Department of Energy
Albuquerque Operations Office
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SEP 07 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 (The Board) Recommendation 98-2, the following provides detail on the deliverables due within the month of August.

1. Deliverable 5.1.3 and 5.2.1b – Issue Technical Business Practice (TBP)-901. A copy of TBP-901/A, Integrated Safety Process for Nuclear Weapons Operations and Facilities is enclosed. The Department has completed the actions within these commitments and proposes closure of these commitments.
2. Deliverable 5.6.4a – Re-authorization of the existing W88 process in accordance with the tasks and schedule identified in the Integrated Weapons Activity Plan (IWAP). The W88 Project Plan Scope and Schedule was under development during the writing of the 98-2 Plan. The W88 Project Plan Scope and Schedule was not approved by the Standing Management Team until March 26, 1999 and revised June 5, 1999. The revision was due to the increase within the HAR development through approval timeframe from 19 weeks to 23.2 weeks. The re-authorization date is February 18, 2000. The W88 Project Team remains committed to achieve the February 18, 2000 Re-Authorization date and is currently on schedule. A copy of the June 5, 1999 approved project plan and schedule is attached. Therefore, this deliverable remains open.
3. Deliverable 5.8.1c – Long-term personnel plan for project management. A copy of the long-term project plan action plan based on the previously submitted Strengths, Weaknesses, Opportunity and Threats (SWOT) analysis from Mason & Hanger (MHC) is attached. Within the plan, eight corrective actions were identified and four of these actions are complete. The remaining four corrective actions are due to be completed November 1999. The Department has completed the actions within this commitment and proposes closure of this commitment.
4. Deliverable 5.8.2b – Complete the required actions necessary to strengthen the experience level of the Pantex Team Leads (Program Managers). A copy of the MHC Report of Completion is attached. The Department has completed the actions within this commitment and proposes closure of this commitment.

5. Deliverable 5.2.3b – Implement process improvements resulting from the Pantex assessment of practices for tooling design, tooling procurement, and procedure development. Evidence of this deliverable has not yet been received from MHC. Therefore, this deliverable remains open.

6. Deliverable 5.3.1c – Complete actions outlined in the action plan addressing the findings within the Authorization Basis Task Force Report. Evidence of this deliverable has not yet been received from MHC. Therefore, this deliverable remains open.

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

Enclosures

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Technical Business Practice (TBP-901)
Integrated Safety Process for Nuclear Weapons Operations and Facilities
SMT Concurrence Sheet

Signatures:

DE Glenn 8/24/99 Date:
Dan Glenn
SMT Chair

Darrell Schmidt for Date: 8/2/99
Steve Goodrum,
SMT Co-Chair

Patricia O'Guin 8/3/99 Date:
Pat O'Guin
SMT WPD Member

for William H Rae 8/27/99 Date:
Mark Baca
SMT WSD Member

Steve Eckert for Date:
Karen Boardman
SMT SASD Member

D F Ward 8/6/99 Date:
Dan Varley
SMT LANL Member

Jerry P. Dow 8/6/99 Date:
Jerry Dow
SMT LLNL Member

Doug Smith 8/23/99 Date:
Corey Knapp
SMT SNL Member

Herb Berman 8/6/99 Date:
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NWC TECHNICAL BUSINESS PRACTICE

TBP-901/A - INTEGRATED SAFETY PROCESS FOR NUCLEAR WEAPONS OPERATIONS AND FACILITIES

CHANGE HISTORY

TBP-901/ Issue	Release/Change No.	Date
A	IER xxxxxxSA	xxxxxx

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[1]. 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 Participating Agencies

Department of Energy

Sandia National Laboratories (SNL)

Los Alamos National Laboratory (LANL)

Lawrence Livermore National Laboratory (LLNL)

Pantex Plant (PX)

1.4 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

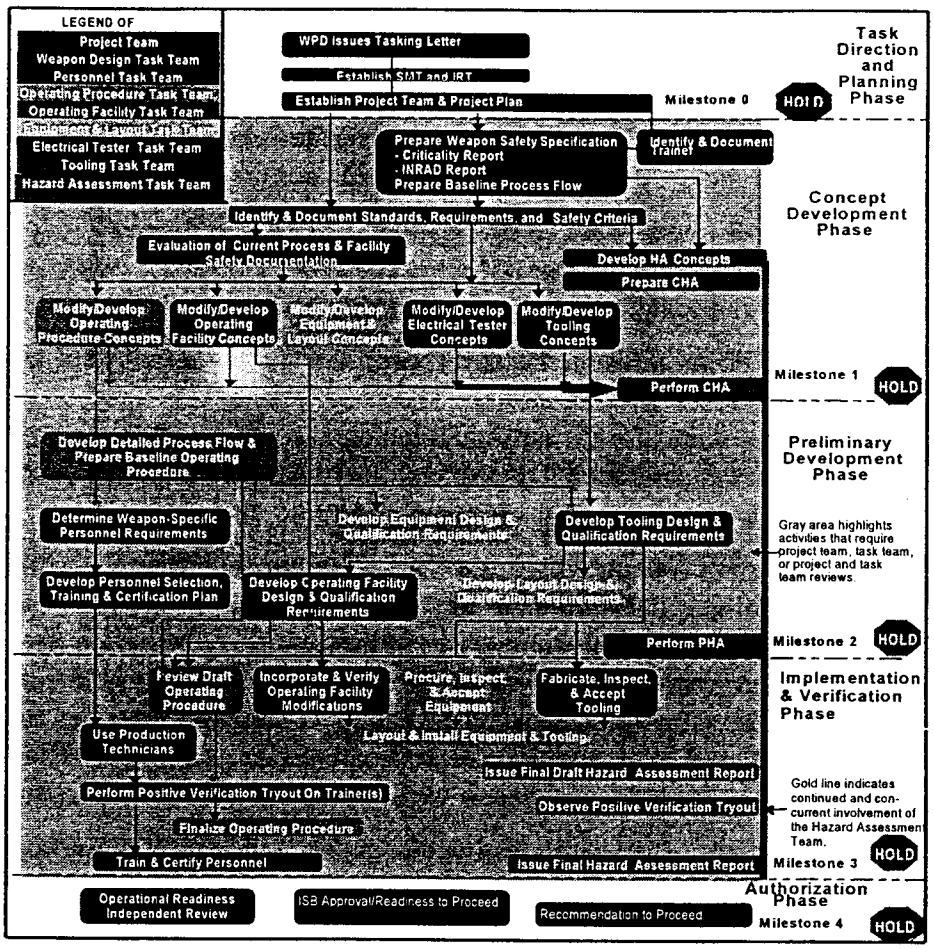
The ISP consists of five contiguous phases, five milestones, and multiple, interdependent, networked steps. It identifies safety criteria that are keyed to the expected process deliverables. It employs Hazard Analyses concurrently with process development.

