR830). Additional standards, such as STD-0107, *Independent Assessment and Self Assessment*, provide confidence that mechanisms are defined for ensuring regulatory compliance.

A review of the system was conducted to ensure assigned workers are qualified for the planned scope of work, that the hazards involved are understood, and that the controls are in place to mitigate those hazards. Various documents reviewed (MHC ISMD, DIR-0001, STD-2777, STD-0154, IOP-729, STD-0107, STD-7403, STD-0265, STD-3357, STD-4525, IOP-AT-80027, STD-2770, IOP-707, STD-0150, MNL-00040, IOP-AT-8151, AAO 103.2.0, AAO 407.1.1, STD-7301, MHC STD-0143, MHC STD-3061) indicate mechanisms exist between DOE (AAO) and MHC to ensure that when work is authorized and performed, qualified workers are knowledgeable of hazards. It was also evident mechanisms are in place to ensure that oversight and assessment activities (to include self-assessments and independent assessments) verify MHC work is performed within agreed-upon controls. There was documented evidence that when changes are made to work, these agreed upon controls are assessed for impact and safety. A review of requirements for procedural adherence was also conducted to better understand what mechanisms exist to ensure work is controlled from a procedural perspective. These mechanisms, which apply to the entire Pantex Plant, provide clear guidance to the worker on procedural adherence and consequences if work procedures are not followed.

A review of the objectives, criteria, and associated implementing documents referenced in the Mission Support S/RID was conducted to assess whether mechanisms related to "confirmation of readiness" and "perform" work were defined for emergency management, facility engineering and construction, maintenance, and environmental management. The adopted standards and implementing documents were generally appropriate, although specific references to sections of State of Texas regulations were not reviewed. One issue regarding design laboratory involvement in off-normal nuclear operational events was identified.

The following discussion addresses issues associated with CRAD Criteria C4.1, C4.2, C4.3 and C4.6. MHC implementing procedures were reviewed to ensure roles and responsibilities were clear for line management responsibility for performing work within controls. The MHC organizational documentation was difficult to follow and understand, especially as it related to *line management* responsibilities. Discussions with MHC senior management led to a better understanding of the documentation. Clarification was also provided to related documentation (MHC ISM system description, DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*, and MHC STD-7403, *Manufacturing Operations*). Based upon a review of related documentation, it was concluded that mechanisms exist to ensure work is performed within controls. However, the term "line management" is not used consistently from the MHC ISM system description to the flow-down documents.

The readiness assessment function reports directly to the Plant Manager, versus a Directorate. In the previous organizational structure, operational readiness functions reported to the Manager, Mission Programs. This reporting hierarchy could lead to the misconception that readiness reviews were not independent, especially as they related to mission programs since this function was under the Mission Programs organization. The current structure provides increased independence and visibility to the "confirm readiness" part of integrated safety management at the Pantex Plant.

A review of MHC STD-7403, *Operations Directorate*, provided some insight into the MHC organization. When reviewing roles and responsibilities associated with "confirm readiness," some inconsistencies were noted in the position responsible for managing the operational readiness program. MHC STD-7403 states that the Program Management Directorate (3.8.1.a.(6)) "maintains oversight of Operational Readiness Review Program." Section 3.14.2 of the standard states that Readiness and Assessment maintains and monitors the plant-wide audit, assessment, and assurance program. The standard states that the Readiness Review Program Manager "coordinates the readiness review program." During interviews with the Director of Program Management and the Readiness Assessment Manager, it was determined this is a Readiness Assessment role. The statement within 3.8.1.a.(6) should be deleted.

AAO procedures were reviewed to ensure roles and responsibilities associated with line management responsibility were clearly defined to ensure that work is performed within controls. After a vertical comparison of the AAO ISM system description to the AAO FRAM to the AAO procedures, it was difficult to understand who had line management responsibility within AAO. Although various mechanisms appear to exist to ensure work is performed within controls, a description of who is the line manager accountable within the AAO organization for this role varied.

A review of the AAO ISM system description (section 4.2) and AAO Procedure 103.2.0, *Authorization Agreements* was conducted to better understand DOE's involvement with the authorization agreement process as it is relates to performing work. An inconsistency was noted between these two documents. Under the AAO system description, "DOE-AL and AAO authorize continued operation of hazardous facilities (Category 2 nuclear facilities and moderate or high hazard non-nuclear facilities) through Authorization Agreements, in accordance with AAO 103.2.0, Authorization Agreements." AAO Procedure 103.2.0, *Authorization Agreements*, requires authorization agreements for high hazard nuclear facilities (Categories 1 and 2). Although AAO

Procedure 103.2.0 provides a provision to develop an authorization agreement for other facilities and activities as directed by the Area Manager, it is unclear what activity or facility requires an authorization agreement.

MHC implementing procedures were reviewed to ensure a system is in place to provide adequate training commensurate with responsibilities to confirm readiness and perform work. MHC STD-2777, *Personnel Selection, Qualification, and Certification*, is the top level implementing document that governs training requirements for all personnel at Pantex. This standard does not address qualification and training requirements for MHC personnel above the Directorate level. Since the Readiness and Assessment Manager and several other key personnel are a direct report to the General Manager, qualification and training requirements for these positions are not addressed. MHC STD-0107, *Independent Assessments and Self-Assessments (3.1.1.c)*, does require the independent assessment team to be technically qualified and knowledgeable in the area to be assessed. It is not clear what qualification and training requirements govern the Readiness and Assessment Manager. This issue affects all personnel above the Directorate level.
A review of the text portion (first 23 pages) of the MHC ISM system description was conducted to assess whether the expectation for performing work within controls is addressed. The MHC ISM system description defines expectations for performing work within controls at the site-level (section 3.2.5), the facility-level (section 3.3.5) and the activity-level (section 3.4.5 and 3.4.6). Section 3.3.1 defines the expectations for Authorization Agreements (AA), but implies AA's are only for Category 2 nuclear facilities. The scope of AA, as defined in the System Description text, is inconsistent with MHC STD-0154, *Authorization Agreements*.

Three Internal Operating Procedures and one Standard that pertain to confirmation of readiness and performing work were not listed in MIC Appendix C, Flowdown Matrix. These operating procedures and the Standard are important because they constitute mechanisms for ensuring readiness is confirmed prior to initiating work. The three IOPs are: IOP-707, *Achieving Readiness for Weapon Programs*; IOP-718, *Performance Based Review for Weapon Programs;* and IOP-729, *Mission Programs Division Project Plan Development*. The plant standard is STD-7012, *Functions of Weapon Program Managers*.

MIC S/RID section 1.5, *Confirm Readiness*, and MIC S/RID section 1.6, *Perform Work*, were reviewed to determine if criteria for the three mission areas appropriately addressed the objectives of sections 1.5 and 1.6. MIC S/RID criteria for section 1.5 requires design laboratory involvement associated with Nuclear Weapon readiness, but the criteria for Nuclear Material did not. A review of lower level MHC procedures implies laboratory involvement with other mission areas. IOP-729, *Mission Programs Division Project Plan Development*, which was not referenced in the MIC S/RID flow-down matrix, requires development of project plans for all program management activities within Mission Programs. These project plans are to "include the scope of design agency support for the Pantex activities identified, including resource requirements, deliverables, and schedules." These plans are to contain, at a minimum, four major phases: concept, planning, execution and termination. This concept ties directly to the AL Supplemental Directive 56XB, Chapter 11.3, section 5.0 and expectations for nuclear weapon project teams. Because special nuclear material (SNM) is also a function within the Program Management organization, IOP-729 implies project plans would also be developed for SNM. Thus, design laboratory involvement would be identified in the project plan. Further clarification from the Program Management Director and the SNM Program Manager indicates the intent is to develop the required project management plans, per IOP-729, for all mission activity to include SNM.

MHC MIC S/RID section 1.5, *Perform Work*, references the Mission Support S/RID for how work is conducted associated with Emergency Management. A review of the Emergency Management S/RID indicates documented criteria for invoking design agency involvement does not exist for abnormal nuclear operational events.

A review of AAO procedures was performed to ensure there are mechanisms in place to involve design agencies if an abnormal nuclear operational event occurs. Emergency management procedures, facility representative procedures, duty officer procedures and the AAO ISM System Description were reviewed. There was no evidence a formal mechanism exists to involve the design agencies in abnormal nuclear operational events, other than emergency situations.

Conclusion

Based on the documents reviewed and interviews conducted, the Objective and Criteria were generally met. However, eight issues were identified.

Issue C4.1

The MHC system description does not accurately reflect who is responsible for the Operational Readiness Program. MHC plant standard STD-7403, *Manufacturing Operations*, reflects the Program Manager Directorate rather than the Readiness Review Program Manager. (Acceptance Criterion C4.1)

Issue C4.2

The AAO ISM system description (AAO Procedure 103.1.0) does not clearly define line management responsibilities for confirmation of readiness. (Acceptance Criterion C4.1)

Issue C4.3

There are inconsistencies between the MHC ISM system description and MHC plant standard STD-0154, *Authorization Agreements* on what types of activities or facilities require an authorization agreement. (Acceptance Criterion C4.1)

Issue C4.4

There are inconsistencies between the AAO ISM system description, section 4.2 and the AAO Procedure 103.2.0, *Authorization Agreements* on what types of activities or facilities require an authorization agreement. (Acceptance Criterion C4.1)

Issue C4.5

The MHC system description defines plant standard STD-2777, *Personnel Selection, Qualification, and Certification* as a key mechanism related to training. However, STD-2777 does not include direct reports to the Pantex Plant Manager. (Acceptance Criterion C4.2)

Issue C4.6

The MHC ISM system description does not include several key mechanism used to define processes, roles, and responsibilities of the Program Management Directorate. (IOP-707, IOP-718, IOP-729, and STD-7012 define mechanisms, but are not identified as part of the MHC system.) (Acceptance Criterion C4.3)

Issue C4.7

The MHC ISM system description does not establish a formal mechanism (process) to ensure design laboratory involvement for resolution of problems subsequent to an abnormal nuclear operational event (i.e., technical or safety problem with a nuclear explosive or component). (Acceptance Criterion C4.6)

Issue C4.8

The AAO ISM system description does not establish a formal mechanism to invoke design laboratory involvement for resolution of problems subsequent to an abnormal nuclear operational event, other than emergency situations. (Acceptance Criterion C4.6)

ISMS Verification Assessment Form

Functional Area:	Objective Number: C-5
Provide Feedback and Continuous Improvement	**Date:** 4/8/00

<u>OBJECTIVE</u>

DOE procedures and mechanisms ensure that hazards are analyzed, controls are developed, and that feedback and improvement programs are in place and effective. Feedback information on the identification of safety standards and requirements, the adequacy of controls, and opportunities for improving the planning of work is identified. Line management and independent oversight is conducted as appropriate, and if necessary, regulatory enforcement actions occur.

<u>Criteria</u>

C5.1 DOE procedures describe clear roles and responsibilities to provide feedback and continuous improvement. [DOE.2.1]

C5.2 DOE procedures ensure that competence is commensurate with the responsibilities to provide feedback and continuous improvement. [DOE.2.2]

C5.3 DOE procedures ensure that feedback is provided and continuous improvement results in the identification of safety standards and requirements. [DOE.2.3]

C5.4 DOE procedures ensure that feedback is provided and continuous improvement results in the tailored hazard controls of the work being performed. [DOE.2.4]

C5.5 DOE procedures promote the continuous improvement and efficiency of operations. DOE priorities are balanced and corrective actions are developed, implemented, and tracked in order to profit from prior experience and the lessons learned. [DOE.2.5]

C5.6 DOE procedures provide line oversight of the contractor's self-assessment programs. [DOE.2.6]

C5.7 The contractor has mechanisms in place to direct, monitor, and verify the integrated implementation of the ISMS as described in the ISMS Description. Implementation and integration expectations and mechanisms are evident throughout all corporate/site organizational functions. [MG.1.2]

C5.8 The contractor has assigned responsibilities and established mechanisms to ensure that the ISMS Description is maintained current and that the annual update information is prepared and submitted. [MG.1.3]

C5.9 The contractor has established a process that establishes, documents, and implements safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance. The ISMS describes how system effectiveness will be measured. [MG.1.4]

C5.10 Contractor procedures describe clear roles and responsibilities to provide feedback and continuous improvement including line management responsibility for safety. [MG.3.1]

C5.11 Contractor procedures ensure that competence is commensurate with the responsibilities to provide feedback and continuous improvement. [MG.3.2]

C5.12 Contractor procedures ensure that priorities are balanced to ensure feedback is provided and continuous improvement results. [MG.3.3]

C5.13 Contractor procedures ensure oversight or assessment results are managed to ensure lessons are learned and applied; that issues are identified and managed to resolution; that fundamental causes are determined and effective corrective action plans are developed and implemented. [MG.3.5]

C5.14 Contractor procedures ensure that performance measures or indicators and performance objectives are developed in coordination with DOE as required. Contractor procedures require effective management and use of performance measures and objectives to improve operations and processes, and to ascertain the status of the ISMS. [MG.3.6]

C5.15 Contractor procedures for hazard analysis and identification of controls are modified to reflect lessons learned and feedback information resulting from assessments and work experience.

C5.16 Contractor procedures include assessment and lessons learned programs to ensure continuous improvement of work planning and conduct of work.

C5.17 Contractor procedures provide for line and independent oversight or assessment activities at all levels.

C5.18 DOE and the contractor have mechanisms to ensure design agency feedback is provided for continuous improvement of processes. Mechanisms similarly exist for DOE and the contractor to provide feedback to the design agencies for continuous improvement.

C5.19 DOE processes exist which ensure feedback from external or independent reviews result in corrective action and process improvement.

Approach:

Record Review

1. Pantex Plant Integrated Safety Management Description (ISMD), Plan 93, Revision 5, issued March 31, 2000
2. DIR-0001 Roles and responsibilities for the Management and Operation of Pantex Plant, dated March 24, 2000
3. ISMS Verification Phase I & II Final Report for Pantex Plant - Volume I, dated October 1998
4. Pantex Plant ISMS Phase I Review Plan - Revision 1, dated March 2000
5. Management Self-Assessment Finding Matrix provided to ISM Team, dated March 31, 2000
6. MHC Organizational Chart, Rev 21, dated March 20, 2000
7. MHC STD 0107 Independent Assessments and Self-Assessments, dated October 10, 1999
14. MHC STD 0129 Trend Analysis of Plant Issues, dated January 25, 2000
15. MHC STD 0148 Integrated Processes for Seamless Safety (SS-21), dated March 22, 2000
16. MHC STD 0282 Compliance Management, dated March 27, 2000
17. MHC STD 2770 Training, dated January 18, 2000
18. MHC STD 2777 Personnel Selection, Qualification, and Certification, dated December 21, 1999
19. MHC STD 3008 Annual Safety & Health Program Evaluation, dated January 6, 1999
20. MHC STD 3071 Authorization Basis, dated October 2, 1998
21. MHC STD 3182 Executive Safety Committee for Safety and Health Activities, dated September 28, 1998
22. MHC STD Self-Assessment Program for Security & Emergency Management Operations Division, dated January 3, 2000

23. MHC STD 6028 Performance Measurement System, dated November 11, 1999
24. MHC STD 6216 Lessons Learned Program, dated August 24, 1998
25. DOE D&P Manual AL56XB, Rev. 1 - Change 32, Chapter 11.3 - Seamless Safety for Assembly and Disassembly of Nuclear Weapons at the Pantex Plant, dated June 3, 1999
26. MHC ISM authorization basis Manual - MNL254543, dated February 21, 2000
27. AAO Organizational Chart, dated March 27, 2000
28. DOE/AL FY00 Performance Evaluation Management Plan, dated January 21, 2000
29. AAO ISM System Description, Revision 0, dated March 30, 2000
30. AAO Procedure 103.1.0 Pantex Integrated Safety Management System Description, Source Requirements Identification Documents, and Directives Review Management Program, dated April 26, 1999
31. AAO Procedure 102.1.0 Revision 1 Training and Qualification Program, dated June 8, 1999
32. AAO Procedure 103.4.0 AAO Functions, Responsibilities and Authorities Manual (FRAM), dated December 27, 1999
33. AAO Procedure 110.1.1 Construction Project Safety and Health Oversight, dated March 31, 1999

Interviews

1. Readiness Review and Assessment Group Manager

Discussion of Results

Amarillo Area Office

Acceptance Criterion C5.1

The AAO ISM system description (AAO Procedure 103.1.0) and the *AAO Functions, Responsibilities, and Authorities Manual* (AAO Procedure 103.4.0) establish the roles and responsibilities for the area office regarding feedback and improvement functions. These are subsequently rolled down into other AAO procedures including the *AAO Assessment Program* (AAO 110.2.1), *AAO Self-Assessment Program* (AAO 114.1.0*), Issues Management and Tracking Program* (AAO 110.4.0), the *Employee Concerns Program* (AAO 111.1.0), and others.

Acceptance Criterion C5.2

The *AAO Assessment Program* (AAO Procedure 110.2.1) and the *Qualification and Training Program* (AAO Procedure 102.1.0) specify that Assistant Area Managers (AAM) establish the training and qualification requirements for assessment teams and subject matter experts. However, it is not clear how the AAMs establish the qualifications for assessment teams members. The qualification requirements for AAO Facility Representatives are well defined in AAO Procedure 511.1.0, *Facility Representative Program Manual*, and AAO Procedure 511.1.3, *Facility Representative Continuing Training.*

Acceptance Criteria C5.3 and C5.4

The AAO Authorization Basis Documentation Program (AAO Procedure 106.1.0) and the Pantex ISMD, S/RIDS, and Directives Review Management Program (AAO Procedure 103.1.0) provide mechanisms to oversee improvements to the MHC processes governing their authorization basis documentation and hazard control.

Acceptance Criterion C5.5

The AAO Issues Management and Tracking Program (AAO Procedure 110.4.0) and AAO Assessment Program (AAO Procedure 110.2.1) provide the processes by which the Area Office accepts inputs (from various feedback mechanisms) and assures continuous improvement. The AAO procedures do not specifically provide for development of AAO corrective action plans. AAO procedures require tracking of corrective action plans developed by the contractor. The AAO procedures do not address lessons learned.

Acceptance Criterion C5.6

The AAO Assessment Program does not specifically address oversight of the contractor's self-assessment program, but does provide for AAO personnel to participate in MHC and external assessments. AAO procedures do include provisions to perform "for cause" assessments in areas were problems have been identified through other mechanisms. AL and DOE/HQ conduct routine assessments of MHC. The AAO Facility Representative Program (AAO Procedure 511.1.0) provides for day-to-day operational oversight. The AAO Emergency Management Oversight Program (AAO Procedure 112.1.0) provides for AAO oversight of MHC emergency management programs.

Mason & Hanger, Corporation

Acceptance Criterion C5.7

In general, the MHC ISM system description cites the various mechanisms that make up the feedback and improvement system. Mechanisms are at the site, facility, and work activity level. Specific implementation mechanisms are not explicitly described, but roles and responsibilities for individual segments are delineated in DIR-0001, *Roles and Responsibilities for the Management and Operation of Pantex Plant*. It is not clear that safety issues identified in the Emergency Management or Safeguards and Securities Programs are incorporated into this system.

Acceptance Criterion C5.8

MHC has assigned the Director of Environment, Safety, Health and Quality (ESH&Q) the responsibility of maintaining a compliance management system. The compliance management standard (STD-0282) requires the Director, ESH&Q to provide an annual update of the ISM system description to AAO via the General Manager. The MHC standard regarding assessments requires that ISM issues be considered in determining assignment of independent assessments. The standard does not specifically address currency of the ISM system description.

Acceptance Criteria C5.9 and C5.14

The MHC standard on their Performance Measurement System (STD-6028) requires three levels of performance metrics and provides guidelines toward helping organizations determine which metrics will be tracked. The standard requires trending for improvement and an annual review (self-assessment) of the individual metrics for future system improvements. Neither the status of ISM implementation, nor its effectiveness are specifically required by STD-6028.

Acceptance Criterion C5.10

MHC standards and procedures describe various feedback and improvement mechanisms. The interfaces between the systems (Performance Metrics, Annual ES&H reviews, Emergency Management reviews, Safeguards and Securities, Hazard Identification Teams, Safety Assessment/Facility Evaluation database, Facility Management Integration database) are not well defined. An interview with the responsible manager (Readiness Review and Assessment Group (RRAG) Manager) indicates the systems are linked to one another, but the standards addressing the different parts of the system are not well integrated and don't clearly define the inter-relationships. While "line management responsible for safety" is not specifically addressed, one can eventually derive this principle based on the roles and responsibilities expressed in the documentation.

Acceptance Criterion C5.11

MHC STD-2777, *Personnel Selection*, requires Department level managers to ensure their staff are trained, qualified, and certified (as appropriate) to properly perform their assigned tasks. STD-0107, *Independent Assessments and Self-Assessments*, requires the Readiness Review and Assessment Group Manager to ensure independent oversight teams are properly trained to perform assigned reviews. This is accomplished in lower tier documentation (IOP-440).

Acceptance Criterion C5.12

Annually, MHC develops assessment schedules utilizing a risk analysis model. The model considers many factors in order to balance priorities and ensure that higher risk assessments are performed. Factors include time since last assessment, known weak areas, financial exposure, Occurrence Reporting and Processing System (ORPS) issues, Price-Anderson Amendments Act (PAAA) issues, and others.

Acceptance Criterion C5.13

The MHC corrective action process (STD-6031, *Corrective Action Program*) requires all findings from independent and self assessments to be addressed in a corrective action plan which includes causal analysis, responsible manager, deliverable evidence of completion, expected date for completion, and action tracking. The lessons learned procedure (STD-6216, *Lessons Learned Program*) requires analysis of events and assessment reports (as well as lessons learned generated off site) in order to identify the existence, applicability, and importance of lessons learned. It also describes a network of lessons learned managers and coordinators charged to disseminate and gather lessons learned.

Acceptance Criteria C5.15 and C5.16

MHC documents describe processes for incorporating event feedback and lessons learned into future work planning and conduct. This is reflected for low hazard and OSHA-type Job Safety and Health Analysis (STD-3116), explosives work (STD-9555), authorization basis processes (MNL-254543) and the Seamless Safety 21 (STD-0148) program.

Acceptance Criterion C5.17

MHC STD-0107, *Independent Assessment and Self Assessment*, describes roles and responsibilities for development of independent and self assessment schedules, performance, and utilization and MHC STD-6216, *Lessons Learned Program*, of report results. MHC STD-2777, *Personnel Selection, Qualification, and Certification*, and IOP 440, *Qualification of Internal Audit and Assessment Personnel*, establish competency requirements for self-assessors and independent assessors, respectively, and STD-6031, *Corrective Action Program*, requires corrective action planning.

Acceptance Criterion C5.18

TBP-901, *Integrated Safety Process for Nuclear Weapons Operations and Facilities* describes the method for including design laboratory input for certain operations. However, there is no mechanism by which the DOE ensures new design agency information is factored into MHC operations.

Acceptance Criterion C5.19

AAO procedures describe the process by which the Issues Management Board (IMB) receives external or independent oversight reports, assigns responsibility to the appropriate AAO or MHC person and tracks (via the AAO Issues Tracking System) the action plan to completion. For issues that are forwarded to MHC, STD-6031, *Corrective Action Program*, meets the requirements for corrective action plans. There is, however, no direct flowdown at AAO of the requirements of DOE O 414.1A, *Quality Assurance*, Appendix 2) for tracking of EH-2 and Emergency Management issues in the Department's Corrective Action Tracking System, nor for development of an AAO Corrective Action Plan.

Conclusion

Based on the documents reviewed and the interview conducted, the objective and acceptance criteria were met. However, four issues and three noteworthy practices were identified.

Issue C5.1

The AAO ISM system description does not identify a mechanism to develop corrective action plans in accordance with DOE O 414.1A *Quality Assurance*, Appendix 2. (Acceptance Criterion C5.5)

Issue C5.2

The AAO ISM system description does not include mechanisms to address "lessons learned." (Acceptance Criterion C5.5)

Issue C5.3

The MHC ISM system describes three levels of feedback and improvement with various mechanisms functioning at one or more different levels. The interfaces and relationships between the different mechanisms can eventually be derived from the implementing standards and manuals. However, the MHC ISM Description does not adequately define how the individual mechanisms are integrated, and how the information derived from the different inputs and analyses actually result in continuous improvement. (Acceptance Criterion C5.7)

Issue C5.4

There is no mechanism by which the DOE ensures new design laboratory information is factored into MHC operations. (Acceptance Criterion C5.18)

Noteworthy Practice C5.1

A common problem seen in any prioritization activity is the lack of a systematic process that is repeatable. The model utilized to determine priority regarding independent assessments to be conducted is outstanding. It involves assigning weighted scores to some objective factors (time since last assessment, Occurrence Reporting and Processing System (ORPS) and Price-Anderson Amendments Act (PAAA) incidence) as well as a reasonable approach to some more subjective factors (customer satisfaction) in order to arrive at a listing organized by priority.

Noteworthy Practice C5.2

MHC Hazard Identified Team Manual (MNL-00053) describes a process by which DOE/AAO and MHC personnel work together to perform facility walkthroughs to cover the entire plant each quarter. Hazards are identified, assigned to the responsible facility manager, and corrective actions are tracked in the Self-Assessment Facility Evaluation database.

Noteworthy Practice C5.3

To assist the ISM Verification Team, MHC conducted a self-assessment using the performance objectives and criteria, review and approach documents contained in the review plan. MHC presented a matrix to the team that delineated where problems were found to exist. MHC also prepared packages containing a set of standards/documents responding to each performance objective. This effort is considered noteworthy and should be employed for any future reviews of a similar nature.

Appendix B

Recommendations from 1998 ISMSV

Recommendations from 1998 ISMSV

- MHC should proceed to formally establish processes (including requirements, roles, and responsibilities) for defining the scope of work, analyzing hazards, developing controls, implementing controls, confirming readiness, and applying change control to nuclear explosive operations
- MHC should proceed to formally establish processes for prioritization of work consistently on a site-wide basis
- MHC should proceed to clarify responsibilities for mission work at lower levels within the management hierarchy, consistent with the current organizational structure addressing the core functions and guiding principles of ISM (i.e., address "chain of command" responsibilities down to the operations manager or department-level manager)
- DOE (Office of Defense Programs and AL) should provide documented expectations, roles, responsibilities, and a process description for the integrated safety process (ISP) for nuclear explosive operations
- AAO should develop a Functions, Responsibilities, and Authorities Manual (FRAM), consistent with the format and content of the AL FRAM
- AAO should develop procedures for site workload prioritization, area office resources, change control of the ISMS Description, the MIC S/RID and other site and hazard S/RID
- AAO, in consultation with other AL offices, should concur in the extent of revisions to the MHC ISMS Description and validate their incorporation through a Phase I review
- AAO should concur in the extent and validate the adequacy of the MHC actions required to address the remaining issues identified in the ISMSV assessment forms
- MHC should take the following actions to address continuing implementation and improvement of ISM:

✓ Strengthen efforts to transition from an "expert-based" to a "standards-based" system of operation by (1) improving the quality of plant procedures, (2) maintaining high emphasis on procedural adherence through training and management supervision, (3) increasing organizational and individual accountability for procedural adherence, and (4) continuing to elicit worker feedback on methods for improvement.

✓ Strengthen continuing training on the ISMS framework provided in the ISMS Description, the MIC S/RID, established MIC S/RID standards, and plant practices and procedures

✓ Subsequent to AL development and guidance publication, MHC should develop and implement a comprehensive configuration management program plan covering all mission programs.

Appendix C

Acronyms

Acronyms

AA	Authorization Agreement
AAO	Amarillo Area Office
AB	Authorization basis
DEAR	DOE Acquisition Regulation
DOE	U. S. Department of Energy
DP	Defense Programs
EHA	Emergency Hazards Assessment
EM	Environmental Management
EPA	Environmental Protection Agency
ESH&QD	Environment, Safety, Health and Quality Division
FHA	Fire Hazard Analysis
FRAM	Functions, Responsibilities and Authorities Manual
G	Guide
HIT	Hazard Identification Team
IOP	Internal Operating Procedure
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWAP	Integrated Weapons Activity Plan
JSHA	Job safety hazard analysis
MHC	Mason and Hanger Corporation
MIC	Management Integration and Controls
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
O	Order
ORPS	Occurrence Reporting and Processing System
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
P	Policy
PAAA	Price-Anderson Amendments Act
PDL	Priority decrement list
PEMP	Performance Evaluation Management Plan
PHA	Process hazards analysis
RRA	Roles, responsibilities, and authorities
S/RID	Standards/Requirements Identification Document
SMT	Standing Management Team
SNM	Special Nuclear Material
STD	Standard
WAD	Work Authorization Directive

Appendix D

Team Member Biographies

Team Member Biographies

John M. Bernier
Mr. Bernier is currently the Deputy Area Manager for the Amarillo Area Office. Mr. Bernier is currently directly responsible for self-assessments, issue management, Price-Anderson Amendment Act, and employee concerns. Prior to this he was the Executive Officer to the Albuquerque Operations Manager. Mr. Bernier worked for the Under Secretary of Energy as the Field Office Liaison Officer responsible for providing daily oral briefs to the Secretary of Energy and his senior staff on significant occurrences that occurred through out the DOE complex. Prior to this, Mr. Bernier was the Chief of Facilities Planning Branch at DOE Albuquerque Office responsible for facilities program implementation at the design and production agencies and lead special facilities moth ball task force. He was also the facilities engineer at the Mound Plant during production operations. He has over 20 year of experience in the areas of nuclear weapons, nuclear materials, authorization basis, configuration management, maintenance, facilities planning, training, environmental restoration, and project management. He has been on several operational readiness reviews for both chemical and nuclear facility start-up operations. Mr. Bernier has a Bachelor of Science Degree in Civil Engineering from the University of New Mexico.

Robert T. (R. T.) Brock
Mr. Brock is the Senior Scientific and Technical Advisor for the Amarillo Area Office and has over fifteen years of nuclear experience. He is responsible for independently reviewing and evaluating: nuclear weapon assembly, disassembly and testing operations; nuclear material storage and handling operations; and high explosive synthesis, fabrication and disposition operations to determine the adequacy of safety. Mr. Brock is a Certified ISMS Verification Team Leader. He served in varying capacities with the Savannah River Operations Office from 1987-1998, and was involved in the operation of a wide range of nuclear facilities, including laboratory research and development, spent fuel storage, special nuclear material storage, and chemical separation processes for tritium, uranium, plutonium and other special isotopes. He has experience in developing tooling, radiological controls, and written technical procedures for refueling of naval nuclear reactors. Mr. Brock has a Bachelor of Science degree in Nuclear Engineering from the University of Tennessee.

Steven C. (Steve) Erhart
Mr. Erhart is presently the Director, Safety Analysis and Support Division. Prior to becoming Director, he worked in the Weapon Programs Division and in the Operations Management Division of the Albuquerque Operations Office and has over 10 years of nuclear engineering experience. Since joining the Department of Energy in 1994, Mr. Erhart has been the Program Manager for the Facility Representative and Conduct of Operations Programs. He was the Readiness Assessment Team Leader for the Integrated Independent review for restart of LINAC operations at Pantex. He was the Deputy Team Leader for the PF-4 Facility Control System (FCS) Upgrade Operational Readiness Review at Los Alamos National Laboratory (LANL) and was a team member for the Isotopic Fuels Impact Test Facility (IFIT) ORR at TA-55. He was also a team member on several other RAs at LANL. He participated in the Integrated Safety Management Verification at Los Alamos in 1999. While working at the Portsmouth Naval Shipyard (June 1987 to October 1994), he completed formal qualification and training on S5W and S6G Reactor Plants, worked as Shift Test Engineer, Shift Test Supervisor and Assistant Chief Test Engineer. He has experience in preparing

electrical and power range test program test procedures as well as extensive training and experience in design, testing, and maintenance of mechanical, electrical, nuclear and instrumentation and control systems on nuclear powered submarines. He has received extensive training in reactor theory, chemistry and radiation control, operating and casualty procedures, and reactor protection analysis. As a result of working at DOE and in the naval nuclear propulsion program, he has extensive experience in conduct of operations and training and qualification programs. He holds a Bachelor of Science in Electrical Engineering from the University of New Mexico.

Joseph J. (Joe) Hassenfeldt

Mr. Hassenfeldt holds a Bachelor of Science Degree from the U.S. Naval Academy, where he graduated with Merit in 1986. He entered the Navy's Nuclear Propulsion Program and served as a Division Officer on a TRIDENT class Ballistic Missile Submarine. In 1991, he joined the Department of Energy (DOE) New Production Reactors (NPR) Program as a Nuclear Engineer guiding and reviewing Heavy Water Reactor design. Mr. Hassenfeldt was the DOE Action Officer for the development of the DOE Business Management Oversight Pilot, the process by which performance expectations are developed, self-assessed, and overseen by the Field and Headquarters offices. This is the model upon which Policy 450.5, *Line ES&H Oversight*, was based. From 1994 to 1999, he led the Department Facility Representative Program for the Office of Field Management, including liaison with the DNFSB, policy development, and program improvements. He now works in the Office of the Departmental Representative to the DNFSB, on safety issues regarding Pantex, the Chicago Operations Office, and the National Labs, specifically, DNFSB recommendations 98-1, 98-2, and 99-1. Mr. Hassenfeldt was the contractor feedback and improvement reviewer for Lawrence Livermore National Laboratory Integrated Safety Management Phase I/II Verification.

Kamiar M. Jamali

Mr. Jamali is recognized expert in safety and risk analysis with over 20 years of work experience. Since joining the DOE in 1992, Mr. Jamali has lead or participated as an SME in the development and reviews of several DOE and DP safety related Rules, Orders, standards, handbooks, and guidance documents. Examples include: leading the development of STD-3011 (related to Basis for Interim Operations), STD-3014 (on accident analysis for aircraft crash into hazardous facilities), and Appendix A to STD-3009 (Evaluation Guidelines for STD-3009 safety analysis reports). Was a major contributor to the development of STD-1027, STD-3009, STD-1104 (on safety analysis report review criteria), STD-DP-3016 (on Hazard Analysis Reports for nuclear explosive operations) and its draft handbook. He has also lead or participated in reviews of numerous Authorization Basis documents such as Safety Analysis Reports, Basis for Interim Operations, Unreviewed Safety Questions, Technical Safety Requirements for nuclear facility operations; and Hazard Analysis Reports, Authorization Basis Controls Document, Nuclear Explosive Safety Study Group Report, and Single Integrated Input Document for nuclear explosive operations. Prior to joining the DOE, Mr. Jamali served as an Executive Consultant at NUS Corporation, and President of Atrek Corporation, performing probabilistic risk assessments (PRA), safety analyses, and related consulting services for the nuclear power industry. Mr. Jamali also worked at the Brookhaven National Laboratory as a researcher in developing methodologies for use of PRA methods in nuclear power plant design applications. Mr. Jamali has Masters and Ph.D. degrees in nuclear engineering from the University of Michigan, and a BS degree in physics from Lehigh University.

Whale (SSN 638) and the USS Providence (SSN 719). He was the commissioning commanding officer of the USS Providence, the first vertical launch Tomahawk missile SSN and the first Naval ship to go to sea with a digital rod control system. As a member of the Naval Nuclear Propulsion Examining Board he conducted over 80 assessments of reactor plants and nuclear facilities and developed the initial sets of drills, evolutions and tests for the 688 class submarine reactor safeguards examinations. Mr. Morrow is the founding director of the Navy's Nuclear Field A School where he supervised the instruction of 5000 students annually. Senior Officer assignments included tours as a Submarine Squadron Commander, two Pentagon tours and Chief of Staff, Battle Force Seventh Fleet. In the latter capacity he was the chief investigator of three significant incidents, one of which received considerable international coverage.

Daniel G. (Dan) Pellegrino

Dan Pellegrino has a Bachelor of Science Degree in Electrical Engineering from the University of New Mexico. He has 18 years of experience in program management, operations, and quality assurance. Dan has been closely involved with the Departments implementation of Integrated Safety Management. He is a Certified ISMS Verification Team Leader, and was the Deputy Team Leader for PX and SNL ISMS Verifications, and was Deputy for the Los Alamos National Laboratory (LANL) Special Assessment.. Dan also led the ISM Verifications for AlliedSignal/Federal Manufacturing (AS/FMT) and the Nonproliferation and National Security Institute (NNSI). Dan's operational experience includes project team membership for restart of the Dynamic Balancer at PX. Other recent duties include: AL representative on the Pantex Integrated Safety Management (ISM) Facilitation Team responsible for facilitation of Integrated Safety Management at PX; Conduct of Operations subject matter expert Team member for the Annual Core Research Reactor (ACRR) Operational Readiness Review (ORR); Primary AL liaison for Defense Nuclear Facility Safety Board activities; AL Price Anderson Coordinator; Member of Type A investigation team for the fatal shooting incident at LANL. From May 1981 to June 1991, Dan was involved in DOE/AL's weapon quality program. He provided oversight of weapon component quality and final assembly for products produced at DOE/AL production facilities. These sites include the Kansas City Plant, the Mound Plant, the Pantex Facility, and the Rocky Flats Plant. He provided direction, guidance, and evaluation to assure product quality met specifications during development, pre-production, and production. He also performed weapon quality assurance surveys, analyzed and approved DOE Area Office survey schedules, and reviewed quality data to detect trends.

Elizia (Liz) Roybal

Ms. Roybal has Bachelor of Science Degrees in Mathematics, Biology, and Chemistry from the University of New Mexico. She has a Master of Science Degree in Nuclear Engineering from the University of New Mexico. Ms. Roybal has over 18 years experience in the nuclear safety area. This experience includes quality assurance, weapons and non-weapons packaging and transportation safety, and nuclear facility safety. She has served as Nuclear Facility Safety Program Manager, Team Leader, and Acting Director, Nuclear Safety Division. She has been involved in numerous SAR/TSR/USQ reviews of nuclear facilities and has conducted nuclear facility safety appraisals and participated in several readiness reviews. She has been responsible for providing oversight of the following: nuclear criticality safety, accelerator safety, reactor and nonreactor facility safety, and hazardous material packaging and transportation safety. She has provided direction/guidance to contractors addressing interpretations of DOE Orders 5480.21, 5480.22, and 5480.23.

SEPARATION

PAGE

Enclosure #6

ATTACHMENT 1

United States Government | Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

DB

DATE: MAY 29 1999

REPLY TO ATTN OF: AAO:ABS:JMC

SUBJECT: Approval of the Pantex Plant Facility TSRs

TO: W. A. Weinreich, General Manager, Mason & Hanger Corporation (MHC)

Re: Memorandum, Weinreich/Goodrum, "Transmittal of Revision 2 Technical Safety Requirements for Pantex Plant Facilities, Proposed Change DCR #29000201," May 27, 1999

This memorandum is in response to the referenced letter presenting the MHC Technical Safety Requirements for DOE approval. The attached DOE Evaluation Report provides the DOE basis for approval. MHC is to be commended for bringing this important project to the point where the TSRs can be approved. The proposed TSRs, excluding the Bases, are approved for implementation pending resubmission of the TSR implementation plan.

The implementation plan included in your April 26 initial submission does not meet DOE expectations for timely implementation of the TSRs. It is expected that TSR implementation will occur in phases based on the amount of work required to perform the implementation. As an example, TSRs that are a straightforward conversion of the existing CSSM requirement should take less time than new or significantly revised TSRs. The importance of timely and successful implementation of the new TSRs cannot be overstated. They provide the foundation for the BIO Upgrade program and for the integrated safety basis for nuclear and nuclear explosive work at Pantex, and are an important step forward in achieving a modern safety basis. You are requested to provide the revised implementation plan by June 11, 1999.

The revision to the implementation plan must also include incorporation of comments and clarifications detailed in the Evaluation Report. Incorporation of comments and clarifications obviously must be completed before implementation of the controls begins. Please ensure that actions recommended in the Evaluation Report are addressed in appropriate authorization basis project and implementation plans. If you should have any further questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

William S. Goodrum
Area Manager

Attachment

cc:
See page 2
ABS #98-036

ADDENDUM A TO THE
DOE-AAO REVIEW PLAN
for
PANTEX PLANT FACILITY TECHNICAL SAFETY REQUIREMENTS
INCORPORATING THE FIRE PROTECTION AND LIGHTNING
BASIS FOR INTERIM OPERATION (BIOs)

Authorization Basis Staff
Amarillo Operations Office
U.S. Department of Energy

Prepared by: [signature] 30 Aug 1999
J. M. Conti Date
DOE-AAO TSR Review Team Lead

Reviewed: [signature] 8/30/99
D. C. Brunell Date
Manager, Authorization Basis Staff

Approved: [signature] FOR 8/31/99
J. M. Bernier Date
Acting Manager, Amarillo Area Office

1. PURPOSE

The purpose of this addendum is to describe the actions, schedule, and criteria necessary to perform a parallel review of the Fire Protection and Lightning BIOs concurrently with the final reviews of the Pantex Plant (PX) Technical Safety Requirements (TSRs) and the associated bases document. The original scope of the Pantex Plant TSR review can be found in the review plan previously approved by the DOE AAO Manager. This addendum supercedes entirely the original review plan. All actions necessary to complete the TSR documents review are contained in this addendum.

2. REVIEW SCOPE

As part of the original review process, to support the contractor (MHC) implementation planning efforts, only the Pantex Plant TSRs were approved. Review of the *Derivation Document*, the *Controls Selection* document, the *Analytical Bases* document, and the TSR bases (Appendix A) were deferred. The scope and content of these documents is described in the original review plan. Review and approval of these documents was required to be completed prior to TSR implementation.

The project to convert the existing Pantex Critical Safety Systems Manual controls to TSRs meeting the requirements of DOE Order 5480.22 was only one of many project to upgrade existing Authorization Basis documents. At the same time projects were in progress to upgrade the existing facility Bases for Interim Operations (BIOs) to Authorization Basis (AB) documents meeting the technical content requirements of Chapters 2 through 5 of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facilities* (STD-3009). Additionally, because BIO upgrade schedule involves multiyear tasks, there were also special hazard studies being performed to address cross-cutting hazards and controls for known weak areas in the existing BIOs. These cross-cutting hazard projects were fire protection, lightning, and seismic (with tornado is undergoing project planning). Because these projects issued special study reports that were recommendations by subject matter experts with regards the hazards and controls, they were not readily usable as authorization basis documents. Rather than updating the existing BIO modules, it was decided to issue special hazard modules addressing the information required by Standard 3009 for chapters 2-5, scoped to only the information related to each specific hazard. As future upgraded facility modules are issued, they will incorporate and supersede the special hazard information contained in the crosscutting BIO modules.

The special hazard modules nearest to completion were the fire protection and lightning hazards for nuclear explosives. The schedule for these BIOs was converging on the final TSR document reviews. During planning for final review and approval, it became obvious that the information contained in the *Derivation Document* would be duplicative with the information contained in Chapters 4 and 5 of the two special hazards BIOs. Because the safety structure, system, and component (safety SSC) and TSR derivation information was duplicative with the *Derivation Document* and TSR Bases, it was decided by the contractor and DOE that the Fire Protection and Lightning BIOs would be integrated with TSRs and basis documents for final approval, and that the review would be conducted by one single integrated review team.

Additionally, while the original scope of information to be contained in *Derivation Document* was to address the information requirements of Chapters 4 (safety SSCs) and 5 (TSR Derivation) of STD-3009 for all safety SSCs, the TSR Project Plan did not commit that the information would meet the technical detail and construct of STD-3009. On the other hand, the special hazard BIOs were planned to be written to the requirements of STD-3009. The *Derivation Document* was originally intended to be issued as Appendix K of the BIO as a DOE approved authorization basis document. For purposes of efficient integration, it was decided to rename Appendix K to "Chapter 4 and 5 Information", structure the technical information presentation to the requirements of DOE STD 3009, and include fire protection and lightning protection system information in that document.

Information contained in Chapters 2 (facility and operations description) and 3 (hazards and accident analysis) of a Safety Analysis Report (SAR), as specified by DOE-STD-3009-94, will be contained in Chapters 2 and 3 of the Lightning and Fire Protection BIOs, scoped to information related to and needed to support the specific topics addressed by these cross-cutting BIOs. Information contained in Chapters 4 and 5 of a SAR will be incorporated into Appendix K for fire protection and lightning, along with the entire set of information required for all other hazards/controls addressed by the TSRs. Because the fire and lightning protection SSC information will be supported by a more fully developed safety analysis, there will be a greater level of detail for these systems than the other SSCs contained in Chapters 4 and 5.

For future modules (e.g., Bays, Cells, Special Purpose Facilities, NE Staging, Nuclear Staging), fully upgraded BIO modules addressing all hazards will be prepared, and TSRs will be revalidated and revisions prepared as necessary. Chapters 2,3,4,&5 will be submitted for each module, and information contained in Appendix K and crosscutting BIO modules will be superceded. The contractor has been tasked to prepare a program plan for updating the General Information Document to provide the information contained in Chapters 1 and 6-17 of a SAR as specified by DOE-STD-3009. The long-term plan/goal is to establish the GID as the SAR information for safety management (defense-in-depth) programs, with the individual BIO modules as the facility SAR information for Chapters 2-5.

As part of the actions to support implementation, the following will be submitted with the final TSRs revisions, crosscutting BIOs, and Appendix K:

- *Controls Selection Document* – as described in the original review plan, this document identifies all the existing CSSM and BIO controls, provides a matrix to the new TSR controls, and provides the technical basis for not carrying froward any control to the TSRs.
- TSR Bases (Appendix A)
- Revision to existing BIO stating that TSR controls supercede and take precedence, and that crosscutting BIO hazards/accident analysis supercede and take precedence
- Any necessary TSR and Activity Based Control Document revisions to address conflict. This issue was covered in the Evaluation Report. Because the ABCDs were written to complement and compensate for the existing CSSM controls, with the new TSR implementation, it will be necessary to issue revisions to eliminate duplicative or conflicting controls.

The following actions/documents will be deferred post-implementation, and will be reviewed or approved by DOE-AAO:

- *Analytical Bases* document. This is a safety bases document that compiles existing disparate analyses for design basis accidents. Where new information is submitted, AAO will ensure that it is reviewed by the necessary disciplines.
- Extensive revisions to the existing BIO, deleting information related to hazards, analysis, and controls superceded by the approved BIOs and TSRs.
- Revisions to the TSRs incorporating common administrative facility or site controls found in existing program HARs/ABCDs.
- Revisions to the TSRs incorporating any appropriate administrative or engineered controls found in Nuclear Explosive Safety Master Studies (i.e., new electrical and security master Studies and older general use and handling, etc).

The following shall be used as guidance by the RT:

- TSR and BIOs Project Plans
- DOE Order 5480.22, *Technical Safety Requirements*
- Document of Example Technical Safety Requirements, DP, Nov 1993
- DOE Order 5480.23, *Safety Analysis Reports*
- DOE-STD-3009-94, *Preparation Guide for US DOE Nonreactor Nuclear FSARs*
- DOE-STD-1104-96, *Review and Approval of Nonreactor Nuclear FSARs*

3. ORGANIZATION

The AAO Manager is the line management approval authority for facility authorization basis (AB) documentation after the review team and the Authorization Basis Staff Manager have documented the basis for approval in the Safety Evaluation Report (SER).

The review team core makeup is as follows:

J. Conti AAO-Authorization Basis Staff (ABS) team leader, DOE

H. Chavez-ALOO-Safety Analysis and Support Division (SASD) technical reviewer, DOE

R. Williams ALOO-SASD support service contractor technical reviewer

F. Rowsome DP-45 technical reviewer

J. Stachew DOE-HQ support service contractor technical reviewer

R. Young AAO-Lightning Protection Subject Matter expert (SME)

E. Hogan AAO-Fire Protection SME

Additional support and Subject Matter Expert (SME) review shall be employed in the areas of ALOO and HQ Fire Protection and Lightning, and AAO Facility Representative. The RT leader shall provide the SMEs direction on the scope of their review. Core team review scope shall cover the Fire Protection and Lightning BIOs *Chapter 2 & 3 Information*, TSR Bases (Appendix A), Appendix K *Chapter 4 & 5 Information*, and the *Controls Selection* document. Review of *Controls Selection* document shall focus on ensuring the SB documents identify existing controls, and that appropriate controls have been carried forward into the new TSRs.

4. REVIEW PROCESS

Because the TSRs have been reviewed and approved prior to this phase of the project, the review team scope will focus on the BIO modules, TSR bases and Appendix K to the BIO.

The scope of the Lightning and BIO Modules: The deliverables for review shall be Chapters 2 and 3 of the BIO, written to the technical content requirements of DOE-STD-3009-94. Information content shall be scoped to that information related to the specific hazards and controls (lightning and fire). Information that would be contained in Chapter 4 and 5 of the BIO will be subsumed into Appendix K of the BIO. Technical content shall be written to the guidance of DOE-STD-3009. Information contained in the Appendix K shall be divided into the existing PX Modules, with generic facility information provided. Facility specific information provided should individual facility deviate for the generic descriptions.

The following proposed schedule for review and approval is provided. The limiting schedule driver is a Defense Nuclear Facility Safety Board commitment for DOE to approve the PX Lightning BIO by October 1999:

Sept 15: Appendix K (Chapter 4&5 information), Fire Protection and Lightning BIOs (Chapter 2&3 information), and the *Controls Selection* document shall be submitted to the Review Team. Additionally, any necessary revisions to the current approved TSRs shall be provided. At the one week point, the RT members shall perform walkdowns of a bay, a cell, a Zone 4 staging facility, a special purpose facility, a nuclear storage facility, and any other facility desired by team members. Two weeks are allotted for the RT Leader to assemble RT comments.

Sept 29: One week is allotted for the RT leader to meet with the contractor TSR team, and resolve RT comments. RT members shall attend if available.

October 6: One week for the contractor to incorporate the resolution of RT comments into the final set of TSR bases.

October 13: Contractor issue the TSR bases (Appendix A of the TSRs) for RT validation that the Bases satisfactorily incorporate information contained in reviewed Appendix K of the BIO. RT is allotted one week to review the Bases and provide feedback to the contractor.

October 20: RT begins final preparation of the TSR/BIO Safety Evaluation Report. One week is allotted to prepare and review the SER.

October 27: Contractor issues finalized TSRs, TSR Bases, Appendix K, Controls Selection Document.

October 29: DOE-AAO issues final TSR SER and approves the TSR documents

Subsequently, the Analytical Bases document shall be provided by the contractor for DOE-AAO review. The documents consists of a compilation of existing information. The AAO review shall consist of a validation of the adequacy of the information presents, and where new information is provided, review and concurrence by DOE. This shall be handled separately from the review process any review comments shall be provided by memorandum to MHC. No schedule has been established, but this final action shall be pursued aggressively once review of authorization basis documents is completed. As listed previously, there are other outstanding actions and improvements related to the Site TSR project that shall also be persued aggressively. Any major revisions to the TSRs and AB documents shall be approved via an addendum to the SER.