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[1]. 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[1], 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.

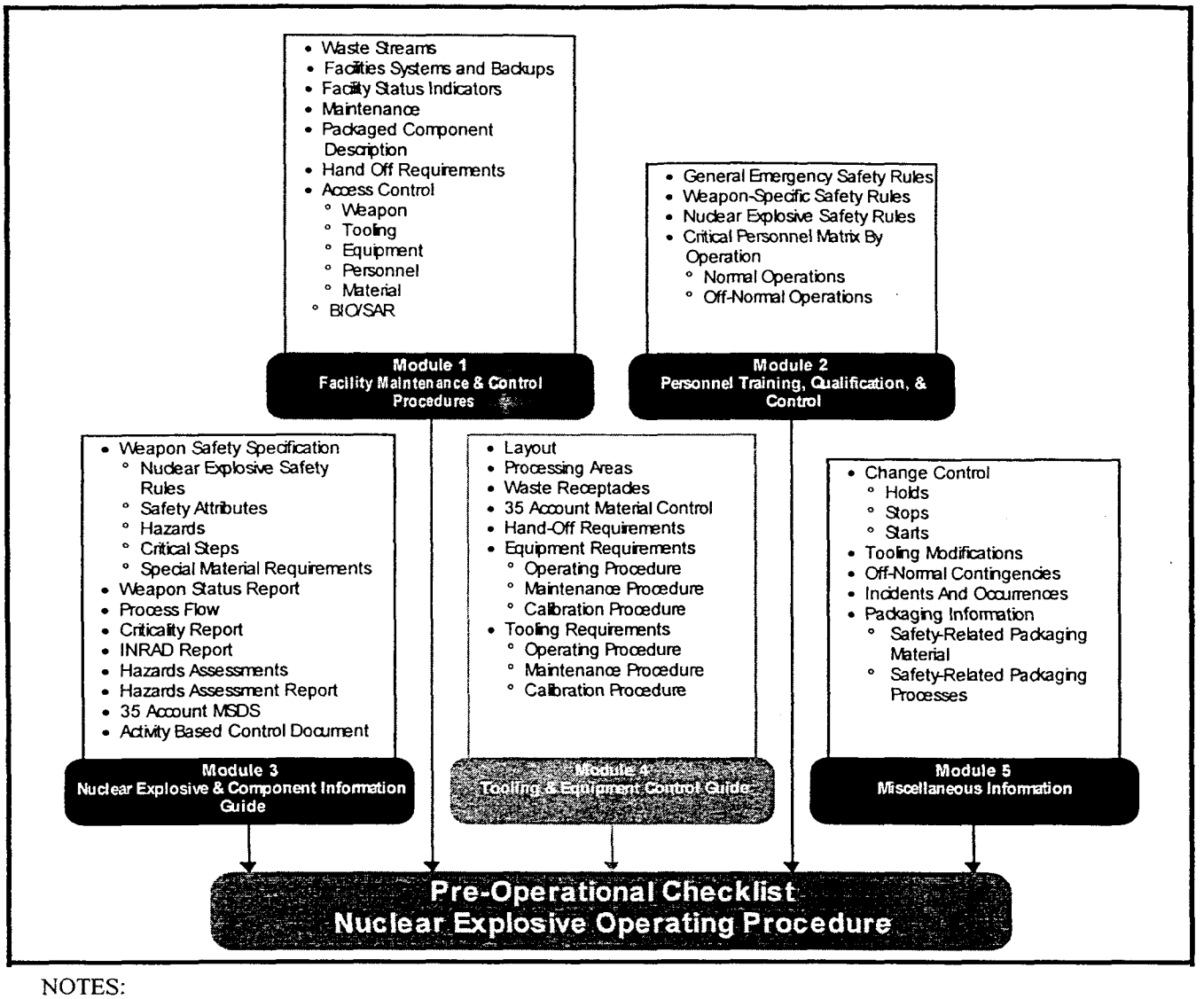
2.5 Activity Based Control Documents

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.

FIGURE 2 - Operating Procedure Structure



NOTES:

1. The Modules identify categories of source information for the weapon-specific, process-specific weapon operations. Information in the Modules are grouped for convenience to correspond to task team activities and shall be recorded in the appropriate document(s) based on need, convenience, standard practice, etc. For example, the equipment and tooling layout may be controlled in a separate drawing with a corresponding image included in the Pre-Operational Checklist and the NEOP. In other words, Module information is not necessarily compiled into a single document, folder, or binder based on the Module groupings, but must be readily retrievable.

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 & 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 2) 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 & 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[1], 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 determines 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 & 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 & 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 & 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 & Install Equipment & 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 & 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 & 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 & 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 & Verification Phases. See the D&P Manual[3], Chapter 11.4, Section 4.3 for HAR guidance.

7. REFERENCES

The following documents are referred to in this EP.

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?