5. REPORT

An Addendum to the approved TSR Safety Evaluation Report (SER) shall be prepared by the RT Leader, documenting the detailed review, conclusions, and approval recommendation to the AAO Manager for the Lightning and Fire Protection BIOs, Appendix K, TSR Bases, and associated TSR revisions. The following format and content will be used:

Title Page and Signature Page - RT Leader, ABS Manager, AAO Manager. (The RT Leader shall make provisions for team member concurrence with the SER.)
Executive Summary
Review Process
Assessment of BIOs, Appendix K, TSR Bases, and TSR revisions (Criteria follows)
Conditions of Approval
Records/References

Fire Protection and Lightning BIOs:

Base Information contained in Chapter 2 of the BIOs contains sufficient documentation to arrive at the following conclusions:

1. The facility missions and scope of operations for which approval is sought are clearly stated and reflected in the type and scope of operations analyzed in Chapter 3.
2. Descriptions of facility and operations provide a knowledgeable reviewer sufficient background information to understand the major elements of the safety analysis.
3. Correlation is established between actual facility arrangements and operations with those stated or referenced in the BIO. Review team walkdowns , while not detailed validations, have concluded that basic descriptions are fundamentally correct and up-to-date.

Hazards and Accident Analysis content in Chapter 3 contains sufficient documentation and basis to conclude the following:

1. A hazards evaluation has been performed for the type of specific hazard and activities for which approval is sought, is consistent with established Pantex methodologies, identifies preventative and mitigative features for the events examined, and identifies dominant scenarios for further evaluation.
2. The HA results are clearly characterized in terms of defense in depth and worker safety. The logic behind assessing the results in terms of safety significant SSCs and designation of TSRs is understandable and internally consistent.
3. Accident analysis clearly substantiates the findings and delineations of the HA for the set of events examined and confirms their potential consequences. Events potentially exceeding evaluation guidelines identify associated safety class SSCs and their basis of TSR derivations.

Controls Selection document:
Satisfactory rationale has been provided for including or excluding the controls in the existing authorization basis documents. Controls appropriate for TSR level controls have been carried forward into the Appendix K.

Appendix K:

Safety SSC level of documentation is sufficient to conclude:

1. The SSC descriptions contain sufficient information for reviewers to understand relationship to the identified accident scenarios. The safety SSCs identified are consistent with the logic presented in hazards/accident analysis in the BIOs.
2. Safety Function for SSCs are defined with clarity and are consistent with the identified accident scenarios and the basis derived in the BIO hazard/accident analyses.
3. Functional requirements and system evaluations are derived from the safety functions and provide reasonable evidence that the safety functions can be performed.
4. Control of the safety functions relevant to TSR development are clearly identified.

Derivation of the Technical Safety Requirements is sufficient to conclude:

1. The bases for deriving the TSRs that are identified and described in the BIO hazard/accident analysis and the safety SSC chapter are consistent with the logic and assumptions presented in the BIO analysis and identified accident sequences in the Appendix K.
2. Bases for deriving Safety Limits, Limiting Control Settings, Limiting Conditions for Operation, Surveillance Requirements, and Administrative Controls are provided as appropriate.

TSR Bases (Appendix A):

1. The TSR Bases consistently carry forward the logic and rationale of the TSR derivation information contained in the Appendix K, written in a language that can be readily understood by trained facility management.
2. Boilerplate, repetitive language is not used, and the wording does not repeat the language of the associate LCO or SR without providing the explanation of why the control was worded the way it was.
3. For SRs where general language is used, the bases identifies the specific aspect of the test that demonstrates operability.

Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400
June 03, 1999

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

Dear Mr. Chairman:

Consistent with the Department's implementation plan (98-2 Plan) for the Defense Nuclear Facilities Safety Board's (DNFSB) Recommendation 98-2, the following commitment deliverable is enclosed.

The transition of Critical Safety System Manuals to Technical Safety Requirements (TSR) has been executed in accordance with step one of the Defense Nuclear Facilities Safety Board's (DNFSB) Recommendation 98-2, Commitment 5.6.3. Attachment 1 is the approval letter for the TSRs for Pantex Facilities and the Evaluation Report developed by the Department of Energy (DOE) Review Team. Attachment 2 is a copy of the TSR.

At this time, we do not consider that the first deliverable under Commitment 5.6.3 has been fully satisfied. You will note that our approval letter and the Review Team Evaluation Report identify a number of issues that require resolution through follow-on actions, including implementation of the TSR. We view approval of the TSR as the first major step in improving the quality of operational controls at Pantex and in achieving consistency of approach with other DOE nuclear facilities. However, until such time that all of the issues have been resolved and the TSR fully implemented, we do not believe the intent of commitment 5.6.3 has been fulfilled.

The Amarillo Area Office is working with Mason & Hanger Corporation to develop an acceptable plan for implementation of the TSR and to develop a path forward to address the remaining technical issues. DOE will keep the DNFSB informed of progress towards full TSR implementation. If you have any questions, please contact me, or have your staff contact Dan Glenn at 505-665-6028.

R E Glass
R. E. Glass
Manager

Attachments

Cc w/attachments: (See page 2)

DOE EVALUATION REPORT
for
PANTEX PLANT FACILITY
TECHNICAL SAFETY REQUIREMENTS

Authorization Basis Staff
Amarillo Operations Office
U.S. Department of Energy

Concurrence: concur with approval of the TSRs [signature] 28 MAY 99
Francis Rowsome DP-45 Date

Concurrence: concur with approval of the TSRs [signature] 28 MAY 99
Lynn Maestas SASD, DOE-AL Date

Prepared by: [signature] 28 MAY 99
J. M. Conti Date
DOE-AAO TSR Review Team Lead

Reviewed: [signature] 5/29/99
D. C. Brunell Date
Manager, Authorization Basis Staff

Approved: [signature] 5/29/99
W. S. Goodrum Date
Manager, Amarillo Area Office

1. EXECUTIVE SUMMARY

This Evaluation Report (ER) documents the Department of Energy (DOE) review of the Pantex Plant (PX) Technical Safety Requirements (TSRs) (Reference 1) and provides the basis for the Amarillo Area Office (AAO) approval. The scope of the Pantex Plant TSR development is the conversion of existing controls found in the Pantex Plant Critical Safety Systems Manual (CSSM) (Reference 2), and Basis for Interim Operation (BIO) (Reference 3) to Technical Safety Requirements format, including any additional controls, enhancements from present studies and upgrade projects far enough along in development to identify needed controls. This scope is documented in the DOE-AAO approved Project Plan for the PX TSRs (Reference 4). The new TSRs also include programmatic and specific Administrative Controls that are currently identified in the BIO.

This ER recommends approval of the TSRs, excluding the Bases. The TSRs are judged to be adequate, and represent an incremental improvement of the existing CSSM/BIO controls. Future improvements of the TSRs are recommended to be addressed during implementation and in future authorization basis document upgrades. These recommendations are contained in the ER Appendices.

The facilities covered by the TSRs include all nuclear and nuclear explosive facilities at Pantex Plant, with the exception of Building 12-116 (which has its own approved SAR and TSRs), Building 12-104A (which is not currently authorized to perform nuclear activities), and transportation activities (which has an upgraded authorization basis nearing completion). The currently authorized activities which are encompassed by the new TSRs include nuclear explosive staging and operations, and nuclear component staging and operations. Nuclear facilities covered by the TSRs are divided into the following functional modules:

- Nuclear Explosive Bays
- Nuclear Explosive Cells
- Nuclear Explosive Special Purpose Facilities
- Zone 4 Staging
- Zone 12 Staging

A complete description of facility systems and operations is contained in the Pantex Plant BIO. The PX Facility TSRs were prepared to meet the requirements of DOE Order 5480.22, Technical Safety Requirements. The Defense Program TSR guide (Reference 5) and DOE approved Building 12-116 TSRs (Reference 6) were also used a templates.

The format and content of the Evaluation Report is based on the guidance provided in DOE-STANDARD-1104-96, Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports (Reference 7). Since the review and approval was for TSRs, the criteria contained in Reference 7 were modified and enhanced to be more applicable to the review of TSRs alone. These criteria were approved by the AAO Manager in the TSR Review Plan (Reference 8).

and evaluates existing AB document facility controls. These controls are screened to determine if they provide a Critical Safety Function on a facility level. The bases for the evaluations are documented. Once selected, linkage to Derivation Document section is provided. Where a control is not selected for inclusion in the TSRs, the basis for exclusion of controls is provided.

Analytical Basis for the Controls (Analytical Bases) - This document captures the existing assumptions, calculations, and engineering judgment that are the bases for controls. Where analytical basis is found in a document maintained under change control, the analysis is referenced, not repeated.

Derivation of the Pantex Facility TSRs (Derivation Document) - This document provides the TSR bases: The event with credited control will be linked to the Limiting Condition for Operation (LCO). System classification, safety function, and functional requirement are listed, along with a description of how the control meets these requirements. This document also includes the derivation of operating modes. The Derivation Document combines information in one location that would normally be contained in Chapters 4 and 5 of the SAR. The Derivation Document is issued as Appendix K of the Pantex Plant BIO. The first two documents form the basis of the Derivation Document. They are safety basis documents, subject to controlled documentation requirements, under contractor approval authority following initial DOE review.

A core DOE review team with expertise in hazard/accident analysis and controls development was established to accomplish the DOE review of the TSRs. The core review team core makeup was as follows:

- J. Conti AAO-Authorization Basis Staff (ABS) team leader, DOE
- L. Maestas AOO-Safety Analysis and Support Division (SASD) technical reviewer, DOE
- R. Williams AOO-SASD support service contractor technical reviewer
- F. Rowsome DP-45 technical reviewer
- J. Stachew DP-45 support service contractor technical reviewer

Note: The two DP-45 members were added after the initial draft document review and participated in the final review only.

Additional support and Subject Matter Expert (SME) review was established in the areas of nuclear explosive operations, nuclear material operations, facility representatives, lightning, engineering, radiation protection, fire protection, explosives, seismic, and nuclear explosives safety to perform reviews in their area of expertise.

The review by core review team members of initial draft of the TSRs was performed in January 1999, focusing on the format and content of the TSRs The review team provided gross feedback to MHC on the level of detail required in the TSRs. Following that review, informal feedback was provided by the RT leader to the AAO project team member on interim products.

3. ASSESSMENT OF THE TSRs

The following criteria were used in the assessment of the acceptability of the TSRs. These criteria were developed and approved in the TSR Review Plan. A discussion follows each criterion, with reference to any actions contained in the ER Appendices.

a. The TSRs are written to the format and content of TSR guidance documents.
The PX TSRs are written to the guidance of the DP TSR Guide, and met the requirements of Attachment 1 of DOE Order 5480.22. This criterion is met.

b. Modes and applicability (including facility) for each of the Safety Limits (SLs) and LCOs are correctly identified.
No existing controls or proposed new controls were identified that warrant SLs. The TSRs contain a table (matrix) at the front of the TSRs, identifying the specific TSR control applicable to each nuclear or nuclear explosive facility at Pantex. Each LCO has an applicability section that specifies mode and/or facility condition. The applicability of LCOs was specifically reviewed. This criterion is met.

c. The SLs and the LCOs are written in a three-column format to facilitate their implementation and to ensure consistency with recent approved TSRs throughout the DOE complex.
The LCOs are written in the three column format consistent with DOE-AL complex TSRs and B12-116 TSRs. This criterion is met.

d. The LCOs operability requirements (including bases) identify functional requirements and system/component definition.
The LCOs satisfactorily address the level of detail required for LCO statements and surveillance requirements. As previously stated, the Bases did not contain a sufficient level of detail, and review of the bases is deferred. This is addressed in Appendix A.

e. Appropriate Conditions, Required Actions, and Completion Times are established for each of the operability requirements defined in the LCOs.
The LCO conditions satisfactorily identify the level of degraded system operability or condition and the required compensatory actions. The required actions are appropriate for the individual conditions, and establish appropriate compensatory measures and operational restrictions, with reasonable completion times. The TSRs use the definition IMMEDIATELY as the completion time for a majority of required actions, which requires initiating actions as soon as possible and working these actions continuously until complete. The RT discussed this approach and accepted it, subject to review of implementing procedures. This issue is addressed in Appendix A.

separately included for engineered systems with LCOs. For the dynamic balancer, it was deemed appropriate to capture mounting screw design and hydraulic oil analysis as design features. Another example is that cell blast valves have active function to shut upon sensing blast overpressures. The surveillances included both inservice inspections (disassembly and inspection), and verification of latching pressures. The contractors approach was to capture these controls as design features., and the RT concluded this was an acceptable alternative. Issues with regard to implementation of new in service inspections are captured in Appendix A.

4. CONDITIONS OF APPROVAL

The Pantex Plant facility TSRs are recommended for approval to allow the contractor to proceed with for implementation activities, with the exception of the Bases, Appendix A. The following actions are recommended to be completed as part of the conditions of approval of the TSRs:

- The contractor should submit the Derivation Document, the Analytical Bases and Controls Selection documents, and the TSR Bases for DOE approval. These documents should be reviewed and approved, and any associated implementation actions complete, prior to implementation completion date for the TSRs.

- The contractor should make the necessary revisions to the TSRs listed in the issues in Appendix A of the ER. These issues represent minor clarifications, and deferred actions where the necessary level of detail has to be developed. Revisions to the TSRs and associated documents should be reviewed and approved, and any associated implementation actions complete, prior to implementation completion date for the TSRs. The contractor should ensure that implementation issues listed in Appendix A are specifically addressed in implementation planning, and reviewed during readiness assessments.

- The contractor should ensure that issues identified in Appendix B are incorporated in the appropriate AB document upgrade projects, and that issues identified in Appendix C are resolved or have approved action plans within six months of approval of the TSRs.

5. SUMMARY CONCLUSION

The Review Team assessment of the new proposed TSRs is that they are adequate, and represent an improvement of the existing controls contained in the BIO and CSSM. They represent a set of controls more focussed on the critical safety issues created by Pantex operations, and written to the requirements of DOE Order 5480.22. While they could be subject to further refinement and improvement, there are no fatal shortcomings. The RT recommends DOE approval of the TSRs as an incremental improvement in operational controls at Pantex. The RT further recommends actions contained in the Evaluation Report Appendices be completed in order to establish an adequate technical bases for controls, and to ensure the controls set is complete.

Appendix A
Issues /Comments to be Addressed on Implementation of Pantex Plant Technical Safety Requirements

Note: Necessary document revisions shall be submitted and approved, and implementation activities complete prior to final implementation date.

1. Review the existing NESS Master Studies to determine if there are any appropriate common controls to capture in the Site TSRs.
2. Review the existing approved ABCDs to determine if there are; 1) Any conflicting controls requiring revision to the ABCDs and /or the TSRs.. 2) Any common facility controls that are appropriate to elevated and captured in the Site TSRs Note: There are some reviewer comments that were deferred to this review. (Reference 11)
3. Determine the specific inspection/surveillance that are appropriate to be performed on the CWIV to address log-term leak containment capability, including periodicity. Submit appropriate TSR revisions.
4. Determine the specific functional test surveillance requirements to be performed on the LPWS to annual verify operability. Submit appropriate TSR revisions.
5. Submit a revision to the existing BIO deleting the existing controls replaced by the TSRs.
6. Complete the DOE review and approval of TSR Bases and Derivation Document, including the Analytical Bases and Control Selection documents.
7. Revise Evaluation Guidelines for Safety Class and Safety Significant per the resolution agreed upon in DOE review. AAO action: Revise the AAO guide for use with DOE-STD-3009.
8. Revise Criticality Safety Program description contained in Appendix G of the BIO, to reflect controls shifted to the TSRs.
9. As part of the revisions to the Derivation Document (Appendix K), delete the material limit control tables, and revise the discussion to provide the bases for the derivation of the controls.
10. Address the formal submission of DD the bases for dropping fire suppression controls, and Bays BDI
11. In the Derivation Document, address the bases for revision to Modified Richmond magazine controls to allow either HE limit, and the revision to the TP-20-7 notes for B12-64
12. Revise the LCO statement for LCO 3.5.1 to state what safety function is being provided by a fully operable system with all field mills and impact detectors operational.
13. Submit a further revision to the AC clarifying that the ACs are contractually bound to approved SRID, and delete those order references that have been deleted by SRIDs and reference correct orders.
14. Delete reference to NFPA design in LCO statements, and add a bullet listing nominal flow density, sprinkler head/heat head setpoint, and reference to the fusible links.
15. B12-94: Delete B12-94 from the facility listing and Material Limits AC. It presently is listed as a nuclear facility, with nuclear material limits limited to zero inventory. This is in conflict with the definition in the TSRs, which state a facility is above the threshold

Specific inservice inspection procedures need to be developed and reviewed for facility cranes inspection, low voltage AC surge suppressors, and pit containers.

4. Procedures for implementation of AC controls that replace the existing LCO controls on Bays BDIs, Alpha and Beta CAMs, and Radsafe interlocks.
5. Facility procedures for implementing the LCO required actions to Administratively Control cells doors when BDIs are inoperable.
6. Site procedures implementing the new definitions of fire patrol and fire watch, where now entry is required to perform fire patrol surveillances.
7. Several comments were received on the contractors inappropriate use of frequency extensions for surveillances (25% extension). Under the TSRs, this will constitute a programmatic violation.
8. Use of STAGING definition: The proposed definition allows movement of material into facilities in the maintenance modes and in operations modes while in safe and stable configuration. While this appears logically inconsistent, the further restriction added to only allow material in approved containers is judged not to significantly increase risk. The specific procedures implementing this philosophy should be reviewed.
9. Site procedures and standards that implement AC specific requirements: A comprehensive review of the appropriateness of the actions and time frames, including configuration control should be performed.
10. Site procedures and standards implementing the new SAFE and STABLE definition.

Appendix C
Issues /Comments to be Addressed in Near-Time Frame (Six Months)

1. Resolve the inconsistencies between the tritium dose calculations and the B12-116 SAR. Provide a revision to the B12-116 SAR/TSRs to make controls consistent with the site TSRs.
2. Evaluate the whether controls are appropriate to be applied for the SST staging pads, parking pads, NELA magazines in Zone 4, and submit a TSR revision if appropriate, with a complete bases.
3. Establish a longterm plan to address the commitment to Appendix G of the BIO as the safety management program description equivalent to the SARs, address the longterm disposition of the General Information Document, and revise the BIO upgrade program plan to incorporate contractor commitments.

ATTACHMENT 2

ince 1827
ASON & HANGER CORPORATION

MAY 27 1999

Mr. W.S. Goodrum, Area Manager
Amarillo Area Office
U.S. Department of Energy
Amarillo, Texas 79177

Re: Transmittal of Revision 2 Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change DCR #29000201

Dear Mr. Goodrum:

Attached is Revision 2 of the Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change DCR #29000201. Comments provided by the DOE Safety Basis Review Team (SBRT) and the resolution of those comments chaired by Mr. Jim Conti of your staff have been incorporated in this revision. An expedited review has also been performed by Mason & Hanger Corporation (MHC) personnel, with the resolution to those comments included in this submission. The changes resulting from the MHC review were also coordinated with Mr. Conti.

During the week of June 7, 1999, the implementation plan submitted to your office on April 26, 1999, will be revised and resubmitted. MHC is committed to implementing this new authorization basis document and will exploit every avenue to expedite implementation of these TSRs. The revised implementation plan will reflect the actual approval date and the approach to expedite the implementation of these TSRs. It is expected that due to potential hardware modifications, full implementation of the lightning protection controls will require a phased implementation that may exceed the implementation of the remaining TSR controls.

If you have any questions, please contact Jeff Yarbrough at extension 3281.

Very truly yours,

W.A. Weinreich
General Manager

dlc

Attachment: As Stated

GM99-00428-985

Date: June 2, 1999

From: Shawn Spivey **Location:** 12-127

To: Distribution

Subject: Technical Safety Requirements for Pantex Facilities

On May 29, 1999, the DOE/AAO approved Revision 0 of the TSRs for Pantex Facilities. Effort are now underway to implement the controls captured in these TSRs to the shop floor. This distribution of the TSRs Revision 0 is being made to aid this implementation. Until the implementation activities are completed, the CSSM will remain as the operating document. When the implementation activities are completed, MHC will declare readiness and the TSRs will replace the CSSM as the operating document.

If you have any questions please contact me at extension 7247.

Shawn Spivey

CONTROLLED COPY

United States Government | Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

DATE: FEB 17 2001

REPLY TO ATTN OF: AAO:ABS:KEW

SUBJECT: Approval of Technical Safety Requirements (TSR) Revision 1, Issue A

TO: Benjamin J. Pellegrini, General Manager, Mason & Hanger Corporation (MHC)

Ref: 1. Letter Bernier/Pellegrini, *"DOE Approval of Pantex Technical Safety Requirements Revision,"* dated February 4, 2000

2. Letter Pellegrini/Bernier, *"Transmittal of Proposed Change AB-00-0011, TSR Draft Revision 1, Issue A,"* dated February 11, 2000

In Reference 1, the Amarillo Area Office (AAO) approved Revision 1 of the Pantex TSRs subject to directed changes (provided in Reference 1). The AAO also specified the proposed flammable solvent controls were not adequate and directed that MHC submit revised controls for approval. The AAO has reviewed the revised controls provided by Reference 2 and the incorporation of the directed changes and concluded the controls are adequate. As a result, Revision 1, Issue A, of the TSRs is approved.

Additionally, MHC should revise MNL-00076, "Basis for Interim Operation for the Pantex Plant," to describe that the basis for interim operation (BIO) document is for information purposes only and does not describe or derive controls for facility operations. AAO review and approval of that change is not required. Further, upon completion of the MHC readiness assessment for TSR implementation and the closure of all "pre-start" items, MHC should cancel MNL-1101, "Critical Safety Systems Manual for the Pantex Plant."

Questions in regard to this matter should be referred to Karl Waltzer at extension 3148.

R.T. Brock
for Daniel E. Glenn
Area Manager

cc:
R. Brock, SSTA, 12-36
D. Schmidt, IWAP, 12-36
D. Phillips, Acting AAMWO, 12-36
D. Brunell, ABS, 12-36
K. Waltzer, ABS, 12-36
J. Conti, ABS, 12-36
L. Eppler, Gen. Mgr. Staff, 12-69
J. Nunley, RMD, 12-5
J. Dionizio, MPD, 12-69
S. Spivey, RMD, 12-127

CONTROLLED COPY

United States Government Department of Energy

)emorandum

Albuquerque Operations Office
Amarillo Area Office

DATE: FEB 4 2000

REPLY TO
ATTN OF: AAO ABS JMC

SUBJECT: DOE Approval of Pantex Technical Safety Requirements Revision

TO: Benjamin Pellegrini, General Manager, Mason & Hanger Corporation

RE: Letter from Pellegrini/Bernier, titled "Transmittal of Proposed Change AB-00-0003, TSR Draft Revision 1," dated January 28, 2000.

This memorandum responds to the referenced letter, which submitted Pantex Plant Technical Safety Requirement (TSR) revisions to support implementation activities. The revisions incorporate changes identified during the course of implementation planning activities.

The attachment provides the Department of Energy (DOE) basis for approval of the proposed TSR changes, including directed changes. The proposed TSR revisions are approved as requested, subject to directed changes contained in the attachment and the exception that the proposed flammable solvent controls are not approved and must be resubmitted to DOE as discussed in the Safety Evaluation Report.

If you have any questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

FOR
John M. Bernier
Acting Area Manager

Attachment

cc w/attachment:
F. Rowsome, DP-45, HQ
S. Erhart, SASD, AL
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DOE Safety Evaluation Report for Proposed Change AB-00-003 to Pantex Plant Facility Technical Safety Requirements

A. Background

This addendum documents the approval bases for further revisions to the Pantex Plant TSRs to support implementation activities (Reference 1)

B. Brief Description of Revision

This revision incorporates changes identified during implementation planning activities, by systems engineers, facility management, and maintenance organizations. The following major changes are discussed:

- Editorial and formatting changes - editorial, formatting, and minor clarifications were made throughout the document. They have no impact on the way the control could be applied, and provide interpretive improvement.
- Reference to the Chapter 4/5 Document was replaced with reference to the Analytical Bases document. MHC had done a good job of compiling existing analytical information in the Analytical Bases Document: This document contains sufficient supporting information for the TSRs, and it was appropriate to focus resources on the preparation of upgraded BIO modules, and to not issue the Chapter 4/5 Document.
- Approved Container and Storage Program: The existing Administrative Control was a programmatic AC with two attributes: 1) that containers are identified and qualified for use in nuclear facilities for handling of nuclear material and explosives, and 2) that approved containers are documented in approved Pantex manuals, standards, and procedures. Programmatic ACs are elements of AC programs generally applied to PX hazards analysis. AC Specific Requirements are those controls credited directly in hazards and accident analysis, and are subject to more stringent criteria for TSR violations. The proposed change converts the Approved Container Program from a programmatic AC to AC Specific Requirement, because containers are credited directly in hazards analysis.
- Emergency Lighting. The existing Limiting Condition for Operation had differing actions between one and more than one emergency light inoperable. The proposed change clarifies that some facilities have only one E-light, and when that light is inoperable, actions have to be taken for the condition of more than one light inoperable.
- Safe and Stable Configuration: Safe and Stable is used in the LCOs to describe a condition where active operations are stopped, and the material is protected to the maximum extent possible from the hazard of concern. With nuclear explosives, procedural safe stopping points exist where operations can be secured. The definition and LCO actions have been revised to provide for immediate stopping of operations, followed by separate actions to place the material and the facility in the most protected configuration. Given the range of operations and configurations possible in PX facilities, the wording proposed by MHC provides the best fit of specificity and flexibility. It acknowledges that operations may be immediately secured, but that operational judgment will always have to be used to determine appropriate actions to further protect material and establish facility configuration
- NFPA valve surveillances For determining appropriate surveillance requirements, the TSRs follow the guidance of DOE Order 5480.22 and the recommendation of the Fire Protection Report (Reference 4) National consensus standards (NFPA) inspections/tests are reviewed to determine if the specified inspections are directly applicable to system

operability. Those tests/inspections whose failure would directly impact operability are captured in the TSRs as surveillance requirements. In many cases, further detail is provided in the bases to clarify that when only portions of the inspections bearing on safety function are applicable as the TSR surveillance. The proposed changes delete two surveillances as not directly bearing on fire suppression systems operability: Annual cycling of fire suppression system valves and 5-year inspection of check and alarm valve. The only safety function ensured by the valve cycling is to maintain valves open, and the check/alarm valve inspection is more appropriately a preventive maintenance function. These inspections are more appropriate for control under the Administrative Control for preventive maintenance. As such, they are deleted from the surveillance requirements. The Surveillance for valve cycling has been left in the HPFL surveillance for the Post Indicator Valves to ensure that valves can be shut to isolate facilities as required to maintain HPFL operability.

- Clarification of Fire Detection and Alarm surveillances: The proposed change revises the bases statements for the fire detection and alarm LCO (3.4.3) to better describe the tests performed on actual configurations. The bases given is that the changes are required per FPE to line SRs up with actual NFPA requirements. The bases statement for SR 4.4.3.4 states that for notification devices, that sound pressure readings are not required for the surveillance. This conflicts with NFPA 72, which requires sound pressure readings per applicable ANSI standard annually.
- Deletion of battery chargers from Fire Alarm Control Panel Battery: The revisions propose changes to the LCO for Fire Detection and Alarm operability deleting reference to the charger as part of operability. The basis given is that only the batteries are considered a part of the critical safety system, as stated in the LCO. The reasoning given is insufficient: If the battery charger were found to be inoperable, the system should then be considered to be operating on battery power. It would be impracticable to attempt to determine at what stage in capacity (percent discharged) the battery is at, and as such, the battery should also be considered inoperable. This is further supported by NFPA requirements to check float voltage on battery systems, and the fact that SR 4.4.3.2 still contains reference to the charger.
- Revision to flammable solvent controls in the fire protection AC: As part of a separate commitment to DOE, MHC submitted a change to the flammable solvent controls. The proposed change is not acceptable for the following reasons:
  - As written, if HE is cased or in an approved container, there are no flammable solvent requirements. There is insufficient bases for this change.
  - The change does not provide level of detail contained in previous wording as to how to minimize ignition sources.
  - The change attempts to address operations authorized during use of flammable solvents by requiring Fire Protection Engineering Approval, but does not describe what the FPE approval is to entail.
- Deletion of High Pressure Fire Loop Surveillances: By revision to the bases description, the proposed change deletes several NFPA inspections of the HPFL fire pumps. The basis provided is that the inspections do not affect operability. The reasoning is unclear, because the inspections listed directly bear on the ability of the pumps to autostart and reach full flow conditions.
- Deletion of design information on the blast valves: The TSR contains a change to delete manufacturers design information on the cells ventilation system blast valves. The reason given is that the information is the design requirements requested from the manufacturers.

not the actual test data. While the change is appropriate, some level of sealing time/capability is required to support the analysis assumption of neglecting this leak path during accident conditions.

- Application of CHE quantity/distance controls to process combustibles only: The fire protection combustible/distance controls for CHE NE operations applies quantity and distance requirements for <u>process</u> combustibles. The latest ABCD controls do not make this distinction, but apply controls to combustibles irrespective of whether they are facility or process related. Prior DOE direction (Reference 5) required that controls be applied to all combustibles. MHC has responded that they are not able to implement controls for all combustibles with the March TSR implementation date, and will be able to implement the control with process combustibles. Full implementation will be performed as the Fire Protection BIO analysis is completed.

<u>C. Effect on Safety Analysis</u>

The changes presented to DOE for approval have no effect on existing analyses contained in Pantex Plant Basis for Interim Operation (Reference 3). The proposed changes identified by implementation planning are clarification of the previously approved controls, editorial corrections, or addition of controls contained in ABCDs appropriate for inclusion in the site TSRs. They represent a further refinement of the controls or the level of information presented that implement the necessary safety class and safety significant engineered (Limiting Condition for Operations, Design Features) and Administrative Controls to prevent and/or mitigate Pantex Plant hazards.

<u>D. Approval Basis/Conclusions</u>

With the exception of the following issues, the proposed changes are acceptable. Because these changes are minor in nature, a revision/addendum to the TSR Safety Evaluation Report is not required.

- As previously discussed in Section B, the proposed changes related to NFPA fire pump surveillances are not acceptable for approval.
- Proposed changes related to FDA battery charger are not justified.
- Proposed changes to the flammable solvent controls are not acceptable for approval, and will require resubmission.
- Proposed changes to blast valve design features are approved, but further action by MHC is required.
- Changes to local alarm surveillances that do not require sound measurement are not supported by the bases provided by MHC.

<u>E. DOE Direction</u>

1. With the controlled distribution of the approved change, the following proposed changes are not approved:

- Page 3/4-35, LCO 3 4.3 B, deletion of "and/or chargers"
- Page 5-12, AC 5 6 3, proposed revisions to flammable solvent controls.
- Bases pages 3/4-82 and 83, proposed revisions to the SR bases for HPFL pumps
- Bases pages 3/4-76, SR 4.4.3 4 proposed NOTE added to surveillance requirement.
- Bases pages 3/4-73, LCO 3 4.3 B 1 revisions related to battery chargers and deletion of defense in depth designation.

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2. The following changes shall be made with the controlled copy distribution:

- Pages 3/4-14, LCO 3 1 2.C, correct editorial error: revise C.3 completion time to "N/A," and C 4 completion time to "15 DAYS."

3. The following actions are required for future TSR revisions:

- Resubmit the revisions to the flammable solvent controls. For restrictions on operations during flammable solvent use, provide the safety function for the FPE review. The controls should apply irrespective of whether HE is cased or contained. The existing programmatic controls, with minor modifications should be sufficient. It is recommended that a draft version be provided to AAO for comment.
- Prior DOE direction to remove the word "process" from CHE combustible quantity/distance controls is rescinded. MHC shall provide definition/discussion, by TSR revision, as to what "process combustibles" actually are prior to TSR implementation, and shall provide a schedule for the incorporation of all facility combustibles in the controls, as the FBIO analyses are completed (prior to the approval of the FBIO).
- MHC shall provide the information related to actual Cell Blast Valve sealing capability and closure times, via revision to Analytical Bases Document prior to implementation, or evaluate the effect on cell leakpath on existing analyses.
- The analytical reference for the TSRs has been revised to the Analytical Bases Document. MHC shall issue the document prior to TSR implementation.

F. References

1. Letter, Weinreich/Bernier, "Transmittal of Proposed Change AB-00-0003, TSR Draft Revision 1," January 28, 2000.
2. Pantex Plant W62 Disassembly and Inspection Activity Based Controls Documents, ABC-W62-256187.
3. Pantex Plant Basis for Interim Operation, MNL-00076.
4. Nuclear Explosives Fire Protection Criteria for the Pantex Plant, Amarillo, Texas, October 30, 1998
5. Memorandum, Bernier/Weinreich, "DOE Approval of Pantex Technical Safety Requirements Revision and request for Extension to the Flammable Solvent Justification for Continued Operation," January 18, 2000.

United States Government Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

NOV 1999
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DATE: NOV 24 1999

REPLY TO ATTN OF: AAO:ABS:JMC

SUBJECT: DOE Approval of the Finalized Technical Safety Requirements for Pantex Plant Facilities

TO: W. A. Weinreich, General Manager, Mason & Hanger Corporation (MHC)

Ref: Letter, Weinreich/Bernier, "Transmittal of Finalized Technical Safety Requirements (TSRs) for Pantex Facilities, Revision 0 Issue B, Proposed Change AB-99-039-R2," November 22, 1999

This memorandum responds to the referenced document, which submits the final Technical Safety Requirements revisions to support implementation activities. The revisions include the TSR Bases (Appendix A), finalized Design Features (Appendix B), and changes addressing prior AAO review comments. The attached Addendum B to the TSR Safety Evaluation Report contains the DOE basis for approval, with direction to be incorporated in implementation planning and future authorization basis documentation. The proposed changes are approved as requested. It is the DOE-AAO's understanding that changes will be submitted in the near time-frame to address incorporation of ramp transportation controls, and combustible control quantity-distance requirements for conventional high explosive nuclear explosive systems.

If you have any questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

John M. Bernier
Acting Area Manager

Attachment

cc w/o attachments:
S. Young, RMD, 12-127
L. Eppler, RMD, 12-127

cc w/ attachment:
F. Rowsome, DP-45, HQ
S. Erhart, SASD, AL
D. Glenn, WPD, AL
H. Chavez, SASD, AL

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Jnited States Government — Department of Energy

memorandum

Albuquerque Operations Offi
Amarillo Area Office

DATE: SEP - 1 1999

REPLY TO ATE. OF: AAO:ABS:JMC

SUBJECT: Approval of Revision 0 Issue A Pantex Plant Technical Safety Requirements

TO: W. A. Weinreich, General Manager, Mason & Hanger Corporation (MHC)

Ref: a) Letter Weinreich/Goodrum titled, "Transmittal of Revision 0 Issue A Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change AB-99-0028," dated July 26, 1999
(really AB-99-0032)

b) Letter Weinreich/Bernier titled, "Additional Changes to Proposed Change AB," dated August 16, 1999

This memorandum is in response to the referenced revisions to the Pantex Plant Technical Safety Requirements. The proposed changes are approved as requested, with directed DOE changes. The attached addendum to the Technical Safety Requirements Evaluation Report contains the DOE basis for approval, including directed changes to be addressed by the next planned revision.

If you have any questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

Donald E. Bell FOR
John M. Bernier
Acting Area Manager

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D. Rhodes, DP-21, HQ
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1ADDENDUM B - DOE APPROVAL OF REVISION 0, ISSUE B TO PANTEX PLANT FACILITY TECHNICAL SAFETY REQUIREMENTS

A. Background

This addendum documents the approval bases for the final revisions to the Pantex Plant TSRs to support implementation activities. (Reference 1)

B. Brief Description of Revision

In the original planned integration of Pantex Plant authorization basis (AB) documents, the Lightning and Fire Protection BIOs (LBIO and FBIO) were to be submitted for approval with final TSR revisions, including with supporting authorization basis (Chapter 4/5, Safety SSCs and TSR Derivation), and safety basis (Controls Selection) documents. A description of the documents and their intended content can be found in Reference 7. The BIOs were submitted in advance of the final TSR revisions, along with Chapter 4/5 document. Due to the number of issues identified during the review of the Lightning BIO, the projects were decoupled, to allow approval of the minimum set of documents to support TSR implementation. The minimum documentation needed to support implementation included the following:

- Review and approval of the TSR Bases. The original TSR review and approval documented in the TSR Evaluation Report (SER) did not include the TSR Bases (Appendix A to the TSRs). The TSR Bases provide the rationale for the choice of LCO conditions, required actions, and surveillance requirements, including linkage to accident scenarios of concern. To support readiness reviews, the information contained in the bases was needed to evaluate flowdown of controls into procedures, particularly for surveillances.
- Review and approval of TSR Design Features. The existing TSR Design features referenced the Chapter 4/5 document for further detail for safety function and in-service inspections. Sufficient level of detail needed to be incorporated into the TSR Design Features section to allow implementation. The review and approval of the Chapter 4/5 document was deferred to post implementation.
- Controls Selection Document. This document lists existing controls contained in the existing PX AB documents (Basis for Interim Operation and Critical Safety Systems Manual), provides the rationale for incorporation or deletion in the TSRs, and if carried forward, the location of the new control. This document is required to be issued for review to allow a final validation that all controls have been identified and properly dispositioned.

The proposed TSR revisions (Reference 3) and the Controls Selection document were submitted to DOE on October 15, 1999. The TSR revisions and Controls Selection document were reviewed by SBRT members, and comment feedback was provided to the contractor. Resolution was finalized, with the final set of comments requiring document revisions provided to the contractor in Reference 4. Reference 5 provided feedback on a second contractor submittal (Reference 2). The final submittal (Reference 1) satisfactorily addresses comments resolutions.

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References 1 also incorporates the following additional changes:

- All controls associated with lightning protection for nuclear explosives have been deleted from the TSRs. Pantex Plant lightning controls for nuclear explosive operations will be addressed by the Lightning Justification for Continued Operation (LJCO) until final TSR revisions associated with the LBIO are approved and implemented.

- Revisions associated with prior review comments: The original Safety Evaluation Report and Addendum A had identified pre-implementation issues required to be addressed by TSR revision. The final DOE review and approval verified that outstanding issues had been addressed.

- Bay interlock cell corridor wetpipe sprinkler(WPS) fire suppression LCO: In the original conversion of the CSSM controls to TSRs, the LCO coverage for the suppression systems outside the NE operating areas was dropped. The basis was MHC fire protection engineering position that fires in these areas did not adversely affect NE in the operating areas. The Fire Protection Report (Reference 9) also did not require these systems. Preliminary results from the FBIO and individual Hazards Analysis Reports for specific systems had concluded that in these areas WPS was required to be operable to preclude radiant heat flux from credible fires of maximum combustibles in line of sight to NE from initiating explosive response. As a result, the proposed TSR revisions incorporated LCO operability and Conditions for cell corridors and bay equipment interlocks.

- Limited Operations Action Plans: The original TSRs had generically established LCO Required Actions to enter Limited Operations Mode with inoperable systems if they had not been repaired. Entering Limited Operations required DOE-AAO approval of the actions and compensatory measures. MHC senior management felt that it was inappropriate to rely on DOE review and approval cycle to preclude a TSR violation (failure to perform the Required Action within the specified Completion Time). The proposed TSRs revised the Required Action wording from "enter Limited Operations Mode" to " submit a Limited Operations Action Plan."

- Administrative Control Requirements: Prior TSR wording included actions and completion times when ACRs were not met. ACRs are specific administrative controls credited in analyses in preventing or mitigating accidents. ACR Violations were defined as failure to perform the compensatory measures within the specified completion times. Based on AAO MHC management decision, the compensatory measures and completion times were dropped (they tended to generically state to restore the ACR), and ACR Violations were defined as the failure to meet the ACR with no qualifiers. The immediate actions contained in section 5.3.4.3 of the Administrative Controls were revised to address generic actions to be taken upon discovery of an ACR Violation.

- Flammable Solvent Justification for Continued Operation: At the time of issue of the final TSRs, an approved JCO was in effect related to the control of the use of flammable solvents. The measures specified in the JCO were going to remain in effect for the longterm. so the controls were incorporated into the TSRs.
- Exceptions to LCO 3.0.4: LCO 3.0.4 is a generic LCO, which requires that all LCOs be met for a Mode prior to transitioning into the Mode, unless specific exceptions are stated in the LCO. Most of the LCO Mode Applicabilities are for both Operations and Maintenance Mode (material present). Most of the LCOs contain Conditions that allow operations for a limited time frame prior to securing operations. In these cases, in would be appropriate to transition between Operations and Maintenance Modes, because the intent was to allow continued operations. The proposed TSR revisions added specific notes to appropriate LCOs, providing exceptions to LCO 3.0.4.

- In Service Inspection surveillances: Design Features contain ISI surveillances that monitor the condition of the passive safety function. These ISIs also contained periodicities upon which these inspections were to be performed. The proposed TSRs added the provision for 25% extensions, similar to that allowed for Surveillance Requirements for LCOs.

- Combustible Controls and Ramp transportation controls: As part of an on-going effort to incorporate controls from Activity Based Control Documents for process specific controls into the TSRs, it was decided to submit revisions to the TSR ACs to add these controls. This was deferred to a later time, pre-implementation to support approval. This addressed in DOE Direction.

C. Effect on Safety Analysis

The changes presented to DOE for approval have no effect on existing analyses. Changes addressing editorial corrections and issues identified by DOE in the ER defacto have no effect on approval bases. The proposed changes identified by implementation planning for the large part represent clarification of the previously approved controls or corrections. They represent a further refinement of the controls or the level of information presented that implement the necessary safety class and safety significant engineered (Limiting Condition for Operations, Design Features) and Administrative Controls to prevent and/or mitigate Pantex Plant hazards.

D. Approval Basis/Conclusions

The review criteria applied to the Bases and Design features portions of the TSR revisions are contained in previously approved review plans (References 7 and 8) and have been revised slightly to reflect changes made as to scope and schedule. The remaining TSR revisions are changes made to support implementation, final clarifications, or addressing prior identified issues. The review criteria are listed below:

- Controls Selection document: Satisfactory rationale has been provided for including or excluding the controls in the existing authorization basis documents. TSR controls have been appropriately addressed in the Site TSRs.
  Assessment: This criterion has been met. Reference 4 provides DOE comments to be addressed by revision. post implementation.

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- TSR Bases: TSR Bases are included as Appendix A to the TSRs. Appendix A provides the bases for selection for each LCO Condition and Surveillance Requirement. The rationale for the selection of compensatory actions and completion is provided. Bases for selection of surveillance requirements, and assurance that such surveillance requirements will meet the operability or functional requirements defined in the LCOs are provided. Assessment: This criterion has been met. In most cases, actions and completion times are based on reasonable time frame to place operations in the safest possible condition, and surveillances are based on consensus/industry standards, or engineering judgment. This is clearly stated in the bases.
- The TSR Bases consistently address the logic and rationale of the TSR derivation, written in a language that can be readily understood by trained facility management. Assessment: This criterion is met. Clear, unambiguous language is provided. The bases provide a useful tool to facility management in understanding the safety basis.
- Boilerplate, repetitive language is not used, and the wording does not repeat the language of the associate LCO or SR without providing the explanation of why the control was worded.
  Assessment: This criterion is met.
- For SRs where general language is used, the bases identifies the specific aspect of the test that demonstrates operability.
  Assessment: This criterion is met. SR bases identify the specific function that is required to be met.
- Design Features: All passive engineered features that provide a safety function are identified under the Design Features (DFs) section of the TSR (Appendix B), if not covered under an LCO. Under each of these, the safety function is summarized. Appropriate surveillances are provided for the design features.
  Assessment: This criterion is met.

The TSRs in total satisfactorily address the primary goal of the CSSM to TSR conversion program. They carry forward the safety class controls contained in the existing BIOs and CSSM. Controls that are readily identifiable as Defense in Depth have been dropped from the TSRs, and presently scoped to be included in the safety management program descriptions contained in the General Information Document upgrade project. Safety class and safety significant controls have appropriately dispositioned between LCOs, ACs, and Design features. The PX TSRs provide the following significant improvements over the previous AB document controls:

- Controls that are safety have been identified. The scope has been tightened, and the set of controls is focused on the truly important ones.

- Controls appropriate for design features and administrative controls have been removed from the LCOs.

- Where LCOs have been written, the required actions have been better defined in terms of compensatory measures, allowed operations, and repair time windows. Major improvements have been made in the areas of time frames to repair, fire suppression fire watch/patrol compensatory measures, and operability definitions.

Formal TSR Administrative Controls have been created, where none had existed, subject to compliance assessment.

- Surveillance requirements have been better defined in terms of operability criteria.

With the approval of the final set of revisions, the TSRs are ready for implementation. Implementation issues, further improvements, and direction to be incorporated in controlled document distribution are identified in DOE Direction.

E. DOE Direction

The following items are to be addressed in implementation of the TSRs, subsequent TSR revision, or in other AB document programs:

Implementation:

1. Implementation issues listed in Appendix A of the TSR Evaluation Report are to be addressed.

2. In response to DOE question with regards to not doing full load test on UPS batteries, (Reference 10) MHC stated that trending is performed on load testing data, and batteries are 'placed every five years. These actions appear to be candidates for inclusion in the PM AC, i.e., .dentify SSCs to be included, establish maintenance, and establish intervals" (AC 5.6.6).

3. MHC shall submit a revision to the existing BIO addressing controls supersedure by the TSRs, including Appendix G (Criticality limits).

4. MHC shall revise Activity Bases Controls Document and/or the TSRs to address conflicts.

5. MHC shall submit revisions incorporating ramp transportation and CHE quantity-distance combustible controls.

6. In the final revision submitted (Reference 1), it appears that the Mode note for LCO 3.3.2 does not allow transition between Operations and Maintenance Mode for Conditions A and D. MHC shall submit a revision (with item 5 revisions) splitting the exception wording between Conditions B and A/D. consistent with other LCO wording, including bases wording.

7. In response to review comments, MHC added wording to the LCO bases for LCO 3.4.3 adding fire flow alarm to component list of the LCO, but did not revise the LCO wording. MHC shall submit a revision (with items 5 and 6), adding fire flow alarms to LCO 3.4.3 listing..

Post Implementation:

Revise the Controls Selection document to address comments provided in Reference 4.

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2. Complete the DOE review /approval cycle on the Chapter 4/5 document, and the Analytical bases document.

3. In the Chapter 4/5 document resubmittal, include TSR level controls for pit cladding, either AC or DF. (Reference 4)

4. In Chapter 4/5 document resubmittal, clarify that wrap-around pressures are less than Class II for cells, and that the door for a potential donor cell is not required to be closed to achieve Class II protection for adjacent cell (Reference 4).

5. In Chapter 4/5 document resubmittal, clarify the bases for operations in support of staging during the Maintenance Mode, in the TSR derivation of modes discussion. (Reference 4).

6. In Chapter 4/5 document resubmittal, include material limits for Zone 4 facilities, including the associated pads and non MR magazines (Reference 4).

7. Complete the review of NE Safety Master Studies and ABCDs for common site/facility controls appropriate for inclusion in the TSRs.

8. In the final issue of the Analytical bases document, reconcile the inconsistent calculation methodologies for tritium dose calculations to the worker.

Actions affecting other AB document programs:

1. Complete DOE review cycle on Lightning BIO, issue and implement LBIO controls representing final endstate controls, to replace the Lightning JCO.

2. Complete DOE review and cycle on the Fire Protection BIO, having it be the endstate controls.

3. In the General Information Document, address Defense in Depth controls and program descriptions that have been dropped from the TSRs.

4. In the Transportation BIO, address the dock material limits not contained in the TSRs, including the nuclear material limits.

5. In the Fire Protection BIO, submit revisions to existing LCO controls for bay/cell operating area/round room, addressing the situation where they are being used for non-NE, NM staging and operations only.

F. References

1. Memorandum, Weinreich Bernier, "Transmittal of Finalized Technical Safety Requirements (TSRs) for Pantex Facilities, Revision 0 Issue B, Proposed Change AB-99-039-R2," November 22, 1999

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2. Memorandum, Weinreich/Bernier, "Transmittal of Finalized Technical Safety Requirements (TSRs) for Pantex Facilities, Revision 0, Issue B, Proposed Change AB-99-0039-R1," November 8, 1999

3. Memorandum, Weinreich/Bernier, "Transmittal of Revision 0 Issue B Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change AB-99-039," October 15, 1999

4. Memorandum, Brunell /Yarbrough, "DOE Review Comments on Revision 0, Issue B, Technical Safety Requirements for Pantex Plant Facilities", November 10, 1999

5. Memorandum, Brunell/Yarbrough, "DOE Comments on Finalized Technical Safety (Requirements)," November 19, 1999

6. Memorandum, Weinreich/Bernier, "Transmittal of Unreviewed Safety Question Determination No. PX-USQD-96-16-A," May 15, 1997

7. DOE-AAO Review Plan for Pantex Plant Facility Technical Safety Requirements, May 17, 1999

8. Addendum A to the DOE-AAO Review Plan for Pantex Plant Facility Technical Safety Requirements incorporating the Fire Protection and Lightning Basis for Interim Operation, August 31, 1999

9. Nuclear Explosives Fire Protection Criteria for the Pantex Plant, Amarillo, Texas, Mason and Hanger Corporation, October 30, 1999

10. Memorandum, Weinreich/Bernier, "Uninterruptible Power Supply (UPS) Battery Annual Testing – DOE Memorandum dated August 31, 1999"

AB-99-0039

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Albuquerque Operations Office
Amarillo Area Office

DATE: SEP - 1 1999

REPLY TO ATTN OF: AAO:ABS:JMC

SUBJECT: Approval of Revision 0 Issue A Pantex Plant Technical Safety Requirements

TO: W. A. Weinreich, General Manager, Mason & Hanger Corporation (MHC)

Ref: a) Letter Weinreich/Goodrum titled, "Transmittal of Revision 0 Issue A Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change AB-99-0028," dated July 26, 1999

b) Letter Weinreich/Bernier titled, "Additional Changes to Proposed Change AB," dated August 16, 1999

This memorandum is in response to the referenced revisions to the Pantex Plant Technical Safety Requirements. The proposed changes are approved as requested, with directed DOE changes. The attached addendum to the Technical Safety Requirements Evaluation Report contains the DOE basis for approval, including directed changes to be addressed by the next planned revision.

If you have any questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

John M. Bernier
Acting Area Manager

Attachment

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S. Erhart, SASD, AL
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Addendum A
Technical Safety Requirements Revision 0, Issue A

A. Background: This addendum documents the approval bases for revisions to the Pantex Plant TSRs issued subsequent to the initial approval. (References F.1 and F.2)

B. Brief Description of Revision: The revision incorporates three types of changes:
1. Editorial corrections
2. Evaluation Report comments listed in Appendix A. *Issues/Comments to be Addressed on Implementation of Pantex Plant Technical Safety Requirements*
3. Changes dealing with implementation issues identified during implementation planning and/or requested by facility management.

A table matrix of changes, with individual summary of change and basis is provided with the proposal.

C. Effect on Safety Analysis: The changes presented to DOE for approval have no effect on existing analyses. Changes addressing editorial corrections and issues identified by DOE in the ER defacto have no effect on approval bases. The proposed changes identified by implementation planning for the large part represent clarification of the previously approved controls or corrections. It represents a further refinement of controls that implement the necessary safety class and safety significant engineered (Limiting Condition for Operations, Design features) and Administrative Controls to prevent and/or mitigate Pantex Plant hazards.

D. Approval Basis/ Conclusions: The proposed changes are acceptable for approval, and improvements over the previously approved TSRs. Section E addresses those changes that cannot be approved as proposed, or issues that still need to be addressed in subsequent revisions prior to implementation.

E. DOE Direction:

1. Evaluation Report Issues: Direction contained in Appendix A of the ER has been addressed satisfactorily. The following outstanding items remain:

a. Lightning Protection: Comments contained in Appendix A relating to lightning protection controls have been addressed by the revisions, with the exception of the request to identify the detailed surveillance testing to be performed. This detail would be mostly contained in the TSR Bases, however, some revision to the surveillance wording of LCO 4.5 may be required. It should be also noted that a Justification for Continued Operation (JCO) is being written to address the complete set of controls related to lightning protection at Pantex Site. In the response (Reference F.3) to the proposed implementation plan, DOE-AAO directed that the TSRs be revised to reflect existing lightning protection controls, as the contractor could not implement the final controls contained in the approved TSRs. The cover memorandum for the proposed TSR revision (Reference F.1) notes that once the JCO is approved, the TSRs will be revised to incorporate the JCO controls. As such, there are two outstanding actions:

- Submit any revisions to SR wording once surveillance testing is established.
- Incorporate Lightning JCO controls

b. Bases documents: It should be noted that many of the comments are associated with Bases information. DOE-AAO has agreed to defer approval of the Analytical bases document, NESS Master Study reviews for controls, and review of ABCDs for common controls to post

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implementation. The remaining comments contained in Appendix A relating to TSR Bases, Derivation Document, and Controls selection still have to be addressed in subsequent revisions prior to TSR implementation. Readiness reviews will not be able to commence until TSR Bases are approved by DOE. (Reference F.3)

c. CWIV testing: The contractor was tasked with determining whether any long term leak test inspection was required on the CWIV and incorporating these requirements in the associated surveillances. At the time of submission of the revision, the issue had not been resolved by MHC systems engineering. The contractor has still committed to incorporating this revision prior to implementation.

2. Cased Explosive definition: An action item from the evaluation report was to further refine the definition. The proposed revision is acceptable, however, the definitions for Cased Explosives and Nuclear Explosive configurations refer to each other. MHC should consider deleting the reference to configurations in the cased explosive definition and adding the clarifier statement that the explosive safety program determines cased explosive configurations. The AC for explosive safety should then be revised to add an attribute that the program provides definitions of cased explosives.

3. Application of fire detection and alarm LCO to B12-44 Cell 8: The facilities listing presently applies the detection and alarm LCO 3.4.3 to B12-44 Cell 8. The facility has only wet pipe fire suppression, with remote alarm as a result of fire flow alarm. LCO for wet pipe fire suppression is not applicable to this facility. LCO 3.4.3 requirements would impose defense in depth controls for fire alarm control panel and flow alarm for a facility that does not require the base fire suppression control. MHC should consider removing the requirement from the facility listing.

4. Low Pressure Alarm capability for B12-44 Deluge system capability: Originally, the TSR submittal contained reference to low pressure air alarm for the LCO operability statement. This was removed by MHC based on the determination that low air pressure in the pneumatic heat detectors would actuate the system, not preclude actuation. Based on rereview of the System Design Description and fire department training package on the system, this determination may be incorrect. A minimum pressure appears to be required to ensure proper actuation. MHC should review the system design, and if appropriate, add the LP alarm back in as part of operability, and ensure that appropriate surveillances are specified.

5. Criticality Safety (CS) Administrative Control Requirements (ACRs) specified actions: In response to an ER issue, MHC revised the ACRs to provide specific response and times for ACRs, including CS ACRs. The first CS action is the generic action for all ACRs to place all material in a safe and stable configuration. This action is possibly misleading in that it implies that further measures may be taken to move fissile material to a safer configuration, when standard CS guidance is not to move configurations until CS engineering has evaluated the situation and provided direction. MHC should consult with criticality safety to determine a more appropriate wording.

6. Alternates to maintaining blast doors closed: The existing AC for explosive safety has a specific ACR to maintain at least one blast door closed at all times. It has an exception that states if the critical safety function of the blast doors has been evaluated and is not required, then the control is not required. Presently the critical safety function listed is not just Class II

level of protection alone. It includes other external events (for example, natural phenomena). Additionally, the control applies to special purpose facilities. The intent of the exception was to allow meeting Class II level of protection via alternate measures when door(s) are required to be opened (or when there is just a single door). MHC should considered revising the wording to reflect that the ES program has to determine that Class II level of protection is met, and to state that opening doors shall then be minimized.

7. Editorial:

- Two pages are included as reflecting changes (5-33 and 5-38), and no change to the text is apparent.
- Changes have been made to material limits tables for Zone 4 magazines (section 5.6.13.5.1 and 5.6.13.5.2), and correspondingly are not listed in the summary list of changes. Basis for these changes will have to be provided when Appendix K of the BIO is submitted for DOE approval.
- An editorial correction is listed in the summary table for section 5.6.1.1. The corresponding revised page is not in the submittal. The change is correct. MHC should incorporate it in the controlled copy distribution.
- Page numbering has been shifted due to the addition of new text, and word processing showing old text strikeout. The text revisions are correct. MHC should address any page numbering revision in the controlled copy distribution.
- Page 1-14 has the addition of an unnecessary dash. MHC should correct in controlled copy distribution.
- SRID has been added and is not on the acronym list. MHC shall add to acronym list in controlled copy distribution.

MHC action: Correct these editorial items in the issue of the revision.

8. Eight hour completion times for fire patrols: MHC has proposed increasing completion times from 4 to 8 hours for the establishment of fire patrols. Not all appropriate revisions have been made: LCOs 3.4.1. B.3 and 3.4.2, B.3 completion times should be revised to be consistent.

9. SR 4.0.3: Wording should be revised to be consistent with proposed generic language: "MODE and associated conditions", vice "MODE or condition".

10. Use of UV as alternate: MHC has proposed wording changes to LCO 3.4.1, wetpipe fire suppression, to allow the detection and alarm system to provide the equivalent to a fire patrol, similar to the deluge suppression systems. For bay operating areas where wetpipe fire suppression systems are installed, no UV detection systems are also installed. As such, the proposed wording is not approved. MHC should ensure that when TSR Bases are issued for approval, that when reference is made to the fire detection system, that it clear that the bays cells UV and area smoke detection are what is meant as providing alternate to fire patrols .

11. Severe weather administrative controls: The present TSRs address controls related only to facilities in response to tornado warnings (closing up Zone 4 magazines and emptying 12-41). The controls do not address the control of ramp transportation presently in effect, as this is under scope of the transportation BIO project. This issue was initially deferred by the review team. However, in retrospect, it is appropriate to include existing controls presently in effect.

MHC shall in subsequent revision address the existing severe weather controls for ramp transportation in the Severe Weather AC.

12. Compensatory measures for loss of fire department alarm notification: The MHC response to ER comments appears to have incorporated the literal wording and not the intent: In the controlled copy distribution, Required Action A.2 for LCO 3.4.3 shall be revised to read: " If Fire Detection Devices are inoperable. ADMINISTRATIVELY CONTROL the notification of the Fire Department of a fire."

13. Pit Quality Controls: In proposed correspondence (Reference F.4) related to safety classification of pit containers, fire suppression, and pit clad, AAO directed that MHC consider the addition of an attribute to the material control administrative control addressing programs onsite to address the monitoring and maintenance of pit quality, similar to reservoir controls. MHC shall evaluate this for inclusion in the TSR controls.

14. Applicability of interlock /outside room fire suppression: The Site TSR submittal dropped fire suppression as a critical safety control for bay/cell areas outside of the operating areas. This the qualitative judgement of MHC fire protection engineering, based on the conclusions of the Fire Protection Report. With the given distances, it was judged that there was insufficient combustible in the bay interlock areas and the rooms outside the cells to generate enough heat flux to ignite explosives prior to the heat detectors sensing hot gases and initiating deluge suppression. However, based on preliminary conservative results from the fire protection BIO, it appears that it is necessary to require wet pipe fire suppression in the bay interlock areas and cell areas outside the round room. This late revision was submitted by Reference F.2. The proposed changes do not logically flow, and are not approved. MHC shall revise to address the following comments and resubmit in subsequent revisions;

- Wet pipe fire suppression now applies to three areas: Bays without deluge, rooms outside cell round rooms, and rooms outside bay operating areas (interlocks). Item 7 disapproves the proposal to use UVs as alternates to fire patrol for bay operating areas that have fire suppression only, because there are no bays with sprinklers and UV detectors.
- The facility listing table revision submitted is confusing. For the Bays, it now does not apply wet pipe fire suppression to bays with deluge systems. For Cells, it does not state that interlock areas are excluded, and as it reads, it applies to those areas. MHC shall revise the Bays and Cells facility listing tables to specifically address applicability with respect to round rooms, operating areas, interlock areas, and rooms outside of round rooms.
- The proposed change attempts to make the revisions with minor modifications to original LCO wording and does not work as written. The actions for fire suppression inoperable outside of bays and cells operating areas are inconsistent. For cells, only a fire patrol is required, and for bays, a fire watch is required. MHC shall rewrite the LCO to address the following conditions: Bay operating area wetpipe, bay interlock area wetpipe, cell rooms outside operating area wetpipe, cell staging cubicle wetpipe.

15. Lightning Protection requirements for Master Tester List equipment: MHC has proposed a change to the requirements for MTL equipment. Previously, the requirement in Section 5.6.5.4 had required MTL equipment be disconnected during lightning warnings unless afforded adequate insulation. In the proposed change, "insulation" has been replaced with "surge suppression." No basis was provided. Surge suppression does not eliminate the common-mode voltage threat. Since the ground reference for the surge suppression may be at a different

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potential than the floor (assumed path off) isolation/insulation adequate for the common-made voltage is still required.

16. Suggested improvement: The LCO Mode Applicability statements for 3.4.1, 3.4.2, and 3.4.3 all contain associated conditions that essentially duplicate the Mode definitions for Operation and Maintenance Modes: The associated conditions all contain the qualifier: "when greater than residual quantities of NM or explosives are present". This qualifier is contained in both Mode definitions. MHC should consider (but is not required) to consider removing this wording.

F. References:

1. Memorandum, Weinreich/Goodrum, Transmittal of Revision 0 Issue A Technical Safety Requirements (TSRs) for Pantex Facilities, Proposed Change AB-99-0028, dated July 26, 1999
2. Memorandum, Weinreich/Bernier, Additional Changes to Proposed Change AB-99-0028, dated August 16, 1999
3. Memorandum, Goodrum/Weinreich, Technical Safety Requirements Implementation Plan, dated July 19, 1999
4. Memorandum, Goodrum/Weinreich, response to MHC position paper on Pit Container Safety System Classification (DRAFT)

United States Government | Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

DATE: MAY 29 1999

REPLY TO ATTN OF: AAO:ABS:JMC

SUBJECT: Approval of the Pantex Plant Facility TSRs

TO: W. A. Weinreich, General Manager, Mason & Hanger Corporation (MHC)

Re: Memorandum, Weinreich/Goodrum, "Transmittal of Revision 2 Technical Safety Requirements for Pantex Plant Facilities, Proposed Change DCR #29000201," May 27, 1999

This memorandum is in response to the referenced letter presenting the MHC Technical Safety Requirements for DOE approval. The attached DOE Evaluation Report provides the DOE basis for approval. MHC is to be commended for bringing this important project to the point where the TSRs can be approved. The proposed TSRs, excluding the Bases, are approved for implementation pending resubmission of the TSR implementation plan.

The implementation plan included in your April 26 initial submission does not meet DOE expectations for timely implementation of the TSRs. It is expected that TSR implementation will occur in phases based on the amount of work required to perform the implementation. As an example, TSRs that are a straightforward conversion of the existing CSSM requirement should take less time than new or significantly revised TSRs. The importance of timely and successful implementation of the new TSRs cannot be overstated. They provide the foundation for the BIO Upgrade program and for the integrated safety basis for nuclear and nuclear explosive work at Pantex, and are an important step forward in achieving a modern safety basis. You are requested to provide the revised implementation plan by June 11, 1999.

The revision to the implementation plan must also include incorporation of comments and clarifications detailed in the Evaluation Report. Incorporation of comments and clarifications obviously must be completed before implementation of the controls begins. Please ensure that actions recommended in the Evaluation Report are addressed in appropriate authorization basis project and implementation plans. If you should have any further questions regarding this matter, please contact Jim Conti of my staff at extension 3638.

William S. Goodrum
Area Manager

Attachment

cc:
See page 2
ABS #98-036

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DOE EVALUATION REPORT
for
PANTEX PLANT FACILITY
TECHNICAL SAFETY REQUIREMENTS

Authorization Basis Staff
Amarillo Operations Office
U.S. Department of Energy

Concurrence: concur with approval of the TSRs 28MAY99
Francis Rowsome DP-45 Date

Concurrence: concur with approval of the TSRs 28MAY99
Lynn Maestas SASD, DOE-AL Date

Prepared by: 28MAY99
J. M. Conti Date
DOE-AAO TSR Review Team Lead

Reviewed: 5/28/99
D. C. Brunell Date
Manager, Authorization Basis Staff

Approved: 5/29/99
W. S. Goodrum Date
Manager, Amarillo Area Office

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TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This Evaluation Report (ER) documents the Department of Energy (DOE) review of the Pantex Plant (PX) Technical Safety Requirements (TSRs) (Reference 1) and provides the basis for the Amarillo Area Office (AAO) approval. The scope of the Pantex Plant TSR development is the conversion of existing controls found in the Pantex Plant Critical Safety Systems Manual (CSSM) (Reference 2), and Basis for Interim Operation (BIO) (Reference 3) to Technical Safety Requirements format, including any additional controls, enhancements from present studies and upgrade projects far enough along in development to identify needed controls. This scope is documented in the DOE-AAO approved Project Plan for the PX TSRs (Reference 4). The new TSRs also include programmatic and specific Administrative Controls that are currently identified in the BIO.

This ER recommends approval of the TSRs, excluding the Bases. The TSRs are judged to be adequate, and represent an incremental improvement of the existing CSSM/BIO controls. Future improvements of the TSRs are recommended to be addressed during implementation and in future authorization basis document upgrades. These recommendations are contained in the ER Appendices.

The facilities covered by the TSRs include all nuclear and nuclear explosive facilities at Pantex Plant, with the exception of Building 12-116 (which has its own approved SAR and TSRs), Building 12-104A (which is not currently authorized to perform nuclear activities), and transportation activities (which has an upgraded authorization basis nearing completion). The currently authorized activities which are encompassed by the new TSRs include nuclear explosive staging and operations, and nuclear component staging and operations. Nuclear facilities covered by the TSRs are divided into the following functional modules:

- Nuclear Explosive Bays
- Nuclear Explosive Cells
- Nuclear Explosive Special Purpose Facilities
- Zone 4 Staging
- Zone 12 Staging

A complete description of facility systems and operations is contained in the Pantex Plant BIO. The PX Facility TSRs were prepared to meet the requirements of DOE Order 5480.22, Technical Safety Requirements. The Defense Program TSR guide (Reference 5) and DOE approved Building 12-116 TSRs (Reference 6) were also used a templates.

The format and content of the Evaluation Report is based on the guidance provided in DOE-STANDARD-1104-96, Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports (Reference 7). Since the review and approval was for TSRs, the criteria contained in Reference 7 were modified and enhanced to be more applicable to the review of TSRs alone. These criteria were approved by the AAO Manager in the TSR Review Plan (Reference 8).

Section 2 discusses the review process used by the Review Team in determining the acceptability of the PX facility TSRs.

Section 3 addresses the adequacy of the PX TSRs in meeting the qualitative acceptance criteria approved in the TSR Review Plan. This section provides the bases for DOE's approval of the TSRs.

Section 4 contains any conditions of approval for the TSRs, i.e., action that need to be complete as part of the approval.

Section 5 is a summary conclusion stating that the TSR may be approved with a general discussion of the basis for approval.

Section 6 completes the body of the report with a list of references.

Appendix A identifies issues identified during the TSRs review that must be addressed prior to the completion of final implementation of the TSRs. Appendix B contains issues to be addressed by future BIO upgrade projects. Appendix C contains issues to be addressed within six months, that cannot be deferred until BIO upgrade modules, or are associated with other site AB documents.

The Pantex Plant Technical Safety Requirements have adequately carried forward appropriate existing authorization basis (AB) document controls, written to the requirements of DOE Order 5480.22. The bases for this conclusion are presented in Sections 3 and 5. Approval authority of the TSRs has been delegated to the DOE-AAO Manager (Reference 9). With the approval of this Evaluation Report, DOE-AAO approves Revision 2, May, 1999 version of the TSRs (Reference 1), subject to the completion of implementation actions specified in Appendix A.

2. REVIEW PROCESS

A TSR Project team was formed by Mason & Hanger Corporation (MHC) to develop the PX TSRs, in accordance with a Project Plan approved by DOE-AAO Authorization Basis Staff Manager. The Project Team included one DOE-AAO ABS member, to provide DOE guidance and feedback during the development process. As previously stated, the scope of the project was to convert existing controls contained in the PX BIO and CSSM to a TSR format meeting the requirements of DOE Order 5480.22. The TSRs also capture conclusions of studies of safety issues (i.e., lightning, fire protection, seismic), for potential inclusion in the TSRs. Note: AAO 12/30/98 memo directs the inclusion of lightning controls in the TSRs. As part of this TSR project the following documentation is issued with the TSRs:

Selection of Controls for Inclusion in the TSR (Controls Selection) - This document identifies and evaluates existing AB document facility controls. These controls are screened to determine if they provide a Critical Safety Function on a facility level. The bases for the evaluations are documented. Once selected, linkage to Derivation Document section is provided. Where a control is not selected for inclusion in the TSRs, the basis for exclusion of controls is provided.

Analytical Basis for the Controls (Analytical Bases) - This document captures the existing assumptions, calculations, and engineering judgment that are the bases for controls. Where analytical basis is found in a document maintained under change control, the analysis is referenced, not repeated.

Derivation of the Pantex Facility TSRs (Derivation Document) - This document provides the TSR bases. The event with credited control will be linked to the Limiting Condition for Operation (LCO). System classification, safety function, and functional requirement are listed, along with a description of how the control meets these requirements. This document also includes the derivation of operating modes. The Derivation Document combines information in one location that would normally be contained in Chapters 4 and 5 of the SAR. The Derivation Document is issued as Appendix K of the Pantex Plant BIO. The first two documents form the basis of the Derivation Document. They are safety basis documents, subject to controlled documentation requirements, under contractor approval authority following initial DOE review.

A core DOE review team with expertise in hazard/accident analysis and controls development was established to accomplish the DOE review of the TSRs. The core review team core makeup was as follows:

- J. Conti AAO-Authorization Basis Staff (ABS) team leader, DOE
- L. Maestas AOO-Safety Analysis and Support Division (SASD) technical reviewer, DOE
- R. Williams AOO-SASD support service contractor technical reviewer
- F. Rowsome DP-45 technical reviewer
- J. Stachew DP-45 support service contractor technical reviewer

Note: The two DP-45 members were added after the initial draft document review and participated in the final review only.

Additional support and Subject Matter Expert (SME) review was established in the areas of nuclear explosive operations, nuclear material operations, facility representatives, lightning, engineering, radiation protection, fire protection, explosives, seismic, and nuclear explosives safety to perform reviews in their area of expertise.

The review by core review team members of initial draft of the TSRs was performed in January 1999, focusing on the format and content of the TSRs The review team provided gross feedback to MHC on the level of detail required in the TSRs. Following that review, informal feedback was provided by the RT leader to the AAO project team member on interim products.

The TSRs were submitted for final approval to DOE on April 26, 1999, along with the Derivation Document (Reference 8). The Controls Selection and Analytical Bases documents were not available for review. The RT performed a preliminary review and concluded that there was insufficient detail in the TSR Bases to support recommendation of approval. Accordingly, the review scope was reduced to the TSRs alone, not including the Bases. Review of the TSR Bases, Derivation Document, Analytical Bases, and Controls Selection documents was deferred until the TSR Bases were rewritten, and all of the supporting documents were issued in final form for DOE review. The review scope was focussed on the structure and content of the TSRs to determine if the controls were effective, and to ensure the TSRs contained sufficient information and detail to support implementation. Since the TSRs were developed from existing controls, the RT did not attempt to verify that the controls adequately prevent or mitigate all accident scenarios of concern at Pantex. (This did not preclude raising obvious or known issues with control selection.) The adequacy of the TSRs to address all accident scenarios of concern to Pantex will be addressed by subsequent review of the Bases, Derivation Document, and associated safety basis documents.. A revision to the TSR Review Plan incorporated this approach and was approved on May 17, 1999.

Following the review and approval of the TSRs, a similar review and subsequent approval action shall be conducted for the TSR Bases, Derivation Document and the associated safety basis documents. The review scope shall at that time focus on controls selection and analytical bases, including consistency with the approved TSRs. The review and approval of the Derivation Document shall be completed, including controlled documentation issuance and implementation actions, prior to implementation of the TSRs. While informal facility walkdowns have been performed by individual review team members, formal walkdowns will be performed as part of the Derivation Document/TSR Bases review. A revision to the approved TSR Evaluation Report shall be issued as part of approval. This issue is addressed in Appendix A.

The RT, including SMEs, then provided comments on the TSRs to the RT leader, who assembled and performed preliminary screening. The RT met to discuss the comments and come to consensus. Following this meeting, the RT leader provided a preliminary list of comments to the contractor. The RT leader met with the contractor and came to resolution. The RT leader formally transmitted the comments and resolutions to the contractor under Authorization Basis Staff Manager signature (Reference11). Reference ~~11~~ provides a documented list of all comments and resolution on the site TSRs. Issues that were deferred to future action may be listed in the Appendices to the ER and not specifically discussed in the subsequent sections. The revised final TSRs were submitted for DOE approval following incorporation of DOE comments by the contractor (Reference 1).

3. ASSESSMENT OF THE TSRs

The following criteria were used in the assessment of the acceptability of the TSRs. These criteria were developed and approved in the TSR Review Plan. A discussion follows each criterion, with reference to any actions contained in the ER Appendices.

a. The TSRs are written to the format and content of TSR guidance documents.
The PX TSRs are written to the guidance of the DP TSR Guide, and met the requirements of Attachment 1 of DOE Order 5480.22. This criterion is met.

b. Modes and applicability (including facility) for each of the Safety Limits (SLs) and LCOs are correctly identified.
No existing controls or proposed new controls were identified that warrant SLs. The TSRs contain a table (matrix) at the front of the TSRs, identifying the specific TSR control applicable to each nuclear or nuclear explosive facility at Pantex. Each LCO has an applicability section that specifies mode and/or facility condition. The applicability of LCOs was specifically reviewed. This criterion is met.

c. The SLs and the LCOs are written in a three-column format to facilitate their implementation and to ensure consistency with recent approved TSRs throughout the DOE complex.
The LCOs are written in the three column format consistent with DOE-AL complex TSRs and B12-116 TSRs. This criterion is met.

d. The LCOs operability requirements (including bases) identify functional requirements and system/component definition.
The LCOs satisfactorily address the level of detail required for LCO statements and surveillance requirements. As previously stated, the Bases did not contain a sufficient level of detail, and review of the bases is deferred. This is addressed in Appendix A.

e. Appropriate Conditions, Required Actions, and Completion Times are established for each of the operability requirements defined in the LCOs.
The LCO conditions satisfactorily identify the level of degraded system operability or condition and the required compensatory actions. The required actions are appropriate for the individual conditions, and establish appropriate compensatory measures and operational restrictions, with reasonable completion times. The TSRs use the definition IMMEDIATELY as the completion time for a majority of required actions, which requires initiating actions as soon as possible and working these actions continuously until complete. The RT discussed this approach and accepted it, subject to review of implementing procedures. This issue is addressed in Appendix A.

f. <u>Surveillance Requirements (including frequency) ensure that the engineered control safety function is operable when needed.</u>
The TSR surveillance requirements mostly carry forward existing CSSM requirements. The proposed surveillances were judged to adequately ensure that system operability were maintained, with a limited number of exceptions requiring action prior to implementation listed in Appendix A

g. <u>Facility or Site administrative control elements are identified under each of the Administrative Control Programs in the TSR. Both programmatic and specific administrative controls are identified. Programmatic ACs provide a general description of the program, and include key elements of the program. Specific AC Requirements capture existing AB document specific controls that provide a safety function.</u>
The Team reviewed the TSRs against this criterion, and judged them to be acceptable, following incorporation of review comments. The following two issues were identified:

- The Emergency Preparedness and Unreviewed Safety Question programs did not have key elements listed out separately; however, a general description of each program is provided. The wording is consistent with the DP TSR guide (Reference 5).
- There are administrative control programs and specific administrative controls not addressed by the TSRs. The existing site NESS Master Studies and individual weapons program NESS studies were not reviewed to include any appropriate specific or administrative controls, nc were the existing HARs/ABCDs. Many ACP and ACP elements currently required by existing and in progress HARs/ABCDs are not identified. This condition should be reconciled as an update to the TSR and/or the HARs/ABCDs. These actions are appropriate following approval of these TSRs. This issue is addressed in Appendix A.

h. <u>TSR Bases are included as Appendix A to the TSRs. Appendix A provides the bases for selection for each LCO Condition and Surveillance Requirement. The rationale for the selection of compensatory actions and completion is provided. Bases for selection of surveillance requirements, and assurance that such surveillance requirements will meet the operability or functional requirements defined in the LCOs are provided.</u>
The Team was unable to justify approval of these bases. The Bases in too many cases contained repeated 'boilerplate" language, or repeated the wording of the LCO/SR. MHC failed to capture the reasoning/rationale of why the controls, actions, and completions times were chosen. The review of the Bases will be deferred until review and approval of all of the "bases" documents. This issue is addressed in Appendix A.

i. <u>All passive engineered features that provide a safety function are identified under the Design Features (DFs) section of the TSR (Appendix B), if not covered under an LCO. Under each of these, the safety function is summarized or further referenced. Appropriate surveillances are provided for the design features.</u>
Passive design features are captured in the design features appendix of the TSRs. In several cases

the RT applied engineering judgment in review of the DFs. For example, design features are not separately included for engineered systems with LCOs. For the dynamic balancer, it was deemed appropriate to capture mounting screw design and hydraulic oil analysis as design features. Another example is that cell blast valves have active function to shut upon sensing blast overpressures. The surveillances included both inservice inspections (disassembly and inspection), and verification of latching pressures. The contractors approach was to capture these controls as design features., and the RT concluded this was an acceptable alternative. Issues with regard to implementation of new in service inspections are captured in Appendix A.

4. CONDITIONS OF APPROVAL

The Pantex Plant facility TSRs are recommended for approval to allow the contractor to proceed with for implementation activities, with the exception of the Bases, Appendix A. The following actions are recommended to be completed as part of the conditions of approval of the TSRs:

- The contractor should submit the Derivation Document, the Analytical Bases and Controls Selection documents, and the TSR Bases for DOE approval. These documents should be reviewed and approved, and any associated implementation actions complete, prior to implementation completion date for the TSRs.

- The contractor should make the necessary revisions to the TSRs listed in the issues in Appendix A of the ER. These issues represent minor clarifications, and deferred actions where the necessary level of detail has to be developed. Revisions to the TSRs and associated documents should be reviewed and approved, and any associated implementation actions complete, prior to implementation completion date for the TSRs. The contractor should ensure that implementation issues listed in Appendix A are specifically addressed in implementation planning, and reviewed during readiness assessments.

- The contractor should ensure that issues identified in Appendix B are incorporated in the appropriate AB document upgrade projects, and that issues identified in Appendix C are resolved or have approved action plans within six months of approval of the TSRs.

5. SUMMARY CONCLUSION

The Review Team assessment of the new proposed TSRs is that they are adequate, and represent an improvement of the existing controls contained in the BIO and CSSM. They represent a set of controls more focussed on the critical safety issues created by Pantex operations, and written to the requirements of DOE Order 5480.22. While they could be subject to further refinement and improvement, there are no fatal shortcomings. The RT recommends DOE approval of the TSRs as an incremental improvement in operational controls at Pantex. The RT further recommends actions contained in the Evaluation Report Appendices be completed in order to establish an adequate technical bases for controls, and to ensure the controls set is complete.

6. RECORDS/REFERENCES

1. Memorandum, W.A. Weinreich to W.S. Goodrum, subj: Transmittal of Revision 2 Technical Safety Requirements, dtd May 27, 1999
2. Critical Safety Systems Manual for the Pantex Plant, MNL-1101
3. Basis for Interim Operation for the Pantex Plant, MNL-00076
4. Project Plan for the Pantex Plant Facility Technical Safety Requirements
5. DOE Memorandum, Document of Example Technical Safety Requirements DP-31, June 23, 1994
6. Building 12-116 Technical Safety Requirements, MNL-184468
7. DOE-STD-1104-96, Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports
8. DOE-AAO Review Plan for Pantex Plant Facility Technical Safety Requirements, 5/17/99
9. Memorandum,
10. Memorandum, W.A. Weinreich to W.S. Goodrum, subj: Transmittal of Technical Safety Requirements for Pantex Facilities, Draft Revision 1, Proposed Change DCR #29000201 and Basis for Interim Operation Appendix K, Derivation of the TSRs, BIO Revision 3 Proposed Change, DCR #29000200, dtd April 26, 1999
11. Memorandum, Brunell to Weinreich, subj: Comments/Resolutions to the Technical Safety Requirements for Pantex Facilities, RPT-SAR-1998091, Revision 1, April 1999, dtd May 28 1999

Appendix A

Issues /Comments to be Addressed on Implementation of Pantex Plant Technical Safety Requirements

Note: Necessary document revisions shall be submitted and approved, and implementation activities complete prior to final implementation date.

1. Review the existing NESS Master Studies to determine if there are any appropriate common controls to capture in the Site TSRs.
2. Review the existing approved ABCDs to determine if there are; 1) Any conflicting controls requiring revision to the ABCDs and /or the TSRs.. 2) Any common facility controls that are appropriate to elevated and captured in the Site TSRs Note: There are some reviewer comments that were deferred to this review. (Reference 11)
3. Determine the specific inspection/surveillance that are appropriate to be performed on the CWIV to address log-term leak containment capability, including periodicity. Submit appropriate TSR revisions.
4. Determine the specific functional test surveillance requirements to be performed on the LPWS to annual verify operability. Submit appropriate TSR revisions.
5. Submit a revision to the existing BIO deleting the existing controls replaced by the TSRs.
6. Complete the DOE review and approval of TSR Bases and Derivation Document, including the Analytical Bases and Control Selection documents.
7. Revise Evaluation Guidelines for Safety Class and Safety Significant per the resolution agreed upon in DOE review. AAO action: Revise the AAO guide for use with DOE-STD-3009.
8. Revise Criticality Safety Program description contained in Appendix G of the BIO, to reflect controls shifted to the TSRs.
9. As part of the revisions to the Derivation Document (Appendix K), delete the material limit control tables, and revise the discussion to provide the bases for the derivation of the controls.
10. Address the formal submission of DD the bases for dropping fire suppression controls, and Bays BDI
11. In the Derivation Document, address the bases for revision to Modified Richmond magazine controls to allow either HE limit, and the revision to the TP-20-7 notes for B12-64
12. Revise the LCO statement for LCO 3.5.1 to state what safety function is being provided by a fully operable system with all field mills and impact detectors operational.
13. Submit a further revision to the AC clarifying that the ACs are contractually bound to approved SRID, and delete those order references that have been deleted by SRIDs and reference correct orders.
14. Delete reference to NFPA design in LCO statements, and add a bullet listing nominal flow density, sprinkler head/heat head setpoint, and reference to the fusible links.
15. B12-94: Delete B12-94 from the facility listing and Material Limits AC. It presently is listed as a nuclear facility, with nuclear material limits limited to zero inventory. This is in conflict with the definition in the TSRs, which state a facility is above the threshold

quantities of DOE Standard 1027. There is not justification for maintaining this facility in the nuclear listing.

17. Reporting requirements for specific AC Requirements. Revise the general ACs to define that an AC specific requirement violation occurs when a requirement is not met.
18. Facility Listings Table:
    - B12-50 and B12-60, revise to include facility lightning protection as design feature
    - General programmatic ACs – sections 5.2 to 5.5 apply to the site
    - The severe weather program has listed programmatic elements and is not listed in the general ACs
    - The specific AC requirement to maintain blast doors shut applies to B12-64 due to external natural phenomena and external events
    - Criticality safety program has specific AC requirements and is not listed anywhere in the tables for specific requirements.
19. The definition of cased HE is now circular. It includes definitions that are uncased IHE. Resolve and revise.
20. Capitalize the word STAGING in the last three Modes.
21. Revise section 1.4.3 third paragraph to clarify that within a facility multiple entries into a condition are not allowed, and leave that conditions may be entered in multiple facilities implicitly understood.
22. LCO 3.4.3 detection and alarm:
    - Revise the LCO statement to clarify that the battery does not support detection and alarm alone. It supports that, and remote alarm notification, and deluge activation.
    - Revise Required Action A.2 to notify fire department is detection is inoperable.
    - Revise Required Action B to repair inoperability within 14 days or enter the limited operations mode.
    - Add required Action C.2 consistent with A.2.
23. Lightning protection Administrative Control: Revise Section 5.6.5.4 wording to be consistent with 5.6.5.1, i.e., instead of full-ups/partials describe in terms of configurations that do not have faraday cage protection.
24. Material Controls Administrative Control: Add controls for B12-41 and 12-64 consistent with Zone 4 staging precluding staging of items that do not have faraday cage protection.

Specific issues to be addressed and assessed on implementation of the Site TSRs:
Note: These are specific issues flagged for review as a result of TSR review, and are not to be construed as the total scope of implementation readiness review.

1. Site procedures implementing the philosophy of the use of the definition IMMEDIATELY. Under the new format of the TSRs, actions should be worked continuously until complete.
2. Site Procedure implementing the preparation and AAO approval of the Limited Operations. This is a new concept, and procedures have to be developed by MHC and AAO to allow timely preparation and approval of Limited Operations.
3. Procedures implementing in-service inspection requirements for Design Features, including the procedures for performance of the inspections, procedures for actions to be followed.

Specific inservice inspection procedures need to be developed and reviewed for facility cranes inspection, low voltage AC surge suppressors, and pit containers.

4. Procedures for implementation of AC controls that replace the existing LCO controls on Bays BDIs, Alpha and Beta CAMs, and Radsafe interlocks.
5. Facility procedures for implementing the LCO required actions to Administratively Control cells doors when BDIs are inoperable.
6. Site procedures implementing the new definitions of fire patrol and fire watch, where now entry is required to perform fire patrol surveillances.
7. Several comments were received on the contractors inappropriate use of frequency extensions for surveillances (25% extension). Under the TSRs, this will constitute a programmatic violation.
8. Use of STAGING definition: The proposed definition allows movement of material into facilities in the maintenance modes and in operations modes while in safe and stable configuration. While this appears logically inconsistent, the further restriction added to only allow material in approved containers is judged not to significantly increase risk. The specific procedures implementing this philosophy should be reviewed.
9. Site procedures and standards that implement AC specific requirements: A comprehensive review of the appropriateness of the actions and time frames, including configuration control should be performed.
10. Site procedures and standards implementing the new SAFE and STABLE definition.

Appendix B
Issues /Comments to be Addressed in Future AB Document Upgrades, Subsequent to Implementation of the TSRs.

1. Fire Suppression in Pit Handling Areas: There is inconsistent application of controls for facility controls during nuclear material handling. The 12-44 Cell 8 relies on combustible loading controls to preclude pit breach. The 12-116 SAR postulates breach and analyzes offsite consequences, and applies administrative controls for both combustible controls and fire suppression. The TSRs allow staging higher inventories of nuclear material and apply fire suppression controls as the LCO. The issue of consistent controls should be addressed as part of the fire protection BIO module. Appropriate revisions to the B12-116 SAR/TSRs should be submitted.
2. Dock Controls: Material Limit Controls were deferred to the Transportation BIO for docks. Ensure that the Transportation BIO addresses these controls.
3. Bays BDIs: As part of the Bays Module upgrade, re-evaluate the appropriateness/implementation of Bays BDI administrative control.
4. Establishment of appropriate lighting levels for emergency Lights: As part of the Bays Module upgrade, establish appropriate controls to monitor and maintain the lighting level (0.5 footcandle) in work areas.
5. Battery surveillances: (AAO action) Review the practice of annually load testing UPS batteries against existing loads, vice full design discharge test.
6. Further expand on analytical bases for dropping wetpipe fire suppression in bays/cells outside of operating areas/round rooms in the fire protection BIO module.
7. As part of the Lightning Protection BIO module, provide expanded bases for the rationale for design of impact detectors and voltage monitors for the Lightning Detection and Warning System. Provide an expanded bases for the required actions for system condition of degraded operability. Evaluate whether surveillances that check system operation against actual lightning data (impact detectors and voltage settings are appropriate). Further expand the LDWS LCOs to provide maximum times that systems may be in degraded condition, and actions to be taken on exceeding these times, consistent with other Site TSR LCOs.
8. As part of the transportation BIO module upgrade, develop an additional attribute under the explosive safety program for site explosive limits that addresses how reviews are conducted to ensure that nuclear AB document external event accident analyses are reviewed for impact, above the limiting quantity distance reviews.
9. As part of the fire protection BIO module, evaluate whether the fire extinguisher controls and operator training recommended by the fire protection report are appropriate to be added as attributes of the fire protection program.

Appendix C
Issues /Comments to be Addressed in Near-Time Frame (Six Months)

1. Resolve the inconsistencies between the tritium dose calculations and the B12-116 SAR. Provide a revision to the B12-116 SAR/TSRs to make controls consistent with the site TSRs.
2. Evaluate the whether controls are appropriate to be applied for the SST staging pads, parking pads, NELA magazines in Zone 4, and submit a TSR revision if appropriate, with a complete bases.
3. Establish a longterm plan to address the commitment to Appendix G of the BIO as the safety management program description equivalent to the SARs, address the longterm disposition of the General Information Document, and revise the BIO upgrade program plan to incorporate contractor commitments.

Table of Contents

APPENDIX A BASES

APPENDIX B DESIGN FEATURES

List of Tables

List of Acronyms and Abbreviations

AAO	Amarillo Area Office
AB	Authorization Basis
AC	Administrative Control
ABCCC	Authorization Basis Change Control Committee
ABCD	Activity Based Controls Document
ALARA	As Low As Reasonably Achievable
BIO	Basis for Interim Operation
BDI	Blast Door Interlock
CFR	Code of Federal Record
CHE	Conventional High Explosives
CWIV	Contaminated Waste Isolation Valve
DF	Design Feature
DOE	Department of Energy
FACP	Fire Alarm Control Panel
FHA	Fire Hazard Analysis
FTIR	Fourier Transform Infra Red
Gpm	gallons per minute
HE	High Explosives
HPFL	High Pressure Fire Loop
IHE	Insensitive High Explosive
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
LLPS	Lightning Location and Protection System
LWDS	Lightning Warning and Detection System
M&H	Mason and Hanger
MOI	Moment of Inertia
M-R	Modified Richmond
N/A	Not Applicable
NCS	Nuclear Criticality Safety
NE	Nuclear Explosive
NELA	Nuclear Explosive Like Assembly
NESD	Nuclear Explosives Safety Department
NEXRAD	Next Generation Radar
NFPA	National Fire Protection Association
NM	Nuclear Material
NV	North Vault
ORO	Oak Ridge Ordnance
OS&Y	Outside Screw and Yoke
PIV	Post Indicator Valve
psi	pounds per square inch
PSS	Plant Shift Superintendent
PV	Pit Vault
QA	Quality Assurance
rpm	revolution per minute
RTG	Radioisotopic Thermoelectric Generator
RWP	Radiation Work Permit
SAC	Steel Arch Construction
SAR	Safety Analysis Report
SC	Safety Class

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SL	Safety Limit
SNM	Special Nuclear Material
SPMS	Static Potential Monitoring System
SR	Surveillance Requirement
S/RID	Standards and Requirements Identification Document
SS	Safety Significant
SSCs	Structures, Systems, and Components
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
V/m	Volts per meter

ISSUE HISTORY & SUMMARY OF CHANGES			
Revision	**Change No.**	**Submittal Date**	**Description of Changes**
00		May 29, 1999	Initial Issue of TSRs. Distributed for implementation. NOTE: Only sections 1 through 5 and Appendix B are have been approved by the DOE. Appendix A will be further developed prior to DOE approval and is included for information purposes to aid implementation only.
00A		September 1, 1999	Issue A incorporates changes identified in the TSR Evaluation report, changes identified during implementation planning, and editorial corrections to the document. The changes identified during implementation planning represent clarification of the previously approved controls.
00B		November 24, 1999	Issue B also incorporated changes identified in the TSR Evaluation report, changes identified during implementation planning, and editorial corrections to the document. The changes identified during implementation planning represent clarification of the previously approved controls. (Proposed Change AB-99-0039)
00C		January 18, 2000	Issue C incorporates changes which were necessary to support the W87 Program RA. Specifically, the combustible quantity-distance requirements for process combustibles of the Fire Protection Program and the Ramp Traffic Control Program were added. (Proposed Change AB-00-0001) This issue was not distributed independently. The distribution of the changes associated with this issue were accomplished with the distribution of Revision 1.
001		February 3, 2000	Revision 1 consists of a compete re-issue of the document as a result of multiple changes. These changes were made to correct technical inaccuracies, make clarifications to existing controls that were identified during implementation activities, and resolve all remaining evaluation report requirements. (Proposed Change AB-00-0003)
01A		February 17, 2000	Revision 1 Issue A addresses the SER comments from Revision 1 for the Fire Protection Program with a revision of the flammable liquid controls and the addition of a process combustible definition. Wording changes for correctness were also made to the following SRs: SR 4.2.1.2, SR 4.4.1.3, and SR 4.4.2.3. (Proposed Change AB-00-0011)
1	B	March 6, 2000	Per proposed change AB-00-0015, revised to clarify the Fire Detection and Alarm LCO to show that only one notification device is required to be installed and operable (TSR prestart).

LIST OF AFFECTED PAGES			
Revision	**Issue**	**Date**	**Affected Pages**
1	0	02/04/00	All
1	A	02/17/00	5-11, 5-12, B 3/4-33, 57, 66, 75, 82, 83
1	B	03/06/00	RH-1 & 2, B 3/4-70

FACILITY LISTING

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FACILITY LISTINGS

Introduction

The Facility Listings are used to identify the FACILITY applicability of each control. The listings are grouped according to each module with additional tables for Plant Wide SSCs and ACs. The listing for a module contains the SSCs and ACs, with corresponding LCO, DF, or AC number, which may apply to those FACILITIES in that module. An "x" is designated beneath the FACILITY for which the control applies. The Plant Wide AC Program table gives a listing of all the AC Programmatic and Specific Requirements that are generically applied across the site. These programs have no specific applicability to FACILITIES, however are applicable at all times to overall plant operations.

The Plant Wide SSCs table lists the SSCs that are required to continually support plant operations. These systems are broken out into a separate table because they are not the responsibility of any one FACILITY, but are maintained and controlled by departments outside the Manufacturing Division.

Nuclear Explosive Bays							
Critical Safety Control	**LCO**	**DF**	**AC**	**12-64**	**12-84**	**12-99**	**12-104**
Facility Structure		DF 1.1		X	X	X	X
Wet Pipe Fire Suppression System	LCO 3.4.1						
Interlock				X	X	X	X
Operations/Staging Area				X	X Bays 1, 10, 14 only	X Bays 2, 4 only	X Bay 16 only
Deluge Fire Suppression System	LCO 3.4.2				X Excluding Bays 1, 10, and 14	X Excluding Bays 2, 4	X Bays 1-15
Fire Detection and Alarm System	LCO 3.4.3			X	X	X	X
Emergency Lighting System	LCO 3.2.1			X	X	X	X
Sandbag Barrier System		DF.2		X Bays 13-17 Only			
Facility Crane Assembly		DF.3		X	X	X	X
AC – NM and EXPLOSIVEs Inventory Control Program			AC 5.6.13.1	X	X	X	X
AC – Explosive Safety Program			AC 5.6.4.1	X	X	X	X
AC - Criticality Safety Program			AC 5.6.12.1 AC 5.6.12.2 AC 5.6.12.3	X	X	X	X

Nuclear Explosive Cells							
Critical Safety Control	**LCO**	**DF**	**AC**	**12-44 Cells 2-6**	**12-85**	**12-96**	**12-98**
Facility Structure		DF.1.2		X	X	X	X
Equipment Blast Door Interlock System	LCO 3.1.1			X			
Equipment Blast Door Interlock System	LCO 3.1.2				X	X	X
Blast Valve		DF.4		X	X	X	X
Wet Pipe Fire Suppression System (see Note 1)	LCO 3.4.1			X	X	X	X
Deluge Fire Suppression System	LCO 3.4.2			X	X	X	X
Fire Detection and Alarm System	LCO 3.4.3			X	X	X	X
Contaminated Waste Isolation Valve System	LCO 3.3.2				X	X	X
Emergency Lighting System	LCO 3.2.1			X	X	X	X
Facility Crane Assembly		DF.3		X	X	X	X
AC – NM and EXPLOSIVEs Inventory Control Program			AC 5.6.13.2	X	X	X	X
AC – Interim Cell Personnel Door Control Program			AC 5.6.18	X Cells 3, 4	X		X Cell 4
AC - Criticality Safety Program			AC 5.6.12.1 AC 5.6.12.2 AC 5.6.12.3	X	X	X	X

Note 1: For all cells conducting assembly/disassembly operations, the wet pipe fire suppression system is only applicable for the staging cubicles and interior cell corridors not including the following areas: equipments and personnel entryways, interior and exterior mechanical rooms, ramps, and interior and exterior equipment rooms.

Nuclear Explosives Special Purpose Facilities						
Critical Safety Control	**LCO**	**DF**	**AC**	**12-41**	**12-50**	**12-60**
Facility Structure		DF.1.3		X	X	X
Wet Pipe Fire Suppression System	LCO 3.4.1			X	X see Note 1	X see Note 1
Fire Detection and Alarm System	LCO 3.4.3			X	X	X
Emergency Lighting System	LCO 3.2.1			X	X	X
Facility Crane Assembly		DF.3		X	X	X
Dynamic Balancer	LCO 3.3.1	DF.6				X Bay 2
AC – NM and EXPLOSIVEs Inventory Control Program			AC 5.6.13.3	X	X	X
AC - Severe Weather Program			AC 5.6.10.1	X		
AC – Criticality Safety Program			AC 5.6.12.1 AC 5.6.12.2 AC 5.6.12.3	X	X	X

Note 1: This control only applies to the Operational/Staging areas.

Zone 12 Staging Facilities							
Critical Safety Control	**LCO**	**DF**	**AC**	**12-26 Pit Vault**	**12-42 North Vault**	**12-44 Cell 8**	**12-58 Bays 4 & 5**
Facility Structure		DF.1.4		X	X	X	X
Wet Pipe Fire Suppression System	LCO 3.4.1						X
Fire Detection and Alarm System	LCO 3.4.3						X
AC – NM and EXPLOSIVEs Inventory Control Program			AC 5.6.13.4	X	X	X	X
AC – Fire Protection Program			AC.5.6.3.1			X	
AC - Criticality Safety Program			AC 5.6.12.1 AC 5.6.12.2 AC 5.6.12.3	X	X	X	X

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Zone 4 Staging Facilities					
Critical Safety Control	**LCO**	**DF**	**AC**	**Modified Richmond (M-R)**	**Steel Arch Construction (SAC)**
Facility Structure		DF.1.5		X	X
Sandbag Barrier System		DF.2		X	X
AC – NM and EXPLOSIVEs Inventory Control Program			AC 5.6.13.5	X	X
AC - Severe Weather			AC 5.6.10.2	X	X
AC – Criticality Safety Program			AC 5.6.12.1 AC 5.6.12.2 AC 5.6.12.3	X	X

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Plant Wide SSCs		
Critical Safety Control	**LCO**	**DF**
High Pressure Fire Loop	LCO 3.4.4	
Pit Containers		DF.7

Plant Wide Administrative Control Programs	
Critical Safety Control	**AC**
Management Responsibilities	AC 5.2
Technical Safety Requirements Application	AC 5.3
Occurrence Reporting	AC 5.4
Reviews and Audits	AC 5.5
Staff Qualification and Training Program	AC 5.6.2
Fire Protection Program	AC 5.6.3
Explosive Safety Program	AC 5.6.4
Preventive Maintenance Program	AC 5.6.6
Configuration Management Program	AC 5.6.7
NM Storage, Handling and Shipping Program	AC 5.6.8
APPROVED CONTAINER and Storage System Program	AC 5.6.9
Severe Weather Program	AC 5.6.10
Radiation Safety Program	AC 5.6.11
Criticality Safety Program	AC 5.6.12
NM and EXPLOSIVES Inventory Control Program	AC 5.6.13
Quality Assurance Program	AC 5.6.14
Emergency Response Program	AC 5.6.15
In-service Inspection Program	AC 5.6.16
Procedures Program	AC 5.6.17
Surveillance Program	AC 5.6.19
Pantex Operating Records Program	AC 5.6.20
USQ Program	AC 5.6.21

Plant Wide AC Specific Requirements	
Critical Safety Control	**AC**
Severe Weather Program	AC 5.6.10.3
Ramp Traffic Control Program	AC 5.6.22
APPROVED CONTAINER and Storage System Program	AC 5.6.9

Section 1

Use and Application

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1.0 USE AND APPLICATION

1.1 Introduction and Scope

1.1.1 Technical Safety Requirement Applicability

This document contains the Technical Safety Requirements (TSRs) developed to address Pantex Plant nuclear FACILITY(s) as described in MNL-00076, Basis for Interim Operation Pantex Plant (BIO). Currently, Building 12-104A and Building 12-116 are not included in the scope of these TSRs. Building 12-104A will have the applicable TSRs developed and added to this document on a case by case operation basis. Building 12-116 has a DOE approved SAR/TSR combination under which it is currently operating. TSRs concerning transportation activities are currently being developed revised and will be updated in this document when completed.

The FACILITY(s) contained in these TSRs are divided into the following functional modules:

- Nuclear Explosive Bays
- Nuclear Explosive Cells
- Nuclear Explosive Special Purpose FACILITY(s)
- Zone 4 Staging
- Zone 12 Staging

In addition to TSRs that pertain to the above-mentioned nuclear FACILITY(s), this document also contains requirements for various Pantex Plant support departments. The non-production departments listed below, are directly responsible for performing Required Action(s) within the LCOs and Administrative Control Specific Requirements of this TSR document.

- Pantex Fire Department
- Pantex Operations Center

Weapons Programs are evaluated under the Nuclear Explosive Safety Program. For each program, a hazard analysis is performed and the required controls are identified. Based on these analyses, Weapons Program specific TSRs are developed. These weapons program TSRs will be added as addendums to the plant wide TSR. The weapons specific TSRs will supplement these plant wide TSRs. Any approved weapon specific TSR control may supersede the controls dictated in these plant wide TSRs, even if the weapon program controls are less restrictive, as long as the CRITICAL SAFETY FUNCTION of the facility control is met with the weapon control.

1.1.2 Methodology

This document was prepared in accordance with guidance contained in Department of Energy (DOE) Order 5480.22," Technical Safety Requirements." The items selected for TSRs consist of the Administrative Controls (ACs), Design Features (DFs), and Limiting Conditions for Operations (LCOs) which perform a Safety Class or Safety Significant function required to ensure that the operations performed in Pantex Nuclear FACILITY(s) are within the analyses contained, or referenced in, the BIO.