5. Has the operating facility been defined to include complete documentation of the safety envelope, and is the documentation on file and available for review?
6. Does the operating facility have an established maintenance schedule that is controlled and maintained by the facility manager?
7. Does the operating facility have controls in place that allow use only after verified compliance with the maintenance schedule and requirements?
8. Does the operating facility have controls in place to ensure that permanent equipment operations within a facility employ good industrial safety practices and comply with DOE and OSHA requirements?
9. Has the operating facility been configured so that facility systems, such as RAMS, exhaust, UV alarms, etc., can be positively verified prior to certification of the facility?
10. Has the operating facility been configured so that the quantities of all hazardous materials that enter the facility and trigger an ALARA concern (e.g., HE, SNM) are known and maintained current, and so that at any time in the operation, the quantities of these hazardous materials can be positively verified?
11. Does the operating facility contain sufficient work space and seating area for the personnel (e.g., tables, carts, chairs) to avoid having personnel use waste cans and other equipment for those purposes?
12. Has the operating facility been configured to avoid uneven surfaces that could detrimentally affect movement or transportation of nuclear weapons and components?
13. Has the operating facility been configured so that ingress and egress areas are obstacle-free and will allow safe movement or transportation of nuclear weapons and components?
14. Has the operating facility been configured so that the limiting conditions of operation (LCO) are positively verified to be operational or non-operational?
15. Has the operating facility been defined so that the LCOs are identified as a part of the building standard and have a normal maintenance schedule as controlled by the facility manager?
16. Has the operating facility been configured so that all critical systems have permanent identification labels?
17. Has the operating facility been established with a facility maintenance plan and does the plan include the proper sign-off requirements?
18. Has the operating facility been configured so that NEPA documentation is in place as a prerequisite to using the facility for specific nuclear-weapon operations?
19. Has the operating facility been configured to enable positive verification that all functional monitors (RAMS, UV alarms, tritium monitors, etc.) are set at a level of detection that protects the personnel?
20. Has the operating facility been configured to support placement of all required operator aids and to support confirmation that all required operator aids are in place?
21. Has the operating facility been established using a configuration control process that enables the user to positively verify that it is operation-ready?

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?
26. Was the hazard assessment conducted in parallel with process development?
27. Were the hazard assessment results communicated to the PT in a timely manner so that threats to safety could be engineered out of the process?

APPENDIX B - SAFETY CRITERIA COMPLIANCE FORM

Date:_____

Task Team:_____

Deliverable:_____

Description of Deliverable Function:

_____

_____

_____

_____

_____

_____

_____

Description Of Safety Criteria	Yes	No	N/A

W88
Existing Operations Reauthorization Project Plan

Revision 1A

August 13, 1999

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Table of Contents

Change History

Issue	Date	Summary
Rev 0	March 26,1999	Scoping for the tasking from Director, WPD/AL/DOE
Rev 1	June 4, 1999	Incorporation of detailed HA process, update to Project Team membership
Rev 1A	August 13, 1999	Revised paragraphs 9.4.5.3, 9.4.5.4.1 and 9.4.6

Approved by the W88 Project Team Leads of:

/s/ Signature on file	*6/4/99*
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Dennis Umshler, Department of Energy / Albuquerque / WPD	**Date**
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Mary Abt, Sandia National Laboratory	**Date**
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David Ryan, Department of Energy / Amarillo Area Office	**Date**
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Approved by the SMT consisting of:

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Karen Boardman, Acting Deputy Director, DOE/AL-OSS	**Date**
/s/ Signature on file	*6/4/99*
Dan Varley, Program Manager, LANL	**Date**
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Jerry Dow, Associate Program Leader, LLNL	**Date**
/s/ Signature on file	*6/4/99*
Corey Knapp, Manager, SNL	**Date**
/s/ Signature on file	*6/4/99*
Jim Angelo, Mission Programs Division Manager, MHC	**Date**

Existing Operations Reauthorization Project Plan

1 Introduction

In response to the March 3, 1999 Weapon Programs Division (WPD) tasking memorandum from Rick Glass, the W88 Project Team (PT) was established and has developed this Existing Operations Reauthorization Project Plan (EORPP). The EORRP is the first phase of a multi-year W88 Integrated Safety Process (ISP) that will address all Seamless Safety for the 21st Century (SS-21) activities.

An informal walk-through of the W88 process was conducted in September, 1998. No safety issues were revealed during the informal walk-through. However, a list of enhancements and improvements that could increase the margin of safety, quality, and efficiency of operations was developed. This list is not included with this plan but will be used by the PT when considering changes to the W88 processes. Schedules, responsibilities, and major milestones for the W88 EORPP program are shown in the Gantt chart, Appendix A.

2 Background

The W88/Mk5 Reentry Body (RB) is a pressurized thermonuclear warhead which is deployed on the Trident II (D5) submarine launched ballistic missile. The first production warhead was completed at Pantex in September 1988. The last Nuclear Explosive Safety Study (NESS) was approved on September 29, 1994 and will expire on September 29, 1999.

3 Program Direction

The W88 EORPP will result in the reauthorization of existing nuclear explosive operations for assembly, disassembly, and inspection. The W88 EORPP does not change the scope of operations that are currently authorized and being performed at the Pantex Plant in accordance with W88 Program Control Document requirements. These include:

- War Reserve surveillance,
- Joint Test Assemblies (traditional and high fidelity),
- Stockpile Laboratory Test (test beds),
- Environmental Sample Test Units,
- Assistance for Significant Finding Investigations issues,
- Accelerated Aging Units (identified in W88 Integrated Pit Manufacturing and Qualification Plan, June 30, 1998), and
- An aggressive warhead rebuild and return schedule to the DoD in support of the Limited Life Component Exchange program.

4 Purpose

The W88 processes are authorized and are being executed at the Pantex Plant. The purpose of this W88 EORPP is to attain the reauthorization, including the NESS, of current W88 operations at the Pantex Plant by formally establishing the safety basis for the current W88 operations. The W88 EORPP will only address the activities necessary to allow DOE to reauthorize the current W88 processes.

5 Project Deliverables

Project Team deliverables for Phase One include the following:

- Development and Approval of a HAR
- Development and Approval of an ABCD
- Issued Nuclear Explosive Operating Procedures (NEOPs)
- Qualified Production Technicians
- Functional Trainer
- Approved NESS Revalidation
- Successful Readiness Review
- Authorization Agreement (AA)

6 Project Team

The W88 PT lead members are Norm Butts (Pantex), Mary Abt (SNL), Kevin Hale (LANL), Dennis Umshler (DOE/AL), and Dave Ryan (DOE/AAO).

Per the WPD tasking, each of the PT member's parent organization will provide the resources necessary for successful completion of the activities as defined in this project plan. The PT members have the full authority at their site to direct work and to assign resources as necessary to ensure the successful implementation of the W88 EORPP.

In executing the W88 EORPP, the W88 PT is responsible for the following:

- Establishing the W88 Safety Basis, including the Hazard Analysis Report (HAR) and Activity Based Control Document (ABCD),
- A qualitative assessment of operational risk,
- Reviewing all changes to the W88 NEOPs and other procedures, tooling, testers, training, trainer, and facilities since the 1994 NESS,
- Identifying enhancements to the W88 NEOPs and other procedures, tooling, testers, training, trainer, and facilities to increase the margin of safety,
- Assessment against MHC SS-21 attributes,
- Ensuring the development of a Weapon Safety Specification (WSS),
- Implementing applicable lessons learned from other programs, and
- Maintaining records of critical decisions and meetings.

This list is not all-inclusive. See Appendix A, Gantt chart, for additional detail.

7 Roles & Responsibilities

7.1 PT EORPP Oversight (Decision Points)

In addition to the required briefings (See Appendix A), the PT will monitor, direct, and report W88 EORPP progress by conducting the following team meetings and briefings.

7.2 Weekly Conference Calls

Weekly conference calls which will focus on:

- Schedule status,
- Status of deliverables,
- Site requirements and or commitments,
- Change control actions, and
- Action items.

Pantex will document these calls via meeting minutes that will be distributed, by e-mail to the PT, before the close-of-business the following day. The weekly PT conference calls will not be conducted the week that the monthly PT meeting is scheduled.

7.3 Monthly PT Meetings

Monthly PT meetings that will include detailed reviews of the following:

- Schedule status,
- Status of deliverables,
- Change Control Actions,
- Comment Resolution,
- Site requirement and / or commitments,
- Preparation for SMT briefings, and
- Action items.

Pantex will document these meetings via meeting minutes that will be distributed, to the PT, prior to the next PT conference call

7.4 EORPP CHANGE CONTROL

The W88 EORPP is a dynamic document and consequently will require changes during implementation. Changes may be proposed by any participating organization, provided that they use this change control process. Significant changes, as defined below, will be

formally directed by the DOE approval authority and coordinated through the PT. The PT will address only project scope, deliverables, resources, and schedule changes that are officially requested in writing.

The PT will provide WPD with a project impact assessment, to include resource impacts, of requested changes for adjudication and subsequent formal tasking. If WPD (when appropriate, in concert with the Standing Management Team (SMT)) approves the requested change after review of the project impact assessment, WPD will provide formal documentation of the change approval. The change approval documentation and project impact assessment will be maintained in the project files.

A significant change is any change to the project plan that adversely affects:

- An individual activity's schedule by more than 5% of the activity's baselined schedule duration;
- An activity's resource planning or requirement by more than 5% of the activity's baselined resources estimate;
- Any change to the schedule that adversely affects the deliverables; or
- Any scope change.

When a baseline change to the project plan is needed, a revised plan will be submitted by the PT for DOE approval. After approval, a copy of this plan will be distributed to each member of the PT and the SMT.

No PT member will act independently on the addition or deletion of requirements to the plan. A quorum of at least three PT lead members, or their designated representative, must be in agreement in order to accept changes to the plan and / or schedule. If the change directly affects a specific organization (plant, laboratory, or area office) the PT lead from that organization must be present. PT members are responsible for addressing concerns that impact their organization.

7.5 MHC Responsibilities

MHC management is responsible and accountable for the HA activities including the HAR and ABCD. The MHC lead PT member will direct the HAR and ABCD activities in accordance with this plan.

8 EORPP Project Assumptions / Risks

The PT asserts that the following programmatic risks to the successful W88 EORPP completion exist to the project as defined.

- The schedule is highly success oriented. The tasks' durations are the minimum necessary for proper completion assuming adequate resources are committed to the schedule. If dedicated resources, which are technically competent and enthusiastic, are not provided, the schedule commitments will not be met.

- Significant changes to W88 NEOPs and other procedures, tooling, testers, training, trainer, or facilities have not been factored into this plan. If significant changes are necessary, the schedule commitments will have to be revised.
- Acceptance and support, by all involved organizations, of the methodology being used to develop the HAR and ABCD is essential for on-time completion of W88 EORPP deliverables.
- The timely receipt of weapons response data, WSS and Weapons Response screens, is imperative for the on time completion of the HAR and ABCD.
- A concurrent review of the HAR and ABCD during their development, by LANL, SNL, Pantex Management, and the Safety Basis Review Team, must occur or project milestones will not be met.
- Support for the Integrated Review concept is essential to meeting project milestones. An integrated review must occur for the on-time reauthorization of the current processes.
- Rework, of the EORPP activities, must be avoided to minimize schedule impacts.
- Work or analysis being performed by the Pantex BIO Upgrades Project will not be duplicated.
- The analysis supporting the existing DOE approved authorization basis will not be duplicated.
- Adequate training facilities are available.
- Other ongoing weapon IWAP activities may be affected by the implementation of this plan (hazard analyses, surge capacity, etc.).
- This plan may impact the accelerated W88 Disassembly and Inspection (D&I) and rebuild schedule.
- The institutional safety programs described in Appendix G of the BIO and the Pantex General Information Document (GID) are not part of this plan. Those are in place and assumed to be adequate (radiation safety, industrial safety, industrial hygiene, etc.). Implied controls or protective measures assumed to be provided by these administrative control programs will not be used in the hazards analysis process.

9 Scope of Work

The W88 ISP will be implemented through a multi-phase approach. The first phase is the reauthorization of existing operations, which includes a Revalidation of the 1994 NESS, and the second phase is the long-term ISP, which will be completed in accordance with the DOE/AL Integrated Weapons Activity Plan (IWAP) schedule implementing the SS-21 criteria.