This TSR document was created by consolidating the analyses, and engineering judgements, which existed in multiple locations and forms, into a clear and concise set of authorization basis and safety basis documents. Any analytical bases used to support this derivation or these TSRs are maintained in one of two forms of safety basis documents. Analytical bases not in a controlled format during the creation of these TSRs were consolidated to form RPT-SAR-209895, Analytical Basis for the Pantex Nuclear Facilities Technical Safety Requirements.

Analytical bases existing as controlled information during the creation of these TSRs were referenced in the Analytical Basis for the Pantex Nuclear Facilities Technical Safety Requirements, RPT-SAR-209895 and maintained in their controlled form.

1.1.3 Use of TSRs

This TSR document represents a commitment between Pantex Plant management and the Department of Energy (DOE) on the requirements which define the conditions, safe boundaries, management of administrative controls and the bases thereof required to assure the safe operation of these FACILITY(s). This TSR will serve as the documented basis for operation for the covered FACILITY(s).

1.2 Definitions

1.2.1 Defined terms in this list appear in capitalized type throughout this TSR.

Term	Definition
ACTION(S)	That part of a TSR that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
ACTIVE OPERATIONS	Handling, processing, or physical activity on or involving NM or EXPLOSIVES. STAGING or operations in support of STAGING are not considered ACTIVE OPERATIONS.
ADMINISTRATIVE CONTROL	ADMINISTRATIVE CONTROLs are the provisions relating to organization and management, procedures, record keeping, reviews, and audits necessary to ensure safe operation of the facility and maintain the underlying assumptions in the TSR Bases. The requirements of these programs are identified as either ADMINISTRATIVE CONTROL Programmatic Requirements or ADMINISTRATIVE CONTROL Specific Requirements.
ADMINISTRATIVELY CONTROL	The act of manually providing a CRITICAL SAFETY FUNCTION, or equivalent protection, when an SSC, that is required by an LCO to be OPERABLE, has been declared INOPERABLE but the CRITICAL SAFETY FUNCTION, or equivalent protection, is still required to complete Action Statements of the LCO. These actions required to provide the manual CRITICAL SAFETY FUNCTION of the SSC are established within procedures and controlled by the Configuration Control Program
APPROVED CONTAINERS	A container which has been identified and qualified to provide protection from the hazards for which the container is credited.
CALIBRATE/ CALIBRATED/ CALIBRATION	The set of operations which establish, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, and the corresponding measurement standard or known values derived from the standard. A requirement to perform a CALIBRATION on an instrument (e.g., an interlock or an alarm) requires a CALIBRATION be performed on all components in the circuit or loop that are subject to drift and that could adversely affect the performance of the instrument.
CASED EXPLOSIVES	EXPLOSIVES that are enclosed in a physical protective cover that will retain the EXPLOSIVES securely and will offer protection against accidental detonation during approved handling and intraplant transportation operations to SC & SS evaluation criteria. CASED EXPLOSIVES are defined by the Explosive Safety Program.

CRITICAL SAFETY FUNCTION	The credited safety function performed by a Safety Class or Safety Significant control to meet the evaluation criteria.
CRITICAL SAFETY SSC	Safety Class or Safety Significant structures, systems, and components.
EXPLOSIVE(s)	The term used to describe Conventional High Explosives (CHE or HE), Insensitive High Explosives (IHE), or a combination of both HE and IHE. Detonators, squib valves, and release assemblies are not considered EXPLOSIVEs (HE or IHE) for the purposes of these TSRs.
FACILITY(s)	The term FACILITY is used to define a specific bay, cell, or vault in a building with a minimum designation of category 3 nuclear FACILITY as defined by DOE Standard DOE-STD-1027-92.
FIRE PATROL	Periodic monitoring of the area of concern for fire or signs of fire.
FIRE WATCH	Continuous monitoring of the area of concern for fire or signs of fire by at least one person.
FUNCTIONAL TEST	A test of a system or component to determine the functional OPERABILITY. These tests can range from a manual test to determine system operability to inputting a CALIBRATED electrical signal to verify component response.
FREQUENCY	FREQUENCY is the prescribed length of time allowed between the successful completion of a Surveillance Requirement on a particular piece of equipment and the successful completion of the next Surveillance on the same piece of equipment as prescribed in the FREQUENCY column of the individual Surveillance Requirement. FREQUENCY does not include the 25% time allowance that is described in the INTERVAL definition. NOTE: See section 1.5, FREQUENCY, for actual defined FREQUENCY duration definitions.
IMMEDIATELY	IMMEDIATELY is used as a Completion Time when a Condition cannot be permitted to continue and the corresponding Required Action shall be initiated without delay and continuously pursued until completed.
IN-SERVICE INSPECTION	An inspection or verification to ensure the CRITICAL SAFETY FUNCTION(s) of Design Features are maintained.
INTERVAL	The INTERVAL is the maximum amount of time allowed for any given FREQUENCY. The INTERVAL is equivalent to 125% of the FREQUENCY.
MODE	FACILITY MODEs designate various distinguishable FACILITY conditions and are used with applicable operational limits to ensure an adequate level of safety while in each operating condition. The MODEs of operation for the FACILITIES in these TSRs are contained in Table 1.2-1.

NUCLEAR MATERIAL	The term used to describe the radioactive materials. For the purposes of these TSRs, the term NUCLEAR MATERIAL includes the material present in Pits, secondaries, RTGs, and Tritium reservoirs.
OPERABLE/ OPERABILITY	A system, subsystem, component, or device shall be OPERABLE when it is capable of performing its specified CRITICAL SAFETY FUNCTION(s) and when all necessary support equipment (e.g., instrumentation, controls, electrical power, lubrication, or other auxiliary equipment) required for the system, subsystem, component, or device to perform its specified CRITICAL SAFETY FUNCTION(s) is also capable of performing its related CRITICAL SAFETY FUNCTION(s). The OPERABILITY of a system, subsystem, component, or device shall be verified by performing Surveillance Requirements at the identified FREQUENCY.
RESIDUAL	The quantity of material allowed in a FACILITY in any MODE. RESIDUAL materials include any of the following: a) Radioactive contamination b) Sealed radioactive check sources c) Hazardous materials used in exempted, commercially available products as described in 10 CFR 30 Parts 30.11 through 30.19. d) Trace quantities of explosives visible to the unaided eye but not capable of being detonated.
SAFE AND STABLE CONFIGURATION	When NUCLEAR MATERIAL and/or EXPLOSIVES are in a configuration where the material is at rest and <u>not involved in ACTIVE OPERATIONS.</u> ACTIVE OPERATIONS may be required, as defined in plant approved procedures, to transition material to a SAFE AND STABLE CONFIGURATION. However, the ACTIVE OPERATIONS performed should be minimized to only those required to safe the material.
SECURED	A FACILITY is considered SECURED when it is unoccupied and the door locks are in place.
STAGING	The storage of NUCLEAR MATERIAL, EXPLOSIVES, or Nuclear Explosives in a FACILITY. Operations in support of STAGING consist of movement of material in APPROVED CONTAINERs into, out of, and within the FACILITY and safeguards verification activities that do not involve opening of containers.
TECHNICAL SAFETY REQUIREMENTS	Those requirements that define the conditions, safe boundaries, and the management or Administrative Controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. A TSR consists of Safety Limits, operating limits, Surveillance Requirements, Administrative Controls, use and application instructions, and the basis thereof. TSRs were formerly known as Operational Safety Requirements for nonreactor nuclear facilities and technical specifications for reactor facilities

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Table 1.2-1, Facility MODEs

MODE	Description
OPERATION	A MODE in which the FACILITY is capable of performing its intended operations with up to design basis quantities of NM and/or EXPLOSIVE materials.
LIMITED OPERATION	A MODE entered when an SSC is inoperable and operations outside the approved Actions are required to be performed. An action plan documenting the actions to be taken in this MODE is required to be completed and approved by the AAO Manager prior to entering this MODE. When a FACILITY is in this mode, all other LCOs required to be met for OPERATION MODE are still applicable. The time allowed to be in this MODE shall be specified in the approved action plan.
MAINTENANCE	A MODE in which ACTIVE OPERATIONS involving greater than RESIDUAL quantities of NM and/or EXPLOSIVE are not permitted. Operations involving greater than RESIDUAL quantities of NM and/or EXPLOSIVE are restricted to those involving STAGING and operations in support of STAGING. Operations may be performed in the FACILITY with RESIDUAL quantities of NM and/or EXPLOSIVE present.

(continued)

Table 1.2-1, Facility Modes
(continued)

REPAIR	A MODE in which no ACTIVE or STAGING operations in the FACILITY involving greater than RESIDUAL quantities of NM and/or EXPLOSIVE are conducted. The FACILITY does not contain greater than RESIDUAL quantities of NM and/or EXPLOSIVE. Operations may be performed in the FACILITY with RESIDUAL quantities of NM and/or EXPLOSIVE present.
STANDBY	A MODE in which a FACILITY is capable of performing its mission, but no operations, ACTIVE or STAGING, involving greater than RESIDUAL quantities of NM and/or EXPLOSIVE are conducted due to lack of production requirements. The FACILITY does not contain greater than RESIDUAL quantities of NM and/or EXPLOSIVE. Operations may be performed in the FACILITY with RESIDUAL quantities of NM and/or EXPLOSIVE present.
SHUTDOWN	A MODE in which no operations, ACTIVE or STAGING, are conducted in the FACILITY. The FACILITY does not contain greater than RESIDUAL quantities of NM and/or EXPLOSIVE. DOE approval is required before the FACILITY can be moved to any other MODE.

1.3 Logical Connectors

1.3.1 Purpose

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in this TSR to discriminate between, and yet connect, Conditions, Required Actions, Completion Times, surveillances, and FREQUENCIES. The only logical connectors that appear in the TSR are "**AND**" and "**OR**." The physical arrangement of these connectors constitutes logical conventions with specific meanings.

1.3.2 Description

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left-justified with the number of the Required Action). The successive logic levels are identified by additional digits of the Required Action number and by successive indention of the logical connectors.

When logical connectors are used to state a Condition, only the first level of logic is normally used. In this case, the logical connector is left justified with the Condition statement. In a few cases, successive levels of logic are used and are identified solely by indenting the logical connector, since subparts of a Condition statement are not numbered separately.

When logical connectors are used to state a Completion Time, surveillance, or FREQUENCY, only the first level of logic is used.

1.3.3 Examples

The following examples illustrate the use of logical connectors.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO is not met.	A.1 Verify . . . **AND** A.2 Restore . . .	

In this example, the logical connector "**AND**" is used to demonstrate that while in Condition A, both Required Actions A.1 and A.2 shall be completed.

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EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO is not met.	A.1 Trip . . . **OR** A.2.1 Verify . . . **AND** A.2.2.1 Reduce . . . **OR** A.2.2.2 Perform . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1 and A.2.1 are alternative choices. Only one of these choices shall be performed, as indicated by the use of the left justified logical connector "**OR.**" Either of these two Required Actions may be chosen. If Required Action A.2.1 is chosen, then Required Actions A.2.1 must be performed and either A.2.2.1 or A.2.2.2 must be performed.

1.4 Completion Times

1.4.1 Purpose

The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.

1.4.2 Background

LCOs specify minimum requirements for ensuring safe operation of the FACILITY. The ACTIONS section associated with an LCO states Actions required to address an identified Condition not meeting the LCO. One or more Required Actions and associated Completion Times are specified with each stated Condition.

1.4.3 Description

The Completion Time is the amount of time allowed for completing a Required Action. The Completion Time starts when it is determined that the FACILITY no longer meets an LCO statement and a Condition Statement is entered (e.g., INOPERABLE equipment or variable not within limits), provided the FACILITY is in a MODE with associated condition(s) stated in the Applicability section of the LCO. Required Actions shall be completed prior to the expiration of the specified Completion Time. A Condition remains in effect, and the Required Actions apply, until the Condition no longer exists or the FACILITY is not within the LCO Applicability.

If situations are discovered that require entry into more than one Condition at a time within a single LCO (multiple Conditions), the Required Actions for each Condition shall be performed within the associated Completion Time. When in multiple Conditions, separate Completion Times are tracked for each Condition, starting from the time of discovery of the situation that required entry into the Condition.

Once a Condition has been entered, subsequent equipment or variables expressed in the Condition found to be INOPERABLE or not within limits in a specific FACILITY, will not result in separate entry into the Condition and separate tracking of Completion Time for each discovery. The Required Actions of the Condition continue to apply to each failure, with the completion times based on initial entry into the Condition.

When "IMMEDIATELY" is used as a special Completion Time there is no definitive associated time frame for completing the Required Action. However, the Required Actions using "IMMEDIATELY" as a Completion Time shall be initiated without delay and continuously pursued until completed.

1.4.4 Examples

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions. It is assumed for this example that this LCO is applicable in OPERATION MODE.

EXAMPLE 1.4-1

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO is not met.	A.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION **AND** A.2 Place FACILITY in MAINTENANCE MODE	IMMEDIATELY 8 Hours

When the SSC of the LCO has been declared INOPERABLE, Condition A is entered. All ACTIVE OPERATIONS are to be suspended IMMEDIATELY. The FACILITY is to be placed in MAINTENANCE MODE within 8 Hours of entry into the action under Condition A.

1.5 FREQUENCY

1.5.1 Purpose

The purpose of this section is to define the proper use and application of FREQUENCY requirements.

1.5.2 Description

Each Surveillance Requirement (SR) has a specified FREQUENCY in which the surveillance shall be successfully met in order to meet the OPERABILITY requirements of the associated LCO. An understanding of the correct application of the specified FREQUENCY is necessary for compliance with the Surveillance Requirement.

1.5.3 Examples

The following examples illustrate the various ways that frequencies are specified. In these examples, the Applicable MODE is OPERATION.

<u>EXAMPLE 1.5-1</u>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.x.x.x	Perform a FUNCTIONAL TEST	WEEKLY

This example contains a FREQUENCY (WEEKLY) during which the associated surveillance shall be performed at least one time. The successful completion of a Surveillance initiates the subsequent FREQUENCY. Although the FREQUENCY is stated as WEEKLY, Surveillance Requirement 4.0.2 allows an extension of 25% of the stated FREQUENCY that is intended for operational flexibility both for scheduling and for performing surveillances. The 25% extension should be used on an "as-needed" basis and should not be considered as a "normally-relied-upon" time frame. The measurement of this Surveillance FREQUENCY/INTERVAL continues at all times, even when the Surveillance Requirement is not required to be met according to Surveillance Requirement 4.0.1 (such as when the equipment is INOPERABLE, a variable is outside of specified limits, or the FACILITY is outside the Applicability of the LCO). If a Surveillance Requirement is not performed within the INTERVAL, and the LCO is applicable, then Surveillance Requirement 4.0.3 becomes applicable. For Inservice Inspections, the stated FREQUENCY is also allowed to be extended 25% to result in an allowable INTERVAL.

If the INTERVAL specified by Surveillance Requirement 4.0.2 is exceeded but the FACILITY is in a MODE, with associated condition(s), for which the particular LCO is not applicable, performance of the Surveillance is NOT required. However, the Surveillance shall be performed prior to entry into a MODE with associated condition(s) for which the particular Surveillance is required. Failure to do so would violate Surveillance Requirement 4.0.4.

Special conditions may dictate when a Surveillance is to be met. These conditions apply to the Surveillance, the FREQUENCY, or both. They are "otherwise-stated" conditions allowed by Surveillance Requirement 4.0.1. They may be stated as clarifying notes in the Surveillance, the FREQUENCY, or both.

Surveillance Requirements are an integral part of the LCO and ensure compliance with the LCO. Inservice Inspections (ISIs) assure conformance with the associated Design Features. The Surveillances and ISIs are performed on a FREQUENCY schedule as specified in the FREQUENCY column of the individual Surveillance Requirement or ISI. The following table indicates each FREQUENCY and its meaning:

Notation	FREQUENCY	INTERVAL
SHIFTLY	Performed prior to beginning initial ACTIVE OPERATIONS within a shift or every 24 Hours for continuous operations.	N/A
WEEKLY	Performed 4 times a month	Not > 10 days
MONTHLY	Performed 12 times a year	Not > 38 days
QUARTERLY	Performed 4 times a year	Not > 114 days
SEMIANNUALLY	Performed 2 times a year	Not > 228 days
ANNUALLY	Performed once a year	Not > 456 days
(X) YEARS	Performed once every (X) years	Not > every (X) times 456 days

Section 2

Safety Limits

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2.0 SAFETY LIMITS

2.1 Safety Limits

2.1.1 As defined in Department of Energy (DOE) Order 5480.22, Safety Limits (SLs) are limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility function and which are found to be required to guard against the uncontrolled release of radioactivity and other hazardous materials. Presently, there are no authorized operations conducted that have a measurable process variable that, if exceeded, could cause the failure of a barrier that prevent uncontrolled release of radioactive material in excess of the off-site evaluation guidelines. Therefore, there have been no SLs identified within the TSR at this time.

Section 3/4

Operating Limits
and Surveillance Requirements

3/4 Limiting Control Settings and Limiting Conditions for Operations

Limiting Control Settings (LCSs) - are settings on Critical Safety Systems that control process variables to prevent exceeding a Safety Limit. As described in section 2.1, FACILITY evaluation of the operations performed in the PANTEX BIO in accordance with the established criteria determined that no Safety Limits were applicable. Therefore *there will be no Limiting Control Settings in this TSR* at this time.

Limiting Conditions for Operations (LCOs) - describe the lowest functional capability or performance level of Critical Safety structures, systems, component and their support systems required for normal safe operation of the FACILITY. Each separate limiting condition has an LCO statement with associated MODE Applicability, ACTION Statements, and Surveillance Requirements. The following generic LCOs are applicable at all times for each FACILITY in this document.

3.0 Generic LCOs

LCO 3.0.1 LCO statements shall be satisfied for the MODEs and associated conditions in the LCO Applicability, and applicable FACILITY(s) as listed in the Facility Listing Section of these TSRs, except as provided in LCO 3.0.2.

LCO 3.0.2 Upon discovery of a failure to satisfy an LCO statement, the associated Required Action(s) and associated Completion Time(s) shall be met, except as provided in LCO 3.0.6. If compliance with the associated LCO statement is restored or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated. Conditions in an LCO ACTIONS section may be concurrently applicable.

The Completion Time(s) for Required Action(s) are also applicable when a system or component is intentionally removed from service.

LCO 3.0.3 When an LCO statement is not satisfied and the associated Required Action(s) are not satisfied, or an associated Required Action is not provided, steps shall be initiated IMMEDIATELY, to place NM and EXPLOSIVES in the affected FACILITY in a SAFE AND STABLE CONFIGURATION and, if required, submit the action plan to transition the FACILITY to LIMITED OPERATION MODE. After the material has been place in a SAFE AND STABLE CONFIGURATION, the Facility Manager shall implement any other actions as deemed necessary to protect the material at risk from the event of concern in the affected area.

When actions are completed that permit operation in accordance with the LCO or its Required Action(s), completion of the Required Action specified by LCO 3.0.3 is not required.

LCO 3.0.3 is applicable in all MODEs. Exceptions to LCO 3.0.3 may be stated in the individual LCOs. LCO 3.0.3 shall not be interpreted to require placing a FACILITY in a higher MODE (e.g., requiring a FACILITY in MAINTENANCE to be placed in OPERATION).

LCO 3.0.4 Entry into any MODE and associated condition in the LCO Applicability shall not be made unless all LCOs that apply in that MODE are met, or unless the associated Required Action(s) permit continued Operation of the affected FACILITY in that MODE for an unlimited period of time. The FACILITY can only be moved between MODE(s) with permission of the Facility Manager.

LCO 3.0.5 Equipment removed from service or declared INOPERABLE in order to comply with Required Action(s) may be returned to service, under Administrative Control, to perform testing required to demonstrate OPERABILITY of the affected equipment or associated equipment. This LCO is an exception to LCO 3.0.2 for the system or component returned to service under Administrative Control to perform the testing required to demonstrate OPERABILITY.

LCO 3.0.6 When a support system is INOPERABLE and an LCO for that support system is specified in the TSR, the supported system is not required to be declared INOPERABLE due solely to support system INOPERABILITY. Only the Required Action(s) of the support system's LCO are required to be entered. This LCO is an exception to the definition of OPERABILITY. LCO 3.0.2 still applies to the supported system. Consideration shall be given to the impact on the CRITICAL SAFETY FUNCTION; and appropriate Required Action(s) shall be entered when the CRITICAL SAFETY FUNCTION of the supported system is lost.

When a support system is found to be INOPERABLE and there is not an LCO for that support system specified in the TSR, the impact of the INOPERABILITY or degradation of the support system's function on the OPERABILITY of the supported system shall be evaluated. Upon determination that the supported system is found to be INOPERABLE, the Required Action(s) of its LCO shall apply.

4.0 Generic Surveillance Requirements

Surveillance Requirements (SRs) identify surveillances required to be performed to ensure compliance with an LCO and associated FREQUENCY. The following generic Surveillance Requirements are applicable at all times for each FACILITY in this document.

SR 4.0.1 Surveillance Requirements shall be met for the MODEs and associated conditions unless otherwise stated in the Surveillance Requirement. Failure to meet a Surveillance Requirement within the specified INTERVAL shall constitute failure to meet the LCO, except as provided in Surveillance Requirement 4.0.3. Surveillance Requirements do not have to be performed on INOPERABLE equipment or variables outside specified limits on the surveillance. However, successful performance of applicable surveillances is necessary to return equipment to OPERABLE status.

SR 4.0.2 The INTERVAL of each Surveillance Requirement is met if the Surveillance Requirement is performed within 1.25 times of the FREQUENCY schedule as specified in the FREQUENCY column of the individual Surveillance Requirement. The 25% extension allowance is not applicable to non-periodic or conditional Surveillance Requirements. This extension is intended for operational flexibility both for scheduling and for performing surveillances. It should not be relied upon as a routine extension of the specified FREQUENCY.

SR 4.0.3 Failure to perform a Surveillance Requirement within the INTERVAL of Surveillance Requirement 4.0.2, as well as any failure to satisfy a Surveillance Requirement, shall constitute a failure to meet the OPERABILITY requirements of the LCO. The LCO ACTIONS shall be entered at the time it is determined that the Surveillance Requirement has not been performed or is not met, except as provided below.

If it is discovered that a Surveillance Requirement was not performed within the required INTERVAL, a delay period of 24 Hours or an additional period equivalent to the INTERVAL, whichever is less, is provided to permit completion of the Surveillance Requirement prior to requiring the ACTIONS to be entered.

Not performing a Surveillance Requirement within the allowed INTERVAL is a TSR violation. The delay period identified in this generic Surveillance Requirement only allows the FACILITY a period of time to demonstrate the OPERABILITY of the affected equipment; it does not remove the violation resulting from the missed Surveillance Requirement.

If the Surveillance Requirement is not performed within the delay period, entry into the applicable Required Action(s) occurs IMMEDIATELY upon expiration of the delay period. When the Surveillance Requirement is performed within the delay period and the Surveillance Requirement is not met, entry into the applicable Required Action(s) occurs IMMEDIATELY upon failure to meet the Surveillance Requirement. The delay period is not applicable to conditional Surveillance Requirements unless specifically noted in the FREQUENCY. Exceptions to the delay period of Surveillance Requirement 4.0.3 are stated in the individual Surveillance Requirements.

SR 4.0.4 Entry into any MODE and associated conditions in the Applicability of an LCO shall not be made unless the Surveillance Requirements for the applicable LCOs have been met.

Exceptions to Surveillance Requirement 4.0.4 may be stated in the individual Surveillance Requirements.

3/4.1 INTERLOCK SYSTEMS

3.1.1 12-44 EQUIPMENT BLAST DOOR INTERLOCK SYSTEM

LCO 3.1.1: The Cell Equipment Blast Door Interlock System shall be OPERABLE assuring that at least one Equipment Blast Door remains closed with the associated Blast Door Closure Pins engaged and Blast Door Floor Gasket down. The following CRITICAL SAFETY SSCs associated with each Equipment Blast Door shall be OPERABLE for the Equipment Blast Door Interlock System to be OPERABLE

- Pneumatic Control subsystem
  Note: An inoperable condition of this subsystem is the Reserve Tank Discharge Valve in the open position

- Electronic Control subsystem
  Note: An inoperable condition of this subsystem is the Maintenance Bypass Switch in the bypass position

- Blast Door Floor Gasket Assembly
  Note: The OPERABILITY of Blast Door Floor Gasket Assembly includes the OPERABILITY condition of the Blast Door Floor Gasket springs

- Blast Door Latching Assembly
  Note: The OPERABILITY of Blast Door Latching Assembly includes the OPERABILITY condition of the Latching Air Cylinder springs

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY
- MAINTENANCE — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY

Note: An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into any condition of this LCO, the FACILITY may be transitioned between OPERATION MODE and MAINTENANCE MODE at the discretion of the FM as long as the Required Actions and Completion Times are being met.

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LCO 3.1.1 ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more of the CRITICAL SAFETY SSCs listed in the LCO Statement above, except for the Reserve Tank Discharge Valve and the Maintenance Bypass Switch, are found to be INOPERABLE	A.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION until Action A.2 is implemented	IMMEDIATELY
	AND	
	A.2 ADMINISTRATIVELY CONTROL to assure that at least one Equipment Blast Door remains closed with Blast Door Closure Pins engaged and Blast Door Floor Gasket down at all times	IMMEDIATELY
	AND	
	A.3 Restore to OPERABLE	15 DAYS

(continued)

LCO 3.1.1 ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	Either Reserve Tank Discharge Valve of the Pneumatic Control subsystem is found opened	B.1	Close Reserve Tank Discharge Valve.	IMMEDIATELY
		OR		
		B.2.1	Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION until Action B.2.2 is implemented	IMMEDIATELY
			AND	
		B.2.2	ADMINISTRATIVELY CONTROL to assure that at least one Equipment Blast Door remains closed with Blast Door Closure Pins engaged and Blast Door Floor Gasket down at all times	IMMEDIATELY
			AND	
		B.2.3	Restore to OPERABLE	15 DAYS

(continued)

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LCO 3.1.1 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. A Maintenance Bypass Switch of the Electronic Control subsystem is found in the Bypass position	C.1 Return the Maintenance Bypass Switch to the non Bypass position	IMMEDIATELY
	OR	
	C.2.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION until Action C.2.2 is implemented	IMMEDIATELY
	AND	
	C.2.2 ADMINISTRATIVELY CONTROL to assure that at least one Equipment Blast Door remains closed with Blast Door Closure Pins engaged and Blast Door Floor Gasket down at all times	IMMEDIATELY
	AND	
	C.2.3 Restore to OPERABLE	15 DAYS

(continued)

LCO 3.1.1 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. If any of the Required Action(s) of Conditions A, B, or C can not be met	D.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	D.2 Continue to ADMINISTRATIVELY CONTROL the Equipment Blast Doors, if possible	N/A
	AND	
	D.3 Prohibit the introduction of additional NM or EXPLOSIVES into the FACILITY	N/A
	AND	
	D.4 Submit LIMITED OPERATION MODE Action Plan	15 DAYS
E. The Equipment Blast Doors are being ADMINISTRATIVELY CONTROLLED per Required Action A.2, B.2.2, or C.2.2	E.1 Continue to ADMINISTRATIVELY CONTROL the Equipment Blast Doors	N/A
	AND	
NOTE: The 15 Day Completion Time requirement to complete the Required Actions of either Condition A.3, B.2.3, or C.2.3 does not stop by entering this Condition	E.2 Operations, STAGING or ACTIVE, may be resumed	N/A

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LCO 3.1.1 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.1.1.1	FUNCTIONAL TEST the Equipment Blast Door Interlock System	SHIFTLY
SR 4.1.1.2	Visual Check the Reserve Tank Discharge Valve	SHIFTLY
SR 4.1.1.3	FUNCTIONAL TEST the Cell Equipment BDI System	SEMIANNUALLY
SR 4.1.1.4	Visual Inspect the Blast Door Floor Gasket Assembly	ANNUALLY
SR 4.1.1.5	Visual Inspect the Latching Air Cylinder Assembly	ANNUALLY

3/4.1 INTERLOCK SYSTEMS

3.1.2 12-85, 12-96, and 12-98 EQUIPMENT BLAST DOOR INTERLOCK SYSTEM

LCO 3.1.2: The Equipment Blast Door Interlock System shall be OPERABLE assuring that at least one Equipment Blast Door remains closed with the associated Blast Door Closure Pins engaged and Blast Door Floor Gasket down. The following CRITICAL SAFETY SSCs associated with each Equipment Blast Door shall be OPERABLE for the Equipment Blast Door Interlock System to be OPERABLE.

- Pneumatic control subsystem
- Electronic Control subsystem
  Note: An inoperable condition of this subsystem is the Maintenance Bypass Switch in the bypass position
- Blast Door Floor Gasket Assembly
  Note: The OPERABILITY of Blast Door Floor Gasket Assembly includes the OPERABILITY condition of the Blast Door Floor Gasket springs
- Blast Door Latching Assembly
  Note: The OPERABILITY of Blast Door Latching Assembly includes the OPERABILITY condition of the Latching Air Cylinder springs

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY
- MAINTENANCE — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY

Note: An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into any condition of this LCO, the FACILITY may be transitioned between OPERATION MODE and MAINTENANCE MODE at the discretion of the FM as long as the Required Actions and Completion Times are being met.

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LCO 3.1.2 ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more of the CRITICAL SAFETY SSCs listed in the LCO Statement above, except for the Maintenance Bypass Switch, are found to be INOPERABLE	A.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION until Action A.2 is implemented	IMMEDIATELY
	AND	
	A.2 ADMINISTRATIVELY CONTROL to assure that at least one Equipment Blast Door remains closed with Blast Door Closure Pins engaged and Blast Door Floor Gasket down at all times	IMMEDIATELY
	AND	
	A.3 Restore to OPERABLE	15 DAYS

(continued)

LCO 3.1.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. A Maintenance Bypass Switch of the Electronic Control subsystem is found in the Bypass position	B.1 Return the Maintenance Bypass Switch to the non Bypass position	IMMEDIATELY
	OR	
	B.2.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION until Action B.2.2 is implemented	IMMEDIATELY
	AND	
	B.2.2 ADMINISTRATIVELY CONTROL to assure that at least one Equipment Blast Door remains closed with Blast Door Closure Pins engaged and Blast Door Floor Gasket down at all times	IMMEDIATELY
	AND	
	B.2.3 Restore to OPERABLE	15 DAYS

(Continued)

LCO3.1.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. If any of the Required Action(s) of conditions A or B can not be met	C.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	C.2 Continue to ADMINISTRATIVELY CONTROL the Equipment Blast Doors, if possible	N/A
	AND	
	C.3 Prohibit the introduction of additional NM or EXPLOSIVES into the FACILITY	N/A
	AND	
	C.4 Submit LIMITED OPERATION MODE Action Plan	15 DAYS

(continued)

LCO 3.1.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. The Equipment Blast Doors are being ADMINISTRATIVELY CONTROLLED per Required Action A.2 or B.2.2	D.1 Continue to ADMINISTRATIVELY CONTROL the Equipment Blast Doors	N/A
	AND	
	D.2 Operations, STAGING or ACTIVE, may be resumed	N/A

LCO 3.1.2 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.1.2.1	FUNCTIONAL TEST the Equipment Blast Door Interlock System	SHIFTLY
SR 4.1.2.2	FUNCTIONAL TEST the Cell Equipment BDI System	SEMIANNUALLY
SR 4.1.2.3	Visual Inspect the Blast Door Floor Gasket Assembly	ANNUALLY
SR 4.1.2.4	Visual Inspect the Latching Air Cylinder Assembly	ANNUALLY

3/4.2 ELECTRICAL SYSTEMS

3.2.1 EMERGENCY LIGHTING SYSTEM

LCO 3.2.1: Emergency Lights within a Bay operation/staging area or Cell round room shall be OPERABLE with the following:

- All emergency lighting lamps OPERATIONAL
- A 30 minute backup power source

MODE APPLICABILITY:

- OPERATION When ACTIVE OPERATIONS involving greater than RESIDUAL quantities of HE are being conducted

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Only one Emergency Lighting lamp is found to be INOPERABLE Note: If only one emergency lamp exists in the affected area, Condition B must be entered when that lamp is found to be INOPERABLE	A.1 Place FACILITY in MAINTENANCE MODE	By the end of the current shift
B: More than one Emergency Lighting lamp is found to be INOPERABLE **<u>OR</u>** 30 Minute Backup Power Source found to be INOPERABLE	B.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION **<u>AND</u>** B.2 Place the FACILITY in the MAINTENANCE MODE	IMMEDIATELY 4 Hours

LCO 3.2.1 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.1.1	Visually Inspect all Emergency Lights	SHIFTLY
SR 4.2.1.2	FUNCTIONAL TEST Emergency Lights	MONTHLY
SR 4.2.1.3	FUNCTIONAL TEST Backup Power for the E-Lights	MONTHLY
SR 4.2.1.4	Verify Emergency Lights Operate on Backup Power	ANNUALLY

3/4.3 PROCESS SYSTEMS

3.3.2 CONTAMINATED WASTE ISOLATION VALVE SYSTEM

LCO 3.3.2: Contaminated Waste Isolation Valve (CWIV) shall remain closed with the Closed Indicator Light lighted. The following components shall remain OPERABLE:

- Contaminated Waste Isolation Valve
- Valve Closed Position Indication System

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY
- MAINTENANCE — When greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY

Note: An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A or D, the FACILITY may be transitioned between OPERATION MODE and MAINTENANCE MODE if directed by the Required Action as long as the other Required Actions and Completion Times are being met. When this LCO statement has not been met requiring entrance into condition B, the FACILITY may be transitioned from OPERATION MODE to MAINTENANCE MODE if directed by the Required Action as long as the other Required Actions and Completion Times are being met.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The CWIV Closure Indicator Light is not lighted	A.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	A.2 Verify that the CWIV is closed	IMMEDIATELY **AND** SHIFTLY thereafter until LCO is restored or no longer applies

(continued)

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LCO 3.3.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. The Contaminated Waste Isolation Valve is not closed	B.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	B.2 Place FACILITY in MAINTENANCE MODE	4 Hours
	AND	
	B.3 Restore Contaminated Waste Isolation Valve System to OPERABLE and confirm that the Closure Indicator Light is lighted	15 DAYS
C. If the Required Action(s) of Condition B can not be met	C.1 Submit LIMITED OPERATION MODE Action Plan	15 DAYS
D. The CWIV is being verified closed per Condition A	D.1 Continue to Verify the CWIV Closure per Required Action A.2	SHIFTLY until LCO is restored or no longer applies
	AND	
	D.2 ACTIVE OPERATIONS may be resumed	N/A

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LCO 3.3.2 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.3.2.1	Verify CWIV Closure Indicator Light is Lighted	SHIFTLY AND when water has been introduced into the sump.
SR 4.3.2.2	Verify the Valve Closed Position Indication System indicates the proper position of the CWIV	SEMIANNUALLY
SR 4.3.2.3	Interior Inspection of Valve	2 YEAR

3/4.4 FIRE PROTECTION SYSTEMS

3.4.1 WET PIPE FIRE SUPPRESSION SYSTEM

LCO 3.4.1: The Wet Pipe Fire Suppression System shall be OPERABLE with the following components:

- An unobstructed and intact Water Delivery System from the FACILITY PIV to the sprinkler heads
- OPERABLE High Pressure Fire Loop supplying adequate water supply at the FACILITY PIV
- Correct sprinkler heads properly installed.

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of NM or EXPLOSIVES are present (Note: Interlock/Interior Corridor Wet Pipe Suppression systems are only applicable when a NE in other than Configuration C or D is present in the Operations/Staging Area)
- MAINTENANCE — When greater than RESIDUAL quantities of NM or EXPLOSIVES are present (Note: Interlock/Interior Corridor Wet Pipe Suppression systems are only applicable when a NE in other than Configuration C or D is present in the Operations/Staging Area)

Note: An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A, B, C, D, or E, the FACILITY may be transitioned to MAINTENANCE MODE at the direction of the Action Statement or at the discretion of the FM as long as the Required Actions and Completion Times are being met.

LCO 3.4.1 ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The Wet Pipe Fire Suppression System is found to be INOPERABLE within a Bay or Special Purpose Operations/Staging Area	A.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	A.2 Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
	AND	
	A.3 Place affected FACILITY in MAINTENANCE MODE	4 Hours
	AND	
	A.4 Implement a FIRE PATROL in the affected Area	8 Hours
	AND	
	A.5 Implement a FIRE WATCH in the affected Area	48 Hours

(continued)

LCO 3.4.1 ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	The Wet Pipe Fire Suppression System is found to be INOPERABLE within a Bay Interlock	B.1	Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
		<u>AND</u>		
		B.2	Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
		<u>AND</u>		
		B.3	ADMINISTRATIVELY CONTROL the opening of the Inner Equipment Blast Door	IMMEDIATELY
		<u>AND</u>		
		B.4	Implement a FIRE PATROL for the affected interlock	8 Hours
C.	The Wet Pipe Fire Suppression System is found to be INOPERABLE within a Cell Staging Cubicle	C.1	Place all NM in the staging cubicle in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
		<u>AND</u>		
		C.2	Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
		<u>AND</u>		
		C.3	Implement a FIRE PATROL for the affected Staging Cubicle	8 Hours

(continued)

LCO 3.4.1 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. The Wet Pipe Fire Suppression System is found to be INOPERABLE within a FACILITY conducting STAGING Operations involving only NM (no EXPLOSIVES present)	D.1 Place all NM in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	D.2 Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
	AND	
	D.3 Implement a FIRE PATROL for the affected bay	8 Hours

LCO 3.4.1 Actions (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. The Wet Pipe Fire Suppression System is found to be INOPERABLE within a cell interior corridor	E.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	E.2 Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
	AND	
	E.3 Remove all exposed combustibles and flammables in the interior corridor from the line of site of the round room	8 Hours
	AND	
	E.4 Implement a FIRE PATROL for the affected area.	8 Hours
F. Actions are required to transfer FACILITY to MODE or condition in which the LCO does not apply	F.1 Submit LIMITED OPERATION MODE Action Plan	AS REQUIRED

LCO 3.4.1 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.4.1.1	Flow Test Main Drain	QUARTERLY
SR 4.4.1.2	Inspect Control Valves are in the Open Position and Locked	QUARTERLY
SR 4.4.1.3	Inspect Exterior (Alarm Valve) Riser/Trim	QUARTERLY
SR 4.4.1.4	Visually Inspect the Mechanical Condition of the Wet Pipe Fire Suppression System	ANNUALLY

3/4.4 FIRE PROTECTION SYSTEMS

3.4.2 DELUGE FIRE SUPPRESSION SYSTEM

LCO 3.4.2: The Deluge Fire Suppression System shall be capable of detecting a fire, actuating the system and spraying water on a FACILITY Fire. The Deluge Fire Suppression System shall be OPERABLE with:

- An unobstructed and intact Deluge Water Delivery System from the FACILITY PIV to the open sprinkler/nozzle
- An OPERABLE High Pressure Fire Loop supplying adequate water supply at the FACILITY PIV
- OPERABLE Heat Actuated Devices or Heat Detectors and Automatic Actuation System
- Correct sprinkler heads/nozzles properly installed

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of NM or EXPLOSIVES are present in a FACILITY
- MAINTENANCE — When greater than RESIDUAL quantities of NM or EXPLOSIVES are present in a FACILITY

Note: An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A or B, the FACILITY may be transitioned to MAINTENANCE MODE under the direction of the Action Statement.

LCO 3.4.2 ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The Deluge Fire Suppression System is found to be INOPERABLE and the Fire Detection and Alarm System is OPERABLE	A.1 Place all NM and EXPLOSIVES in SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	A.2 Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
	AND	
	A.3 Place FACILITY in MAINTENANCE MODE	4 Hours
	AND	
	A.4 Implement a FIRE WATCH for the affected Area	48 Hours

(continued)

LCO 3.4.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. The Deluge Fire Suppression System is found to be INOPERABLE and the Fire Detection and Alarm System is INOPERABLE	B.1 Place all NM and EXPLOSIVES in a SAFE AND STABLE CONFIGURATION	IMMEDIATELY
	AND	
	B.2 Implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area	IMMEDIATELY
	AND	
	B.3 Place the affected FACILITY in MAINTENANCE MODE	4 Hours
	AND	
	B.4 Implement a FIRE PATROL in the affected Area	8 Hours
	AND	
	B.5 Implement a FIRE WATCH in the affected Area	48 Hours

(continued)

LCO 3.4.2 ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Activities are required to transfer FACILITY to a MODE or condition for which the LCO does not apply	C.1 Submit the LIMITED OPERATION MODE Action Plan	AS REQUIRED

LCO 3.4.2 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.4.2.1	Flow Test Main Drain	QUARTERLY
SR 4.4.2.2	Inspect Control Valve is open and Locked	QUARTERLY
SR 4.4.2.3	Inspect Exterior (Deluge Valve) Riser/Trim	QUARTERLY
SR 4.4.2.4	Visually Inspect the Mechanical Condition of the Deluge Fire Suppression System	ANNUALLY
SR 4.4.2.5	Deluge Valve Trip Test	ANNUALLY
SR 4.4.2.6	Inspect Interior of Deluge Valves	ANNUALLY
SR 4.4.2.7	Full FUNCTIONAL TEST Deluge Automatic Initiation Devices	ANNUALLY

3/4.4 FIRE PROTECTION SYSTEMS

3.4.3 FIRE DETECTION AND ALARM SYSTEM

LCO 3.4.3: The Fire Detection and Alarm System shall be capable of detecting a fire, actuating the local fire alarms and notifying the Fire Department of an alarm at the FACP. The Fire Detection and Alarm System shall have OPERABLE:

- fire detection devices (Ultra Violet Flame Detectors, Area Smoke Detectors, Water Flow Alarms [Vane Type or Pressure Switch])
- local audible and/or visual alarm(s)
- fire alarm signal from the FACP to the Fire Department
- FACP Batteries and Associated Chargers to support local audible and/or visual alarm(s), signal from the FACP to the Fire Department, and deluge activation (excluding 12-44 Cells 2 through 6 for deluge activation only)
- FACP Components that support the detection devices, local alarms, and deluge valve controls

MODE APPLICABILITY:

- OPERATION — When greater than RESIDUAL quantities of NM and/or EXPLOSIVES are present in a FACILITY
- MAINTENANCE — When greater than RESIDUAL quantities of NM and/or EXPLOSIVES are present in a FACILITY

LCO 3.4.3 ACTIONS

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One or More Local Audible and/or Visible Alarms are found to be INOPERABLE	A.1	ADMINISTRATIVELY CONTROL the notification of FACILITY occupants of a fire	IMMEDIATELY
OR		**AND**		
	One or more of the Fire Detection Devices are found to be INOPERABLE	A.2	ADMINISTRATIVELY CONTROL the notification of the Fire Department of a fire, if detection devices are inoperable	8 Hours
		AND		
		A.3	Submit a LIMITED OPERATION MODE Action Plan	14 Days
B.	Fire Alarm Control Panel Battery(s) and/or Charger(s) are INOPERABLE	B.1	Restore system to operable	14 Days
		OR		
		B.2	Submit a LIMITED OPERATION MODE Action Plan	14 Days
C.	The Fire Department is incapable of receiving a Fire Alarm Signal from the FACP	C.1	ADMINISTRATIVELY CONTROL the notification of the Fire Department of a fire	8 Hours
		AND		
		C.2	Submit a LIMITED OPERATION MODE Action Plan	14 Days

LCO 3.4.3 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.4.3.1	Test Automatic Alarm Initiating Devices	ANNUALLY
SR 4.4.3.2	Test Fire Alarm Control Panel Batteries and Chargers	ANNUALLY
SR 4.4.3.3	Test Fire Alarm Control Panel Equipment	ANNUALLY
SR 4.4.3.4	Test Alarm Notification Devices (Operational)	ANNUALLY
SR 4.4.3.5	Test Fire Alarm Control Panel interface equipment circuitry	ANNUALLY
SR 4.4.3.6	Test Fire Alarm Signal from Fire Alarm Control Panel to Fire Department	ANNUALLY
SR 4.4.3.7	Test Area Smoke Detector Sensitivity	2 YEAR

3/4.4 FIRE PROTECTION SYSTEMS

3.4.4 HIGH PRESSURE FIRE LOOP

LCO 3.4.4: The High Pressure Fire Loop (HPFL) shall be OPERABLE with the following:

- Unobstructed and intact water delivery system from the tank(s) through the FACILITY PIVs
- One of the following minimum tank and pumping system configurations in Table 3.4.4-1

Table 3.4.4-1. Minimum HPFL Operations Configuration

	Building 15-24 Pump Station			Building 15-25 Pump Station		
Configuration	Tank	Electric Pump	Diesel Pump	Tank	Electric Pump	Diesel Pump
1	X	X	X			
2				X	X	X
3	X	X		X		X
4	X		X	X	X	
5	X		X	X		X

- To be considered OPERABLE, a tank shall contain a minimum of 166,800 gallons of water with an OPERABLE Water Level Alarm System
- A combined Pump System, with Automatic Start, to maintain discharge of at least 1,190 gpm at 115 psi at the Building 12-99 Bays 1, 3, and 5-9 PIVs

MODE APPLICABILITY: At all times

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LCO 3.4.4 ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. High Pressure Fire Loop System is found to be INOPERABLE **OR** An automatic start, except during testing, of one or more HPFL pump(s) occurs as a result of detecting Low Pressure within the High Pressure Fire Loop System.	A.1 Fire Department shall determine which FACILITY(s) Fire Suppression Systems are affected and notify the respective FACILITY Managers via Operations Center	IMMEDIATELY
	AND	
	A.2 On receipt of notification from the Fire Department, the FACILITY Manager of the affected FACILITY shall declare the FACILITY(s) Fire Suppression System(s) INOPERABLE and enter the appropriate LCO Action Statements	IMMEDIATELY
B. Water Level Alarm System Indicator is found to be INOPERABLE	B.1 Manually verify tank level	IMMEDIATELY **AND** SHIFTLY thereafter
	AND	
	B.2.1 Repair Water Level Alarm System Indicator	30 Days
	OR	
	B.2.2 Enter Condition A	30 Days

LCO 3.4.4 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.4.4.1	Inspect Fire Pump System	WEEKLY
SR 4.4.4.2	Test Fire Pump OPERABILITY	WEEKLY
SR 4.4.4.3	Inspect the Fire Pump Electrical and Diesel Systems	WEEKLY
SR 4.4.4.4	Inspect Water Supply Control Valves (position Open and Locked)	QUARTERLY
SR 4.4.4.5	Test Tank Water Level Alarm Indicators	SEMIANNUALLY
SR 4.4.4.6	Fire Pump Flow Test	ANNUALLY
SR 4.4.4.7	FUNCTIONAL Test of Post Indicator Valves (PIVs)	ANNUALLY
SR 4.4.4.8	Flow Test of Underground Piping	5 YEARS

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Section 5

Administrative Controls

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5.1 Purpose

The purpose of the Administrative Controls (ACs) is to state the provisions relating to organization and management, procedures, record keeping, review and audit, reporting, and safety control programs necessary to ensure safe operation in accordance with the TSRs.

The administrative control programs shall meet the applicable portions and revisions of authorizing documents as specified in the Pantex S/RIDs. These TSRs do not impart any additional order requirements not contained in the S/RIDs.

5.2 Management Responsibilities

The Plant Manager shall be responsible for the overall safe operation and management of the FACILITY(s) and shall have control over those activities necessary for safe operation of the FACILITY(s). The Plant Manager can formally designate, in writing, the succession to this responsibility. The Plant Manager or designee shall ensure that the operation of the FACILITY(s) is in accordance with approved TSRs and that On-Call Support Personnel are assigned and that technical support personnel will be available to provide technical assistance to the production staff.

The Plant Manager delegates the responsibility for FACILITY operations to a Division Manager of a FACILITY, which in turn delegates to a Facility Manager. In accordance with this safety chain of command, the responsibilities of the Facility Manager or designee:

(1) Coordinates contractor activities in the building
(2) Maintains copies of current building standards, procedures, and safety documentation
(3) Reviews/performs management walkthroughs
(4) Directs FACILITY MODE changes
(5) Ensures that material limits do not exceed those specified in section 5.6.13
(6) Follows Pantex Conduct of Operations Manual
(7) Supports building preventive maintenance, predictive maintenance, and surveillance schedules.

5.2.1 Staffing Requirements

The following represents the minimum staffing required to support the commitments made within the TSRs:

- One Plant Shift Superintendent directing overall Plant activities from the Operations Center at all times (except during emergency situations inside the OC, when the function of the Plant Shift Superintendent is transferred to an alternate location)
- One Facility Manager or alternate when ACTIVE OPERATIONS with NM are being conducted in a FACILITY
- One Operations Supervisor for ACTIVE OPERATIONS in a FACILITY.
- Adequately staffed plant Fire Department available at all times

5.3 Technical Safety Requirements Application

5.3.1 General

The TSR shall:

(1) Be prepared, independently reviewed, and approved in accordance with DOE Order 5480.22.

(2) Define the controls to ensure that the FACILITY remains within the operations defined in the BIO.

(3) Be complied with except for reasonable action taken (as defined in section 5.3.6) in an emergency when this action is immediately needed to protect the public health and safety and when action consistent with the TSRs is not immediately apparent

(4) Be procedurally controlled to require that changes are:

  (a) Prepared with a submittal package, including a description of the revision, justification for the change, and supporting analyses

  (b) Reviewed by the Management and Operations (M&O) Contractor

  (c) Approved by DOE prior to incorporation and implementation of the TSR change. NOTE: Changes to the TSR bases do not require DOE approval if they meet the conditions of Section 5.3.5.

5.3.2 Compliance

The contractor is responsible for ensuring that the requirements of the TSRs are met. Compliance shall be demonstrated by:

(1) Operating within the LCOs during their Applicability

(2) Operating within the Actions of LCOs when required

(3) Performing all SRs as required

(4) Establishing, implementing, and maintaining the required ACs

5.3.3 Violation of a TSR

Violations of a TSR occur as the result of the following:

(1) Failure to perform an ACTION within the required Completion Time after:

   (a) Failing to meet an LCO Statement

   OR

   (b) Failing to successfully meet an SR

(2) Failure to perform a Surveillance within the required INTERVAL

(3) Failure to comply with an AC Specific Requirement

(4) A systematic breakdown of an AC Programmatic Requirement

5.3.4 Response to TSR Violations

5.3.4.1 Response to an LCO Violation

If an LCO is violated, as defined by Criterion 1 of Section 5.3.3, proceed as follows:

(1) Place the facility in a safe condition by entering LCO 3.0.3

(2) Notify the DOE of the violation in accordance with DOE O 232.1

(3) Prepare an Occurrence Report in accordance with DOE O 232.1.

5.3.4.2 Response to a Surveillance Requirement Violation

If a SR has not been performed within the required INTERVAL, (Criterion 2 of Section 5.3.3) proceed as follows:

(1) Enter SR 4.0.3 and complete the SR within 24 Hours, or an additional period equivalent to the INTERVAL (whichever is less), of discovery

 (a) If the SR is successfully met, exit SR 4.0.3 and continue operation in a compliant condition.

 Note: Actions 2 and 3 must still be completed

 (b) If the SR is not successfully met, enter the ACTIONS of the applicable LCO.

 Note: Actions 2 and 3 must still be completed

(2) Notify the DOE of the violation in accordance with DOE O 232.1.

(3) Prepare an Occurrence Report in accordance with DOE O 232.1.