Phase One is the implementation of the W88 EORPP, which will only address the activities necessary, as defined in this plan, for the PT to establish the safety basis and assert that the current W88 processes are safe. Phase One will allow DOE to reauthorize the current W88 processes at the Pantex Plant.

The second phase will implement the SS-21 philosophy specified in EP401110. The W88 PT will develop the detailed W88 Phase 2 ISP plan after reauthorization of W88 operations has been granted. Requirements for the WSS, HAR, and ABCD documents as described in the D&P Manual will be incorporated into the W88 ISP plan.

9.1 Process Changes

9.1.1 Nuclear Explosive Operating Procedures (NEOPs) and Other Procedures

The W88 NEOPs and other procedures will be reviewed for changes that have occurred since the 1994 NESS. These changes will be documented in support of the NESS Revalidation portion of the Integrated Review.

The PT will make W88 NEOPs and other procedure changes (i.e. additional controls, etc.) that are deemed necessary as a result of information gained from the HAR and ABCD development to increase the margin of safety. The W88 Phase 2 ISP plan will address the longer-term enhancements and upgrading of the W88 NEOPs and other procedures to the SS-21 NEOP format.

9.1.2 Operations and Facilities

Pantex currently operates three nuclear bays (Bldg.12-104, bays 9, 11, & 13) and two cells (Bldg.12-44, cells 4 & 6) for the W88 program. The PT assumes that the facility utilization will remain constant throughout the execution of the W88 EORPP. The MHC lead PT member will address potential facility conflicts to ensure that there is no impact on the implementation of this plan.

The satellite operations required for W88 operations are as follows: Radiography (Bldg. 12-84, Bays 1 & 10), Separation Test Facility (Bldg. 12-50), Mass Properties (Bldg. 12-60), Purge & Backfill (Bldg. 12-104, Bay 16). Weapons interface issues with these facilities will be addressed in this EORPP.

9.1.3 Equipment and Facility Layouts

Equipment and Facility Layouts are not required or formally documented in the current W88 procedures.

The PT will develop and incorporate Facility Layouts into the W88 general procedures as part of the EORPP.

9.1.4 Testers

All testers used on the W88 Program will be identified. The current W88 testers will be reviewed, for changes since the 1994 NESS, during the NESS Revalidation portion of the Integrated Review. These changes will be documented.

The PT will make W88 tester changes that are deemed necessary as a result of information gained from the HAR and ABCD development to increase the margin of safety.

The second phase of the W88 ISP will address the upgrading of the W88 testers to meet SS-21 criteria.

9.1.5 Trainer

The current W88 trainer will be reviewed for necessary upgrades and enhancements to increase the fidelity of the trainer.

Prior to the training of the W88 production technicians, the scheduled enhancements to the W88 trainer will be made.

The PT will also make W88 trainer changes that are deemed necessary as a result of information gained from the HAR and ABCD development to increase the margin of safety.

The second phase of the W88 ISP will address the upgrading of the W88 trainer to meet SS-21 criteria.

9.1.6 Training

The W88 Program Production Technicians and Operations Managers are qualified and certified per the current Pantex Plant Standards and internal operating procedures and are performing W88 processes.

The PT will identify, document, and implement W88 specific training enhancements, as required, to the existing W88 training program.

Prior to the PT's declaration of readiness to proceed to the Integrated Review, the W88 production technicians will be trained in any process that changes as a result of the implementation of this EORPP.

9.1.7 Tooling

The current W88 tooling will be reviewed, for changes since the 1994 NESS, during the NESS Revalidation portion of the Integrated Review. These changes will be documented.

During phase 1 of the ISP, the PT will make any necessary W88 tooling changes that impact nuclear explosive safety.

The second phase of the W88 ISP will address the upgrading of the W88 tooling to meet SS-21 criteria.

9.2 SS-21 Assessment

The PT will conduct a comparison of the W88 current nuclear explosive operations at the Pantex Plant using the MHC SS-21 Attributes. This comparison will be used in the implementation of the W88 EORPP and the second phase of the ISP to focus actions on necessary improvements to the W88 processes.

9.3 Weapon Safety Specification

A WSS containing the following items will be in place prior to the start of the HA for the W88 EORPP. The WSS will, at a minimum, include the following:

- Warhead description,
- Identification of hazards,
- Identification of hazardous components and materials contained within the warhead,
- Definition of the safety attributes and concerns,
- Criticality information,
- Intrinsic Radiation (INRAD) information,
- Safety information,
- Potential contamination information,
- Major component descriptions, and
- Component handling information.

9.4 Hazard Analysis Report and Activity Based Control Document

As mentioned previously, MHC management is responsible and accountable for the Hazard Analysis (HA) activities including the Hazard Analysis Report (HAR) and the Activity Based Control Document (ABCD). The MHC lead PT member will direct the HAR and ABCD activities in accordance with this plan.

9.4.1 HAR & ABCD Objectives

The W88 HA for nuclear explosive operations and associated activities will provide the technical basis for deriving the necessary operation-specific controls to ensure safe W88 operations at the Pantex Plant. The HAR will document, in summary form, the results of the HA, which will be used in the development of the ABCD.

This plan provides direction to the Hazards Analysis Task Team (HATT) for the development of the W88 HAR. The W88 HAR will be prepared to support the W88 EORPP. The plan employs a pre-screening of the W88 procedures to determine the extent of procedures to be analyzed, a comparison of the W88 process to incorporate previous analyses, and analysis of W88 specific processes. It is anticipated that the process for developing the W88 HAR will involve the examination of approximately thirty-nine procedures in order to identify those W88 operational hazards whose consequences meet or exceed Nuclear Explosive Operations (NEO) Evaluation Guidelines as defined in D&P Manual Chapter 11.4, Rev 1, Change 27. These hazards include:

- Inadvertent Nuclear Detonation (IND),
- High Explosive Detonation/Deflagration (HED/D)
- Fire leading to fissile material dispersal
- Uncontrolled release of radioactive material from the facility, and
- Death or serious worker injury resulting from non-standard industrial hazards

To achieve this end, the PT will ensure that the W88 HAR and ABCD development will:

- Document the scope for W88 nuclear explosive operations at the Pantex Plant and provide a concise description and basic flow for the W88 activities (Figure 1: Example for Informational Purposes Only).

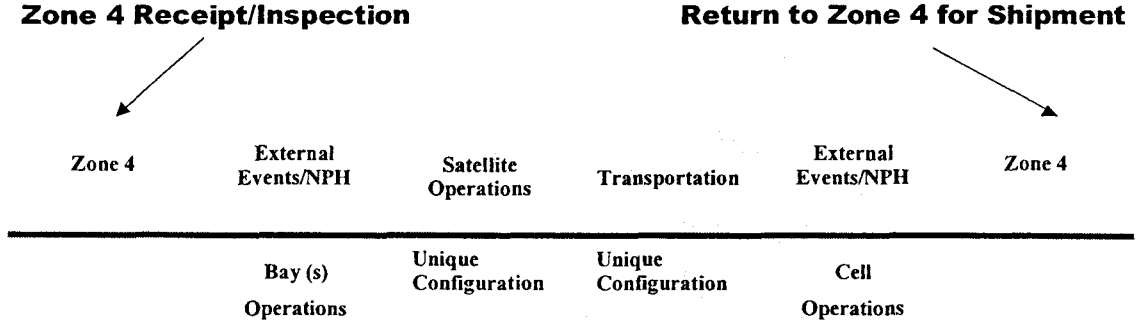


Figure 1: Example for Informational Purposes Only

- Identify hazards inherent in the W88 warhead, the processes used for assembly, disassembly, and testing, and the facilities where the work is performed. These

include hazards posed by the W88 warhead and its components, by the process (e.g. tooling), and by the facility (e.g., electrical energy available). Hazard identification will be accomplished primarily by viewing of videos and reviewing of prior analyses (e.g., the WSS, the Basis of Interim Operations (BIO), etc.), coupled with walkdowns of those processes that require additional observation.

- Identify and analyze accident scenarios associated with hazards identified in the WSS with consequences that meet or exceed the NEO Evaluation Guidelines using the focused What-if Analysis and/or other industry accepted hazard evaluation techniques (e.g. fault tree analysis, event tree analysis, etc.). The W88 HAR will describe the analytical technique used and present the results. Analysis of a comprehensive set of accident initiators and event sequences resulting in consequences that meet or exceed NEO Evaluation Guidelines will be identified and developed by trained and experienced analysts. Accidents will be grouped into common scenarios (e.g., drops, minor strikes, fire, etc.) where common controls for prevention or mitigation apply.

- Include a synopsis of the results and relevance to the proposed nuclear explosive operation when existing analyses in DOE approved documentation are relied upon and referenced.

- Describe each control, provide the technical basis for selection of the control, and provide the linkage, through the accident scenario description, from the hazard to the control (i.e., shows the derivation). For each TSR level control, the ABCD will document the basis statement for Safety Limits (SL), Limiting Conditions for Operation (LCO), and Surveillance Requirements (SR). The basis statement will describe how each requirement was derived from the hazard analysis and why it is an adequate control. The primary purpose for describing the basis for each requirement is to ensure that any future changes to the requirement will not affect its original intent or purpose.

- Document the adequacy of the proposed control set in establishing an understood risk envelope.

- Evaluate the adequacy and effectiveness of the control set and then compare the proposed controls to the Target Level of Controls (TLC) guidance.

- Document that the existing W88 nuclear explosive processes are within the safety envelope established for the facilities (BIO, Critical Safety Systems Manual (CSSM)/Technical Safety Requirements (TSR)) and the Nuclear Explosive Operations (HAR/ABCD).

- Build upon lessons learned from HAR and ABCD development efforts on other weapon programs as applicable (e.g., W56, W87).

- Provide the DOE approval authority sufficient information to enable an assessment of the adequacy of the identified controls and an understanding of the residual risk DOE is accepting if the operation is authorized.

9.4.2 HAR & ABCD Briefings

To ensure that the PT is achieving the objectives per this plan, periodic reviews with the SMT will be performed. Each organization's SMT member must review the PT's progress with their respective PT member prior to the SMT review. For the HAR and ABCD work, the PT will present progress on the following:

- Hazard analysis plan (part of the EORPP)
- Development of the Technical Support Document (TSD)
  - Including Hazard identification matrix and process flow chart
- Preliminary HAR and ABCD
- Final HAR and ABCD

9.4.3 HAR & ABCD Orientation

In preparation for the W88 HAR and ABCD development, the HATT and the PT will receive the following briefings:

- HAR & ABCD Development briefing (HAR, TLC, ABCD, TSR, etc.) including lessons learned from previous programs
- W88 nuclear weapon design overview
  - Hazardous components
  - Component qualification information
  - STS information
  - Weapon system safety features, including intrinsic radiation and criticality information
- W88 Process overview
  - Existing process flows
  - Videos of W88 operations
- Facilities Orientation
  - Walkthrough of the facilities
  - Identification of facilities (including transportation and satellite facilities)
  - Description of potential hazards/energy sources

  Review of existing Authorization Basis/Safety Basis including NES studies
  - BIO upgrade initiatives

9.4.4 HAR & ABCD Preparation

The following information/documents will be made available to the HATT for use during the HA process:

- Weapon Safety Specification (WSS)
- Weapon Response Screens table
- Process Flow Chart
- Tester list
- NEOP and O&I lists

This information will be used during the identification of hazards and the development of scenarios using the What-If Analysis and/or other industry accepted hazard evaluation techniques.

9.4.5 HAR Development

The methodology to be used will provide a defensible risk profile for W88 operations, identify effective control sets linked to specific hazards as well as comply with the guidance set forth in D&P Manual Chapter 11.4, Rev 1, Change 27. The products produced by this process will be released for review upon approval by MHC Risk Management and the W88 Project Team. Written comments concerning the products produced by the HATT are appreciated and will be dispositioned in writing through the W88 Project Team. The methodology to develop the W88 HAR is shown in Figure 2.