5.3.4.3 Response to an AC Specific Requirement Violation

If an AC Specific Requirement is violated, as defined by Criterion 3 of Section 5.3.3, proceed as follows:

(1) Perform initial actions to bring the material to a SAFE AND STABLE CONFIGURATION as specified in procedural implementation of the AC Specific Requirement
(2) Notify DOE of the violation in accordance with DOE O 232.1.
(3) Prepare an Occurrence Report in accordance with DOE O 232.1.
(4) Prepare a recovery plan describing the steps leading to compliance with the AC Specific Requirement.

5.3.4.4 Response to an AC Programmatic Requirement Violation

A deficiency in executing an AC Programmatic Requirement is a procedural violation, not a violation of a TSR or TSR program. The identified deficiency must impact the CRITICAL SAFETY FUNCTION of the AC Programmatic Requirement.

If an individual deficiency within an AC Programmatic Requirement is discovered, proceed as follows:

(1) Notify DOE of the procedural violation in accordance with DOE O 232.1.
(2) Prepare an Off-Normal Occurrence Report in accordance with DOE O 232.1.
(3) Conduct an assessment to determine the stability of the program containing the requirement, if deemed necessary.

If the program is determined to have had a systematic breakdown, then proceed as follows:

(1) Notify DOE of the AC violation in accordance with DOE O 232.1
(2) Prepare an Occurrence Report in accordance with DOE O 232.1
(3) Prepare a recovery plan describing the steps leading to compliance with the AC

5.5.2 Reviews

5.5.2.1 Independent Reviews

Reviews shall be conducted by a group independent of Facility Management. These reviews shall sample all applicable functional areas to assess level of performance, ensure adherence to applicable DOE directives and regulatory requirements, as defined in the contractor requirements, and evaluate the adequacy of the ongoing self-assessment program..

5.5.2.2 Authorization Basis Change Control Committee (ABCCC)

An ABCCC shall be established to advise the Plant Management on the adequacy of proposed Authorization Basis (AB) changes requiring DOE approval. The charter of this committee shall specify, at a minimum, the functions, organizational representation, and responsibilities of the personnel that contribute to this committee.

5.5.3 Audits

An audit program shall be established, implemented and maintained to ensure that the plant is being operated in accordance with the TSRs and other operating contract requirements.

5.6 Programs

5.6.1 General

This section contains the commitments for the programs necessary to preserve assumptions made in the analysis. There are two classifications of ADMINISTRATIVE CONTROLS (ACs): AC Programmatic Requirements and AC Specific Requirements. The following sections discuss both of these.

5.6.1.1 ADMINISTRATIVE CONTROL Specific Requirements

AC Specific Requirements are those requirements that have been credited to prevent or mitigate accidents resulting in consequences that could exceed the Safety Class or Safety Significant evaluation Criteria. Only AC program elements indicated to be AC Specific Requirements are considered as such. If an element is not directly stated to be an AC Specific Requirement, then it shall be considered a general element of the AC program, and thus an AC Programmatic Requirement

5.6.1.2 ADMINISTRATIVE CONTROL Programmatic Requirements

AC Programmatic Requirements are elements of AC programs generically applied in the hazards and accident analyses. The programs and programmatic elements that define the AC Programmatic Requirements encompass a large number of details that are discussed in the BIO. If an individual deficiency of an AC Programmatic Requirement is discovered, it is not necessarily considered a violation of a TSR or the TSR program. The requirements contained in Sections 5.2 through 5.5 are considered AC Programmatic Requirements.

5.6.2 Staff Qualification and Training Program

A Staff Qualification and Training Program shall be established and implemented to ensure that FACILITY staff performing TSR related activities or operations with NUCLEAR MATERIAL are provided sufficient training to be qualified or certified for their positions. This program shall meet established training and qualification requirements of DOE Order 5480.20A and the associated contract requirements.

Procedures shall be in place to implement the Staff Qualification and Training Program requirements such as:

- All personnel who perform operations on NEs shall be trained on the two person program
- All personnel who perform operations with NUCLEAR MATERIAL or TSR related activities shall be trained in their assigned activities
- Training records shall be maintained on required training

The Staff Qualification and Training Program is considered an AC Programmatic Requirement.

5.6.3 Fire Protection Program

A Fire Protection Program shall be established, implemented, and maintained for control of FACILITY fire protection in accordance with the contractual requirements cited in the Pantex S/RIDs. The elements of the Fire Protection Program shall be considered AC Programmatic Requirements.

The Fire Protection Program shall include the following AC programmatic requirements:

- preparing and maintaining Fire Hazard Analysis (FHA) for each nuclear FACILITY
- establishing and maintaining combustible, flammable, and ignition controls for all FACILITIES. In addition, NE Bays and NE Cells conducting Conventional High Explosive (HE) weapons assembly/disassembly operations shall have either of the following elements in order to reduce the potential for thermal ignition of the HE:
  - quantity and distance requirements for staged process combustibles identified and maintained (per the requirements of the Nuclear Explosives Fire Protection Criteria for the Pantex Plant, Amarillo, Texas, October 30, 1998) or
  - containerization of the process combustibles in a combustible storage container approved by Fire Protection Engineering.

  (Note: Process combustibles are combustible materials required in the performance of a process. These materials are required to be specified in process-specific procedures (i.e., NEOPs). Process combustibles include, but are not limited to, boxes of Kimwipes, boxes of gloves, swabs, orange sticks, solvents, liquids, paints, and adhesives. Although not specifically listed in the process-specific procedure, tooling boxes containing tooling that is required by the process are considered process combustibles.)
- evaluating any changes to the process combustible loading for impact against the established combustible loading requirements
- establishing and maintaining Fire Department Response criteria
- establishing and maintaining requirements for performing a FIRE WATCH or FIRE PATROL

In addition, the Fire Protection Program shall establish the controls associated with the use of flammable liquids in FACILITIES containing NM or EXPLOSIVES in greater than RESIDUAL quantities. Where feasible, non-flammable liquids shall be substituted as approved by the contractor and design agencies. If the flammable liquid can not be eliminated, one or more of the following controls shall be established, as determined by Fire Protection Engineering in accordance with the Fire Protection Program

- The possibility of electrostatic discharge shall be minimized, (examples may include gloves that reduce the buildup of static charge on the wearer, bonding techniques, touch-off procedures).
- Drying times shall be provided to ensure that ignition sources in the area of flammable vapors are controlled after and during use of flammable liquids prior to proceeding with other operations, on weapons or components, that could provide an ignition source in an area of flammable vapors.
- To ensure ignition controls are appropriately incorporated, all operations conducted during drying times within the established flammable liquid standoff distances shall be approved by Fire Protection Engineering with the following exception: additional flammable liquid application within the same standoff area.

The Fire Protection Program shall also establishing requirements for performing a FIRE WATCH or FIRE PATROL to include the following attributes:

Personnel performing a FIRE PATROL shall:

- ensure the minimization of combustible and ignition sources on initial performance of the FIRE PATROL
- be aware of the impaired state of the FACILITY Fire Protection System(s)
- be aware of FACILITY fire suppression actuation methods
- be educated in the use of portable fire extinguishers and methods to notify pertinent FACILITY and Fire Department personnel in the event of a fire
- enter the affected area at least once evry 4 hours to monitor for the fire or signs of fire

- Personnel performing a FIRE WATCH shall:
  - continuously monitor the area for signs of fire
  - have an approved portable fire extinguisher available at all times
  - be aware of the impaired state of the FACILITY Fire Protection System(s)
  - be aware of FACILITY fire suppression actuation methods
  - be trained in the use of portable fire extinguishers
  - be trained in how to notify pertinent FACILITY and Fire Department personnel in the event of a fire
  - perform no duties other than that of FIRE WATCH

5.6.3.1 12-44 Cell 8 Combustible Loading

The combustible loading for 12-44 Cell 8 is an AC Specific Requirement. This AC Specific Requirement is applicable when pits are present in Building 12-44 Cell 8.

5.6.4 Explosive Safety Program

An Explosive Safety Program shall be established, implemented and maintained in accordance with the contractual requirements cited in the Pantex S/RIDs for operations and activities involving the development, testing, handling, and processing of EXPLOSIVES or assemblies containing EXPLOSIVES.

Procedures shall be in place to implement the Explosive Safety Program AC Programmatic Requirements such as:

- Class II level of protection, as defined in the DOE Explosive Safety Manual, shall be provided for personnel in occupied areas
- EXPLOSIVES shall be stored in APPROVED CONTAINERS when not in use
- Administratively controlling the amount of EXPLOSIVES within the AB Limits.
- Identifying configuration of EXPLOSIVES that are considered CASED HE
- Ensure changes to EXPLOSIVES limits for all Facilities are maintained within the assumptions of the Authorization Basis

5.6.4.1 Explosive Safety Program AC Specific Requirements

A minimum 3-foot separation between UNCASED HE and walls common to two FACILITIES (12-84 Bays 2 through 8) is an AC Specific Requirement.

Maintaining at least one blast door per corridor in a Nuclear Explosive Bay (excluding 12-64) closed at all times is an AC Specific Requirement. For Building 12-64, maintaining at least one set of blast doors per corridor closed at all times is an AC Specific Requirement. These requirements are applicable when NM and/or EXPLOSIVES are present in the FACILITY in greater than RESIDUAL quantities. If the specific situation has been evaluated through the Explosive Safety Program to show that Class II levels of protection have been met through alternate means, then a door (or set of doors) is not required to be closed at all times. However, the duration the doors are open is to be be minimized.

5.6.5 Lightning Protection Program

The Lightning Protection Program will be developed and inserted at a later date.

5.6.6 Preventive Maintenance Program

A Preventive Maintenance Program shall be established, implemented and maintained in accordance with the contractual requirements cited in the Pantex S/RIDs. This program shall identify the applicable SSCs and preventive maintenance actions and establish the required intervals for these actions.

Procedures shall be maintained and followed to identify the AC Programmatic Requirements for a Preventive Maintenance Program such as:

- establishing SSCs to be included in the program.
- establishing the maintenance to be performed
- establishing the required intervals for the preventive maintenance

There are no AC Specific Requirements for the Preventive Maintenance Program.

5.6.7 Configuration Management Program

A Configuration Management Program shall be established, implemented, and maintained to meet the configuration elements captured by the contractual requirements cited in the Pantex S/RIDs. This program shall be maintained and followed to identify the requirements for CRITICAL SAFETY SSC configuration management.

Procedures shall be maintained and followed that identify the AC Programmatic Requirements for the Configuration Management Program such as:

- ensuring all changes to CRITICAL SAFETY SSCs are reviewed for an impact to the safety basis, approved, and authorized prior to being implemented
- ensuring all changes to CRITICAL SAFETY SSCs' controlled documentation are reviewed, approved, and distributed prior to operations commencing
- ensuring Critical Safety requirements are identified, incorporated into flow down documentation, and implemented at the shop floor level.

There are no AC Specific Requirements for the Configuration Management Program.

5.6.8 NM Storage, Handling, and Shipping Program

An NM Storage, Handling, and Shipping Program shall be established, implemented and maintained to define the requirements for the storage, handling and shipping of radioactive materials. Procedures shall be in place to implement the AC Programmatic Requirements of the NM Storage, Handling, and Shipping Program such as:

- NM shall be staged and shipped in APPROVED CONTAINERS
- NM is kept inside APPROVED CONTAINERS unless involved in operations requiring the handling of bare NM
- Forklifts are not allowed in Building 12-64 Weapons Staging Bays.
- Only approved forklifts are allowed in Nuclear FACILITY(s) containing greater than RESIDUAL quantities of NM
- All NE or NM movements must be scheduled, coordinated, and controlled
- Use of squib valve shorting plugs on tritium reservoirs, when staging tritium bottles with squib valves
- Tritium reservoirs are not permanently staged at Pantex if the limited life has expired

There are no AC Specific Requirements for the NM Storage, Handling, and Shipping Program.

5.6.9 APPROVED CONTAINER and Storage System Program

A program shall be established, implemented and maintained that identifies and qualifies containers for handling of NUCLEAR MATERIAL and EXPLOSIVES at Pantex Plant. Procedures shall be in place to implement the following AC Specific Requirements of the APPROVED CONTAINER and Storage System Program

- Containers are identified and qualified for use in nuclear FACILITIES and activities on Pantex Plant.
- APPROVED CONTAINERS are captured in approved Pantex manuals, standards, and procedures.

5.6.10 Severe Weather Program

A program shall be established, implemented and maintained to detect adverse weather conditions (i.e., tornado) and notify personnel performing operations requiring actions to be taken in severe weather. Procedures shall be in place to implement Severe Weather Program AC Programmatic Requirements such as:

- develop and implement a criteria for determining the conditions that require a severe storm warning to be issued (i.e., weather conditions that indicate a high risk of a tornado)
- implement methods to detect an approaching storm and to issue a severe storm warning when the weather conditions exceed the criteria
- implement a severe storm warning program to require sensitive operations / equipment be identified and operating procedures be developed to provide steps to stop those operations when a severe storm warning is issued.

Procedures shall be in place to implement the following AC Specific Requirements:

5.6.10.1 Building 12-41

Upon receipt of a severe storm warning, activities shall be initiated to remove NE from Building 12-41 and place in a SAFE AND STABLE CONFIGURATION within a FACILITY that provides protection to the NE from the event of concern.

5.6.10.2 Zone 4

Upon receipt of a severe storm warning, activities shall be initiated to close the Zone 4 Storage Facilities. This AC specific requirement is applicable when NM and/or EXPLOSIVES are present in a magazine.

5.6.10.3 Transportation

Upon receipt of a severe storm warning, NEs involved in transportation and not contained in a NE transportation trailer shall be IMMEDIATELY placed into a FACILITY that provides protection to the NE from the event of concern or back into the NE transportation trailer.

5.6.11 Radiation Safety Program

A Radiation Safety Program shall be maintained to control the radiation exposure of employees, subcontractors, visitors, and members of the general public as committed in the contractual requirements cited in the Pantex S/RIDs.

Procedures shall be in place to implement the Radiation Safety Program AC Programmatic Requirements such as:

(1) Ensure that individual and collective radiation exposures will be minimized through the following programs:
   (a) As low as reasonably achievable (ALARA) program
   (b) Radiation work permit (RWP) program.

(2) Ensure that radioactive contamination of personnel, areas, and equipment shall be minimized through a radioactive contamination control program

(3) Ensure that operations involving NM are monitored by radiation protection instrumentation (e.g., Alpha and Tritium CAMS), as required.

(4) Ensure the operation of radiation generating devices are operated in accordance with industry standards

There are no AC Specific Requirements for the Radiation Safety program.

5.6.12 Criticality Safety Program

A Criticality Safety Program shall be established, implemented, and maintained to meet the requirements of DOE Orders 420.1 and the associated contract requirements. The program shall be a formal, documented system for controlling nuclear criticality safety parameters and their analysis, basis, identification, and verification.

For purposes of this AC Program, bare fissile components/assemblies are fissile material components/assemblies in greater than RESIDUAL quantities that are removed from their respective NE unit or DOE APPROVED CONTAINER. In addition, pits in sealed insert vessels not surrounded by AL-R8 overpack are to be controlled as bare pits with respect to criticality controls.

The following elements of the Criticality Safety Program are AC Programmatic Requirements:

(1) Use inherently safe process designs that control one or more of the factors affecting criticality.

(2) Perform NCS reviews, evaluations, and walkdowns for new, existing, and modified operations with fissile material in greater than RESIDUAL quantities.

(3) Maintain appropriate controls for onsite transportation and staging of fissile materials.

5.6.12.1 Stacking Requirements

All Criticality Safety Program stacking requirements are AC Specific Requirements. These requirements are applicable when a FACILITY contains bare fissile material.

The prohibition of stacking bare fissile component/assemblies is an AC Specific Requirement.

Fissile components/assemblies in APPROVED CONTAINERS shall be restricted to configurations specifically analyzed and approved by Criticality Safety. This is an AC Specific Requirement.

5.6.12.2 Handling Requirements

All Criticality Safety Program handling requirements are AC Specific Requirements. These requirements are applicable whenever fissile material in greater than RESIDUAL quantities is present in the facility.

- Parts containing fissile materials in greater than RESIDUAL quantities shall not be submerged in cleaning mixtures or other liquids, except as explicitly instructed by the program-specific operating procedure.

- If components/assemblies containing fissile material in greater than RESIDUAL quantities are damaged such that the fissile material or cladding may be breached, cease operations and follow the approved Operating Procedure. Notify the Operations Center immediately.

- Bays or cells that do not contain EXPLOSIVES are allowed to concurrently conduct bare fissile material operations and staging operations involving more than twelve containerized fissile material items provided a Nuclear Criticality Safety (NCS) approved physical barrier is used to prevent physical co-mingling of the above operations.

- Plutonium pits shall not be intermixed with other types of fissile material components/assemblies in greater than RESIDUAL quanties within a staging array.

5.6.12.3 Criticality Limits

Table 5.6.12.3-1 identifies the allowed fissile configurations that can be out of DOE APPROVED CONTAINERS at the same time in a bay or cell. The limits contained in Table 5.6.12.3-1 are to be used in conjunction with, but never exceed, the limits set by the NM and EXPLOSIVES Inventory Control Program. These limits are considered AC Specific Requirements and are applicable whenever fissile material is present in the FACILITY in greater than RESIDUAL quantities.

Table 5.6.12.3-1. Allowed Types of Bare Fissile Items[1]

Fissile Material Type	Maximum Limit
Pits (excluding W48)	6 pits
Pits (W48 or W48 with others)	4 pits
OROs	12 OROs
OROs & Pits (same program)	Total of 12. w/ no more than 6 pits
OROs & Pits (mixed programs)	Operations will be analyzed in accordance with the Criticality Safety Program as required.

Note (1): For the purposes of this table, Oralloy pits are counted as plutonium pits.

5.6.13 NUCLEAR MATERIAL and EXPLOSIVES Inventory Control Program

An NM and EXPLOSIVES Inventory Control Program shall be established, implemented and maintained to ensure the FACILITY material inventory limits contained in the following tables are not exceeded.

An NM and EXPLOSIVES Inventory Control limits table is given for each FACILITY or group of FACILITIES with identical limits. A FACILITY may be in any one of the allowable configurations identified in the table.

For the pit staging FACILITIES, accident analysis conservatively assumes all material in a pit is weapons grade plutonium. Based on this assumption, is it not necessary to specifically control any of the materials associated with a pit other than Pu-239 where only pits are being staged. The U-235 limits listed in the tables are for controlling the presence of U-235 in components other than pits.

In addition to specific material limits, the configurations of Nuclear Explosives allowed to be present in the facility are also specified. These configurations are defined as follows

- Configuration A – CASED EXPLOSIVEs or UNCASED IHE with a plutonium-containing pit assembly
- Configuration B – UNCASED EXPLOSIVEs with Oralloy pit assembly or UNCASED HE with a plutonium-containing pit assembly
- Configuration C – Fully assembled outer case
- Configuration D – Ultimate user configuration

The material limits and the associated configurations and restrictions contained in the in the remainder of this section are considered AC Specific Requirements.

The following restrictions apply generically to all the listed FACILITIES:

- Mixtures of HE and IHE are subject to the HE inventory limits
- Inventory limits do not include items which make up RESIDUAL materials

5.6.13.1 Nuclear Explosive Bays

The following items are generic to Nuclear Explosive Bays:

- UNCASED HE may not be present in a bay containing Pu. HE, in conjunction with Pu and/or weapons components, is permitted in bays provided the HE is in an unopened APPROVED CONTAINER. Only operations in conjunction with staging are permitted in this situation.
- APPROVED CONTAINERs containing HE may not be opened when staged with U-235.

5.6.13.1.1 Building 12-64

Table 5.6.13.1-1. Building 12-64 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Bays	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
1-17	0	600	0	0	0	1.4 EXPLOSIVES can be present
1-17	100	0	1000	0	0	
1	25	100	1000	20	390	
2, 4	25	100	1000	50	390	
3	25	100	1000	140	390	
5-17	25	100	1000	230	390	
13-17	25 per compart-ment	100 per bay	1000 per bay	105 per compart-ment	105 per compart-ment	These limits are only allowable when the bay contains a Sandbag Barrier System, as described in TP 20-7. Weapons staging must be in accordance with TP 20-7. Up to 5 Compartments per bay
1	0	0	3000	20	390	
2, 4	0	0	3000	50	390	
3	0	0	3000	140	390	
5-17	0	0	3000	230	390	

The following restrictions apply:

NEs present in Building 12-64 must be in Configurations C or D

5.6.13.1.2 Building 12-84

Table 5.6.13.1-2. Building 12-84 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Bays	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
2-9, 11-20	100	0	1000	0	0	
2-9, 11-20	25	100	1000	300	390	
2-9, 11-20	0	0	3000	300	390	
1, 10	25	100	1000	300	390	Radiography Operations Only EXPLOSIVEs that are part of a partially or completely assembled NE or NE component are allowed while NM is present.

The following restrictions apply:

NEs present in Building 12-84 must be in Configurations A, C or D.

5.6.13.1.3 Building 12-99

Table 5.6.13.1-3. Building 12-99 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Bays	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
1-9	100	0	1000	0	0	
1-9	25	100	1000	300	390	
1-9	0	0	3000	300	390	

The following restrictions apply:

NEs present in Building 12-99 must be in Configurations A, C or D.

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5.6.13.1.4 Building 12-104

Table 5.6.13.1-4. Building 12-104 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Bays	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
1-16	100	0	1000	0	0	
1-16	25	100	1000	300	390	
1-16	0	0	3000	300	390	

The following restrictions apply:

NEs present in Building 12-104 must be in Configurations A, C or D.

5.6.13.2 Nuclear Explosive Cells (12-44 Cells 2-6, 12-85, 12-96, and 12-98 Cells 1-4)

The following items are generic to Nuclear Explosive Cells

- Pu-239 limits in a cell apply to total of both the round room and cubicle(s).
- Plutonium in a cell cubicle shall be staged in APPROVED CONTAINERS, within the marked area unless the containers are being moved into or out of a cell.
- Main Charge EXPLOSIVES may only be staged in the round room.
- Limits in Table 5.6.13.2-1 shall be used in conjunction with the weapons program specific cell dispersion report (RPT-MIS-163913) to ensure site evaluation criteria are not exceeded.
- NEs in Configurations A, B, C, or D are allowed in the NE Cells

Table 5.6.13.2-1. Nuclear Explosive Cells NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Cells	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
All Cells	0	0	3000	No Main Charge		
All Cells	30	100	1000	423	550	
All Cells	130	0	1000	0	0	

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5.6.13.3 Nuclear Explosive Special Purpose Facilities

5.6.13.3.1 Building 12-41

Table 5.6.13.3-1. Building 12-41 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
12-41	25	40	1000	430	800	

The following restrictions apply:

- Mixtures of EXPLOSIVES and NM are only allowed as NEs in Configurations C or D

5.6.13.3.2 Building 12-50

Table 5.6.13.3-2. Building 12-50 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
12-50	6	20	1000	60	78	

The following restrictions apply:

- No UNCASED HE allowed.
- No NEs are allowed in the control or mechanical equipment room.
- Only EXPLOSIVEs contained in Configuration C or D NEs are allowd to be staged in Building 12-50.
- Mixtures of EXPLOSIVES and NM are only allowed as NEs in Configurations C or D.

5.6.13.3.3 Building 12-60

Table 5.6.13.3-3. Building 12-60 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
12-60 Bay 1	25	20	1000	50	300	
12-60 Bay 2	25	20	1000	50	300	
12-60 Bays 3-6	25	20	1000	50	300	
12-60 Bays 3-6	0	0	3000	No Main Charge		

The following restrictions apply:

- Only one NE allowed in Building 12-60 Bay 2
- No NEs allowed in Bay 2 during setup, balancing, and removal of POI fixture and during maintenance of the Dynamic Balancer
- No NEs are allowed in the control or mechanical equipment room.
- No W-62 main charge is allowed in Building 12-60 Bay 2.
- Mixtures of EXPLOSIVES & NM are only allowed as NEs in Configurations C or D

5.6.13.4 Zone 12 Staging

5.6.13.4.1 Building 12-26 PV

Table 5.6.13.4-1. Building 12-26 PV NM and EXPLOSIVES Inventory Limits

	Radionuclides		EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	HE	IHE	Comments
12-26 PV	1008	0	0	0	

The following restrictions apply:

- The containers in the Building 12-26 PV are not opened during operations conducted within the vault.

5.6.13.4.2 Building 12-42 NV

Table 5.6.13.4-2. Building 12-42 NV NM and EXPLOSIVES Inventory Limits

	Radionuclides		EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	HE	IHE	Comments
12-42 NV	0	0	0	0	Only Pu-238 is allowed

The following restrictions apply:

- All Pu-238 must be in an APPROVED CONTAINER

Note: Containerized Pu-238 is not considered material at risk, and therefore may be staged in quantities up to the physical limit of the FACILITY.

5.6.13.4.3 Building 12-44 Cell 8

Table 5.6.13.4-3. Building 12-44 Cell 8 NM and EXPLOSIVES Inventory Limits

	Radionuclides		EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	HE	IHE	Comments
12-44 Cell 8	2184	0	0	0	

The following restrictions apply:

- No more than 20 pits, in APPROVED CONTAINERS, are allowed in the Building 12-44 Cell 8 equipment passageway.
- No more than 336 pits are allowed in Building 12-44 Cell 8, including pits both inside and outside containers.
- Only Pits containing plutonium may be staged in Building 12-44 Cell 8.
- Inert Pits may be used for training purposes in Building 12-44 Cell 8 without restrictions.

5.6.13.4.4 Building 12-58 Bays 4 and 5

Table 5.6.13.4-4. Building 12-58 Bays 4 and 5 NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Facility	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
12-58 Bays 4, 5	0	0	4300	No Main Charge		

5.6.13.5 Zone 4 Staging Facilities

A Modified Richmond (M-R) or a Steel Arch Construction (SAC) magazine may be categorized as either of the following:

- Nuclear explosive magazines – These facilities shall only contain NE assemblies, NELAs, and ORO components. For a M-R, the entire magazine is considered a NE magazine when either side is used for staging NELAs.
- Special nuclear material magazines – These facilities may contain a combination of either Pits and RTGs, or, ORO components and RTGs. Pits and ORO components shall not be staged together.

The following ACs are generic to Zone 4 Staging Facilities

- Bulk EXPLOSIVES are not allowed in the Zone 4 Staging Facilities
- There are no specific limits on the quantity of pits, ORO components, or RTGs that can be placed in a Zone 4 Staging Facility.
- If all NE assemblies in a magazine are IHE systems only, there are no limits on either Pu or IHE.
- Zone 4 Staging Facilities may contain Stage Right or planar array staging configurations for pits
- Mixtures of EXPLOSIVES & NM are only allowed as NEs and/or NELAs in Configurations C or D

5.6.13.5.1 4-19, 4-21, 4-25, 4-30 to 4-44 Modified Richmonds

Table 5.6.13.5-1. M-R (4-19, 4-21, 4-25, 4-30 to 4-44) NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Configuration	Pu-239 (kg)	Tritium (g)	U-235 (kg)	HE	IHE	Comments
Open	0	No Limit	No Limit	2000	No Limit	
Open	No Limit	0	No Limit	0	0	
Open	No Limit	No Limit	No Limit	0	0	

Note: Containerized Pu-238 is not considered material at risk, and therefore may be staged in quantities up to the physical limit of the FACILITY.

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5.6.13.5.2 4-101 to 4-142 SAC

Table 5.6.13.5-2. SAC(4-101 to 4-142) NM and EXPLOSIVES Inventory Limits

	Radionuclides			EXPLOSIVES (lbs.)		
Configuration	Pu-239	Tritium	U-235	HE	IHE	Comments
Open	No Limit	No Limit	No Limit	0	No Limit	
Open	30	No Limit	No Limit	2000	No Limit	
Open	No Limit	No Limit	No Limit	0	0	
Compartmented	30	No Limit	No Limit	210 or 105	No Limit	HE limits for compartments are program specific and specified in TP 20-7 Limits are per compartment

Note: Containerized Pu-238 is not considered material at risk, and therefore may be staged in quantities up to the physical limit of the FACILITY.

5.6.14 Quality Assurance Program

A program shall be established and implemented for control of the FACILITY quality assurance that is consistent with the contractual requirements cited in the Pantex S/RIDs. The facility QA program shall:

(a) Be implemented through written procedures and instructions
(b) Be applicable to construction, operation, maintenance, and design
(c) Require that sufficient records be maintained to preserve the technical baseline documentation
(d) Support individual audit verification requirements to determine compliance with the site Quality Assurance Program

There are no AC Specific Requirements for the Quality Assurance Program.

5.6.15 Emergency Response Program

An Emergency Response Program shall be developed and implemented based on the contractual requirements cited in the Pantex S/RIDs. The site emergency plan shall define specific measures, policies, and actions to prevent or minimize injuries, damage to property, and an impact on the environment caused by accidents, natural disasters, or deliberate damage within the area of responsibility. DOE Orders and Site Emergency Planning shall be implemented through the Pantex Plant Emergency Management Plan.

There are no AC Specific Requirements for the Emergency Response Program.

5.6.16 In-service Inspection Program

An In-service Inspection (ISI) Program shall be established, implemented, and maintained. This program shall ensure the TSR Design Features' ISIs are performed as prescribed in Appendix B of these TSRs. The ISI Program shall, at a minimum,

- Establish procedures for performing ISIs for design features
- Establish procedures for actions to be taken on discovery of a nonconformance of a Design Feature as identified through the ISIs

There are no AC Specific Requirements for the In-service Inspection Program.

5.6.17 Procedures Program

Procedures shall be established, implemented and maintained to address NE operations, NUCLEAR MATERIAL operations, and the controls and programs captured in these TSRs. Procedures shall be approved by defined management levels. All changes to procedures that implement TSR requirements are evaluated against current Safety Basis documents to ensure the changes do not affect the safety envelope.

Procedures shall be in place to

- define NE and NUCLEAR MATERIAL operations
- implement the AC programmatic and specific requirements contained in these TSRs
- implement the SRs specified in the LCOs

There are no AC Specific Requirements for the Procedures Program.

5.6.18 Interim Cell Personnel Door Control Program

An Administrative Control Program shall be established and implemented to maintain the personnel swinging leaf door closed whenever both HE and Pu are present within the FACILITY in greater than RESIDUAL quantities except for brief periods.

Procedures shall be in place to implement the following AC Specific Requirement:

- administratively control the personnel doors for 12-44 Cells 3 and 4, 12-85, and 12-98 Cell 4 to ensure that the time for the personnel doors to be in the opened position is limited to as short a time as reasonably possible whenever there is both Pu and HE in greater than RESIDUAL Quantities in the FACILITY.

This AC Specific Requirement is applicable whenever Pu and HE are present in the FACILITY.

5.6.19 Surveillance Program

A Surveillance Program shall be established, implemented, and maintained. This program shall ensure the LCO Surveillance Requirements of the LCOs are performed as described in the LCOs and their bases.

There are no AC Specific Requirements for the Surveillance Program.

5.6.20 Pantex Operating Records Program

The following records shall be retained for the FACILITY(s) covered by these TSRs for a period as defined by the specific program requiring the records

(1) Records and logs of facility operation
(2) Records and logs of maintenance activities, inspections, repairs, and replacements of CRITICAL SAFETY SSCs
(3) Reportable events/occurrences
(4) Records of surveillance activities, inspections, and calibrations required by TSRs
(5) Records of changes made to procedures
(6) Records and drawing changes reflecting facility design modifications made to systems and equipment described in the Authorization Basis Documents
(7) Records of radiation exposure for all individuals entering radiologically controlled areas
(8) Records of facility tests and experiments
(9) Records of training and qualification for personnel as required by the Staff Qualification and Training Program
(10) Records of USQ screens and determinations performed for changes made to CRITICAL SAFETY SSCs or for tests and experiments .

There are no AC Specific Requirements for the Pantex Operating Records Program.

5.6.21 Unreviewed Safety Question Program

A program shall be established, implemented, and maintained for USQEs, based on the contractual requirements cited in the Pantex S/RIDs.

There are no AC Specific Requirements for the Unreviewed Safety Question Program.

5.6.22 Ramp Traffic Control Program

A program be established, implemented, and maintained covering the transportation of NEs in the ramps. This program shall, at a minimum, provide for a walker spotter to accompany all NE transportation. The walker spotter shall provide the following functions:

- serve as spotter during transportation
- accompany NE during transport and assure the NE travels at normal walking speed
- observe all approaching traffic and warn material handler or production technician of any hazards, obstacles, or blind corners they may encounter and
- stop oncoming traffic while weapon passes or until weapon is inside facility or in NE transportation trailer. If multiple NE movements meet, the associated walker spotters will direct movements.
- wear an orange/red flourescent vest identifiable and be visible to oncoming traffic.

The provision of a walker spotter accomplishing the above functions is an AC Specific Requirement of the Ramp Traffic Control Program. The walker spotter has the authority to direct personnel and vehicle traffic during material moves to ensure safety is maintained.

Appendix A

Bases

B3/4.0 APPLICABILITY

B3.0 Bases for Limiting Control Settings and Limiting Conditions for Operation

BASES

GENERAL	These generic LIMITING CONDITIONS FOR OPERATION (LCOs) establish the general requirements applicable to all LCOs in this document. These requirements are based on DOE Order 5480.22, "Technical Safety Requirements."
LCO 3.0.1	LCO 3.0.1 establishes the Applicability statement within each LCO as the requirement for conformance to the LCO statement for safe Operation of the FACILITY (i.e., when the FACILITY is in the MODEs and associated conditions of the Applicability statement of each LCO). LCO 3.0.2 establishes the exception for requiring each LCO to be met.

(continued)

BASES(Continued)

LCO 3.0.2

LCO 3.0.2 establishes that, upon discovery of a failure to meet an LCO statement, the associated Required Action(s) shall be met. The Completion Time of each Required Action for a given Condition is applicable from the point in time that the Condition is discovered. The Required Action(s) establish those remedial measures that shall be taken within specified Completion Times when the requirements of an LCO statement are not met. The purpose of this specification is to clarify the following:

a. Implementation of the Required Action(s) within the specified Completion Time(s) constitutes compliance with an LCO, and

b. Completion of the remedial measures of the Required Action(s) is not required when compliance with an LCO is restored, unless otherwise specified.

Conditions in an LCO ACTIONS section may be concurrently applicable. For example, an LCO that requires two systems to be OPERABLE will typically have a Condition addressing the situation where one system is found to be INOPERABLE and another Condition addressing the situation where both systems are found to be INOPERABLE. When both systems are found to be INOPERABLE, both Conditions are applicable concurrently. The effect of this requirement is to ensure that the Completion Times associated with the Conditions are tracked correctly.

The Completion Times for the Required Action(s) are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the Required Action(s) include, but are not limited to, performance of Surveillance Requirements, preventive maintenance, corrective maintenance, or investigation of operational problems.

The "Discovering" amplification is to better define when an INOPERABLE condition is to be declared and TSR Action Statements are to be entered. It was determined that several of the Required Actions within this document must have a Completion time of IMMEDIATELY. It is important to know precisely when the discovery took place to determine if the Required Actions where, "initiated without delay and continuously pursued until completed." It is to be clear that once an INOPERABLE Condition has been discovered, requiring entry into a Required Action with a Completion Time of IMMEDIATELY, that any delay of action taken thereafter, without proper justification, until the Required Action has been satisfied, may be considered not meeting the Required Action time requirements and a TSR violation.

(Continued)

LCO 3.0.3

LCO 3.0.3 establishes the Required Actions that shall be implemented when an LCO statement is not satisfied and when one of the following conditions occurs:

a. An associated Required Action is not satisfied in the specified Completion Time, and no other Condition applies, or

b. The associated ACTIONS section does not specifically address the Condition.

This LCO requires that the NM and Explosives in an affected FACILITY(S) be placed in SAFE AND STABLE CONFIGURATION and the Facility Manager shall implement any other actions deemed necessary to protect the material at risk from the event of concern in the affected area. If applicable, a Limited Operation Action Plan be submitted to the DOE if the limits for operation, as defined by the LCO and its ACTIONS section, cannot be met or associated Required Actions are not provided. This Required Action shall be initiated IMMEDIATELY. The use of IMMEDIATELY is necessary in order to place the FACILITY into the safest condition possible while a plan can be developed and appropriate actions taken.

The actions documented in LCO 3.0.3 may be terminated and LCO 3.0.3 exited if any of the following occurs:

a. The LCO statement is now met.

b. A Condition exists for which the Required Actions have now been performed.

c. Required Actions exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time LCO 3.0.3 is exited.

Exceptions to LCO 3.0.3 may be provided in instances where the proscribed actions would not provide appropriate remedial measures for the associated condition of the FACILITY. Also, LCO 3.0.3 shall not be interpreted to require placing a FACILITY in a higher MODE (e.g., requiring a move from MAINTENANCE to OPERATION).

(continued)

LCO 3.0.4

LCO 3.0.4 establishes limitations for MODE changes when an LCO statement is not met. It precludes placing the FACILITY in a different MODE when the following exist:

a. The requirements of an LCO for that MODE have not been met, and

b. Continued noncompliance with these requirements would result in the FACILITY being placed in a MODE and associated condition in which the LCO does not apply to comply with the Required Action(s).

This LCO ensures that the operational activities within the FACILITY are not initiated when corrective action is being taken.

Compliance with Required Action(s) that permit continued Operation of the FACILITY for an unlimited period of time provides an acceptable level of safety for continued operation without regard to the status of the FACILITY before or after a MODE change. Therefore, in this case, entry into a MODE or other Condition may be made in accordance with the provisions of the applicable Required Action(s). The provisions of this LCO should not be interpreted as endorsing the failure to exercise good Operating practice in restoring systems or components to OPERABLE status before beginning Operations.

The provisions of LCO 3.0.4 shall not prevent changes in MODEs and associated conditions in the Applicability that are required to comply with Required Actions. In addition, the provisions of LCO 3.0.4 shall not prevent changes in MODEs and associated conditions in the Applicability that result from a normal shutdown. When a FACILITY is to be removed from operation to comply with Required Action(s), LCO 3.0.4 does not apply if it would delay placing the FACILITY in a lower MODE.

Exceptions to LCO 3.0.4 are stated in the individual LCOs. Exceptions may apply to all the Required Actions or to a specific Required Action. Where exceptions to LCO 3.0.4 are specified, they remove the capability to rely on Required Actions for an unlimited period of time before entry into a MODE and they require compliance with the LCO prior to entry into the MODE.

(continued)

LCO 3.0.4 (continued)	When changing MODEs while in a Required Action's Condition, in compliance with LCO 3.0.4, or where an exception to LCO 3.0.4 is stated, the Required Actions define the remedial measures that apply. Surveillances do not have to be performed on the associated INOPERABLE equipment (or on variables outside the specified limits), as permitted by Surveillance Requirement 4.0.1. Therefore, a change in MODE and associated condition in this situation does not violate Surveillance Requirement 4.0.1 or Surveillance Requirement 4.0.4 for those surveillances that do not have to be performed due to the associated INOPERABLE equipment. However, Surveillance Requirements shall be met to demonstrate OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.
LCO 3.0.5	LCO 3.0.5 establishes criteria to allow testing of equipment removed from service or declared INOPERABLE to comply with Required Action(s). This LCO provides an exception to LCO 3.0.2 to allow testing to demonstrate one of the following: a. OPERABILITY of the equipment being returned to service, or b. OPERABILITY of other equipment. It is reasonable to allow such testing to be conducted under Administrative Control to prove OPERABILITY and to return equipment to service. Typically, the return of equipment to service places the FACILITY in a more reliable and, therefore, safer condition. The return of equipment to service to test OPERABILITY shall be performed in accordance with approved procedures. Approved procedures are controlled administratively by the Administrative Controls Section of this TSR. The Administrative Controls are to ensure that the time the equipment is returned to service in conflict with the requirements of the Required Actions is limited to the time absolutely necessary to perform the allowed Surveillance Requirements. This LCO does not provide time to perform any other preventive or corrective maintenance.

(continued)

BASES (continued)

SR 4.0.3 (continued)

Surveillance Requirement 4.0.3 is not to be used to allow a MODE change prohibited by Surveillance Requirement 4.0.4.

Failure to comply with specified frequencies for Surveillance Requirements is expected to be an infrequent occurrence. Use of the delay period established by Surveillance Requirement 4.0.3 is a flexibility that is not intended to be used as an operational convenience to extend surveillance intervals.

If a surveillance is not completed within the allowed delay period, then the equipment is considered INOPERABLE, or the variable is considered outside the specified limits, and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. When the surveillance is performed and the acceptance criteria are not met within the delay period, then the equipment is considered INOPERABLE, or the variable is considered outside the specified limits, and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the surveillance.

Completion of the surveillance within the delay period allowed by this LCO restores compliance with Surveillance Requirement 4.0.1.

(continued)

BASES (continued)

SR 4.0.4

Surveillance Requirement 4.0.4 establishes the requirement that all applicable Surveillance Requirements shall be met before entry into a MODE and associated condition in the Applicability statement. The purpose of this requirement is to ensure that system and component OPERABILITY requirements, or parameter limits, are met before they apply. Unless otherwise stated, the required Surveillance Requirements shall have been performed within their specified FREQUENCY prior to a change in MODE.

The precise requirements for performance of Surveillance Requirements are specified such that exceptions to Surveillance Requirement 4.0.4 should not be necessary. The specific time frames and conditions necessary for meeting the Surveillance Requirements are specified in the FREQUENCY, in the surveillance, or both. This Surveillance Requirement allows performance of surveillances when the prerequisite condition(s) specified in a surveillance procedure require entry into the MODE prior to the performance or completion of a surveillance. A surveillance that could not be performed until after entering the LCO Applicability would have its FREQUENCY specified such that it is not "due" until the specific conditions needed are met.

The Surveillance Requirements are annotated consistent with the requirements of Section 1.5, FREQUENCY, of this TSR.

B3/4.1 INTERLOCK SYSTEMS

3.1.1 12-44 EQUIPMENT BLAST DOOR INTERLOCK SYSTEM

BASES

BACKGROUND SUMMARY	A steel Equipment Blast Door is located at each end of a cell equipment passage way. The Equipment Blast Doors are considered part of the Facility Structure and are in place to limit the leak path following an EXPLOSIVE detonation inside the cell. The Equipment Blast Door Interlock (BDI) System supports the CRITICAL SAFETY FUNCTION of the Facility Structure by ensuring that at least one Equipment Blast Door is closed at all times when the system is OPERABLE.
APPLICATION TO SAFETY ANALYSIS	The Equipment BDI System is credited with supporting the Facility Structure integrity of Cells 2 through 6 of Building 12-44 by ensuring that at least one Equipment Blast Door is closed and latched at all times when greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY. By supporting the Facility Structure, the system mitigates the consequences of a High Explosive Detonation with Dispersion event by limiting the leak path. The Equipment BDI System also ensures the Blast Door Floor Gasket on a closed door is in the lowered position. The Blast Door Floor Gasket in the lowered position is credited with reducing the leak area around the equipment doors.

(Continued)

LCO

This LCO requires that 12-44 (Cells 2 through 6) Equipment Blast Door Interlock System be OPERABLE. The following subsystems must be operable for the Equipment Blast Door System to be OPERABLE:

- Pneumatic Control Subsystem
- Electronic Control Subsystem
- Blast Door Floor Gasket Assembly
- Blast Door Latching Assembly

Pneumatic Control Subsystem – The Pneumatic Control Subsystem consists of the Latching Air Cylinder, Gasket Air Cylinder, Electro-Pneumatic Solenoid Valve, Spool Valve, Reserve Tank Discharge Valve, and interconnecting tubing. The Reserve Tank Discharge Valve is specifically noted because its failure alone makes the BDI System INOPERABLE. For a Reserve Tank Discharge Valve to be OPERABLE, it must be in the closed position isolating the Reserve Tank from the Latching Air Cylinder and the Gasket Air Cylinder.

Electronic Control Subsystem – The Electronic Control Subsystem consists of the Control Panel, Blast Door Latching Rod Position Detector, Electromagnetic Lock/Magnetic Bond Sensor, Blast Door Interlock Relay, Maintenance Bypass Switch, and the connecting circuits. The Maintenance Bypass Switch is specifically noted because its failure alone makes the BDI System INOPERABLE. For a Maintenance Bypass Switch to be OPERABLE, it must not be preventing the energizing of the BDI Relay. A Maintenance Bypass Switch in the bypass position prevents the energizing of the BDI Relay and thus makes the system INOPERABLE.

Blast Door Floor Gasket Assembly – The Blast Door Floor Gasket Assembly consists of the Blast Door Floor Gasket and the Gasket Air Cylinder Rod. The OPERABILITY of the Blast Door Floor Gasket Assembly requires that the Blast Door Floor Gasket lower into position when a blast door closes. For the Blast Door Floor Gasket Assembly to be OPERABLE, the Floor Gasket Springs must be OPERABLE.

Blast Door Latching Assembly – The Blast Door Latching Assembly consists of the Latching Rod Pin and the Blast Door Latching Rod. The OPERABILITY of the Blast Door Latching Assembly requires the Blast Door Latching Air Cylinder Springs extend the Latching Rod when the Latching Air Cylinder is vented. The Blast Door Latching Assembly maintains the Blast Door Rebound Pins engaged through a mechanical connection to ensure the doors remain in the closed position during the rebound response of the blast doors following an internal detonation.

(Continued)

LCO 3.1.1 BASES (continued)

D.2 Condition D was entered because the Required Actions of Condition A, B, or C could not be met. It is therefore assumed that all Required Actions of Condition A, B, C are no longer being followed. During the transition from Condition A, B, or C to Condition D there is no requirement to remove any material from the affected FACILITY so it is assumed that the original material still remains. Because the inventory remains, the CRITICAL SAFETY FUNCTION is still required. It is for this reason that Required Action D.3 is necessary to assure that the Equipment Blast Doors Continue to be ADMINISTRATIVELY CONTROLLED. The Completion Time remains N/A because it is unsure how long it will take to transition to the LIMITED OPERATION MODE, and the action is performed that entire time.

The exception to this is if Required Action D was entered because the doors could not be ADMINISTRATIVELY CONTROLLED. If this is the case, then this action is not applicable.

D.3 At this point the FACILITY has been unable to return the Blast Door Interlock System to an OPERABLE status. The next Required Action (D.4) is to submit the LIMITED OPERATION MODE Action Plan. The introduction of additional NM or EXPLOSIVES into the FACILITY is to be prohibited while transitioning to the LIMITED OPERATION MODE. This Required Action is necessary as to not contribute to the material of concern within the FACILITY. The Completion time of N/A is appropriate for this Required Action because this is actually "non-action." As such there is no start time or completion time. From the time the Condition is entered until the time the condition is exited, the introduction of any additional NM or EXPLOSIVES into the FACILITY is prohibited.

D.4 If the Blast Door Interlock System can not be restored to OPERABLE, LIMITED OPERATION MODE Action Plan shall be submitted to restore the CRITICAL SAFETY FUNCTION of the system or to transition the FACILITY to a condition for which the LCO is no longer applicable.

E.1 & E.2 Once the Equipment Blast Doors are being ADMINISTRATIVELY CONTROLLED in accordance with Required Action A.2, B.2.2, or C.2.2, operations may be continued. Since the CRITICAL SAFETY FUNCTION provided by the Equipment BDI System has been re-established, operation may be continued while the Equipment BDIs are being repaired. If necessary, the FACILITY may be transitioned to OPERATION MODE, in accordance with the exception to LCO 3.0.4 stated in the Mode Applicability to allow for operations to be performed while the doors are being ADMINISTRATIVELY CONTROLLED. The Completion Time of N/A is allowable because the actions are only required if resuming operations is desired.

NOTE: It must be understood that entry into Condition E does not cancel the 15 Day Completion Time requirement for restoring the BDI System to OPERABLE required by Condition(s) A, B, or C.

(continued)

B3/4.1 INTERLOCK SYSTEMS

3.1.2 12-85, 12-96, and 12-98 EQUIPMENT BLAST DOOR INTERLOCK SYSTEM

LCO 3.1.2 BASES

BACKGROUND SUMMARY	A steel Equipment Blast Door is located at each end of a cell equipment passage way. The Equipment Blast Doors are considered part of the Facility Structure and are in place to limit the leak path following an EXPLOSIVE detonation inside the cell. The Equipment Blast Door Interlock (BDI) System supports the CRITICAL SAFETY FUNCTION of the Facility Structure by ensuring that at least one Equipment Blast Door is closed at all times when the system is OPERABLE.
APPLICATION TO SAFETY ANALYSIS	The Equipment BDI System is credited with supporting the Facility Structure integrity of the cells in Buildings 12-85, 12-96, and 12-98 by ensuring that at least one Equipment Blast Door is closed and latched at all times when greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY. By supporting the Facility Structure, the system mitigates the consequences of a High Explosive Detonation with Dispersion event by limiting the leak path. The Equipment BDI System also ensures the Blast Door Floor Gasket on a closed door is in the lowered position. The Blast Door Floor Gasket in the lowered position is credited with reducing the leak area around the equipment doors.

(Continued)

LCO

This LCO requires that the 12-85, 12-96, and 12-98 (Cells 1 through 4) Equipment Blast Door Interlock System be OPERABLE. The following subsystems must be operable for the Equipment Blast Door System to be OPERABLE:

- Pneumatic Control Subsystem
- Electronic Control Subsystem
- Blast Door Floor Gasket Assembly
- Blast Door Latching Assembly

Pneumatic Control Subsystem – The Pneumatic Control Subsystem consists of the Latching Air Cylinder, Gasket Air Cylinder, Electro-Pneumatic Solenoid Valve, Spool Valve, and interconnecting tubing.

Electronic Control Subsystem – The Electronic Control Subsystem consists of the Control Panel, Blast Door Latching Rod Position Detector, Blast Door Interlock Relay, Maintenance Bypass Switch, and the connecting circuits. The Maintenance Bypass Switch is specifically noted because its failure alone makes the BDI System INOPERABLE. For a Maintenance Bypass Switch to be OPERABLE, it must not be preventing the energizing of the BDI Relay. A Maintenance Bypass Switch in the bypass position prevents the energizing of the BDI Relay and thus makes the system INOPERABLE.

Blast Door Floor Gasket Assembly – The Blast Door Floor Gasket Assembly consists of the Blast Door Floor Gasket and the Gasket Air Cylinder Rod. The OPERABILITY of the Blast Door Floor Gasket Assembly requires that the Blast Door Floor Gasket lower into position when a blast door closes. For the Blast Door Floor Gasket Assembly to be OPERABLE, the Floor Gasket Springs must be OPERABLE.

Blast Door Latching Assembly – The Blast Door Latching Assembly consists of the Latching Rod Pin and the Blast Door Latching Rod. The OPERABILITY of the Blast Door Latching Assembly requires the Blast Door Latching Air Cylinder Springs extend the Latching Rod when the Latching Air Cylinder is vented. The Blast Door Latching Assembly maintains the Blast Door Rebound Pins engaged through a mechanical connection to ensure the doors remain in the closed position during the rebound response of the blast doors following an internal detonation.

(Continued)

MODE APPLICABILITY

The Equipment Blast Door Interlock System is required to protect against a High Explosive Detonation with Dispersion event inside a cell. System OPERABILITY is required at times when this event can happen. Therefore, this LCO is applicable in OPERATION and MAINTENANCE MODES when greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY.

An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A, B or D, the FACILITY may be transitioned between OPERATION MODE and MAINTENANCE MODE at the discretion of the FM as long as the Required Actions and Completion Times are being met. This is acceptable based on the CRITICAL SAFETY FUNCTION of the BDI is being met through the compensatory action of ADMINISTRATIVELY CONTROLLING the operation of the blast doors such that only one is open with the blast pins retracted at a time. Thus the CRITICAL SAFETY FUNCTION of the blast doors (containment) is also preserved.

(continued)

ACTION STATEMENTS	A.1	Being CRITICAL SAFETY SSCs, if one of either the Electronic Control or the Pneumatic Control subsystem(s) or the Blast Door Floor Gasket Assembly or the Blast Door Latching Assembly are INOPERABLE, the Blast Door Closure Pins and the Floor Gaskets may be allowed to be disengaged on both Equipment Blast Doors at the same time. Once one or more of these SSCs are declared to be INOPERABLE, Condition A is to be entered. The only exception to this is an INOPERABLE Maintenance Bypass Switch, of the Electronic Control subsystem, in which case Conditions B is to be entered. Action A.1 directs all NM and EXPLOSIVES are to be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The SAFE AND STABLE CONFIGURATION will prevent operations which could potentially lead to the event occurring while both Equipment Blast Doors are allowed to be open. Placing the NM and EXPLOSIVES in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to reduce the time at risk of the NM and EXPLOSIVES being exposed to the postulated event with the possibility of having both Equipment Blast Doors open. The NM and EXPLOSIVES within the FACILITY are to remain in the SAFE AND STABLE CONFIGURATION until the Equipment Blast Doors are being ADMINISTRATIVELY CONTROLLED in accordance with the Required Action A.2 and Condition D is entered or the LCO has been restored.
	A.2	Placing all NM and EXPLOSIVES within the FACILITY in the SAFE AND STABLE CONFIGURATION of Required Action A.1 does not provide the required CRITICAL SAFETY FUNCTION of having one Equipment Blast Door closed with the Blast Door Closure Pins engaged, satisfying the LCO Statement. This CRITICAL SAFETY FUNCTION may be provided by ADMINISTRATIVELY CONTROLLING the Equipment Blast Doors. Required Action A.2 allows for the Equipment Blast Doors to be ADMINISTRATIVELY CONTROLLED. The Completion Time of Required Action A.2 is IMMEDIATELY. This is appropriate because, even though compensatory, it is necessary to provide the CRITICAL SAFETY FUNCTION as soon as possible while there is Pu and EXPLOSIVES in the FACILITY.

(continued)

A.3 Even though the CRITICAL SAFETY FUNCTION is being ADMINISTRATIVELY CONTROLLED, this is a compensatory measure but must not be allowed to continue indefinitely. If this restoration of the LCO takes more than 15 days from the time of discovery that the BDI SSC was lost, Condition C shall be entered. The Completion Time of 15 Days is considered safe because the CRITICAL SAFETY FUNCTION of the LCO is being assured by the Administrative Control of A.2. It is recognized the an AC control is not as reliable as an SSC; that is why the time is limited to 15 Days. The 15 Days was based on engineering judgement and has no other documented basis.

B.1 When the Maintenance Bypass Switch is in the bypass position, the Equipment BDI System is overridden electrically, and both Equipment Blast Doors could be opened at the same time thus losing the required CRITICAL SAFETY FUNCTION. Should the Maintenance Bypass Switch be found in the bypass position, it shall be switched to the non-bypass position IMMEDIATELY or Required Action B.2.1 shall be entered. The Completion Time of IMMEDIATELY minimizes the time at risk.

B.2.1, B.2.2, & B.2.3 If the Maintenance Bypass Switch is not restored to OPERABLE IMMEDIATELY, compensatory actions must be taken to ensure the NM and EXPLOSIVES are placed in a SAFE AND STABLE CONDITION. The Required Actions B.2.1, B.2.2, and B.2.3 and their bases are the same as Required Actions A.1, A.2 and A.3 respectively.

C.1 If the Equipment Blast Door Interlock System has been declared INOPERABLE and can not be restored by the Required Actions of Condition A or B within the allowed time, Condition C.1 requires that all NM and EXPLOSIVES be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. This is required because Condition D may have been entered and ACTIVE OPERATIONs may have resumed. Just as in Condition A, placing the NM and EXPLOSIVES in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to reduce the time at risk of the NM and EXPLOSIVES being exposed to the postulated event with the possibility of having both Equipment Blast Doors open.

(continued)

C.2 Condition C was entered because the Required Actions of Condition A or B could not be met. It is therefore assumed that all Required Actions of Condition A or B are no longer being followed. During the transition from Condition A or B to Condition C there is no requirement to remove any material from the affected FACILITY so it is assumed that the original material still remains. Because the inventory remains, the CRITICAL SAFETY FUNCTION is still required. It is for this reason that Required Action C.2 is necessary to assure that the Equipment Blast Doors Continue to ADMINISTRATIVELY CONTROLLED. The Completion Time remains N/A because it is unsure how long it will take to transition to the LIMITED OPERATION MODE, and the action is performed that entire time.

The exception to this is if Required Action C was entered because the doors could not be ADMINISTRATIVELY CONTROLLED. If this is the case, then this action is not applicable.

C.3 At this point the FACILITY has been unable to return the Blast Door Interlock System to an OPERABLE status. The next Required Action (C.4) is to submit the LIMITED OPERATION MODE Action Plan. The introduction of additional NM or EXPLOSIVES into the FACILITY is to be prohibited while transitioning to the LIMITED OPERATION MODE. This Required Action is necessary as to not contribute to the material of concern within the FACILITY. The Completion time of N/A is appropriate for this Required Action because this is actually "non-action." As such there is no start time or completion time. From the time the Condition is entered until the time the condition is exited, the introduction of any additional NM or EXPLOSIVES into the FACILITY is prohibited.

C.4 If the Blast Door Interlock System can not be restored to OPERABLE, a LIMITED OPERATION MODE Action plan shall be submitted to restore the CRITICAL SAFETY FUNCTION of the system or to transition the FACILITY to a condition for which the LCO is no longer applicable within 15 DAYS.

(Continued)

D.1 & D.2 Once the Equipment Blast Doors are being ADMINISTRATIVELY CONTROLLED in accordance with Required Action A.2 or B.2.2, operations may be continued. Since the CRITICAL SAFETY FUNCTION provided by the Equipment BDI System has been re-established, operations may be continued while the Equipment BDIs are being repaired. If necessary, the FACILITY may be transitioned to OPERATION MODE, in accordance with the exception to LCO 3.0.4 stated in the Mode Applicability to allow for operations to be performed while the doors are being ADMINISTRATIVELY CONTROLLED. The Completion Time of N/A is allowable because the actions are only required if resuming operations is desired.

NOTE: It must be understood that entry into Condition D does not cancel the 15 Day Completion Time requirement for restoring the BDI System to OPERABLE required by Condition(s) A or B.

(Continued)

SURVEILLANCE REQUIREMENTS	4.1.2.1	FUNCTIONAL TEST of the Equipment Blast Door Interlock System – SHIFTLY – Test the system to assure that it is not possible to open both Equipment Blast Doors at the same time by attempting to open each door while the other is closed. The SHIFTLY FREQUENCY is required to assure that the time the BDIs are INOPERABLE is limited.
	4.1.2.2	FUNCTIONAL TEST the Cell BDI System – SEMIANNUALLY – Test the cell Equipment BDI System shall be to assure the correct operation of the system and each Critical Safety component of the subsystem and assemblies listed in the LCO statement. The subsystems and components are designed for the usage that they will receive during normal cycling of the BDI System throughout the year. In order to assure the subsystems or components will not be overburdened SEMIANNUAL FREQUENCY is appropriate.
	4.1.2.3	Visual Inspection of the Blast Door Floor Gasket Assembly – ANNUALLY – Inspect for signs of abnormal wear or damage. This SR assures the Blast Door Floor Gasket springs, Gasket Air Cylinder, and Gasket Air Cylinder Rod are in good working order and maintained though out the year. These subsystems and components will be cycled each time the Equipment Blast Doors are opened and closed again. Any major degradation of these components will be detected by this inspection. The ANNUAL FREQUENCY is adequate to detect any abnormal conditions that may lead to possible failures.

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4.1.2.4 Visual Inspection of the Latching Air Cylinder Assembly – ANNUALLY – Inspect for signs of abnormal wear or damage. The SR to assures the Latching Rod Pin and Latching Air Cylinder are in good working order and maintained though out the year. These subsystems and components will be cycled each time the Equipment Blast Doors are opened and closed again. Any major degradation of these components will be detected by these components. The ANNUAL FREQUENCY is adequate to detect any abnormal conditions that may lead to possible failures.

REFERENCES

Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.2 ELECTRICAL SYSTEMS

B3.2.1 EMERGENCY LIGHTING SYSTEM

LCO 3.2.1 BASES

BACKGROUND SUMMARY	The Emergency Lighting System provides sufficient lighting to place HE in a SAFE AND STABLE CONFIGURATION following a loss of normal power to lightming. The Emergency Lighting System consists only of those lights located in the Bay Operation/Staging Area or Cell Round Room that have a back up power supply. In some FACILITIES, the Emergency Lights are a part of the normal lighting system in that they remain on all the time that the normal lights are lit. However should there be a loss on normal power to lighting, these Emergency Lights will remain on. In other FACILITIES, the Emergency Lights remain off until they are needed at the loss of normal power to lighting.
APPLICATION TO SAFETY ANALYSIS	The Emergency Lighting System is credited with providing sufficient lighting to allow HE to be placed in a SAFE AND STABLE CONFIGURATION following a loss of normal power to lighting. This function reduces the frequency of an HE detonation caused by mishandling due to insufficient illumination.
LCO	This LCO requires the OPERABILITY of the Emergency Lighting System. System operability requires all emergency lighting lamps in the applicable portions of a facility be operational and a 30 minute backup power source available. Based on engineering judgement and present practices, it has been determined that when all installed Emergency Lights are lighted within any given FACILITY's Operating area that there is sufficient lighting available to place the material in a SAFE AND STABLE CONDITION should there be a loss of normal power to lighting. It is also assumed that any activity involving HE can safely be stopped within 30 minutes. Therefore, the Emergency Backup Power Source is only required to power the Emergency Lighting System for 30 minutes. Note: If redundant Emergency Backup Power Sources are available, only one operable source is required to be connected to the Emergency Lightming System.

(continued)

MODE APPLICABILITY

The Emergency Lighting System is credited with preventing an HE detonation, which can only happen whenever ACTIVE OPERATIONS involving greater than RESIDUAL quantities of HE are conducted. Therefore, this LCO is applicable when ACTIVE OPERATIONS involving greater than RESIDUAL quantities HE are being conducted, which are only allowed in OPERATION MODE.

Because IHE is not susceptible to impact as an initiator, this LCO is not applicable when only IHE is present.

ACTION STATEMENTS

A.1 When only one Emergency Lighting Lamp is found to be INOPERABLE, the FACILITY must be placed in MAINTENANCE MODE by the end of the current shift. Because of the reliability of Normal Lighting it was determined that if only one Emergency Lighting Lamp goes out during a shift, it would not be necessary to stop operations IMMEDIATELY in order to replace it. However, it was judged not to be acceptable to begin the next shift after the initial discovery of any Emergency Lighting lamp being INOPERABLE without restoring system OPERABILITY. Should there be a loss of more than one lamp during any one period while the LCO is applicable, Condition B shall be entered.

The note addresses the situation where there is only one lamp available in the Emergency Lighting System in the affected area. In this case, if the only lamp burns out, Condition B must be entered as opposed to Condition A. This is based on no emergency lighting capability on loss of normal power would be available in the affected area.

B.1 When more than one Emergency Light lamp is found to be INOPERABLE, during a shift, or the 30 minute Backup Power Source is found to be INOPERABLE, all NM and EXPLOSIVES must be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. This is required because should there be a loss of normal power to lighting during ACTIVE OPERATIONS involving HE, based on engineering judgement, there may not be sufficient lighting for a safe termination of ACTIVE OPERATIONS.

B.2 When more than one Emergency Light lamp is found to be INOPERABLE, during a shift, or the 30 minute Backup Power Source is found to be INOPERABLE, the FACILITY shall be placed in MAINTENANCE MODE within the next 4 hours. Allowing 4 Hours to go to MAINTENANCE MODE will allow for any unforeseen obstacles but yet require completion within a reasonable time period. This action is required to ensure that no ACTIVE OPERATIONS occur until system OPERABILITY.

(continued)

SURVEILLANCE REQUIREMENTS	SR 4.2.1.1	Visually Inspect all Emergency Lights – SHIFTLY – Inspect to ensure all Emergency Lighting lamps within the bay operations/staging area or cell round room area of the FACILITY are lighted. It should be noted that this Surveillance applies to only those facilities containing normally burning Emergency Lights. The SHIFTLY FREQUENCY ensures that INOPERABLE lamps are quickly identified and restored to OPERABLE status.
	SR 4.2.1.2	FUNCTIONAL TEST of Emergency Lights – MONTHLY – Test the lights to assure all Emergency Lights operate at a loss of normal power to lighting. This SR only applies to those facilities containing Emergency Lights with battery packs, and FACILITIES containing Emergency Lights not normally lighted but which become lighted from a backup power source upon loss of normal power to lightning. This test must simulate a loss of normal power to lighting and ensure that all Emergency Lamps in the applicable area light or remain lighted on the loss of normal power to lighting. Included in the FUNCTIONAL TEST is a visual inspection of the fixture hardware for damage and/or wear. The MONTHLY FREQUENCY is based on Engineering Judgement and past operating experiences. Because the lights are operated only on such occasion, a longer life is expected, thus requiring less frequent surveillance.
	SR 4.2.1.3	FUNCTIONAL TEST Backup Power for the Emergency Lights – MONTHLY – Test the automatic transfer of the backup power to the emergency lights. This SR only applies to Emergency Lights connected to a UPS System. This test must ensure that the Emergency Lighting System continues to operate on a loss of normal power. The successful completion of this FUNCTIONAL TEST will also affirm that the Manual Transfer Switches are in the proper position. The MONTHLY FREQUENCY is based on Engineering Judgement and past operating experiences.

(continued)

SR 4.2.1.4 Verify Emergency Lights Operate on Backup Power – ANNUALLY – Verify the lights operate for 30 minutes minimum on loss of normal power with all potential loads energized or with an equivalent load applied. The Emergency Lights depend on a Backup Power Source, in case there is a loss of electricity to them. This Backup Power Source is Required to Operate the Emergency Lights for a Minimum of 30 Minutes to supply their CRITICAL SAFETY FUNCTION. The successful completion of this SR will also affirm that the Automatic Transfer Switch functions properly and that the Manual Transfer Switches are in the proper position. Manual transfer switches in the proper position is only applicable to emergency lights connected to a UPS. This test is to be performed while all loads that will be connected to the UPS are connected and energized ANNUALLY. This test is to verify that this 30-Minute Safety Function is provided.

REFERENCES

Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.3 PROCESS SYSTEMS

B3.3.1 DYNAMIC BALANCER

LCO 3.3.1 BASES

BACKGROUND SUMMARY	The Dynamic Balancer is a piece of non-destructive evaluation equipment that supports and spins the NE or NELA under test to determine the amount and location of imbalance, its product of inertia (POI) and dynamic balance parameters. If the Dynamic Balancer malfunctions while performing these operations, it could result in several events that would cause harm to the FACILITY Worker, Site Worker, or Public.
APPLICATION TO SAFETY ANALYSIS	The Dynamic Balancer is credited with preventing High Explosive Detonations with Dispersalevent. The CRITICAL SAFETY FUNCTIONS of the Dynamic Balancer are to properly shut down should a malfunction occur during operations. The components listed within the LCO statement are in-place to assure that the Dynamic Balancer shuts-down should a malfunction occur to prevent an impact initiated event.

(continued)

LCO

This LCO requires the Dynamic Balancer to be OPERABLE. OPERABILITY of the Dynamic Balancer requires that the following components be OPERABLE:

- Shunt Field Monitor
- Motor Armature Over-voltage Control Module
- Low hydraulic pressure auto shutdown interlock on thrust and radial bearings
- Case Vibration Shut-off Interlock
- The Emergency Shut-Off Circuit

Shunt Field Monitor - The OPERABILITY of the Shunt Field Monitor requires the ability of the monitor to shut down the balancer on a shunt field undercurrent.

Motor Armature Over-voltage Control Module - The OPERABILITY of the Motor Armature Over-voltage Control Module requires power to be removed to the balancer motor upon detection of over-voltage to the motor armature which could result in a corresponding faceplate speed of 600 rpm.

Low hydraulic pressure auto shutdown interlock on thrust and radial bearings - The OPERABILITY of the Low hydraulic pressure auto shutdown interlock on thrust and radial bearings requires power to be shut off to the balancer motor when the hydraulic pressure in the Dynamic Balancer is less than 15 bars on the thrust bearings and less than 78 bars on the radial bearings.

Case Vibration Shut-off Interlock - The OPERABILITY of the Case Vibration Shut-off Interlock requires power to be shut off to the balancer motor on detection of an imbalance greater than 300 Newton-meters

Emergency Shut-Off Circuit - The OPERABILITY of the Emergency Shut-off requires the shut down of the balancer drive motor on activation of the console emergency stop button.

MODE APPLICABILITY

The Dynamic Balancer is required to prevent impact-initiated events caused by a balancer failure. These types of events can only happen when the balancer is operating and a NE or NELA is present in the bay. Therefore, this LCO is applicable in OPERATION MODE only when NE or NELA (containing EXPLOSIVES) is present within the Bay.

(continued)

ACTION STATEMENTS	A.1	If any of the CRITICAL SAFETY Components of the Dynamic Balancer are found to be INOPERABLE, all balancing operations are to be suspended. The Completion Time of IMMEDIATELY is required to prevent the balancer from inadvertently releasing the NE or NELA and resulting in an Impact event.
	A.2	Once the Dynamic Balancer has been shutdown per the Required Action A.1, the NE or NELA shall be removed from the FACILITY IMMEDIATELY. The Completion Time of IMMEDIATELY is required because, with the Dynamic Balancer found to be INOPERABLE, continued presence of the NE or NELA within the FACILITY would still leave the material unprotected from a postulated Fire event.
SURVEILLANCE REQUIREMENTS	SR 4.3.1.1	Verify the Shunt Field Monitor is Capable of Detecting a Loss of Shunt Field Current – SEMIANNUALLY – Verify that upon a loss of shunt field current, shutdown of the Dynamic Balancer is initiated. The Shunt Field Monitor must detect a loss of shunt field current and remove power from the Dynamic Balancer motor to prevent over-speeding. Based on past operational experiences, a verification that this component performs the intended CRITICAL SAFETY FUNCTION shall be done SEMIANNUALLY

(continued)

LCO 3.3.1 BASES (continued)

SR 4.3.1.2	CALIBRATE the Motor Armature Over-voltage Control Module – SEMIANNUALLY – CALIBRATE the system to detect a motor armature voltage of 325 ± 5 V DC, and verify removal of power from the Dynamic Balancer drive motor on detection of setpoint voltage. Certain failures of the Dynamic Balancer may cause an increase in armature voltage and over-speed of the DC drive motor. This over-speed introduces kinetic energy into the unit that could increase the consequences of a unit being released from the balancer. To prevent over-speed of the Dynamic Balancer motor, the Motor Armature Over-voltage Control Module must disconnect the power to the motor when it detects a voltage that would result in a corresponding faceplate speed of 600 rpm or greater. Based on past operational experiences, a verification that this component performs the intended CRITICAL SAFETY FUNCTION shall be done SEMIANNUALLY
SR 4.3.1.3	CALIBRATE the Low Hydraulic Pressure Auto Shutdown Interlock – SEMIANNUALLY – CALIBRATE the system to detect a pressure of less than 15 bars for the thrust bearing and less than 78 bars for the radial bearings, and verify removal of the on-permissive signal from the Dynamic Balancer motor controller on detection of setpoint pressures. Loss of proper fluid supply to the thrust and radial bearings may cause failure of the balancer bearings. The low hydraulic pressure shutdown interlock provides an on-permissive signal to the motor controller when minimum fluid pressure is reached. This SR verifies if the pressure is less than 15 bars for the thrust bearing or less than 78 bars for the radial bearings that the Low Hydraulic Pressure Auto Shutdown Interlock does not provide an on-permissive signal to the motor controller. Based on past operational experiences, a verification that this component performs the intended CRITICAL SAFETY FUNCTION shall be done SEMIANNUALLY.

(continued)

SR 4.3.1.4 CALIBRATE the Case Vibration Shut-off Interlock – SEMIANNUALLY – CALIBRATE the system to detect an imbalance of greater than 300 Newton-meters, and verify removal of power from the Dynamic Balancer drive motor on detection of the setpoint. To prevent excessive vibrations, the Case Vibration Shut-off Interlock must remove power from the Dynamic Balancer motor when an imbalance >300 Newton-meters is detected. Based on past operational experiences, a verification that this component performs the intended CRITICAL SAFETY FUNCTION shall be done SEMIANNUALLY

SR 4.3.1.5 Verify Emergency Shut-Off Circuit – SEMIANNUALLY – Verify the system removes power from the Dynamic Balancer drive motor on activation of console emergency stop button. To assure that the Emergency Shut-Off Circuit functions properly, a SEMIANNUAL surveillance shall be conducted that demonstrates that the power is removed from the motor when the Emergency Shut-Off Circuit is activated. This FREQUENCY of SEMIANNUAL is based on past operational experiences.

REFERENCES

Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.3 PROCESS SYSTEMS

B3.3.2 CONTAMINATED WASTE ISOLATION VALVE SYSTEM

LCO 3.3.2 BASES

BACKGROUND SUMMARY	Contaminated Waste Isolation Valves (CWIV) are provided in the contaminated waste sump drain lines for cells in Buildings 12-85, 12-96 and 12-98. The CWIVs are required to isolate these lines to limit the leak path following an High Explosive Detonation with Dispersion event. The Contaminated Waste Isolation Valves are designed as wafer-sphere, high performance, 6 inch, butterfly valves and are normally closed. The valve is designed to automatically open when the water level in the FACILITY sump exceeds a predetermined level.
APPLICATION TO SAFETY ANALYSIS	The Contaminated Waste Isolation Valve System is credited with mitigating the consequences of a HED with Dispersal event by closing off the drain line from the contaminated waste sump located outside each round room.

(continued)

LCO

This LCO requires the Contaminated Waste Isolation Valve System be OPERABLE. The following SSCs must be OPERABLE to ensure system OPERABILITY:

- Contaminated Waste Isolation Valve
- Valve Closed Position Indication System

Contaminated Waste Isolation Valve - The OPERABILITY of the Contaminated Waste Isolation Valve requires that the valve be in the closed position

Valve Closed Position Indication System - The OPERABILITY of the Valve Closed Position Indication System requires the proper detection of the CWIV position and that the Closure Indicator Light functional

MODE APPLICABILITY

The CWIV System is credited with mitigating the consequences of a High Explosive Detonation with Dispersal event. System Operability is required at times when this event could happen. Therefore, this LCO is applicable in OPERATION and MAINTENANCE MODEs when greater than RESIDUAL quantities of Pu and HE are both present within the FACILITY.

An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A, B or D, the FACILITY may be transitioned between OPERATION MODE and MAINTENANCE MODE if required by the required action as long as the OTHER Required Actions and Completion Times are being met. This is acceptable for Conditions A and D based on the CRITICAL SAFETY FUNCTION of the CWIV is being met through the SHIFTLY verification of the valve closed. This is acceptable for Condition B based on the fact that transitioning to MAINTENANCE MODE will ensure that ACTIVE OPERATIONS are not conducted, thus significantly reducing the risk of the Internal High Explosive Detonation from occurring.

(Continued)

LCO 3.3.2 BASES (continued)

ACTION STATEMENTS	A.1	When the CWIV Closure Indicator Light is not lighted, there are two possible conditions. The first condition is that the CWIV is not closed. The second condition is that there is a malfunction in the Valve Closed Position Indication System. Regardless of the reason, if the CWIV Closure Indicator Light is not lighted it shall be assumed that the CWIV valve is not closed and Condition A shall be entered. Required Action A.1 requires that the NM and EXPLOSIVES be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. This action will reduce the risk of a High Explosive Detonation with Dispersal with the possibility of the CWIV being open.
	A.2	Once the NM and EXPLOSIVES are in the SAFE AND STABLE CONFIGURATION it is safe to investigate the cause of the light not being lighted. Required Action A.2 says to "Verify that the CWIV is closed." As long as the CWIV is closed, the required CRITICAL SAFETY FUNCTION is present. The FACILITY may continue operations in accordance with Required Action D.2 while they are restoring the Valve Closed Position Indication System to an OPERABLE status as long as the CWIV remains closed and is verified as such on a SHIFTLY basis.
	NOTE:	Once Required Action A.2 is completed, should it be found that the CWIV is not closed, declare the CWIV INOPERABLE and enter Condition B. Should it be found that the problem is not an open valve, then as long as the LCO is applicable, verification that the CWIV remains closed per Required Action A.2 is required. However, if ACTIVE OPERATIONs are required, Condition D must be entered.

(continued)

L LCO 3.3.2 BASES (continued)

B.1 The Contaminated Waste Isolation Valve System can not provide the required CRITICAL SAFETY FUNCTION when the Contaminated Waste Isolation Valve is not in the closed position. Therefore should the CWIV be found in the open position, all operations are to be stopped within the affected FACILITY and the NM and EXPLOSIVES placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The Completion Time of IMMEDIATELY is required to limit the time at risk.

B.2 Since closing the CWIV can not be fully accomplished from inside the FACILITY, the proper action is to place the FACILITY in MAINTENANCE MODE in preparation to close, or repair if necessary, the INOPERABLE CWIV. This Action is required within 4 Hours of discovery that the CWIV is open. Because the NM and EXPLOSIVES are in a SAFE AND STABLE CONFIGURATION per Required Action B.1, having the CWIV open is not a Safety concern. While changing MODEs, from time-to-time unpredictable constraints may surface. Allowing 4 Hours to go to MAINTENANCE MODE will allow for any unforeseen obstacles but yet require completion within a reasonable time period.

B.3 While the NM and EXPLOSIVES are in a SAFE AND STABLE CONFIGURATION per Required Action B.1, having the CWIV open is not a Safety concern. The Required Action B.3 allows the FACILITY 15 days to restore the CWIV back to OPERABLE. This Completion Time is appropriate because should the valve require replacing it is estimated that it will not take longer than 15 days. However if the CWIV can not be restored to OPERABLE within the 15 Day period, Condition C shall be entered.

C.1 If after 15 DAYS, the CWIV has not been restored to OPERABLE, a LIMITED OPERATION MODE Action Plan shall be submitted. Condition C.1 shall be entered in order to develop a plan to safely remove the Pu or HE from the FACILITY so that the CWIV will no longer be required to be closed. Based on engineering judgement the Completion Time of 15 Days has been chosen because it is difficult to predict what ACTION(s) will be required to prepare to remove the Pu and HE from the FACILITY.

(continued)

B3/4.4 FIRE PROTECTION SYSTEMS

B3.4.1 WET PIPE FIRE SUPPRESSION SYSTEM

LCO 3.4.1 BASES

BACKGROUND SUMMARY	The Wet Pipe Fire Suppression Systems mitigate the consequences of fires in FACILITIES by spraying water on fires. This function prevents fires from initiating more serious events such as a High Explosive Detonation with Dispersal or a Burning Dispersal. The Wet Pipe Fire Suppression Systems include all piping and hardware up to, but not including, the facility Post Indicator Valve (PIV). The Wet Pipe Fire Suppression Systems maintain an unobstructed water delivery flow path from the PIV through all outlets in a facility. The Wet Pipe Fire Suppression System also includes the frangible bulbs or fusible links used for system actuation.
APPLICATION TO SAFETY ANALYSIS	The Wet Pipe Fire Suppression System prevents High Explosive Detonation with Dispersal and Burning Dispersal events. The system performs this function by spraying water on fires to prevent them from leading to more serious events.

(continued)

LCO

This LCO requires that the Wet Pipe Fire Suppression System is OPERABLE. The following SSCs are required to ensure system OPERABILITY:

- An unobstructed and intact Water Delivery System from the FACILITY PIV to the sprinkler heads
- OPERABLE High Pressure Fire Loop supplying adequate water supply at the FACILITY PIV
- Correct sprinkler heads properly installed

Water Delivery System - The OPERABILITY of the Water Delivery system requires that it be minimally designed to the hazard and grouping classification, as listed below, as defined by NFPA 13. The Water Delivery System shall be free of impairments and obstructions which would prevent the system from meeting the intended function of the NFPA design as determined by Fire Protection Engineering. The OPERABILITY of this system also includes the installation of the correct sprinkler heads to achieve the flow density required by NFPA 13.

Table B3.4.1-1

Area	Classification
12-64 Ops/Staging Area and Interlock	Ordinary Hazard Group 1
12-84 Bays 1-13 & 15-20 Interlock	Ordinary Hazard Group 1
12-84 Bays 1 & 10 Ops/Staging Area and Interior Corridor	Extra Hazard Group 1
12-84 Bay 14 Ops/Staging Area and Interlock	Extra Hazard Group 1
12-99 Bays 1, 3, & 5-9 Interlock	Ordinary Hazard Group 1
12-99 Bays 2 and 4 Interlock and Ops/Staging Area	Ordinary Hazard Group 1
12-104 Bays 1-15 Interlock	Extra Hazard Group 1
12-104 Bay 16 Interlock and Operations/Staging Area	Ordinary Hazard Group 1
Cell Interior Corridor and Staging Cubicles	Ordinary Hazard Group 1
12-41 Ops/Staging Area	Extra Hazard Group 1
12-50 Ops/Staging Area	Ordinary Hazard Group 1
12-60 Ops/Staging Area	Ordinary Hazard Group 1
12-58 Bays 4&5 Ops/Staging Area	Ordinary Hazard Group 1

High Pressure Fire Loop - The requirements for OPERABILITY of the High Pressure Fire Loop are contained in LCO 3.4.4 of this document.

(Continued)

ACTION STATEMENTS (continued)	C.1	If the Wet Pipe Fire Suppression System is found to be INOPERABLE within a Cell Staging Cubicle, Required Action C.1 shall be entered. The NM in the staging cubicle shall be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The SAFE AND STABLE CONFIGURATION will reduce the risk of a fire affecting the NM within the cubicle. Placing the NM in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to minimize the time at risk.
	C.2	The basis for Action C.2 is the same as for Action A.2. It is not anticipated that any actions will be required in response to this action, as the material in the staging cubicle is staged in APPROVED CONTAINERS.
	C.3	Once the NM is in a SAFE AND STABLE CONFIGURATION, a FIRE PATROL for the cubicle must be established within 8 Hours. A fire event is less likely with the minimization of the flammables and combustibles and the material in APPROVED CONTAINERs, but a FIRE PATROL shall be set per Required Action C.3 to further reduce the likelihood of a potential fire going undetected. The Completion Time of 8 Hours is appropriate to set the FIRE PATROL because when performing Required Action C.2, the FACILITY will assure through the Fire Protection Program that combustibles will be limited within the Staging Cubicle. This reduces the likelihood of a fire.

(continued)

ACTION STATEMENTS (continued)	D.1	If the Wet Pipe Fire Suppression System is found to be INOPERABLE within a NM Staging Bay, Required Action D.1 shall be entered. The NM in the bay shall be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The SAFE AND STABLE CONFIGURATION will reduce the risk of a fire affecting the NM within the bay. Placing the NM in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to minimize the time at risk.
	D.2	The basis for Action D.2 is the same as for Action A.2.
	D.3	Once the NM is in a SAFE AND STABLE CONFIGURATION a FIRE PATROL must be established within 8 Hours. The likelihood of a fire event is reduced by accomplishing actions D.1 and D.2. However, a FIRE PATROL shall be set per Required Action D.3 to further reduce the likelihood of a potential fire going undetected. The Completion Time of 8 Hours is appropriate to set the FIRE PATROL because when performing Required Actions D.1 and D.2, the FACILITY will assure through the Fire Protection Program that combustibles will be limited within the NM Staging Bay. This reduces the likelihood of a fire.

(continued)

ACTION STATEMENTS (continued)	E.1	If the Wet Pipe Fire Suppression System is found to be INOPERABLE within a Cell Interior Corridor, Required Action E.1 shall be entered. The NM or EXPLOSIVES in the Round Room area shall be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The SAFE AND STABLE CONFIGURATION will reduce the risk of a fire affecting the NM or EXPLOSIVES within the Round Room. Placing the NM and EXPLOSIVES in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to minimize the time at risk.
	E.2	The basis for Action E.2 is the same as for Action A.2.
	E.3	Once the NM or EXPLOSIVES are in a SAFE AND STABLE CONFIGURATION, all exposed combustibles and flammables in the interior corridor that are in a direct line of sight of the round room shall be removed, either by physical relocation or by securing in an approved combustible or flammable storage location, within 8 Hours. Removal of exposed combustibles can be achieved through containerization or physical removal of all combustibles that can be seen from the round room. This removes the possibility of a fire in the interior corridor and provides the NE in the Round Room protection from the direct heat flux resulting from a fire in the corridor. The Completion Time of 8 Hours is appropriate because when performing Required Action E.2, the FACILITY will assure through the Fire Protection Program that combustibles will be limited within the interior corridor. This reduces the likelihood of a fire.
	Note:	In Building 12-98, the Tool Staging, SNM Staging, and Parts Staging rooms are in a direct line of sight from the round room. However, combustibles located in these rooms are protected by rated fire doors. This compartmentation feature creates two separate fire zones within the fire area. Therefore, removal of combustibles from these fire zones is not required.

(Continued)

E.4 Once the NM and EXPLOSIVEs are in a SAFE AND STABLE CONFIGURATION and the action to remove the combustibles from the line of sight is accomplished, a FIRE PATROL for the corridor area must be established within 8 Hours. An event resulting from a fire is less likely with the minimization of the flammables and combustibles and the material in APPROVED CONTAINERs, but a FIRE PATROL shall be set per Required Action E.4 to further reduce the likelihood of a potential fire going undetected. The Completion Time of 8 Hours is appropriate to set the FIRE PATROL because when performing Required Action E.2, the FACILITY will assure through the Fire Protection Program that combustibles will be limited within the affected area, thus reducing the likelihood of a fire.

(Continued)

F.1 Condition F may be entered at the discretion of the FACILITY Manager. Depending on the area of protection of the INOPERABLE Wet Pipe Suppression System, per Required Actions above, a FIRE WATCH or FIRE PATROL has been implemented. Although the FACILITY shall not do ACTIVE OPERATIONs, it may remain in this Condition indefinitely. It is anticipated however, that the FACILITY Manager will not want to continue with the FIRE WATCH or FIRE PATROL. If after a period of time the Wet Pipe Fire Suppression System has not been returned to OPERABLE status, Condition F.1 may be entered to prepare the LIMITED OPERATION Action Plan. LIMITED OPERATION MODE may be entered upon the completion and approval by the DOE/AAO of a LIMITED OPERATION Action Plan that will identify the actions to safely remove the NM and/or EXPLOSIVEs from the FACILITY so that the Wet Pipe Fire Suppression System will no longer be required to be OPERABLE.

(Continued)

GENERAL NOTE: All Surveillance FREQUENCIES for this LCO are based on NFPA codes and/or DOE Exemption MHPP-DOE-5480.7A-EX-2 (STD – 4281 Appendix E)

SURVEILLANCE REQUIREMENTS	SR 4.4.1.1	Flow Test Main Drain – QUARTERLY - Ensures the adequacy of the water supply from the PIV to the system riser. Static and residual water pressures are recorded as part of this test and compared to previous results to trend the condition of the water supply. When a significant deviation is observed between the current test results and historical test results an investigation must occur to ensure that the minimum functionality conditions for the water supply system are met. Lower resulting pressure can often be observed and acceptable when a leg of the HPFL underground loop is isolated for maintenance or when flow testing is being conducted on the HPFL simultaneously to the main drain test.
	SR 4.4.1.2	Inspect Control Valves are in the Open Position and Locked - QUARTERLY - Valve inspections are conducted to ensure valves are locked or sealed in their normal operating position.
	SR 4.4.1.3	Inspect Exterior (Alarm Valve) Riser/Trim - QUARTERLY – Verify the exterior of the riser and its trim is absent of any physical damage which could impair the system. Inspect and ensure pressure gauges with a current test date are installed prior to performing the main drain flow test and recording system pressure readings (current test date exists if the date is within 5 years of last test). Verify that trim valves are in their normal operating position.

(Continued)

SR 4.4.1.4 Visually Inspect the Mechanical Condition of the Wet Pipe Fire Suppression System – ANNUALLY – Ensure the Wet Pipe Fire Suppression System is in good mechanical condition including the following:

- Condition of hangers
- Condition of piping and fittings
- Conditions of sprinkler heads, including verifying they are free of external obstructions, corrosion, and excessive foreign material

REFERENCES Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.4 FIRE PROTECTION SYSTEMS

B3.4.2 DELUGE FIRE SUPPRESSION SYSTEM

LCO 3.4.2 BASES

BACKGROUND SUMMARY	The Deluge Fire Suppression Systems mitigate the consequences of fires in FACILITIES by spraying water on fires. This function prevents fires from initiating more serious events such as a High Explosive Detonation with Dispersal or a Burning Dispersal. The Deluge Fire Suppression Systems include all piping and hardware, up to, but not including the FACILITY Post Indicator Valve (PIV). The Deluge Fire Suppression Systems maintain an unobstructed water delivery flow path from the PIV through all outlets in a FACILITY. The Deluge Fire Suppression System also includes the Heat Actuated Devices or Heat Detectorsand is supported by the Fire Alarm Control Panel used for system actuation.
APPLICATION TO SAFETY ANALYSIS	The Deluge Fire Suppression System prevents High Explosive Detonation with Dispersal and Burning Dispersal events. The system performs this function by spraying water on fires to prevent them from leading to more serious events.

(continued)

LCO

This LCO requires that the Deluge Fire Suppression System is OPERABLE. The following SSCs are required to ensure system OPERABILITY:

- An unobstructed and intact Deluge Water Delivery System from the PIV to the open sprinkler/nozzle
- An OPERABLE High Pressure Fire Loop supplying adequate water supply at PIV
- OPERABLE Heat Actuated Devices or Heat Detectors and Automatic Actuation System
- Correct Sprinkler head/nozzles properly installed

Water Delivery System - The OPERABILITY of the Water Delivery system requires that it be minimally designed to the hazard and grouping classification, as listed below, as defined by NFPA 13. The Water Delivery System shall be free of impairments and obstructions which would prevent the system from meeting the intended function of the NFPA design as determined by Fire Protection Engineering. The OPERABILITY of this system also includes the installation of the correct sprinkler heads to achieve the flow density required by NFPA 13.

Table B3.4.2-1

Area	Classification
12-84 Bay 2-9, 11-13, &15-20 Ops/Staging Area	Exceeds Extra Hazard Group 2 (0.5gpm/ft^2)
12-99 Bays 1, 3, &5-9 Ops/Staging Area	Exceeds Extra Hazard Group 2 (0.5gpm/ft^2)
12-104 Bays 1-15 Ops/Staging Area	Exceeds Extra Hazard Group 2 (0.5gpm/ft^2)
NE Cells round Room	Exceeds Extra Hazard Group 2 (0.5gpm/ft^2)

High Pressure Fire Loop - The requirements for OPERABILITY of the High Pressure Fire Loop are contained in LCO 3.4.4 of this document.

Heat Actuated Devices or Heat Detectors and Automatic Actuation System - The OPERABILITY of the detection systems requires the Fixed Temperature/Rate Compensated heat detectors or the Heat Actuated Devices be designed to NFPA 72.

(Continued)

LCO 3.4.2 BASES (continued)

MODE APPLICABILITY

The Deluge Fire Suppression System is credited with preventing High Explosive Detonations with Dispersal and Burning Dispersal events. Therefore, this LCO is applicable whenever greater than RESIDUAL quantities of NM or EXPLOSIVES are present within the FACILITY. This material is only allowed during OPERATION and MAINTENANCE MODES, thus this LCO is only applicable during OPERATION and MAINTENANCE MODES whenever greater than residual quantities of NM or EXPLOSIVEs are present.

An exception to LCO 3.0.4 exists for this LCO. When this LCO statement has not been met requiring entrance into condition A or B, the FACILITY may be transitioned to MAINTENANCE MODE under the direction of the Action Statement. This is allowable because the transition of the FACILITY to MAINTENANCE MODE will help ensure no ACTIVE OPERATIONs are conducted, thus ensuring the probability of an internal event requiring the system is reduced.

(Continued)

LCO 3.4.2 BASES (continued)

ACTION STATEMENTS (continued)	B.1	If the Deluge Fire Suppression System is INOPERABLE with no available means of detection and Fire Department Notification, Condition B shall be entered. Required Action B.1 requires that the NM and EXPLOSIVES shall be placed in a SAFE AND STABLE CONFIGURATION IMMEDIATELY. The SAFE AND STABLE CONFIGURATION will reduce the risk of a fire affecting the NM and EXPLOSIVES prevent within the FACILITY. Placing the NM and EXPLOSIVES in a SAFE AND STABLE CONDITION IMMEDIATELY is necessary to reduce the time at risk.
	B.2	The basis for Action B.2 is the same as for Action A.2.
	B.3	With an INOPERABLE Deluge Fire Suppression System and Fire Detection and Fire Alarm System, the system shall be repaired prior to resuming ACTIVE OPERATIONS. In order to make repairs safely and to ensure ACTIVE OPERATIONs do not inadvertently commence, the FACILITY must be placed in the MAINTENANCE MODE within 4 hours. The Completion Time of 4 hours to place the FACILITY in to MAINTENANCE MODE is a reasonable amount of time to transition the FACILITY to MAINTENANCE MODE.
	B.4	Once the NM or EXPLOSIVES are in a SAFE AND STABLE CONFIGURATION, a FIRE PATROL must be established within 8 hours. This FIRE PATROL is required due to the lack of an OPERABLE Fire Detection and Alarm System containing either area smoke detector or UV flame detectors in the area which deluge coverage is lost. A fire event is less likely without ACTIVE OPERATIONS taking place but a FIRE PATROL shall be set per Required Action B.4 to further reduce the likelihood of a potential fire going undetected. The Completion Time of 8 hours is appropriate to set the FIRE PATROL because when performing Required Action B.2 the FACILITY will assure, through the Fire Protection Program that combustibles will be limited within the FACILITY. This reduces the likelihood of a fire.

(continued)

B.5 After 48 Hours of attempting to restore the INOPERABLE Deluge Fire Suppression System, the FIRE PATROL is to be replaced with a FIRE WATCH. The FIRE WATCH is more intensive in that personnel are required to remain in the FACILITY at all times. This should result in a even a faster response should a fire occur. The 48 hour completion time ensures the facility is not at a high level of risk for prolonged periods of time.

C.1 Condition C may be entered at the discretion of the FACILITY Manager. Within 48 Hours of the discovery that the Deluge Fire Suppression System is INOPERABLE, per Required Action A.4 or B.5 above, a FIRE WATCH is to be implemented. Although the FACILITY shall not do ACTIVE OPERATIONS it may remain in this Condition indefinitely. It is anticipated however, that the FACILITY Manager will not want to continue with a FIRE WATCH and not return to ACTIVE OPERATIONS. If after a period of time the Deluge Fire Suppression System has not been returned to the OPERABLE status, the Facility Manager may desire to place the FACILITY in LIMITED OPERATION MODE. Condition C.1 may be entered to prepare the LIMITED OPERATION Action Plan. LIMITED OPERATION MODE may be entered upon the completion and approval by the DOE/AAO of a LIMITED OPERATION Action Plan that will identify the actions to safely remove the NM or EXPLOSIVEs from the FACILITY in order that the Deluge Fire Suppression System will no longer be required to be OPERABLE.

(Continued)

GENERAL NOTE: All Surveillance FREQUENCIES for this LCO are based on NFPA codes and/or DOE Exemption MHPP-DOE-5480.7A-EX-2 (STD – 4281 Appendix E)

SURVEILLANCE REQUIREMENTS	SR 4.4.2.1	Flow Test Main Drain – QUARTERLY - Ensures the adequacy of the water supply from the PIV to the system riser. Static and residual water pressures are recorded as part of this test and compared to previous results to trend the condition of the water supply. When a significant deviation is observed between the current test results and historical test results an investigation must occur to ensure that the minimum functionality conditions for the water supply system are met. Lower resulting pressure can often be observed and acceptable when a leg of the HPFL underground loop is isolated for maintenance or when flow testing is being conducted on the HPFL simultaneously to the main drain test.
	SR 4.4.2.2	Inspect Control Valve is Open and Locked - QUARTERLY - Valve inspections are conducted to ensure valves are locked or sealed in their normal operating position.
	SR 4.4.2.3	Inspect Exterior (Deluge Valve) Riser/Trim - QUARTERLY – Verify the exterior of the riser and its trim is absent of any physical damage which could impair the system. Inspect and ensure gauges with a current test date are installed prior to performing the main drain flow test and recording system pressure readings (current test date exists if the date is within 5 years of last test). Verify that trim valves are in their normal operating position. The surveillance is also applicable to valves located within a bay/cell that were installed for the purpose of bleeding the system when pre-priming the system. Note: This requirement applies to systems with these valves regardless of whether or not they are pre-primed.

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SR 4.4.2.4	Visually Inspect the Mechanical Condition of the Deluge Fire Suppression System – ANNUALLY – Assure the Deluge Pipe Fire Suppression System is in good mechanical condition including the following: • Condition of hangers • Condition of piping and fittings • Condition of open sprinklers / nozzles including verifying free of external obstructions

(Continued)

SURVEILLANCE REQUIREMENTS (continued)	SR 4.4.2.5	Deluge Valve Trip Test – ANNUALLY - The Deluge Valves are tested per manufacturer's instructions to ensure operation of the deluge valve clapper. For deluge systems where water discharge is not practical, the water supply valve is closed to prevent water discharge in accordance with NFPA.
	SR 4.4.2.6	Inspect Interior of Deluge valves – ANNUALLY - Perform interior inspection of deluge valve to verify that all valve components operate properly, move freely, and are in good condition.
	SR 4.4.2.7	Full FUNCTIONAL TEST Deluge Automatic Initiation Devices – ANNUALLY – Verify the deluge solenoid valve is actuated when heat actuated devices or heat detectors are activated with a heat source. Heat actuated devices and heat detectors are required to activate within 60 seconds of applying heat source.

REFERENCES — Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.4 FIRE PROTECTION SYSTEMS

B3.4.3 Fire Detection and Alarm System

LCO 3.4.3 BASES

BACKGROUND SUMMARY	The Fire Detection and Alarm System mitigates the consequences of fires by notifying FACILITY workers to evacuate the FACILITY in the event of a fire and by transmitting a fire alarm signal to the Fire Department when a fire alarm is present at the Fire Alarm Control Panel (FACP). When a Fire is detected in an affected area, a Fire Detection Device sends a fire alarm signal to the Fire Alarm Control Panel (FACP) which then transmits a fire alarm to the Local Notification Device and to the Fire Department. The Fire Alarm Control Panel is powered by normal electrical power with battery backup. The Fire Detection and Alarm System (for 12-85, 12-96, and 12-98 only) also supports the deluge system by supplying backup power to the detectors and valves. Duct smoke detectors do not perform a CRITICAL SAFETY FUNCTION and are not considered a part of this system.
APPLICATION TO SAFETY ANALYSIS	The Fire Detection and Alarm System is credited with mitigating the consequences of a Burning Dispersal event by detecting and notifying FACILITY occupants of the fire and supplying power to the deluge systems, where applicable. This system also provides a support function for the prevention of the High Explosive Detonation with Dispersion event by providing power for the Deluge Fire Suppression System (except in 12-44 cells 2 through 6). The system also provides significant defense-in-depth protection against the consequences of an Internal Fire by notifying the Fire Department of a fire alarm in the FACILITY.

(continued)

LCO

This LCO requires that the Fire Detection and Alarm System be OPERABLE. The following SSCs are required to ensure system OPERABILITY:

- Fire Detection Devices (Ultra Violet Flame Detectors, Area Smoke Detectors, Water Flow Alarms [Vane Type or Pressure Switch])
- Local Audible and/or Visual Alarms
- Fire Alarm Signal from the FACP to the Fire Department
- FACP Batteries to support local audible and/or visual alarms, signal from the FACP to the Fire Department, and deluge activation (excluding 12-44 Cells 2 through 6 for deluge activation)
- FACP Components that support the detection devices, local alarms, and deluge valve controls

Fire Detection Devices - The OPERABILITY of the Ultra Violet Flame Detectors. Area Smoke Detectors. or Water Flow Alarms [Vane Type or Pressure Switch] requires that they meet applicable sections of NFPA 72 and NFPA 101. Only one of the listed Fire Detection Device examples in the LCO statement is required to be installed and OPERABLE for the Fire Detection and Alarm System to be OPERABLE.

Local Alarms - The OPERABILITY of the Local Alarms requires that they meet applicable sections of NFPA 72 and NFPA 101.

Fire Alarm Signal from the FACP to the Fire Department - The OPERABILITY of this signal requires that it be transmitted to the Fire Department when a fire alarm condition has been received at the FACP.

FACP Batteries and Associated Chargers - The OPERABILITY of the FACP Batteries requires that they meet applicable sections of NFPA 72 and NFPA 101.

FACP Components - The OPERABILITY of the FACP components requires that they meet applicable sections of NFPA 72 and NFPA 101 to support the CRITICAL SAFETY FUNCTION of the Fire Detection Devices and the Local Alarms. These components also support deluge activation (excluding 12-44 cells 2-6)

(continued)

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MODE APPLICABILITY	The Fire Detection and Alarm System is credited with mitigating the consequences of a Burning Dispersal event by detecting and notifying FACILITY occupants of the fire, preventing an internal fire from progressing to a more severe event by providing support the to Deluge suppression system, and providing a significant contribution to defense-in-depth function by notifying the Fire Department of a Fire Alarm in the FACILITY. This event can only happen when greater than RESIDUAL quantities of NM and/or EXPLOSIVES are present within the FACILITY. Therefore, this LCO is applicable in OPERATION and MAINTENANCE MODE when greater than RESIDUAL quantities of NM and/or EXPLOSIVES are present within the FACILITY.

(Continued)

ACTION STATEMENTS (continued)

C.1 If the Fire Department is incapable of receiving a fire alarm signal from the FACP, then the notification is required to be ADMINISTRATIVELY CONTROLLED for an UNSECURED FACILITY. The completion time of 8 hours limits the time that the FACILITY is at a higher than normal risk. ADMINISTRATIVE CONTROL of the notification to the Fire Department replaces the Safety Function provided by the automatic alarm.

C.2 If the Fire Department is incapable of receiving a fire signal from the FACP, the FACILITY must restore the notification system to OPERABLE. If the system is restored before 14 days, the LCO will be met and no further action will be required. If the all NM and EXPLOSIVES are removed from the FACILITY, then the LCO will no longer be required to be met. However, if the Fire Department is still incapable of receiving a signal from the FACP, and the MODE Applicability still applies, then a LIMITED OPERATION Action Plan must be submitted to inform DOE/AAO of the activities to be performed in LIMITED OPERATION MODE. Based on engineering judgement, the 14-day completion time ensures that the FACILITY is not operated for a prolonged period of time with degraded notification capability.