The successful completion of the W88 HAR will require the staffing of three hazards analysis teams under the guidance of a HAR Coordinator. The HAR Coordinator will be a Pantex, Risk Management employee and will be responsible for overall project development, maintaining schedule, and serving as the primary point of contact between the hazard analysis teams, the Project Team, the review teams, and the Design Agencies.

The three hazard analysis teams will assemble the HAR in a parallel effort. Each team will consist of a mix of MHC and Design Agency hazard analysts. The first team (Team 1) will be responsible for comparing the W88 processes to existing analyses (e.g., BIO, CSSM, site-wide TSRs) and identifying W88 specific controls in Satellite operations, and validating the applicability of both the identified hazards and their corresponding control sets. This team will be led by a LANL hazard analyst experienced in previous analyses. The second team (Team 2) will be responsible for documenting the W88 hazards associated with bay operations. This team will be led by a Pantex Risk Management hazard analyst with hazard analysis experience in similar bay operations as they apply to other weapons systems. The third team (Team 3) will be responsible for documenting the W88 hazards associated with cell operations. This team will be led by a Pantex Risk Management hazard analyst with hazard analysis experience in similar cell operations as they apply to other weapons systems.

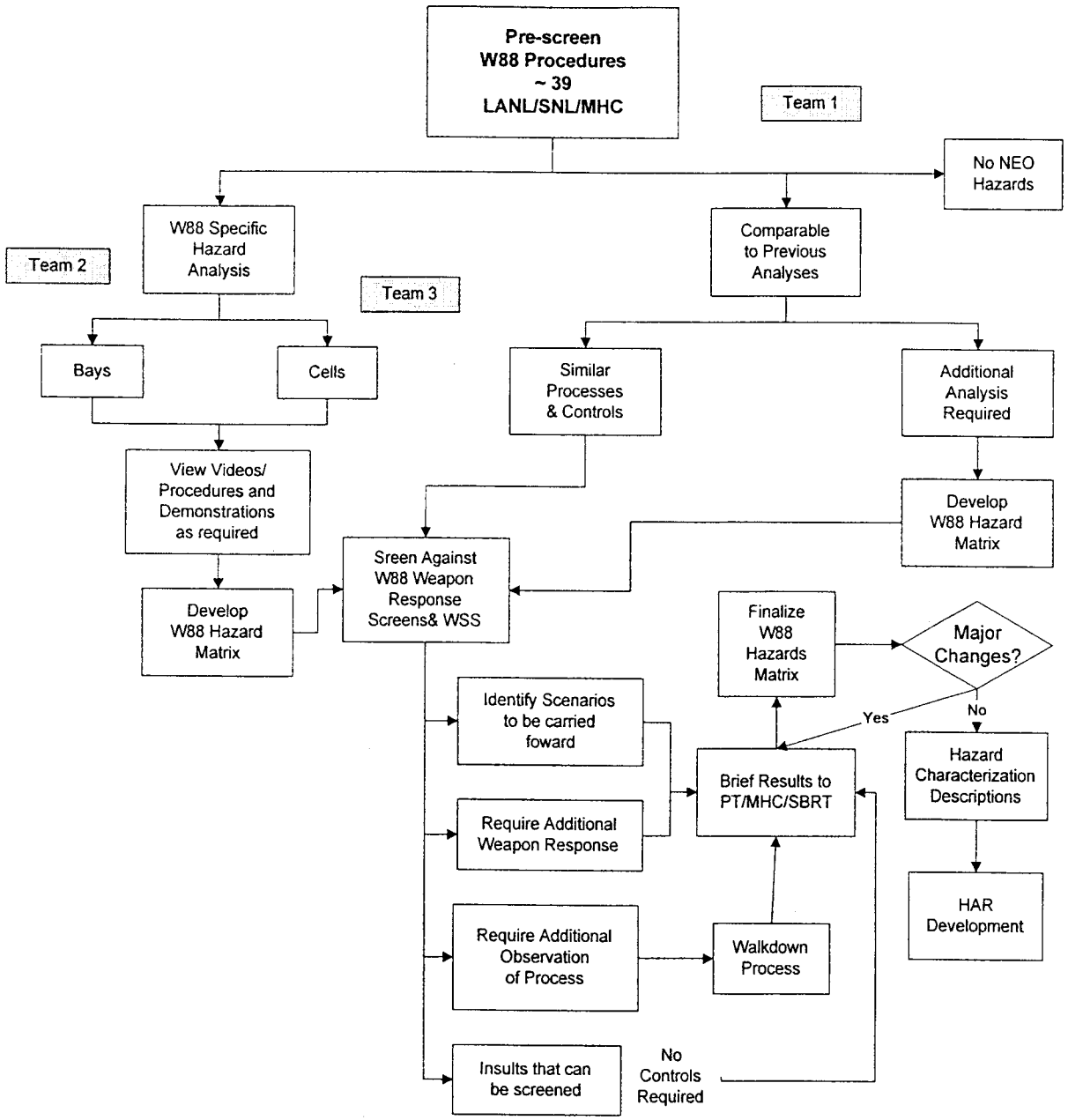


Figure 2 W88 Hazard Analysis Flow Chart

9.4.5.1 Procedure Pre-Screen

A pre-screen of the W88 procedures will be performed by LANL, SNL, and MHC experienced risk analysts. This pre-screen will be used to divide the W88 Procedures into four categories and to allow assignment of the procedures to the three independent hazards analysis teams. The division of the procedures will be accomplished based on the experience and judgement of the analysts.

1. Procedures which introduce no NEO hazards- Team 1
2. Procedures which have hazards that compare to previous analyses - Team 1
3. Bay procedures expected to introduce NEO hazards - Team 2
4. Cell procedures expected to introduce NEO hazards - Team 3

9.4.5.2 Review of No NEO Hazards (Team 1)

For those processes that pose no NEO hazards, the team will prepare a written summary with justification to be included in the TSD.