(Continued)

GENERAL NOTE:	All Surveillance FREQUENCIES for this LCO are based on NFPA codes and/or DOE Exemption MHPP-DOE-5480.7A-EX-2 (STD – 4281 Appendix E)

SURVEILLANCE REQUIREMENTS

SR 4.4.3.1 Test Automatic Alarm Initiating Devices – ANNUALLY - Tests are conducted for the following devices:

- UV Flame Detectors
- Area Smoke Detectors
- Water flow Alarms (vane or pressure switch type)

Note: Heat Actuated Devices and Heat Detector surveillances are specified within SR 4.4.2.7.

SR 4.4.3.2 Test Fire Alarm Control Panel Batteries and Chargers – ANNUALLY – The following surveillances are performed:

— Battery open-circuit voltage measurement
— Battery load voltage test (Momentary)
— Battery discharge test (30 minutes)
— Operability of battery charger

SR 4.4.3.3 Test Fire Alarm Control Panel Equipment – ANNUALLY - Verify that the fire alarm panel activates the appropriate audible and visual notifications for each zone, or individually addressed point when the automatic alarm initiating device described in SR 4.4.3.1 are activated.

SR 4.4.3.4 Test Alarm Notification Devices (Operational) – ANNUALLY - Verify each audible and visual notification appliance is operating properly. This surveillance can be accomplished in conjunction with SR 4.4.3.3. Note: Sound pressure level tests are only required to be accomplished in FACILITIES that have had the Fire Detection and Alarm Systems audible notification devices upgraded from the design code of record to the 1996 or later NFPA code.

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	SR 4.4.3.5	Test Fire Alarm Control Panel Interface Equipment Circuitry – ANNUALLY - Test the interface circuitry between control panels where 2 or more panels are connected together in a fire alarm system configuration. This surveillance is accomplished by verifying the appropriate notification appliances activate when automatic alarm initiating devices connected directly to the UV control panel are activated. This surveillance is accomplished when deluge initiating devices connected to a FACP are activated and initiation of the deluge release solenoid occurs. This surveillance is accomplished in conjunction with SR 4.4.2.7 and SR 4.4.3.3. NOTE: The interfaces between a FACP and the following types of systems are not required to accomplish this surveillance: HVAC, task exhaust, Bay BDI, and process equipment.

(Continued)

LCO 3.4.3 BASES(continued)

SR 4.4.3.6 Test Fire Alarm Signal from Fire Alarm Control Panel to Fire Department – ANNUALLY -
Verify that an activated alarm initiating device will cause the FACP to communicate an alarm signal to the Fire Department. The surveillance should verify that fire department received an alarm signal from the appropriate building where the activated alarm intiating device is located. This surveillance shall be performed for at least one automatic alarm initiating device per communications module installed in a FACP panel, and/or at least one automatic alarm initiating device per digital alarm communication transmitter (DACT) installed in a fire alarm system as applicable.

SR 4.4.3.7 Test Area Smoke Detector Sensitivity – 2 YEAR - Verify smoke detectors are operating within their listed sensitivity range. This SR only applies to those FACILITIES with area smoke detectors.

REFERENCES Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

B3/4.3 FIRE DETECTION & SUPPRESSION SYSTEMS

B3.4.4 High Pressure Fire Loop

LCO 3.4.4 BASES

BACKGROUND SUMMARY	The High Pressure Fire Loop (HPFL) supports the CRITICAL SAFETY FUNCTIONS of the Wet Pipe and Deluge Fire Suppression Systems by providing an adequate supply of water to the systems. The HPFL is designed to provide water at a pressure, flow rate, and quantity to meet the demands of the fire suppression system in each FACILITY. The system is designed to meet demand for only one FACILITY's systems at a time. The worst case water demand for the HPFL is established for Building 12-99 Bays 1, 3, and 5-9 which requires 1,190 gpm at 115 psi at the listed FACILITIES' PIV. The system must also be able to maintain a two-hour supply of 166,800 gallons of water available for suppression purposes to support the maximum flow facility, located in 12-85 and 12-96, requiring 1390 gpm at 92 psi.
APPLICATION TO SAFETY ANALYSIS	The HPFL is credited with preventing fires from progressing to more severe events such as a High Explosive Detonation with Dispersal or a Burning Dispersal. The system performs this function by supporting the FACILITY Fire Suppression Systems.

(Continued)

LCO

This LCO requires that the High Pressure Fire Loop be OPERABLE. The following SSCs are required to ensure system OPERABILITY:

- Water Delivery System
- Tank and Pump System
- Water Level Alarm System

Water Delivery System - The OPERABILITY of the Water Delivery System requires that it be intact and free of obstructions from the tanks through the facility PIVs. The HPFL system is a looped and gridded system, however a single line up from the pumps to a FACILITY is acceptable.

Tank and Pump System - An OPERABLE tank and pump system must consist of one of the configurations shown in Table 3.3.4-1. These configurations ensure that a single pump failure will not result in loss of the system CRITICAL SAFETY FUNCTION. For the system to be considered operable, it must be able to provide for the worst case water demand of 1,190 gpm at 115 psi at the Building 12-99 Bays 1, 3, and 5-9 PIVs.The system must also be able to maintain a two-hour supply of 166,800 gallons of water available for suppression purposes to support the maximum flow facility, located in 12-85 and 12-96, requiring 1390 gpm at 92 psi.

Water Level Alarm System - The OPERABILITY of the Water Level Alarm System requires that it alarms when tank water level drops below the 166,800-gallon level.

MODE APPLICABILITY

This LCO is applicable at all times. When the system becomes INOPERABLE. affected FACILITIES are notified, and the FACILITIES take appropriate actions based on the current respective modes.

(continued)

ACTION STATEMENTS

A.1 This Condition is entered on discovery of an INOPERABLE High Pressure Fire Loop or when an automatic start, except during testing, of one or more HPFL pump(s) occurs as a result of detecting Low Pressure within the High Pressure Fire Loop System. Upon Entry into this condition the Pantex Fire Department shall evaluate the INOPERABILITY or pump start and determine which FACILITIES are affected. Once this information has been determined, the Fire Department shall notify the Operations Center, who in turn will notify the Facility Managers for those FACILITIES.

The cause of the pump start could be from a large scale leak in the system or from water demand from a connected Fire Suppression System. In either case, that level of flow in the system would not allow for the system to meet the flow requirements to the other FACILITIES. During testing, the pumps may be expected to start. This is acceptable without declaring the system INOPERABLE, so long as the system returns to normal state within a reasonable time after completion of the test.

A.2 On receipt of notification from the Fire Department that the HPFL supply to a FACILITY is not available, the Facility Manager for the affected FACILITY shall declare the FACILITY Fire Suppression Systems to be INOPERABLE. The ACTIONS given in Condition A of LCO 3.4.1 and/or 3.4.2 of these TSRs shall be performed, as required. The FACILITY Manager shall declare these systems INOPERABLE IMMEDIATELY after the notification is received, as the unavailability of the HPFL means an immediate INOPERABILITY of the FACILITY Fire Suppression System.

B.1 Condition B shall be entered if the Water Level Alarm System of either one of the High Pressure Fire Loop Delivery System Storage Tanks is found to be INOPERABLE. Required Action B.1 directs that a manual measurement of the tank level be taken. The Minimum Tank Level shall be verified manually IMMEDIATELY upon discovery of the Alarm System INOPERABILITY and SHIFTLY thereafter. There are different ways this manual measurement can be taken. One of which is a visual measure by plunging a graduated rod down into the tank and converting inches of depth into volume. The SHIFTLY basis for this surveillance ensures that any loss of capability to deliver an adequate water supply is detected in a timely manner.

(continued)

ACTION STATEMENTS (continued)	B.2.1	The Water Level Alarm System provides a more reliable means of detecting an inoperable tank than SHIFTLY manual checks. For this reason, the Water Level Alarm System should be returned to service. The 30 day Completion Time for this requirement is based on the acceptability of the interim manual measurements, and the judgement on the duration required to repair or replace the system.
	B.2.2	If the system can not be repaired or replaced in the 30 days, Condition A of this LCO shall be entered prior to the expiration of the Completion Time.

(Continued)

GENERAL NOTE: All Surveillance FREQUENCIES for this LCO are based on NFPA codes and/or DOE Exemption MHPP-DOE-5480.7A-EX-2 (STD – 4281 Appendix E). Where the specific parameters and tolerances are not specified, they are provided through Fire Protection Engineering in accordance with the requirements of NFPA.

SURVEILLANCE REQUIREMENTS

SR 4.4.4.1 Inspect Fire Pump System – WEEKLY – The following checks shall be conducted to verify the overall OPERABILITY of the pump station:

- Pump House Temperature - Check temperature to prevent freezing conditions.
- Pump System Conditions:
  - Pump suction and discharge valves are fully open
  - Piping is free of significant leaks
  - Water tank level (minimum distance from bottom of tank)
- Electrical Motor System Conditions:
  - Motor Controller Pilot Light to ensure power
- Diesel Engine System Conditions:
  - Fuel Tank Level (minimum of 2 hours run time)
  - Fuel supply lines/fittings in good condition and free of leaks
  - Pump controller switch in the Auto Position
  - Battery electrolyte level
  - Battery terminal corrosion check
  - Crankcase oil level
  - Cooling water level
  - Water jacket heater operating
  - Water hoses in good condition and free from leaks
  - Exhaust system in good condition and free from leaks

ACTION STATEMENTS (continued)	B.2.1	The Water Level Alarm System provides a more reliable means of detecting an inoperable tank than SHIFTLY manual checks. For this reason, the Water Level Alarm System should be returned to service. The 30 day Completion Time for this requirement is based on the acceptability of the interim manual measurements, and the judgement on the duration required to repair or replace the system.
	B.2.2	If the system can not be repaired or replaced in the 30 days, Condition A of this LCO shall be entered prior to the expiration of the Completion Time.

(Continued)

GENERAL NOTE: All Surveillance FREQUENCIES for this LCO are based on NFPA codes and/or DOE Exemption MHPP-DOE-5480.7A-EX-2 (STD – 4281 Appendix E). Where the specific parameters and tolerances are not specified, they are provided through Fire Protection Engineering in accordance with the requirements of NFPA.

SURVEILLANCE REQUIREMENTS

SR 4.4.4.1

Inspect Fire Pump System – WEEKLY – The following checks shall be conducted to verify the overall OPERABILITY of the pump station:

- Pump House Temperature - Check temperature to prevent freezing conditions.

- Pump System Conditions:
  - — Pump suction and discharge valves are fully open
  - — Piping is free of significant leaks
  - — Water tank level (minimum distance from bottom of tank)

- Electrical Motor System Conditions:
  - — Motor Controller Pilot Light to ensure power
  - — Condition of electrical wiring and connections

- Diesel Engine System Conditions:
  - — Fuel Tank Level (minimum of 2 hours run time)
  - — Fuel supply lines/fittings in good condition and free of leaks
  - — Pump controller switch in the Auto Position
  - — Batteries Current and Voltage readings
  - — Battery electrolyte level
  - — Battery terminal corrosion check
  - — Crankcase oil level
  - — Cooling water level
  - — Water jacket heater operating
  - — Water hoses in good condition and free from leaks
  - — Exhaust system in good condition and free from leaks

SURVEILLANCE REQUIREMENTS (continued)	SR 4.4.4.2	Test Fire Pump Operability – WEEKLY – Perform weekly operating test to include the following: • Pump System: — Record Suction and Discharge Pressure Gauge Readings — Check pump packing glands (water cooled bearings) for water discharge — Check for unusual Noise or Vibration — Record the Pump Starting Pressure
	SR 4.4.4.3	Inspect the Fire Pump Electrical and Diesel System – WEEKLY - Test the following • Electrical System: — Observe and record the time for motor to attain full speed • Diesel Engine System: — Observe and record Automatic start time for engine to crank/start and attain full speed — Observe and record oil pressure — Observe and record water and oil temperature — Observe and record tachometer — Observe and record cooling water flow
	SR 4.4.4.4	Inspect Water Supply Control Valves (Position Open and Locked) – QUARTERLY - Inspect the control valves to the HPFL system to assure proper position, locked, and sealed.
	SR 4.4.4.5	Test Tank Water Level Alarm Indicators – SEMIANNUALLY • Test water level alarm for water storage reservoir

(Continued)

LCO 3.4.4 BASES(continued)

SURVEILLANCE REQUIREMENTS (continued)	SR 4.4.4.6	Fire Pump Flow Test – ANNUALLY Diesel Engine - Observe and record the following for NFPA specified hose flows 1. Suction Pressure 2. Discharge Pressure 3. Pitot Tube readings 4. Engine Revolutions per Minute (RPM) Diesel Fire Pump Controller Test(s) Observe and record the following information: Manual Starting Cranking Cycle Oil Pressure Failure High Water Temperature Engine Over Speed Battery Charger Battery Failure Pressure Starting Electric Motor - Observe and record the following for the NFPA specified hose flows 1. Suction Pressure 2. Discharge Pressure 3. Pitot Tube readings 4. Engine Revolutions per Minute (RPM) 5. Voltage 6. Current Diesel and Electric Motor Fire Pump Controller Test Observe and record the following: Line Pressure Starting test
	SR 4.4.4.7	Functional Test of Post Indicator Valves – ANNUALLY - Perform physical operation of the HPFL water control valves
	SR 4.4.4.8	Flow Test of Underground Piping – 5 YEARS • Underground Distribution System — Flow test grids — Cycle valves

(Continued)

REFERENCES Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

Appendix B

Design Features

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APPENDIX B - DESIGN FEATURES

Appendix B identifies the design features, which ied, could have an effect on safe operation within the respective FACILITY(s).

The feature and/or function being controlled is th SAFETY FUNCTION of the SSC. However, the Functional Requirements, which ar sign Feature, are the means to control these CRITICAL SAFETY FUNCTIONS tures are being controlled to the existing design drawings and/or design specifica 998. The design feature is being controlled to ensure that if the SSC is modified o odification or new equipment provides the same CRITICAL SAFETY FUNCT SSC. Typically, the material, construction, or actual physical dimensions of the as a design feature. Some examples are fire wall ratings, FACILITY dimen an item. Other things that may be controlled as design features include the requirem codes and standards (e.g., IEEE, NFPA, or NEC).

Design Features will have a Safety Class or Safet cation per the existing analysis. However, the SC/SS designation will apply only d to provide the credited CRITICAL SAFETY FUNCTION from the safet ance with the Design Feature is only required when there are greater than RESID M and/or EXPLOSIVEs present or operations are being conducted such that the CRI NCTION of the Design Feature is required. If the material of concern is not present being conducted that require the CRITICAL SAFETY FUNCTION of the Design irements of the Design Feature are not applicable.

The following generic constraints apply to ISIs:

- The Completion Time requirements for S d INTERVALs also apply to ISIs.
- Exceeding an INTERVAL for an ISI is no is a procedural deficiency of the In-Service Inspection Program (AC 5.6.1
- The Actions to be completed when a non ied for a design feature are contained in the procedural implementati

DF.1 FACILITY STRUCTURE

DF.1.1 Nuclear Explosive Bays (12-64, 12-84, 12-99, 12-104)

The following are the Functional Requirements for the Nuclear Explosive Bays Facility Structure

- Provide a fire barrier to withstand the design basis External Fire, including those caused by External Explosions and Aircraft Crashes, without progressing to an Internal Fire event.
- Provide a physical barrier to withstand the shock wave and missiles from an External Explosion without progressing to an Impact event.
- Provide a physical barrier to withstand the impact force from an Aircraft Crash without progressing to an Impact event.
- Provide a physical barrier to withstand the wind forces and the missiles of a PC-3 Tornado/High Wind event without progressing to an Impact event.
- Provide a design that will withstand the forces from a PC-3 Seismic event without resulting in facility damage or facility component damage that would progress to an Impact event.
- Provide a physical barrier or physical separation to limit the shock wave and fragments resulting from an internal High Explosive Detonation to adjacent facilities.

The critical characteristics that satisfy the above Functional Requirements are found in Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

In-Service Inspection	FREQUENCY
Inspect the Facility Structure Critical Safety Components for signs of wear and erosion and related fire barrier integrity measures.	ANNUALLY

DF.1.2 Nuclear Explosive Cells (12-44 Cells 2 through 6, 12-85, 12-96, and 12-98 Cells 1 through 4)

The following are the Functional Requirements for the Nuclear Explosive Cells Facility Structure:

- Provide a fire barrier to withstand the design basis External Fire, including those caused by External Explosions and Aircraft Crashes, without progressing to an Internal Fire event.
- Provide a physical barrier to withstand the shock wave and missiles from an External Explosion without progressing to an Impact event.
- Provide a physical barrier to withstand the impact force from an Aircraft Crash without progressing to an Impact event.
- Provide a physical barrier to withstand the wind forces and the missiles from a PC-3 Tornado/High Wind event without progressing to an Impact event.
- Provide a design that will withstand the forces from a PC-3 Seismic event without resulting in facility damage or facility component damage that would progress to an Impact event.
- Provide a filtration of the release following a High Explosive Detonation with Dispersion event that has sufficient force to exercise the gravel gertie. Filtration shall limit the consequences to within the evaluation guidelines.
- Provide a limited leak path following a High Explosive Detonation with Dispersion event that does not have sufficient force to exercise the gravel gertie. Leak path shall limit the consequences to within the evaluation guidelines.
- Provide a physical barrier or physical separation to limit the shock wave and fragments resulting from an internal High Explosive Detonation to adjacent facilities.
- Provide a fire door for the staging cubicles (Building 12-98 Only)

The critical characteristics that satisfy the above Functional Requirements are found in Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

In-Service Inspection	FREQUENCY
Inspect the Facility Structure Critical Safety Components for signs of wear and erosion and related fire barrier integrity measures	ANNUALLY
Inspect the Facility Structure Leak Area	ANNUALLY

DF.1.3 Nuclear Explosives Special Purpose Facilities (12-41, 12-50, and 12-60)

The following are the Functional Requirements for the Special Purpose Facilities facility Structure:

- Provide a fire barrier to withstand the design basis External Fire, including those caused by External Explosions and Aircraft Crashes, without progressing to an Internal Fire event (Buildings 12-41, 12-50 and 12-60).
- Provide a physical barrier to withstand the shock wave and missiles from an External Explosion without progressing to an Impact event. This function does not apply to Building 12-41.
- Provide a physical barrier to withstand the impact force from an Aircraft Crash without progressing to an Impact event. This function does not apply to Building 12-41.
- Provide a physical barrier to withstand the wind forces and the missiles from a PC-3 Tornado/High Wind event without progressing to an Impact event. This function does not apply to Building 12-41
- Provide a design that will withstand the forces from a PC-3 Seismic event without resulting in facility damage or facility component damage that would progress to an Impact event. This function does not apply to Building 12-41.
- Provide a physical barrier or physical separation to limit the shock wave and fragments resulting from an internal High Explosive Detonation to adjacent facilities. This function does not apply to Building 12-41.

The critical characteristics that satisfy the above Functional Requirements are found in Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

In-Service Inspection	FREQUENCY
Inspect the Facility Structure Critical Safety Components for signs of wear and erosion and related fire barrier integrity measures	ANNUALLY

DF.1.4 Zone 12 Staging Facilities (12-26 PV, 12-42 NV, 12-44 Cell 8, and 12-58 [Bays 4 and 5])

The Zone 12 Staging Facilities Functional Requirements are:

- The facility structure shall provide a fire barrier to withstand the design basis External Fire, including one caused by External Explosions and Credible Aircraft Crashes, without progressing to an Internal Fire event.
- Provide a physical barrier to withstand the impact force from an Aircraft Crash without progressing to an Impact event. This function only applies to Building 12-44 Cell 8.

The critical characteristics that satisfy the above Functional Requirements are found in Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

In-Service Inspection	**FREQUENCY**
Inspect the Facility Structure Critical Safety Components for signs of wear and erosion and related fire barrier integrity measures	ANNUALLY

DF.1.5 Zone 4 Staging Facilities (4-19, 4-21, 4-25, 4-30 through 4-44, and 4-101 through 4-142)

The following are the Functional Requirements for the Zone 4 Staging Facilities Facility Structure:

- Provide a fire barrier to withstand the External Fire event, including those caused by External Explosions and Aircraft Crashes, without progressing to an Internal Fire event.
- Provide a physical barrier to withstand the shock wave and missiles from an External Explosion without progressing to an Impact event.
- Provide a physical barrier to withstand the impact force from an Aircraft Crash without progressing to an Impact event.
- Provide a physical barrier to withstand the wind forces and the missiles of a PC-3 Tornado/High Wind event without progressing to an Impact event.
- Provide a design that will withstand the forces from a PC-3 Seismic event without resulting in facility damage or facility component damage that would progress to an Impact event.

The critical characteristics that satisfy the above Functional Requirements are found in Pantex Nuclear Facilities Analytical Basis for the Technical Safety Requirements, RPT-SAR-209805

In-Service Inspection	FREQUENCY
Inspect the Facility Structure Critical Safety Components for signs of wear and erosion and related fire barrier integrity measures	ANNUALLY

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DF.2 Sandbag Barrier System

The Sandbag Barrier System mitigates the consequence of an event involving a High Explosive Detonation by maintaining a barrier to prevent a detonation from initiating sympathetic detonations in adjacent compartments inside a facility.

The design of the Sandbag Barrier System shall be in accordance with Technical Manual - Nuclear Safety Criteria (U), DOE-DNA TP 20-7, latest revision.

In-Service Inspection	FREQUENCY
Verify compliance with TP 20-7	ANNUALLY

DF.3 Facility Crane Assembly

The Facility Crane Assembly prevents an Impact initiated event by not failing during all operating and credible seismic accident conditions. This function protects the public, the facility worker, and the site worker.

The Facility Crane Assemblies shall be designed and installed in accordance with the applicable Sections of 29 CFR 1910.179 and ASME B30 Series for the following key elements: load rating, brakes, and stops.

In addition to the above requirements, the following special design features apply for enhanced seismic protection:

- 12-64 – maintain the enhanced structural fasteners to the current configuration
- 12-85, 12-96, and 12-98 – maintain the Pivot Bearing Restraint to the current configuration

IN-SERVICE INSPECTION	FREQUENCY
Perform load test (100 Percent of rated load)	3 YEARS AND upon completion of load path modification
Inspect for wear, deterioration or, malfunction in accordance with the provision given in applicable sections of 29 CFR 1910.179 ASME B30 Series	Per source document requirements

DF.4 Blast Valves

The Blast Valves mitigate releases to the public and site workers following a High Explosive Detonation with Dispersion by isolating the ventilation inlet and exhaust ducts.

The Blast Valves are designed to close and latch with the following maximum force applied to the valve:

- Supply ducts: 150 pounds
- Exhaust ducts: 95 pounds

During an Internal High Explosive Detonation, the Blast Valves close in sufficient time to minimize the leak through the ventilation ducts such that the additional leakage areas are negligible to the overall cell leak area for dispersion calculations.

In-service Inspection Requirements:

In-service Inspection	FREQUENCY
The close and latching capability of the Blast Valves shall be inspected.	ANNUALLY
The valves shall be removed and the sealing surfaces of the Blast Valves shall be inspected.	3 YEARS

DF.5 Facility Lightning Protection System

The Facility Lightning Protection System will be added at a later date.

SEPARATION

PAGE

Enclosure #7

MASON & HANGER CORPORATION

BENJAMIN J. PELLEGRINI, Ph.D.
Pantex General Manager
P.O. Box 30020
Amarillo, TX 79120-0020
(806) 477-6200

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MAR : : 2000

Mr. R. E. Glass, Manager
U. S. Department of Energy
Albuquerque Operations Office
P. O. Box 5400
Albuquerque, NM 87185-5400

Through: Mr. Daniel E. Glenn, Area Manager
Amarillo Area Office

Subject: Declaration of Readiness - Master Authorization Agreement for Pantex Category 2 Nuclear Operations

Ref: Letter from W. A Weinreich to J. M. Bernier dated October 29, 1999, *Authorization Basis List and Annual Revision of AB Documents*

Dear Mr. Glass:

The purpose of this letter is to declare our readiness to proceed with implementation of the Master Authorization Agreement (Agreement) for Category 2 Nuclear Operations at Pantex. Since your approval of the Agreement on January 4, 2000, Mason & Hanger Corporation (MHC) has: (1) established formal change control and distributed 81 controlled copies of the Agreement; (2) revised Plant Standard 0154, *Authorization Agreements*, that establishes the procedures for developing, revising, and controlling the Agreement and Authorization Agreements for individual Covered Operations; (3) trained essential personnel; and (4) completed a management self-assessment to assure that mechanisms are in-place and sufficient for controlling nuclear material and nuclear explosive operations. In addition, the Agreement has been revised to reflect the implementation of the Technical Safety Requirements for Pantex Facilities (RPT-SAR-199801).

The Management Self Assessment (MSA) was conducted during the period February 11 to February 18, 2000, in accordance with the MSA of the Agreement Implementation Plan (IP) dated February 10, 2000. The MSA identified 5 Pre-start findings, 5 Post-start findings, and 7 Observations. All findings and observations have been resolved. Resolution of the Pre-start findings required: (1) adding clarification in Plant Standard 0154 regarding the identification of specific Bay and Cell locations for authorized activities; (2) eliminating authorized activities form Appendix A and adding individual Authorization Agreement numbers, the names of responsible managers, and effective and expiration dates; and (3) one-on-one meetings with each manager responsible for an individual Authorization Agreement to review in detail the Scope of Authorized Activities, the Authorization Basis (AB), Special Reviews, and additional Terms and Conditions which constitute the basis for DOE's authorization to perform work. The results and disposition of findings and observations of the MSA are attached.

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It is understood that, following your approval, this Agreement will supercede and replace all previous Authorization Agreements governing Nuclear Operations. As identified in the referenced letter, MHC will use the *Master Authorization Agreement for Nuclear Operations* (ABC-258600) as the DOE authorized AB list for the Pantex Plant.

If you have any questions or require further clarification, please contact Larry Eppler at (806) 477-6460.

Very truly yours,

Benjamin J. Pellegrini for
General Manager

BJP/rwk

Attachment:
Final Report of the Management Self-assessment of the Master Authorization Agreement

cc: D. E. Glenn, AAO Manager, 12-36
J. M. Bernier, Deputy Area Manager, 12-36
R. T. Brock, Senior Technical Advisor, 12-36
D. C. Brunell, Authorization Basis Staff Manager, 12-36
D. J. Kelly, Assistant Area Manager for Nuclear Material Operations, 12-36
R. E. Phillips, Assistant Area Manager for Weapon Operations, 12-36
D. D. Schmidt, IWAP Manager, 12-36
S. C. Erhart, Manager AL Safety Analysis and Support Division, DOE/AL/SASD

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Albuquerque Operations Office

&

Mason & Hanger Corporation

Master Authorization Agreement

For

Nuclear Operations

at the

Pantex Plant

Amarillo, Texas

RK ABC
~~MNL~~ - 258600
Revision 1
+ Change 1
April 4, 2000

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Authorizing Signatures

Effective Date and Expiration Date

This Agreement is effective upon the latest date of signature by both parties and shall expire upon the earlier of the expiration of the Contract (Contract Exp.) or a specific termination clause incorporated in Appendix C to this Agreement.

†We, the undersigned, authorize Revision 1, Change 1 to this Agreement. Transactions to this agreement are summarized in the Issue History and Summary of Changes Log.

U. S. Department of Energy		Mason & Hanger Corporation
Tenny J. Kelly / 4/4/00 for Richard E. Glass /Date Manager, AL Operations Office		John C Drummond for Benjamin J. Pellegrini /Date General Manager, Pantex Plant

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Issue History and Summary of Changes Log

Revision No.	Change No.	Submittal Date	Description of Change(s)	Affected Pages
1	0	11-30-99	Initial Issue	All
1	1	1-5-00	➢ Incorporated AA for the W62 Program and repaginated Appendix A (pages A3 & A4)	A2, A3, A4 C18
			➢ Added Change Level to Header	i, ii
	2	1-19-00	➢ Revised W87 AA to permit Armed MSAD Operations: Revised Authorization Basis (HAR & ABCD), added DOE MSAD Readiness Review to Specific Reviews, and added MSAD and Maintenance/Repair to Scope Of Activities.	C-11
			➢ New General Manager Signature Block	i
			➢ Added Change Level to Header	i, ii
	3	1-28-00	➢ Revised Zone 12 SNM AA to delete reference to Line 1 and Line 2.	C-14
			➢ Revised ALR-8 SI AA to authorize Activities in Building 12-64, Bays 1, 2, 4, 6 & 7 and added Thermal Instrumentation of Pits & Containers in Zone 4, and Zone 12 in Building 12-116 to Scope Of Activities; added MHC Readiness Approach and DOE validation of PX-3322A for revised scope to Specific Reviews; and corrected typo in Additional Terms & Conditions.	C-16
			➢ Added Change Level to Header	i, ii
1	0	3-13-00	Master Authorization Agreement Manual MNL-258600 revised to Control Document ABC – 258600, Revision 1, Change 0.	All
	1	4-4-00	Revised AL-R8 SI AA to delete Activities in Building 12-99 and provide clarification of Activities authorized in Building 12-64; also added MHC Readiness Approach and DOE validation of PX-3322A for revised scope of Bay 4 operations to Specific Reviews.	C-16
			Added Change Level to Header	i, ii

Table of Contents

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1 Purpose

This Master Authorization Agreement (Agreement) is entered into by the United States Department of Energy (DOE) and Mason & Hanger Corporation (MHC) to establish and maintain the basis for authorizing Nuclear Operations at the Pantex Plant. The Pantex Plant is owned by the DOE and managed and operated by MHC pursuant to prime contract DE-AC04-91AL65030 (Contract).

The purpose of this Master Authorization Agreement is to document agreement with the United States Department of Energy on key terms and conditions (controls and commitments) under which Mason & Hanger Corporation is authorized to perform work on Category 2[1] nuclear weapon programs and nuclear material operations. This Master Authorization Agreement integrates both common and specific terms and conditions for Category 2 Nuclear Operations into one document readily accessible to line managers and support staff while providing the Department of Energy reasonable assurance regarding the adequacy and effectiveness of the overall system of safety management at Pantex.

This Agreement sets forth a comprehensive framework for:

a) Authorizing Category 2 Nuclear Operations at Pantex;
b) Establishing the scope of authorized operations;
c) Correspondence and change requests for Covered Operations;
d) Capturing and defining operation-specific authorization basis terms and conditions;
e) Establishing the prerequisites, for Nuclear Operations and Nuclear Explosive Operations, which demonstrate that the conduct of proposed operations is adequate to protect the public, the workers, and the environment;
f) Establishing ground rules for responding to requests for new operations (e.g., an operation that is not currently included within an existing Agreement);
g) Administering and reporting exceptions, deviations, and potential nonconformance with established terms and conditions in the Agreement;
h) Establishing the protocol for making changes to Facilities and Covered Operations, including individual Authorization Agreements;
i) Establishing the requirements for process relocation to alternate Facilities; and,
j) Establishing the Authorization Authority for startup or restart of Nuclear Facilities and Operations.

[1] Category 2 nuclear operations are those operations with radioactive material inventory in excess of the thresholds defined in DOE-STD-1027-92. Categorization is determined by MHC and agreed to by DOE. This includes both Nuclear Operations and Nuclear Explosive Operations.

1.1 Scope

This Agreement applies to Category 2 Nuclear Operations conducted at Pantex that are managed and operated by MHC.

The Agreement contains common controls and commitments which have Site-wide application and are included in the main text of the Agreement, and specific controls and commitments which have weapon system - or facility - specific application and are included as Appendix C, incorporated herein as part of the Agreement that define the terms and conditions under which Nuclear Operations are performed. Modifications and revisions to the terms and conditions require a formal change to this Agreement agreed to by both parties.

Appendix A presents a summary of Nuclear Operations and Nuclear Explosive Operations conducted in Pantex Category 2 nuclear facilities covered by this Agreement (Covered Operations). Appendix B identifies the Master Studies and Reviews, Site Standards/Requirements Identification Documents (S/RIDs), and Site-wide Authorization Basis (AB) Documents applicable to the Covered Operations listed in Appendix A.

For each Covered Operation, Appendix C, in conjunction with Appendix B and the requirements specified in Section 6 of this Agreement, represents the basis for official DOE authorization to perform the scope of work under the terms and conditions for which the operation is authorized. Appendix C presents the scope of authorized work activities, AB documents tailored specifically for each operation, Specific Reviews (e.g., Nuclear Explosive Safety Studies, Readiness, Qualification Evaluation, etc.), and operations-specific Terms and Conditions.

1.2 Order of Precedence

If there is a conflict between any provisions of this Agreement and any provision of the Contract, including without limitation the clause entitled "Work Control System," the Contract provisions prevail over the provisions of this Agreement.

1.3 Previous Authorization Agreements

This Agreement shall supercede and replace all previous authorization agreements entered into by the parties governing Nuclear Operations at the Pantex Plant.

2 Communications

Except as noted in section 2.1 below, all technical, administrative, and other correspondence pursuant to this Agreement shall be submitted in accordance with Section G of the Contract.

The Manager, Amarillo Area Office (AAO), or his designee, is the Contracting Officer for administration only of the Contract. The Manager, Department of Energy Albuquerque Operations Office (DOE AL), or his designee, is the Contracting Officer for all other matters including waivers, deviations, or modifications to the requirements, terms, or conditions of the Contract.

2.1 Correspondence

Technical, administrative, and other correspondence issued pursuant to this Agreement shall include a reference to the Agreement in the subject title.

2.1.1 Technical and Administrative Correspondence

Technical correspondence and administrative correspondence, excluding Other Correspondence (see Section 2.1.2), must be addressed to the Administrative Contracting Officer at the DOE AAO Manager's office.

2.1.2 Other Correspondence

Other correspondence which propose or otherwise involves waivers, deviations, or modifications to the requirements, terms, or conditions of the Contract, including Authorization Agreements, must be addressed to the Contracting Officer at the DOE Albuquerque Operations Office (currently the Manager, Albuquerque Operations Office) with a copy sent to the Administrative Contracting Officer at the DOE AAO Manager's office.

2.2 Change Request to Covered Operations

2.2.1 Administrative Changes

MHC's Director of Program Management is delegated as the single point of contact for evaluating and managing all work commitments associated with this Agreement. The Program Management Directorate is responsible for managing and accomplishing work in accordance with Work Authorization Directives (WADs) and ensuring changes in work scopes are aligned with approved WADs. Correspondence with the potential to impact cost, technical performance, or requirements of the Contract must be addressed to the Plant General Manager at MHC's Pantex office with a copy to the Director of Program Management.

2.2.2 Technical Changes

MHC's Authorization Basis Development & Management Department (ABD&M) is delegated as the single point of contact for developing AB documents. The ABD&M is responsible for maintaining Authorization Basis and Safety Basis documents associated with this Agreement. Correspondence with the potential to impact the Authorization Basis or Safety Basis of any Facility or Process covered under this Agreement must be addressed to the Plant General Manager at MHC's Pantex office with a copy to the Senior Technical Advisor and the Director of Program Management.

Changes to drawings, other specifications, Qualification Evaluation Releases (QERs), or Additional Terms & Conditions of individual Authorization Agreements (Appendix C) must be evaluated for potential impact on the Authorization Basis or Safety Basis. In addition, an assessment of the programmatic impact on cost and funding, technical performance, and schedule must be performed and formally agreed upon with DOE (prior to implementation) in the event the proposed change(s) is not within a currently approved WAD.

3 Interpretations

Except as specifically authorized by DOE in writing, no interpretation of the requirements in this Agreement by an official or employee of the DOE other than a written interpretation by the Administrative Contracting Officer (AL or AAO) or the AAO Manager will be binding upon the DOE or MHC.

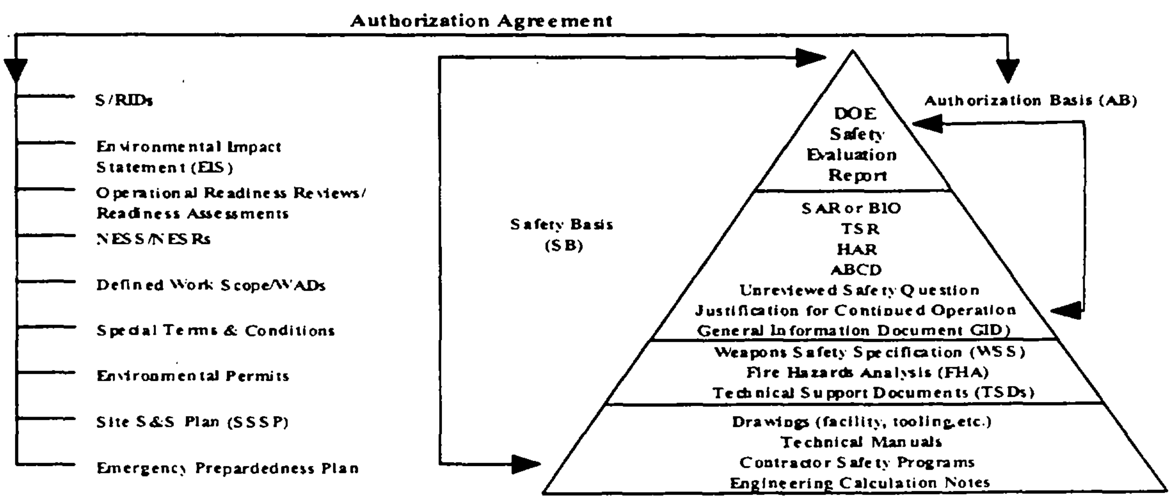
4 Basis for Authorization

DOE has determined, through the performance of studies and performance-based reviews, that certain Category 2 Nuclear Operations can be safely conducted and that an adequate infrastructure exists to conduct specific operations listed in Appendix A. This determination is based upon the provision that terms and conditions listed in the Contract and this Agreement (including Appendix B and Appendix C) are met.

4.1 Authorization for Category 2 Nuclear Operations

The Authorization Basis for all Category 2 Nuclear Operations conducted at the Pantex Plant is established through programs as delineated in the Management Integration & Controls (MIC) Standards/ Requirements Identification Document (S/RID) (MIC-1000). The Authorization Basis is comprised of those aspects of the facility design basis and operational requirements relied upon by DOE to authorize operations. These aspects are considered to be important to the safety of facility operations. The Authorization Basis is described in documents such as: Facility Final Safety Analysis Reports, Basis for Interim Operations, Hazard Analysis Reports, Technical Safety Requirements, and DOE-issued Safety Evaluation Reports.

The Authorization Basis is the top tier of information, directed or approved by the DOE, relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls). relied upon to conclude that activities at the facility can be conducted safely. This collective set of documents constitutes the Safety Basis. The illustration, below, shows the relationship between the Authorization Basis and Safety Basis, as well as the primary elements that support an Authorization Agreement.



The Authorization Agreement, as delineated in MIC S/RID Criterion 1.6.2.b, and its Adopted Standards, encompasses a wide variety of documents, processes, permits, and plans. The successful integration of these requirements into individual operations is accomplished through specific Authorization Agreements. The general philosophy for these processes is the overlaying of increasingly rigorous-technical analyses from the more general Site-wide programs to specific facility operations.

The Authorization Agreement integrates essential DOE approved elements and Site-wide programs with the Authorization Basis for individual Covered Operations. Essential elements, in addition to Authorization Basis documents, consist of Defined Work Scope (WAD), Environmental Impact Statement (EIS), Operational Readiness Reviews, Nuclear Explosive Safety Studies (for operations involving nuclear explosives); and special terms and conditions governing or limiting operations. Site-wide programs include Site S/RIDs, Environmental Permits, the Site Safeguards & Security Plan (SSSP), and the Site Emergency Preparedness Plan. All Category 2 Nuclear Operations are reviewed and controlled through the framework defined by Integrated Safety Management (ISMD, Plan 93). DOE review and approval of many of the essential elements of this Agreement, in conjunction with the prerequisites for conducting Nuclear Explosive Operations and Nuclear Material Operations, provide the Department of Energy reasonable assurance that operations will be conducted safely at Pantex.

The current Nuclear Explosive Safety (NES) Master Studies, the Pantex Basis for Interim Operation (BIO) #MNL-00076, and the Technical Safety Requirements for Pantex Facilities (RPT-SAR-199801) are also used to establish the Safety Basis for Nuclear Explosive Operations. Beyond these general requirements are the specific AB/SB documents required by the Adopted Standards of MIC Criterion 1.6.2.b. This set of Site and Facility controls establishes acceptable provisions for the protection of the public, workers, and the environment.

Prerequisites for Nuclear Explosive Operations include the following:

- Approved Site-wide EIS.
- Approved Safety Analysis Report (SAR) or interim document.
- Approved Hazards Analysis Report (HAR)[2].
- Approved NESS (Includes Nuclear Explosive Safety Rules (NESRs)).
- Approved and implemented Technical Safety Requirement (TSR) Controls.
- Approved Activity Based Controls Document (ABCD)[2] that contains the full set of:
  - Program Specific Controls
  - Common Controls

[2] Note: HARs and ABCDs are developed in accordance with the Integrated Weapons Activity Plan, and therefore are not currently available for all authorized Weapon Programs.

- Operational Readiness Review/Readiness Assessment performed in accordance with the Performance Criteria and Adopted Standards of MIC S/RID Section 1.5, *"Confirm Readiness"*, as applicable.
- Certification by the AL Operations Office Manager that all NES Surety Standards, as specified in DOE O 452.1A, have been met.
- Design Agency Engineering Evaluation and/or Qualification Evaluation Release.

The necessary prerequisites for Nuclear Material Operations, covered by this Agreement, include the following:

- Approved Site-wide EIS.
- Approved SAR or interim document.
- Approved and implemented TSR controls.
- Operational Readiness Review/Readiness Assessment, performed in accordance with the Performance Criteria and Adopted Standards of MIC S/RID Section 1.5, *"Confirm Readiness"*, as applicable.
- Design Agency, National Laboratory Evaluation, and/or Qualification Evaluation Release, as applicable.

4.2 EIS Record of Decision

DOE issued the Record of Decision for the Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components (DOE/EIS-0225, November 1996). The Department has decided to implement the preferred alternative by: (1) continuing nuclear weapon operations involving assembly and disassembly of nuclear weapons at the Pantex Plant; (2) implementing facility projects, including upgrades and construction consistent with conducting these operations; and (3) continuing to provide interim pit storage at the Pantex Plant and increasing the storage level from 12,000 to 20,000 pits.

4.3 MHC Technical Qualifications

DOE has determined that MHC: 1) is technically qualified to engage in Nuclear Operations and Nuclear Explosive Operations authorized by this Agreement, and 2) has established an adequate program for hiring, training, and qualifying personnel in accordance with the requirements delineated in MHC's Site S/RIDs ((MIC-1000, Hazards Control (HC-2100 through 2500), and Mission Support (MS-3100 through 3400)).

5 Authorization Agreements for Covered Operations

Nuclear Operations and Nuclear Explosive Operations, authorized under this Agreement for Pantex Category 2 nuclear facilities, are defined as Covered Operations and are identified in Appendix A. The Authorization Agreement for each Covered Operation includes: 1) NESS Studies & Reviews (for NE

Operations only), Site S/RIDs, Site-wide Evaluations, and Site-wide Authorization Basis listed in Appendix B, 2) Requirements & Conditions for Covered Operations presented in Section 6 of this Agreement, and 3) Program/Process-specific agreements presented in Appendix C, which are comprised of the following 4 sections:

- Scope of Activities
- Authorization Basis
- Specific Reviews
- Additional Terms & Conditions

The following subsections describe the contents of program/process-specific agreements presented in Appendix C.

5.1 Scope of Activities

This section of the Authorization Agreement summarizes the scope of work that is specifically authorized for each Covered Operation, including a clear description of the work being authorized and the facility or facilities where the work is to be performed. Formal work scopes are documented in the annual Work Authorization Directive (WAD). The WAD is the agreement between MHC and DOE that authorizes the expenditures of funds in support of these activities. For Nuclear Explosive and most Nuclear Material Operations, the scope of work specified in individual Authorization Agreements is developed from the Production & Planning Directive, by DOE/AL, and described in Program Control Documents (PCDs) for each weapon program. PCDs for each weapon program are combined with the Quality Assurance Production Plan (QAPP) and any special letters from DOE/AL to become the workload as directed by DOE. If there is a conflict between any provisions of this Agreement and any provision of the approved WAD, the provisions of the WAD prevail over the provisions of this Agreement.

5.2 Authorization Basis

This section of the Authorization Agreement presents a summary listing of documents that identify program specific AB documents which comprise the basis for conducting each Covered Operation. In general, program specific AB documents tailor the controls for each operation to the hazards involved.

All Nuclear Explosive Operations are subject to Unreviewed Safety Question (USQ) and NES change control, as defined by MIC Criterion 1.7.2.a. Nuclear Explosive Operations that do not have an approved HAR/ABCD will rely upon relevant Nuclear Explosive Safety Studies and the Site-wide AB, as identified in Appendix B, as their basis for AB change control.

Technical Safety Requirements (TSRs) for Pantex are identified as a Site-wide AB document in Appendix B. TSRs define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and reduce the potential risk to the public, the environment, and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality.

5.3 Specific Reviews

Specific Reviews for each Covered Operation complete the technical basis for authorizing work and provide added assurance that the operation can be performed safely. Examples of Specific Reviews that may be included are Operational Readiness Review/Readiness Assessments, Design Agency Evaluation or Qualification Evaluation Release (QER), National Environmental Policy Act Documentation, and Nuclear Explosive Safety Studies. The Criteria for inclusion as a Specific Review are assessments and/or evaluations which are conducted to provide assurance that proposed operations and activities can be conducted safely, within the requirements and conditions imposed by the Agreement; this does not include reviews conducted in preparation for more extensive or external reviews by DOE.

5.4 Additional Terms & Conditions

In addition to the Requirements and Conditions for Nuclear Operations and Nuclear Explosive Operations specified in Section 6 of this Agreement, Appendix C includes Additional Terms & Conditions that MHC commits to perform and follow to assure that authorized work will be performed safely. Additional Terms & Conditions include special restrictions, limitations, and operational/process requirements that may be imposed as deemed necessary for authorizing individual operations. Qualification Evaluation Releases (QERs) may impose additional terms and conditions (see Technical Business Practice, TBP-100, *Concurrent Qualification*). MHC shall comply with Additional Terms & Conditions (Ts&Cs) as stipulated in current Qualification Evaluation Releases and subsequent revisions thereto.

For Nuclear Weapon Operations, additional information to be identified in the Ts&Cs section include the Weapon Evaluation B-series Drawing set, the Weapon Safety Specification (WSS), and the Weapon Assembly Materials List (ML), as applicable. In addition, special process-specific requirements, which must be implemented in operating procedures, are identified in the WSS and NESS (Immediate Action Procedures and specific NES Rules (NESRs)).

Requirements that are part of the Authorization Basis should not be included as additional Ts&Cs. Each T&C must be appropriately referenced to its source.

6 Requirements & Conditions for Covered Operations

MHC shall conduct Nuclear Operations and Nuclear Explosive Operations, in accordance with the terms and conditions specified in the Contract, this section of the Agreement, Appendix B, and Appendix C to this Agreement.

6.1 Conduct of Nuclear Operations and Nuclear Explosive Operations

Operations, not listed in Appendix C, shall be conducted in accordance with the operational controls specified in Site-wide AB documents (e.g., BIO, TSRs, GID) listed in Appendix B. Nuclear Operations and Nuclear Explosive Operations covered by Appendix C are conducted in accordance with the specific authorization basis documents listed in Appendix B and Appendix C. Nuclear Explosive Operations shall be performed in accordance with: 1) the Authorization Basis, and 2) as presented during the NESS, or as subsequently approved through the NES change control process.

6.2 Deviations to Standards and Requirements

Deviations from standards and requirements listed in Section J, Appendix E of the Contract, shall be documented by MHC and approved by DOE through temporary or permanent exemptions, equivalencies, or implementation plans, as defined by MIC Criterion 1.3.1.a, or modifications to approved Site S/RIDs. New or revised requirements shall be reviewed by MHC, and incorporated into the MIC, Hazards Control, or Mission Support S/RIDs, as appropriate. MHC shall ensure compliance commitments are tracked and completed within established time frames.

6.3 Maintenance of the Authorization Basis

MHC shall maintain the authorization basis, defined in Appendix B and Appendix C, as amended, consistent with the facility configuration, through the USQ/NES change control process, compliant with the requirements of MIC S/RID Criteria 1.7.2.a and 1.7.4.a.

6.4 Emergency Conditions

MHC shall comply with the provisions of this Agreement except for reasonable action taken in an emergency; when this action is immediately needed to protect the safety and health of the public, workers, and/or the environment, and it is not immediately apparent to MHC, that action consistent with this Agreement would provide adequate or equivalent protection.

6.5 Potential Deviations, Exceptions, or Nonconformances

MHC shall report to the DOE AAO Area Manager or designee any exception, deviation, or potential nonconformance to this Agreement and actions taken to bring operations to a safe and stable condition. Specifically, MHC shall inform AAO of:

- Corrective actions which have been taken by MHC and the results achieved; and
- Proposed corrective actions that will be taken.

6.6 Occurrence Reporting

A deviation or potential nonconformance to this Agreement shall be reviewed by the Responsible Manager (listed in Appendix A and Appendix C) and if required, reported as an Occurrence and submitted to the Occurrence Reporting and Processing System (ORPS) in accordance with MIC Criteria 1.7.1.i and 1.7.1.n. In addition, internally generated documents that may identify deficiencies involving Nuclear Operations and Nuclear Explosive Operations, such as Occurrence Reports, Nonconformance Reports, and assessments are reviewed to identify potential Price-Anderson Amendment Act (PAAA) noncompliances.

6.7 Nuclear Material and Nuclear Explosive Process Relocation

In the event it becomes necessary or desirable to change production Facilities for an approved-Covered Operation, the following minimum conditions must be satisfied:

- A negative USQ Evaluation (USQE) and NES concurrence, as defined by MIC Criterion 1.7.2.a.
- A completed Process Relocation Readiness Checklist (PX-3322A) validated by DOE, as appropriate.

  (Meets the intent of an appropriately scoped readiness assessment in accordance with MIC S/RID Section 1.5)
- No Facility Modifications are required.

When the conditions stated above are satisfied and appropriate page changes to the HAR or ABCD have been issued, formal DOE approval is not required to commence operations in the new (relocated) facility.

In the event Facility modifications are required, the following conditions must be satisfied:

- A negative USQ Evaluation (USQE) and NES concurrence, as defined by MIC Criterion 1.7.2.a.
- A completed Process Relocation Readiness Checklist (PX-3322A) validated by DOE, as appropriate.
- Completion of the core requirements for a Readiness Assessment identified in Plant Standard-7303; which applies the elements of MIC S/RID Criteria (Section 1.5).

When the conditions stated above are satisfied and appropriate page changes to the HAR or ABCD have been issued, formal DOE approval is not required to commence operations in the new (relocated) facility. Evaluations that result in a positive USQE require formal submittal to DOE for approval, including the USQE, PX-3322A, and other information as required by Section 7 of this Agreement.

6.8 Justification for Continued Operations

Deviations or potential nonconformances to any requirement, term, or condition of this Agreement that affect the AB requires a formal submittal to DOE providing Justification for Continued Operations (JCO). A JCO enables temporary DOE approval for operating a facility or performing an activity when current requirements cannot be fully met. A JCO is a request to operate temporarily beyond the current authorization basis while a safety evaluation is being conducted, to determine if a Potential Inadequate Safety Analysis (PISA) exists, for a specified period of time. Once approved by DOE, the JCO becomes part of the authorization basis.

6.9 Startup and Restart of Nuclear Facilities, Nuclear Operations & Nuclear Explosive Operations

MHC shall follow MIC S/RID Criterion 1.5.2.c for startup and restart of all Nuclear Facilities, Nuclear Operations, and Nuclear Explosive Operations. Operations that MHC has suspended, without DOE intervention, may restart upon approval from the MHC General Manager, provided the USQE (if required) is negative, NES concurrence is obtained (if required), and the shutdown has been less than 12 months. For all other activities not requiring a readiness review, Authority for startup or restart is delegated to MHC, unless specified otherwise by DOE.

7 Change Control

7.1 Authorization Agreements

All changes to covered operations, with the potential to impact the AB, are reviewed through the USQ/NES change control process; thereby enabling the identification of issues that would require a change to this Agreement. Changes to AB documents that impact individual Agreements (Appendix C) shall be processed with Authorization Agreement page change(s) (see Section 7.4.d). This permits changes to this Agreement and the AB to be processed simultaneously.

MHC shall maintain the authorization basis, defined in Appendix B and Appendix C, as amended, consistent with facility configurations, weapon configurations, and processes used to assemble, disassemble, test, stage, and store nuclear explosives (and their nuclear components).

Changes to safety basis documents that serve as the technical foundation for the authorization basis, and are under MHC configuration control, shall also be reviewed through the USQ/NES change control process to determine their implications on the authorization basis.

Approved JCOs represent transitory AB documents. Changes to this Agreement, based upon approved JCOs, will be accomplished by updating either Appendix B or the applicable Appendix C Covered Operation. Changes to this Agreement, resulting from JCOs, will be incorporated through an administrative change as described in Section 7.4.c.

7.2 Facility and Process Changes

Either MHC or the DOE may initiate change requests for Facilities or Processes covered by this Agreement. Regardless of the initiator, change requests that affect program costs, technical performance, or schedule will be processed in accordance with the Work Authorization change control process.

MHC may make changes to Nuclear Facilities, Nuclear Operations, and Nuclear Explosive Operations, without prior DOE approval, provided the costs are within a currently authorized WAD and all of the following conditions are satisfied:

a) MHC shall evaluate the safety implications of proposed changes to *safety significant* and *safety class* structures, systems, and components and to nuclear processes to determine that the changes would not result in any increase in risk to the health and safety of the public or the workers and the environment.

b) The changes must be authorized by MHC management and concurred with by the appropriate subject matter experts as required by the nuclear explosive operations change control process delineated by MIC S/RID Criterion 1.7.2.a.

c) The changes do not decrease effectiveness of the facility's safety, safeguards, and security programs.

d) The changes do not constitute an Unreviewed Safety Question as required by MIC S/RID Criterion 1.7.4.a.

7.3 Evaluation of Emergent Conditions

MHC shall evaluate any emergent facility and process conditions that do not agree with the facility & process design, programs, plans, policies, and operations in accordance with MIC S/RID Criteria 1.7.2.a or 1.7.4.a, as applicable. Changes to Nuclear Explosive Operations that do not have an Activity Based Controls Document (ABCD) or Hazard Analysis Report (HAR) will be reviewed and approved through the nuclear explosive change control process delineated by MIC S/RID Criterion 1.7.2.a.

7.4 Effecting Changes

a) The Agreement may be modified only by written agreement of both parties. To keep the approved Agreement current with respect to actual facilities and process descriptions and to maintain the programs, plans, policies, and operations current, MHC shall submit revised pages to the Agreement (including its appendices) for DOE approval, marked and dated to indicate each change.

b) Changes which do not constitute a USQ, but which warrant a change to an authorization basis document in order to maintain consistency and accuracy, may be accumulated and incorporated as part of an annual update to this Agreement. Changes that are accumulated and submitted as an annual update will be accompanied by a report summarizing the changes considered and the basis for the determination (i.e., why the change is not a USQ). If such changes are submitted in conjunction with other changes that require DOE approval, MHC shall similarly summarize the changes and the basis for the determination. Updates to this Agreement shall be made consistent with guidance provided in Memorandum, W. S. Goodrum to W. A. Weinreich, *Authorization Basis Documents Requiring Yearly Update and Approval by the Department of Energy (DOE),* dated June 30, 1999.

c) Upon DOE approval of changes to the authorization basis, MHC shall make subsequent changes to Appendix B or the applicable section(s) of individual Authorization Agreements (Appendix C) to ensure consistency. Such changes to the authorization agreement shall be considered administrative in nature and do not require separate DOE approval. Page changes to the authorization agreement shall be issued through controlled distribution. The timing of the page changes should be consistent with the effective date established for the change(s) to the authorization basis. As TSRs and ABCDs are added or deleted, this Agreement shall be maintained current at all times.

d) MHC shall maintain records of changes in facility(s), process(s), programs, plans, policies, and operations described in the approved Agreement, and copies of the safety analyses on which the changes were based.

e) Changes to covered Nuclear Operations and Nuclear Explosive Operations (see Appendix A), which do not require changes to the main body of this Agreement, will be effected through issuance of page changes to the Appendices. Changes to the Appendices of this Agreement, submitted for review and approval, shall be processed concurrently and accompany the documentation that supports and justifies the change to the covered operation. Changes to Appendices (additions and deletions) will be accomplished on a page replacement basis, with each change page clearly identifying change number and area of change (i.e., change bars). Processes that are no longer authorized or have been retired will be processed as changes, as described in this section.

f) Changes to the main body of this Agreement will be processed as full revisions to this Agreement. Following approval, this Agreement will be re-issued at the next higher revision level. When re-issued at the next higher revision level, all previous Changes to this Agreement will be incorporated and previous change bars will be omitted. Changes made at the time of revision will be noted with change bars and issued as Change 0 to the revision.

g) Revisions and Changes to this Agreement require signature approval by both the Manager, Department of Energy Albuquerque Operations Office, or his designee, and MHC's Plant General Manager.

h) The Issue History and Summary of Changes Log will be maintained current and up-to-date, showing a complete history of all revisions and changes thereto. A revised Title page, Authorizing Signatures' page, and Issue History and Summary of Changes Log, identifying the latest - approved Revision and Change level, will accompany all approved revisions and changes.

7.5 Authorizing New Programs

The authorization to commence work on new or not currently authorized programs will be accomplished by issuing Changes to the Appendices to this Agreement on a page addition or page replacement basis, as appropriate. Changes to Appendix A will be required to add or delete programs or operations. Appendix B Changes will be included as required. The principal authorizing agent for new programs will be Changes to Appendix C that consists of the following newly identified or revised information (see Section 5 of this Agreement for additional detailed information):

- Scope of Activities Covered
- Authorization Basis
- Specific Reviews
- Additional Terms & Conditions

Section 7.4 of this Agreement describes the protocol for effecting changes to this Agreement, which includes the processing of changes to authorize a new program.

Appendix A

Operations Covered by this Agreement

Master Authorization Agreement
Appendix A
Operations Covered by this Agreement

Authorization Agreement No.	Covered Operation	Responsible Manager	Effective Date	Expiration Date (early Date)
AA-001, Rev. 0	B53 End Cap Operations	D. Butler	3-24-00	Contract Exp.
AA-002, Rev. 0	W56-4 Dismantlement	J. Ingraham	3-24-00	1-20-04 Contract Exp
AA-003, Rev. 0	B61-3/4/10 Evaluation	A. Carroll	3-24-00	1-31-01 or Contract Exp
AA-004, Rev. 0	B61-7 Evaluation	A. Carroll	3-24-00	4-2-02 or Contract Exp
AA-005, Rev. 0	B61-11 Evaluation	A. Carroll	3-24-00	4-2-02 or Contract Exp
AA-006, Rev. 0	W78 Repairs/SFI	P. Goodfellow	3-24-00	11-9-00 or Contract Exp
AA-007, Rev. 0	W79 Dismantlement	J. Ingraham	3-24-00	5-3-03 or Contract Exp
AA-008, Rev. 0	W80-0/1 Evaluation	R. Nance	3-24-00	2-1-02 or Contract Exp
AA-009, Rev. 0	B83-0/1 Assembly (ALT 752), Rebuild, and Evaluation Disassembly	E. Henke	3-24-00	8-1-02 or Contract Exp
AA-010, Rev. 0	W84-0 Evaluation Disassembly	R. Wright	3-24-00	1-31-03 or Contract Exp
AA-011, Rev. 1	W87-0 Assembly LEP, Rebuild, Evaluation Disassembly & LEP D&I	R. Wright	1-21-00	3-9-02 or Contract Exp
AA-012, Rev. 0	Zone 4 Operations	J. Beckley	3-24-00	Contract Exp
AA-013, Rev. 0	Transportation & Zone 12 Staging	J. Beckley	3-24-00	Contract Exp
AA-014, Rev. 1	Zone 12 SNM Operations	J. Beckley	2-1-00	Contract Exp
AA-015, Rev. 0	Special Nuclear Material Component Staging Facility, Bldg. 12-116	J. Beckley	3-24-00	Contract Exp
AA-016, Rev. 1	ALR-8 Sealed Insert Container Process	B. Rhodes	2-1-00	Contract Exp
AA-017, Rev. 0	Dynamic Balancer	C. Pratt	3-24-00	Contract Exp
AA-018, Rev. 0	W62 Disassembly & Inspection	M. Carry	1-6-00	8-7-02 Contract Exp

Appendix B

S/RIDs, Evaluations, Reviews & Master Studies Applicable to All Covered Operations

Master Authorization Agreement
Appendix B
S/RIDs, Evaluations, Reviews & Master Studies Applicable to All Covered Operations

TITLE	APPROVAL DATE	EXPIRATION DATE {NESS Studies or Extensions}	REMARKS
Site S/RIDs			
Management Integration & Controls S/RID (MIC-1000)	11-9-99	N/A	
Hazards Control S/RIDs			
Fire Protection (HC-2100)	5-6-99	N/A	
Radiation Protection (HC-2210)	12-13-99	N/A	
Criticality Safety (HC-2200)	5-19-99	N/A	
Occupational Safety & Health (HC-2300)	12-22-98	N/A	
Off-Site Packaging & Transportation (HC-2500)	6-29-99	N/A	
On-Site Packaging & Transportation (HC-2600)	Under Development	N/A	
Mission Support S/RIDs			
Emergency Management (MS-3100)	10-23-98	N/A	
Facility Engineering & Construction (MS-3210)	2-17-99	N/A	
Maintenance (MS-3300)	3-18-99	N/A	
Environmental Management (MS-3400)	4-5-99	N/A	
Site-wide Authorization Basis			
Pantex Plant Safety Analysis Report General Information Document (GID) #MNL163944	Latest Date W/Approved Changes	N/A	
Pantex Basis for Interim Operation (BIO) #MNL-00076	Latest Date W/Approved Changes	N/A	
Technical Safety Requirements for Pantex Facilities (RPT-SAR-199801)	Latest Date W/Approved Changes	N/A	

TITLE	APPROVAL DATE	EXPIRATION DATE {NESS Studies or Extensions}	REMARKS
Evaluation of Lightning Hazards and Justification for Continued Operation of Nuclear Explosive Operations (PX-JCO-99-002)	Latest Date W/Approved Changes	N/A	
Site-wide Evaluations			
Site Safeguards & Security Plan (SSSP) for Pantex Plant	November 10, 1999	N/A	
Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components, DOE/EIS-0225	November 1996	N/A	
NESS Studies & Reviews			
Nuclear Explosive Safety Master Study of General-Use Processing Facilities at the USDOE Pantex Plant	9/29/94	2/28/01	Extended by DOE memo 4/5/99 from DP-21. Will be replaced by BIO Modules/specific subject Master Studies.
Nuclear Explosive Safety Master Study of Operations and Staging Facilities at the USDOE Pantex Plant	9/29/94	10/31/01	Extended by DOE memo 4/5/99 from DP-21. Will be replaced by BIO Modules/specific subject Master Studies.
Nuclear Explosive Safety Master Study of AL Over-the-Road Transportation of Nuclear Explosives	11/27/95	11/27/00	
Over-The-Road Transportation Master Study Addendum for the Safeguards Transporter	11/27/95	11/27/00	
Nuclear Explosive Safety Master Study of General-Use Handling and Transportation Equipment at USDOE Pantex Plant	6/29/94	10/31/01	Extended by DOE memo 4/5/99 from DP-21. Will be replaced by BIO Modules/specific subject Master Studies.
Nuclear Explosive Safety Master Study of Security Operations at the USDOE Pantex Plant	12/10/97	12/10/02	
Nuclear Explosive Safety Master Study of the Electrical Equipment Control Program at the USDOE Pantex Plant	10/20/98	10/18/03	Authorizes use of Master Tester List (MTL), Master Equipment List (MEL), and Pink Sticker equipment in Nuclear Explosive Areas.

Appendix C

Authorization Agreements for Individual Operations

RESPONSIBLE MANAGER: D. BUTLER

TITLE: B53 END CAP OPERATIONS	AA-001, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

a) Staging of End Caps in Zone 4.
b) Acceptance of directed shipments from DoD for temporary staging.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Memorandum, *B53 End Cap Assembly (ECA) Movement and Staging*, Mark C. Baca, DOE/AL/WSD, to W. A. Weinreich, dated May 3, 1999.
b) Memorandum, *SAC Magazine 4-112 Configuration*, April Dunbar (MHC PE), Bob Henderson (LANL Tri-Lab), Leroy Thompson (DOE/AAO NES), Jake Galloway (MHC NESD), Betty Whitfield (MHC PE), and Robb Wright (MHC MPO), to Steve Ufford (MHC Transportation), dated May 6, 1999.

ADDITIONAL TERMS & CONDITIONS:

a) LANL Memorandum, *Zone 4 Storage of B53 End Cap Assemblies (ECA)*, Dr. George F. Hurley, Program Manager, Nuclear Weapons – Stockpile Surety Program, to Herb Berman, dated March 8, 1999.
   - No other components or assemblies, exceeding 200 grams of explosives per component or assembly, are to be stored in the magazine with the B53 ECAs.
   - B53 ECAs are to be physically separated from other explosive components, explosive assemblies, and other items containing nuclear material by a minimum of three meters.
   - B53 ECAs are to be separated from other B53 ECAs by a minimum of three meters.
   - B53 ECAs are to be separated from other B53 ECAs with sandbag barriers.
b) MHC Plant Standard 7-5650, *General Safety Requirements for Zone 4 (U)*.
   - No plutonium is to be stored in the magazine with the B53 ECAs.
   - Each ECA will be placed at least 36 inches from the open end of the sandbag barrier.
   - Approximately 12 inches (nominal) will be maintained between the ECA and the walls of the magazine.
   - The sandbag barrier separating B53 ECAs will be at least 36 inches in thickness and will extend at least 24 inches above the height of the ECA containers and 36 inches beyond the width of the ECA.
   - Administrative, visual boundaries are to be used to ensure the required separations are maintained.
c) Weapon Safety Specification, B53 SS301800.

RESPONSIBLE MANAGER: J. INGRAHAM

TITLE: W56-4 DISMANTLEMENT	AA-002, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 1-20-04 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This agreement authorizes the performance of W56-4 Dismantlement activities in accordance with the DOE W56 Program Control Document (PCD). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Safeguards Verification & Receiving Inspection of units in Zone 4 and Zone 12.
c) Transportation of units in Zone 12 and Staging of units in 12-99, Bays 1, 3 & 5.
d) Disassembly operations performed in 12-99, Bays 1 & 5.
e) Cell operations performed in 12-85.
f) Radiography operations performed in 12-84, Bays 1 & 10.
g) Inspection and Evaluation of units in Zone 4, 12-85, and 12-99, Bays 1, 3, & 5.

AUTHORIZATION BASIS:

a) Pantex Plant W56 Dismantlement Activity Based Controls Document – ABC-W56-266929, Rev. 3, effective March 13, 2000.
b) W56 Hazards Analysis Report – RPT-HAR-255442, Rev. 002, January 19, 2000.
c) See Appendix B.

SPECIFIC REVIEWS:

a) W56 Dismantlement Safety Evaluation Report (SER) – November 30, 1998.
b) Design Agency Review Team (DART) - 12/11/98.
c) Readiness Assessment of the W56-4 Dismantlement Operations at Pantex (RA) – March 23, 1999.
d) Nuclear Explosive Safety Study (NESS) of W56 Dismantlement Operations at the USDOE Pantex Plant (approved January 21, 1999 – expires January 20, 2004).
e) W56-4 Integrated Safety Process Evaluation of the Dismantlement Process Qualification Evaluation Release ER No. 98059SLL, Revision 1, March 3, 1999.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, W56-4 SS458330.
b) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Release.
c) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item d (Specific Reviews).

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RESPONSIBLE MANAGER: A. CARROLL

TITLE: B61-3/4/10 MAINTENANCE & EVALUATION	AA-003, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 1-31-01 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of B61-3/4/10 maintenance and evaluation activities to include SFT/SLT/NMFT/NMLT Disassembly & Inspection (D&I) and rebuild of B61-3/4/10 nuclear explosives in accordance with the DOE B61-3/4/10 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Safeguards Verification, Receiving Inspection, and Stronglink verification of units in Zone 4.
c) Transportation and staging of units in Zone 12.
d) PAL/CAP operations in 12-98, Cell 4.
e) Radiographic inspection in 12-84, Bays 1 & 10.
f) Evaluation D&I of units in 12-104 (except Bay 16).
g) Rebuild of units in 12-104 (except Bay 16).
h) Repairs, LLCEs, and SFIs in 12-104 (except Bay 16).
i) JTA Assembly, Disassembly & Postmortem activities in 12-104 (except Bay 16).
j) Testbed Assembly and Disassembly in 12-86.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Qualification Evaluation for Surveillance for B61-3/4/10 D&I completed in September1996 – Qualification Evaluation Release ER No. 961144SA, Revision 0, September 27, 1996.
b) Tool Made Sample (TMS) Evaluation for B61-3/4 WR assembly completed in April 1979 – Qualification Evaluation Release ER No. 790716SC, Rev. 3, June 6, 1989.
c) Tool Made Sample (TMS) Evaluation for B61-10 WR assembly completed in April 1990 – Qualification Evaluation Release ER No. 900834SC Rev. 1, August 1, 1990.
d) NESSG Report, Nuclear Explosive Safety Study of B61-3/4 Disassembly, Assembly, and Command Disablement Test Operations at the USDOE Pantex Plant, dated May 17, 1989 (approved June 2, 1989).
e) NESSG Report, Nuclear Explosive Safety Study of B61-10 Assembly and Disassembly Operations at the USDOE Pantex Plant, dated February 14, 1990 (approved March 6, 1990).
f) NESSG Report, *Revalidation for the Nuclear Explosive Safety Studies of B61-3/4/10 Operations at the USDOE Pantex Plant*, dated March 19, 1996 (approved on May 17, 1996) [B61-3/4 approval expired June 1, 1999; B61-10 approval expires March 5, 2000].
g) DOE Memorandum from Gene Ives to Albuquerque Operations Office Manager, SUBJECT: *Request for Extension of Nuclear Explosive Safety (NES) Studies*, dated April 5, 1999 extends the NES Expiration for the B61-3/4/10 to January 31, 2001.

ADDITIONAL TERMS & CONDITIONS:

a) A fully assembled B61-3/4/10 or Center Bomb Subassembly may be present during gas generator and spin rocket operations. Any lower level nuclear explosive subassembly is not allowed to be present in the bay (derived from: B61-7 Specific Review, Item d).
b) Disassembly of B61-3/4, bombs that have had an inadvertent command disablement, is authorized (Item f, Specific Reviews).
c) Weapon Safety Specification, B61-3/4/10 SS707285.
d) Evaluation and Assembly activities for the B61-3/4/10 shall be performed in accordance with Materials List and B-Series Drawings 301424, 301457, and 301833.
e) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
f) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item f (Specific Reviews).

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RESPONSIBLE MANAGER: A. CARROLL

TITLE: B61-7 MAINTENANCE & EVALUATION	AA-004, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 4-2-02 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of B61-7 maintenance and evaluation activities to include SFT/SLT/NMFT/NMLT Disassembly & Inspection (D&I) and Rebuild of B61-7 nuclear explosives in accordance with the DOE B61-1, 7, 11 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Safeguards Verification, Receiving Inspection, and Stronglink verification of units in Zone 4.
c) Transportation and staging of units in Zone 12.
d) PAL/CAP operations in 12-98, Cell 4.
e) Radiographic Inspection in 12-84, Bays 1 & 10.
f) Evaluation D&I of units in 12-104 (except Bay 16).
g) Rebuild of units in 12-104 (except Bay 16).
h) Repairs, LLCEs, and SFIs in 12-104 (except Bay 16).
i) JTA Assembly, Disassembly & Postmortem activities in 12-104 (except Bay 16).
j) Testbed Assembly and Disassembly in 12-86.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Safety Evaluation for Surveillance (SES) for B61-7 D&I completed in January 1996 – Qualification Evaluation Release ER No. 960602SA, Revision 2, January 12, 1998.
b) Qualification Evaluation Release ER No. 851262SC, Revision 3, October 2, 1997.
c) NESSG Report, Nuclear Explosive Safety Study of B61-7 Disassembly and Reassembly Operations at the USDOE Pantex Plant, dated December 12, 1991 (approved April 3, 1992).
d) NESSG Report, Revalidation for the Nuclear Explosive Safety Study of B61-7 Operations at the USDOE Pantex Plant, dated June 19, 1997 (approved July 28, 1997) [approval expires April 2, 2002].

ADDITIONAL TERMS & CONDITIONS:

a) A fully assembled B61-7 or Center Bomb Subassembly may be present during gas generator and spin rocket operations. Any lower level nuclear explosive subassembly is not allowed to be present in the bay (See Specific Reviews, Item d above).
b) Weapon Safety Specification, B61-7 SS706488.
c) Evaluation and Assembly activities for the B61-7 shall be performed in accordance with Materials List and B-Series Drawing 301668.
d) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation.
e) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item d (Specific Reviews).

RESPONSIBLE MANAGER: A. CARROLL

TITLE: B61-11 MAINTENANCE & EVALUATION	AA-005, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 4-2-02 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of B61-11 maintenance and evaluation activities to include SFT/SLT/NMFT/NMLT Disassembly & Inspection (D&I) and rebuild of B61-11 nuclear explosives in accordance with the DOE B61-1, 7, 11 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Safeguards Verification, Receiving Inspection, and Stronglink verification of units in Zone 4.
c) Transportation and staging of units in Zone 12.
d) PAL/CAP operations in 12-98, Cell 4.
e) Radiographic Inspection in 12-84, Bays 1 & 10.
f) Evaluation D&I of units in 12-104 (except Bay 16).
g) Rebuild of units in 12-104 (except Bay 16).
h) Repairs, LLCEs, and SFIs in 12-104 (except Bay 16).
i) ALT 349 operations in 12-104 (except Bay 16).
j) JTA Assembly, Disassembly & Postmortem activities in 12-104 (except Bay 16).
k) Testbed Assembly and Disassembly in 12-86.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Safety Evaluation for Surveillance and Rebuild completed March 2, 1998 – Qualification Evaluation Release ER No. 980160SA, Revision 1, May 28, 1998.
b) Safety Evaluation Part of the B61-11 Disassembly process for the Single Integrated Readiness Review at the M&H Pantex Plant - Qualification Engineering Release ER No. 980067SA, April 21, 1998.
c) NESSG Report, *Nuclear Explosive Safety Evaluation of B61-11 Operations at the USDOE Pantex Plant*, dated April 24, 1998 (approved May 7, 1998) [approval expires April 2, 2002].
d) NESSG Report, Nuclear Explosive Safety Study of B61-7 Disassembly and Reassembly Operations at the USDOE Pantex Plant, dated December 12, 1991 (approved April 3, 1992).
e) NESSG Report, Revalidation for the Nuclear Explosive Safety Study of B61-7 Operations at the USDOE Pantex Plant, dated June 19, 1997 (approved July 28, 1997) [approval expires April 2, 2002].
f) NES Change Review of ALT 349 Operations, September 21 & 22, 1999, DOE/AL/WSD.

ADDITIONAL TERMS & CONDITIONS:

a) A fully assembled B61-11 or Center Bomb Subassembly may be present during spin rocket operations. Any lower level nuclear explosive subassembly is not allowed to be present in the bay (See Specific Reviews, Items c and e above).
b) Weapon Safety Specification, B61-11 SS301975.
c) Evaluation and Assembly activities for the B61-11 shall be performed in accordance with Materials List and B-Series Drawing 301975.
d) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
e) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item e (Specific Reviews).

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RESPONSIBLE MANAGER: P. GOODFELLOW

TITLE: W78 REPAIRS/SFI	AA-006, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 11-09-00 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of the W78 Repairs and Significant Finding Investigation 99-24-W78-05 activities to include Mechanical Disassembly, Repair of Cables and/or Isolator, and Mechanical Assembly of W78 Nuclear Explosives in accordance with the DOE W78-0 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Safeguard Verification in Zone 4 and 12-104 Bay 7, Receiving inspection in Zone 4, and Stronglink verification of Units in 12-104 Bay 7.
c) Transportation of units in Zone 12, and Staging of units in 12-84, Bay 15 and 12-104, Bays 1 & 7.
d) Mass Properties operations in 12-60, Bays 1 & 2.
e) Vacuum chamber operations in 12-104, Bay 16.
f) Mechanical Disassembly operations in 12-104, Bay 7.
g) Cable and/or isolator repair operations in 12-104, Bay 7.
h) Mechanical Assembly operations in 12-104, Bay 7.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) W78 Qualification Evaluation for Surveillance (QES) as documented in Qualification Evaluation Release ER No. 950000SA, Revision 1, March 24, 1997.
b) W78 War Reserve (WR) Safety Evaluation (SE) ER No. 981015SA, Revision 0, September 23, 1998.
c) Nuclear Explosive Safety Study (NESS) extension memorandum from the Deputy Assistant Secretary for Military Applications and Stockpile Operation performance of a NESS, dated October 5, 1999.
d) W78 NESS, Nuclear Explosive Safety Study of W78 Re-entry Body Assembly (RBA) Disassembly, Reassembly Operations at the USDOE Pantex Plant, dated September 18, 1989.
e) NESS Revalidation of the W78 operations, approved June 27 1996.
f) DOE/AL Memorandum, *Extension of the W78 Nuclear Explosive Safety Study*, dated November 10, 1999.

ADDITIONAL TERMS & CONDITIONS:

a) Only the existing 18 units at Pantex as of October 12, 1999 are authorized for work under the NESS extension letter. (See Specific Reviews, Item f above)
b) W78 Repair Operations are limited to a 12 month time period, beginning November 10, 1999 and ending November 9, 2000. (See Specific Reviews, Item f above).
c) Weapon Safety Specification RS12147/97/0087.
d) Evaluation and Assembly activities for the W78 shall be performed in accordance with Materials List and B-Series Drawing 301459.
e) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
f) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item e (Specific Reviews).

RESPONSIBLE MANAGER: J. INGRAHAM

TITLE: W79 DISMANTLEMENT	AA-007, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 5-3-03 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of W79 Dismantlement activities in accordance with the DOE W79 Program Control Document (PCD). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Transportation of units in Zone 12 and Staging of units in 12-64, Bays 13 through 17, 12-84, 12-98, Cells 1 & 2, and 12-99, Bay 5.
c) Mechanical Disassembly operations in 12-84, Bays 16 & 18.
d) HE Disassembly operations in 12-98, Cells 1 & 2.
e) Safeguards Verification in Zone 4 and Zone 12.
f) Inspection & Evaluation of units in Zone 4, 12-84, Bays 16 & 18, 12-98, Cells 1 & 2, and 12-99 Bay 5.

AUTHORIZATION BASIS:

a) W79 Activities Based Control Document – ABC-W79-266928, Revision 002, March 13, 2000 (the hazard assessment is included within the ABCD).
b) See Appendix B.

SPECIFIC REVIEWS:

a) Single Integrated Readiness Review for Bay & Cell, December 1997.
b) Nuclear Explosive Safety Study of W79 Disassembly operations at the USDOE Pantex Plant, approved May 3, 1998.
c) Safety Evaluation Release/Dismantlement (concurrent with NESS) ER No. 980162LL, January 7, 1999.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, W79 SS457519.
b) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
c) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item b (Specific Reviews).

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RESPONSIBLE MANAGER: R. NANCE

TITLE: W80-0/1 EVALUATION	AA-008, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 2-1-02 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This agreement authorizes the performance of W80-0/1 evaluation activities to include New Material Laboratory Test/Stockpile Laboratory Tests and New Material Flight Tests/Stockpile Flight Test and Surveillance, in accordance with the Nuclear Explosive Safety Study of W80 Disassembly, Assembly, and Command Disablement Test Operations at the USDOE Pantex Plant and the Nuclear Explosive Safety Study of W80 Command Disable System Tester (QU2446 and QU2455) at the USDOE Pantex Plant. Specific operations covered area:

a) Transportation and Staging of units in Zone 4.
b) Transportation and Staging of units in Zone 12.
c) Evaluation Disassembly of units in Zone 12 Bays.
d) Evaluation Rebuild of units in Zone 12 Bays.
e) Command Disablement Testing operations performed in Cells 12-85, 12-96, or 12-98, Cell 3.
f) Mass Properties performed in 12-60.
g) Radiography operations performed in 12-84, Bays 1 & 10.
h) Purge & Backfill operations in 12-84, Bays 19 & 20 and 12-104, Bay 16.
i) PAL re-coding in 12-98, Cell 4.
j) Safeguards Verification in Zone 4 and Zone 12.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Nuclear Explosive Safety Study of W80-0/1 Disassembly, Reassembly and Command Disablement Test operations at the USDOE Pantex Plant, (approved May 30, 1991).
b) Nuclear Explosive Safety Study of W80 Command Disable System Tester (QU2446 and QU2455) at the USDOE Pantex Plant (Approved February 16, 1993).
c) Revalidation for the Nuclear Explosive Safety Studies of W80 Operations at the USDOE Pantex Plant (Approved April 30, 1997, extending the validity of NES Studies listed in a & b above to May 29, 2001).
d) W80 Qualification Evaluation for Surveillance review at the USDOE Pantex Plant, ESA-WE-97-156U, August 28 – September 1, 1995, conducted by Los Alamos National Laboratory.
e) W80-0/1 Qualification Evaluation Release ER No. 950710SA, Revision 3, October 23, 1996.
f) W80-0/1 Qualification Evaluation Release ER No. 931358SA, Revision 1, April 7, 1995.
g) W80-0/1 Qualification Evaluation Release ER No. 980710SA, Revision 0, August 13, 1998, to release as acceptable the QE status of the Pantex Vacuum Chamber System (including the Purge & Backfill and Tracer Manifolds) for performing the Leak Rate/Tracer Gas/Backfill Process for the W80.
h) DOE Memorandum from Gene Ives to Albuquerque Operations Office Manager, SUBJECT: *Request for Extension of Nuclear Explosive Safety (NES) Studies*, dated April 5, 1999 extends the NES Studies (b & c above) to February 1, 2002.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, W80 SS301515.
b) Evaluation activities for the W80-0/1 shall be performed in accordance with SNL B-Series Drawings.
c) Assembly activities for the W80-0/1 shall be performed in accordance with SNL Drawings 301515 and 301516.
d) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
e) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item c (Specific Reviews).

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RESPONSIBLE MANAGER: E. HENKE

TITLE: B83-0/1 ASSEMBLY, REBUILD, EVALUATION DISASSEMBLY, AND ALT 752 ASSEMBLY/DISASSEMBLY	AA-009, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 8-1-02 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This agreement authorizes the performance of B83 assembly and evaluation activities to include New Material Laboratory Tests/Stockpile Laboratory Test, New Material Flight Tests/Stockpile Flight Tests per the DOE B83 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Transportation and Staging of units in Zone 12.
c) Assembly/Rebuild of units in 12-84, 12-104, & 12-99.
d) Evaluation Disassembly in 12-84 & 12-104.
e) Radiography operations in 12-84, Bays 1 & 10.
f) Purge and backfill operations in 12-84, Bays 19 & 20, & 12-104, Bay 16.
g) PAL/CAP operations 12-98, Cell 4.
h) ALT 752 performed in 12-84, 12-99 & 12-104 (all Bays), 12-44 (Cells 2 through 6), 12-85, and 12-96.
i) Maintenance and Repair of Mod 1 Units returned to Pantex from DoD.
j) Safeguards Verification in Zone 4 and Zone 12.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS

The B83 has been subjected to the following reviews that apply for assembly and disassembly activities. The specific reviews that apply are listed as follows with appropriate title and date of the review:

a) B83-0 Tool Made Sample (TMS) Evaluation Qualification Evaluation Release ER No. 831532LS, Revision 2, August 2, 1983.
b) B83-1 Tool Made Sample (TMS) Evaluation for Quality Improvement Plan Retrofit from the MOD-0 – Qualification Evaluation Release ER No. 930277SL, Revision 3, October 17, 1994.
c) B83-1/ALT 750 Qualification Evaluation Release ER No. 960244SA, Revision 4, November 1, 1996.
d) B83-0 to -1 Qualification Evaluation on Production ER No. 930397SL, Revision 2, August 1997.
e) B83-1/ALT 752 Qualification Evaluation Release ER No..980391SL, Revision 0, December 21, 1998.
f) Tooling Product Verification (TPV) – Qualification Evaluation Release for Surveillance ER No. 940105LL, Revision 1, August 15, 1997.
g) Nuclear Explosive Safety Study of B83 Assembly and Disassembly operations at the USDOE Pantex Plant, dated September 27, 1991, approved December 6, 1991.
h) Revalidation for the Nuclear Explosive Safety Study of B83 Operations at the USDOE Pantex Plant; dated September 20, 1996, approved November 14, 1996.
i) DOE Memorandum from Gene Ives to Albuquerque Operations Office Manager, SUBJECT: *Request for Extension of Nuclear Explosive Safety (NES) Studies*, dated April 5, 1999 extends the NES Expiration for the B83 to August 1, 2002.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, B83 SS458794.
b) Evaluation and Assembly activities for the B83-0/1 shall be performed in accordance with Materials List and B-Series Drawings 210387 and 210467.
c) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
d) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item h (Specific Reviews).

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RESPONSIBLE MANAGER: R. WRIGHT

TITLE: W84-0 EVALUATION DISASSEMBLY	AA-010, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: EARLIER DATE 1-31-03 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This Authorization Agreement authorizes the performance of W84 evaluation activities to include Stockpile Laboratory Tests (SLT) in accordance with the DOE W84 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Transportation and Staging of units in Zone 12.
c) Evaluation Disassembly in 12-84 (all Bays except 1, 10, 19 & 20) and 12-104 (except Bay 16).
d) Radiography operations performed in 12-84, Bays 1 & 10.
e) PAL/CAP operations performed in 12-98, Cell 4.
f) Maintenance and Repair of Units returned to Pantex from DoD.
g) Safeguards Verification in Zone 4 and Zone 12.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

The W84 has been subjected to the following reviews that apply for disassembly activities. The specific reviews that apply are listed as follows with appropriate title and date of the review:

a) Weapon Program Readiness Review conducted November 1996.
b) W84 Safety Evaluation (SE) Qualification Evaluation Release ER No. 980107SL, Revision 0, April 3, 1998.
c) Nuclear Explosive Safety Study (NESS) approved in April 1993. Study expired April 1998.
d) DOE Memorandum from Gene Ives to Albuquerque Operations Office Manager, SUBJECT: *Request for Extension of Nuclear Explosive Safety (NES) Studies*, dated April 5, 1999 extends the NES Expiration for the W84 to January 31, 2003.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, W84 SS458969.
b) Evaluation activities for the W84 shall be performed in accordance with B-Series Drawing 210385.
c) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
d) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item c (Specific Reviews).

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MASTER AUTHORIZATION AGREEMENT

APPENDIX C

AUTHORIZATION AGREEMENTS FOR INDIVIDUAL OPERATIONS

RESPONSIBLE MANAGER: R. WRIGHT

TITLE: W87-0 ASSEMBLY LEP, REBUILD, EVALUATION DISASSEMBLY AND LEP D&I	AA-011, REV 1	EFFECTIVE DATE: 1-21-00	EXPIRATION DATE: EARLIER DATE 3-9-02 OR CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This agreement authorizes the performance of W87 assembly and evaluation activities to include New Material Laboratory Tests/Stockpile Laboratory Tests, New Material Flight Tests/Stockpile Flight Tests and Life Extension Program (LEP) surveillance and LEP assembly/rebuild per the DOE W87 Program Control Document (PCD) and Quality Assurance Program Plan (QAPP). Specific operations covered are:

a) Transportation and Staging of units in Zone 4.
b) Transportation and Staging of units in Zone 12.
c) Assembly/Rebuild of units for LEP in 12-84 (all Bays except 1, 10, 19 & 20).
d) Evaluation Disassembly of units for LEP in 12-84 (all Bays except 1, 10, 19 & 20).
e) Mass Properties performed in 12-60, Bays 1 & 2.
f) Radiography operations performed in 12-84, Bays 1 & 10.
g) Leak test, Purge, and Backfill operations performed in 12-104, Bay 16.
h) Purge and Backfill operations performed in 12-84, Bays 19 & 20.
i) Arming of Mechanical Safe Arm Device in 12-84 (all Bays except 1, 10, 19 & 20).
j) Maintenance & Repair of units returned to Pantex from DoD.
k) Safeguards Verification in Zone 4 and Zone 12.

AUTHORIZATION BASIS:

a) Pantex Plant W87 Operations Activity Based Controls Document – ABC-W87-262508, Revision 003, March 13, 2000.
b) Pantex Plant W87 Hazards Analysis Report – RPT-HAR-262506, Revision 002, March 13, 2000.
c) See Appendix B.

SPECIFIC REVIEWS:

The W87 has been subjected to the following reviews that apply for assembly and disassembly activities. The specific reviews that apply are listed as follows with appropriate title and date of the review:

a) Tool Made Sample (TMS) performed on 2/1/99.
b) Engineering Evaluation (EE) performed on 1/14/99.
c) W87 Safety Evaluation for Production (SEP) ER No. 970424LL, Revision 3, January 5, 1999.
d) W87 Qualification Evaluation for Surveillance (QES) ER No. 950285SL, Revision 1, September 10, 1996.
e) W87 Qualification Evaluation Release ER No. 950099LL, Revision 2, September 3, 1996.
f) Weapon Process Readiness Review conducted 9/98.
g) AL Readiness Review Final Report for the W87 Life Extension Program, April 27, 1999.
h) Nuclear Explosive Safety Study of W87 Disassembly and Reassembly Operations at the USDOE Pantex Plant (approved March 10, 1992).
i) Nuclear Explosive Safety Study of W87 High Explosive Reassembly Operations at the USDOE Pantex Plant (approved August 9, 1995).
j) Revalidation for the Nuclear Explosive Safety Studies of W87 Operations at the USDOE Pantex Plant (approved February 27, 1997, extending the validity of the above NES Studies (Items h & i above) to March 9, 2002).
k) Nuclear Explosive Safety Study of PT4174 Operations with the W87 at the USDOE Pantex Plant (approved January 7, 1999).
l) DOE Memorandum from Gene Ives to Albuquerque Operations Office Manager, SUBJECT: *Request for Extension of Nuclear Explosive Safety (NES) Studies,* dated April 5, 1999 extends the NES Expiration for the W87 to July 30, 2004.
m) Final Report of the DOE AAO W87 Armed Mechanical Safe Arming Device (MSAD) Operations Readiness Assessment (RA), January 19, 2000.

ADDITIONAL TERMS & CONDITIONS:

a) Weapon Safety Specification, W87 SS458804.
b) Evaluation and Assembly activities for the W87 shall be performed in accordance with Materials List and B-Series Drawing 210414.
c) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.
d) MHC shall comply with Specific NESRs and Immediate-Action Procedures as stipulated in Item j (Specific Reviews).

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RESPONSIBLE MANAGER: J. BECKLEY

TITLE: ZONE 4 OPERATIONS	AA-012, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

Specific operations covered are:

a) Receipt, Staging or interim storage, and retrieval of magazine contents:
 - ➢ Nuclear Explosives
 - ➢ Pits
 - ➢ Oak Ridge Ordnance (ORO) components
 - ➢ Radioisotopic Thermoelectric Generators (RTGs)
 - ➢ Nuclear Explosive-Like Assemblies (NELAs)

b) Receipt and Transfer Operations.
c) Off-Site shipping & receiving.
d) On-Site shipping & receiving.
e) Magazine operations.
f) Minor shipping/receiving inspections (weapons in containers).
g) Performing a physical inventory of SNM contents of each magazine.
h) Stage Right operations (pit storage).
i) Thermal Monitoring of Pits, Containers, and Magazines.
j) Inventory of nuclear weapons and major nuclear weapons components.
k) Survey and inspection of storage magazines.
l) Safeguards Verification of Nuclear Explosives and Components.
m) Temporary Staging of In-Transit materials.
n) Vehicle-to-Vehicle transfer of In-Transit materials.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Operational Readiness Review (ORR) of Zone 4 Operations, July 1994.
b) Readiness Assessment (RA) of Stage Right Operations, July 1994.
c) Readiness Assessment (RA) of Operations Using the Automated Guided Vehicle (AGV), June 1996.

ADDITIONAL TERMS & CONDITIONS:

a) None

RESPONSIBLE MANAGER: J. BECKLEY

TITLE: TRANSPORTATION & ZONE 12 STAGING	AA-013, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

This agreement authorizes the activities required to:

a) Transport Nuclear Materials, Nuclear Explosives, and Components between Zone 12 and Zone 4.
b) Loading and unloading of transport vehicles at authorized loading docks:
   ➢ Loading docks 12-26, 12-R-84, 12-R-98, 12-104A, 12-117, and 12-79.
c) Intra-Zone 12 transportation (Nuclear Materials, Nuclear Explosives, and Components).
d) Packaging and shipment of Nuclear Materials, Nuclear Explosives, and Components off-site.
e) Nuclear Materials and Nuclear Component Staging.
f) Thermal Monitoring of Pits, Containers, and Facilities.
g) See Authorization Agreement AA-015 for Operations in 12-116.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) None

ADDITIONAL TERMS & CONDITIONS:

a) None

RESPONSIBLE MANAGER: J. BECKLEY

TITLE: ZONE 12 SNM OPERATIONS	AA-014, REV 1	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

Zone 12 SNM (other than full-up weapons) covered operations include:

a) Pit and Container Surveillance:
  - Weight and leak check
  - Radiography
  - Microscopy
  - Surface analysis
  - Digital photography
  - Laser sampling
  - CSA Packaging & Interim Storage
  - Pit Requalification

b) Other Component Packaging (Tritium Reservoirs, RTGs, and Gas Generators).

c) Thermal Monitoring of SNM Staging or storage.

d) Pit Packaging:
  - ALR8-SI Pit packaging Operations Conducted in Building 12-64 and Building 12-99.
  - FL/DT packaging

e) Pit Staging.

f) Safeguards Verification of Components.

g) NDE Operations (i.e., Acoustical Emission Testing and Dye Penetrant Testing).

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) Readiness Assessment of AL-R8 SI Operations; Line 1, July 1999; Line 2, August, 1999.

b) AL-R8/SI Qualification Evaluation Release ER No. 990156LL, Revision 3, August 22, 1999.

ADDITIONAL TERMS & CONDITIONS:

a) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.

RESPONSIBLE MANAGER: J. BECKLEY

TITLE: SPECIAL NUCLEAR MATERIAL COMPONENT STAGING FACILITY - BUILDING 12-116	AA-015, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

The following activities involving the processing, handling and staging of radioactive materials are authorized in Building 12-116:

a) Containerized pits - receiving, staging, and shipping.
b) Containerized pits - Phase I Staging Stage Right Concept using a Shielded Forklift.
c) Containerized pits - stage right palletizing.
d) Tritium reservoirs - receiving, staging, and shipping.
e) Tritium reservoirs - packaging and unpacking.
f) Inspection/quality evaluation of the staged items, including the equipment necessary to perform:
   - *Non-destructive evaluation through visual inspection and dye-penetrant testing;*
   - *Radiography utilizing a 2 MeV Linear Accelerator (LINAC); and*
   - *Savannah River Ordnance (SRO) container leak check testing.*
g) Thermal Monitoring of Pits, Containers, and the Facility.

AUTHORIZATION BASIS:

a) *Final Safety Analysis Report for Building 12-116*, RPT-SAR-246577, Revision 0, March 1998.
b) *Safety Evaluation Report for Building 12-116*, RPT-SAR-248943, Revision 1, March 10, 1998.
c) *Technical Safety Requirements for Building 12-116*, RPT-SAR-184468, Revision 0, Change 3, August 23, 1999.
d) See Appendix B.

SPECIFIC REVIEWS:

a) Record of Decision for the Storage and Disposition of Weapons-Usable Fissile Materials (DOE/EIS-0229).
b) Record of Decision for the Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components (DOE/EIS-0225).
c) Review and approval of the National Environmental Policy Act (NEPA) Checklist, Modifications to Backfit Special Nuclear Material Component Staging Facility (SNMCSF), Building 12-116 (01/06/97) and the NEPA related Document, Building 12-116 (Special Nuclear Material Component Staging Facility) Supplement to Address ORR Findings (05/29/98).
d) Operational Readiness Review (ORR) of operations in Building 12-116. (DOE Implementation Plan for Operational Readiness Review of Building 12-116 Special Nuclear Material Component Staging Facility Pantex Plant, Final Report, June 1998).
e) Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management, DOE/EIS-0236, U.S. Department of Energy, Washington, D. C., September 1996.

ADDITIONAL TERMS & CONDITIONS:

a) Only containerized National Security Asset (NSA) or in-transit Quality Assurance (QA) Pits shall be stored in Building 12-116 as described in DOE Memorandum, *Loading Plan for Building 12-116 at Pantex (PX)*, Corey A. Cruz, Director Nuclear Programs Division, to S. Hallett, dated August 4, 1998.
b) W48 pits shall not be stored in Building 12-116 as part of Phase I operations as described in DOE Memorandum, *Building 116 Pit Loading*, William S. Goodrum, AAO Area Manager, to W. A. Weinreich, dated September 15, 1998.
c) LLNL Letter, R. Bailey to S.G. Hallett, MHC, dated June 14, 1999, and LLNL Letter, R. Bailey to P. Foster, MHC, dated April 8, 1998:
   - The configuration of containerized pits must meet the Instrumentation Plan (Thermal Loading Plan) developed by the Laboratories, as delineated in this letter.

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RESPONSIBLE MANAGER: B. RHODES

† TITLE: AL-R8 SEALED INSERT CONTAINER PROCESS	† AA-016, REV 2	† EFFECTIVE DATE: 4-4-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

† The following activities in Building 12-64, Bays 1, 2, 3, 4, 5, 6 & 7 involving the AL-R8/SI Pit Packaging process are authorized:

a) Staging/unpackaging of pits from AL-R8, Model FL and AL-R8/SI Containers.
b) † Pit inspection and imaging performed in Bays 3 & 4.
c) † Pit placement into AL-R8/SI Containers performed in Bays 3 & 4.
d) † Packaging/sealing of AL-R8/SI Containers performed in Bays 3 & 4.
e) † Purge & Backfill and Leak Check of AL-R8/SI Containers performed in Bays 3 & 4.
f) Staging of AL-R8/SI Containers.
g) † Palletizing of AL-R8/SI Containers in Stage Right pallets performed in Bays 1, 2, 5, 6, & 7.
h) Safeguards Verification of AL-R8/SI Containers.
i) Onsite Transportation of pits in AL-R8/SI Containers.
j) † Stage Right activities with AL-R8/SI Containers in 12-116 performed in Rooms 120, 121, and 122.
k) Stage Right activities with AL-R8/SI Containers in Zone 4.
l) † Thermal Instrumentation of Pit surfaces and containers in Zone 4 and Zone 12 (Building 12-116, Room 121 and Building 12-64, Bays 3 & 4).

AUTHORIZATION BASIS:

a) *Final Safety Analysis Report for Building 12-116*, RPT-SAR-246577, Revision 0, March 1998.
b) *Technical Safety Requirements for Building 12-116*, RPT-SAR-184468, Revision 0,Change 3, August 23, 1999.
c) See Appendix B.

SPECIFIC REVIEWS:

a) Mason & Hanger Corporation AL-R8 Sealed Insert (SI) Container Process Readiness Assessment (RA), July 2, 1999 [Line 1].
b) Startup Authorization for the AL-R8 Sealed Insert (SI) Process in Building 12-99, August 16,1999 [Line 2].
c) AL-R8/SI Qualification Evaluation Release ER No. 990156LL, Revision 3, August 22, 1999.
d) MHC Letter from S. G. Hallett, Director Nuclear Materials Program to Dennis J. Kelly, Assistant Area Manager, Amarillo Area Office, Subject: *MHC's Readiness Approach for Building 12-64 AL-R8 Sealed Insert Restart*, dated January 19, 2000.
e) PX-3322A, *Weapon Process Relocation Readiness Checklist or Continue Enduring Stockpile Cycle Notification Checklist*, for Building 12-64, bays 3 & 5 and Building 12-64, bays 1, 2, 4, 6 & 7, validated by DOE on January 28, 2000 and February 1, 2000, respectively.
f) † PX-3322A, *Weapon Process Relocation Readiness Checklist or Continue Enduring Stockpile Cycle Notification Checklist*, for Building 12-64, bay 4, validated by DOE on April 4, 2000.

ADDITIONAL TERMS & CONDITIONS:

a) LLNL Letter, R. Bailey to S.G. Hallett, MHC, dated June 14, 1999, LLNL Letter, R. Bailey to S.G. Hallett, MHC, dated June 11, 1999, and LLNL Letter, R. Bailey to P. Foster, MHC, dated April 8, 1998:
   > The configuration of containerized pits must meet the Instrumentation Plan (Thermal Loading Plan) developed by the Laboratories and delineated therein.
b) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.

† CHANGE BAR

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RESPONSIBLE MANAGER: C. PRATT

TITLE: DYNAMIC BALANCER	AA-017, REV 0	EFFECTIVE DATE: 3-24-00	EXPIRATION DATE: CONTRACT EXPIRATION

SCOPE OF ACTIVITIES:

The following activities in Building 12-60, Bay 2, involving the processing, handling, and staging of nuclear explosives include:

a) Dynamic Balancing and Weighing of the following:
- W88 (P/N 301741) and associated JTA applications.
- W87 (P/N 210414) and associated JTA applications.
- W78 (P/N 422069) and associated JTA applications.
- W76 (P/N 301439) and associated Type 2 applications.
- W62 JTA applications.
- W80 (P/Ns 301515 and 301516) and associated JTA applications (Weighing only).

b) Unit staging.

AUTHORIZATION BASIS:

a) See Appendix B.

SPECIFIC REVIEWS:

a) *Independent Review of Readiness Team report on Dynamic Balancing Operations*, October 31, 1997.
b) Qualification Evaluation Release for Safe Conduct of Mass Properties Measurement Operations in Building 12-60, Bay 2 – ER No. 970407LL, Revision 2, April 27, 1998.
c) Qualification Evaluation Release ER No. 970853SA, Revision 6, March 31, 1999, to release as acceptable the EQ status of Pantex Mass Properties Equipment located in Building 12-60.

ADDITIONAL TERMS & CONDITIONS:

a) MHC shall comply with Additional Terms & Conditions as stipulated in current Qualification Evaluation Releases.