9.4.5.3 Previous Comparison Analysis (Team 1)

During the comparison analysis, the procedures will be compared to previous analyses to determine if the hazards and controls from those analyses can be applied to the W88. Comparisons may include the Basis of Interim Operations (BIO), Master Studies, Nuclear Explosive Safety Studies, and other weapon program hazard analyses. The comparison analysis will provide the opportunity to use existing analyses to decrease the amount of time and cost required to establish W88 controls. The comparison analysis will focus primarily on satellite activities and activities that are common to other weapon programs. The comparison process is expected to evaluate:

- Radiography Operations
- Separation Testing
- Mass Properties
- Purge & Backfill Operations
- Ramp Transport in the Shipping Configuration

In the areas of the process where the W88 is similar to a previous hazard analysis, the hazards and events identified in the previous analysis will be evaluated to determine if the analysis can be applied to the W88. If the scenarios identified in the previous analysis can be applied to the W88, the scenarios will be screened against the W88 weapon response criteria and the controls identified in the previous analysis will be modified to apply to the W88. If the scenarios in the previous analysis are not appropriate for use on the W88, then additional hazard scenario development will be completed. In the areas of the process where the W88 is not similar to the previous analysis, development of W88 specific hazard scenarios will be completed.

The results of the procedure comparison process will be the separation of satellite and common procedures into two categories as follows:

1) **Similar Processes and Controls** For those procedures which are comparable to other program processes, the team will screen them against the W88 Weapon Response Screens and the WSS, then forward them to the Project Team for Review. Eventually accident scenario characterization descriptions will be developed.

2) **Additional Analysis Required.** The procedures which require further hazards analyses will either be analyzed by the procedure comparison team or forwarded to the Bay or Cell team.

9.4.5.4 Bay and Cell Analysis (Teams 2 and 3)

The W88 specific analysis will provide a hazard analysis and control identification for assembly operations, disassembly and inspection (D&I) operations, and transportation of full and partial assemblies outside the shipping container. The W88 specific analysis will use a modified "what-if" approach to identify hazards associated with the nuclear explosive operations, determine the unmitigated consequences associated with each hazard, and qualitatively assign likelihoods to hazards and events which meet the NEO Evaluation Guidelines as defined in the D&P Manual. Additional analytical techniques may be used at the discretion of the HATT to characterize the W88 hazards and events. External events and Natural Phenomena Hazards (NPH) will rely on the existing site safety analysis. The transportation and facility master studies and the Pantex dispersal analysis included all weapon systems and does not need to be repeated for the W88. It is expected that the HATT will provide analysis of operationally enabled external hazards, such as lightning strikes, during the operation.

In addition, special studies such as the Fire Hazards Analysis (FHA), will be used in support of the W88 HAR.

9.4.5.4.1 Team Process Review

The bay and cell teams will consist of hazard analysts from MHC Risk Management, an analyst from the appropriate laboratory (i.e., bay analyst from SNL, cell analyst from LANL), and a production technician. The W88 Program Manager, Program Engineer, and Tooling Engineers may also be asked to participate. The team composition provides the best opportunity to complete a thorough examination of the hazards associated with the W88 operation. The use of a "what-if" methodology examining all process steps, performed by experienced hazard analysts and Design Agency weapons response experts will serve to provide confidence that all hazards potentially resulting in accidents with consequences that meet or exceed the NEO Evaluation Guidelines have been identified and analyzed.

The bay and cell teams will view the videotapes and procedures, coupled with demonstrations of the process as required to identify potential threats of concern. The process used in the W88 HAR will examine each step of the assembly and disassembly/inspection procedure. These potential threats of concern will be documented in the W88 Hazards Matrix. To insure that the hazard analysis methodology will focus on operationally induced hazards, the hazard matrix prepared for each procedure will have check boxes linked to each process step for both the broad category on insult (e.g., mechanical, electrical, thermal) and the resulting unmitigated NEO consequence (e.g., IND, HEDD).

The scenarios will be screened using the W88 Weapon Response Screens and the WSS to separate those scenarios that:

1. Will be carried forward into the accident scenario characterization Descriptions in the TSD, or
2. Require additional weapon response information, or
3. Require additional observation of the process, or
4. Do not require controls due to benign consequences, or because the scenarios are determined to be sufficiently unlikely

The disposition of the proposed scenarios will be indicated on the Hazards Matrix in the TSD.

For those scenarios not readily screened by either the Weapons Safety Specification or the W88 Weapons Response Screens, weapons response information will be requested from the Design Agencies. If the required weapons response information cannot be provided by the Design Agencies in a timely manner, conservative controls will be assigned to the scenarios until such time as the modified screening criteria can be provided. In these cases, the likelihood of the scenario will be determined by the likelihood of the occurrence.

For those scenarios that require additional observation, walkdowns of the process will be conducted.

Benign consequences are defined as those not meeting or exceeding the NEO Evaluation Guidelines. Sufficiently unlikely scenarios may be screened using the W88 weapon response screens or weapon response information from either Design Agency. Sufficiently unlikely scenarios, as determined by the Design Agency, will be screened and, therefore, not characterized or controlled.

9.4.6 Accident Scenario Characterization Descriptions

Accident scenario characterization descriptions will be developed to include descriptions of the events of concern along with bounding unmitigated consequences, likelihoods and the justifications for the likelihoods, and controls and the bases for those controls. The accident scenario characterization descriptions will be documented in the TSD. Only those hazards which meet or exceed NEO Evaluation Guidelines will be developed into a accident scenario characterization description. Where practical, for those scenarios to be carried forward into the HAR, accidents will be grouped into common scenarios where the same controls for prevention or mitigation apply. In accordance with D&P Manual Chapter 11.4, Rev 1, Change 27, the HAR will only examine those scenarios which could lead to either an inadvertent nuclear detonation, a high explosive detonation or deflagration, a fire leading to the dispersal of fissile material, an uncontrolled radiological release, or those non-standard industrial hazards which could result in serious worker injury or death.

Unmitigated occurrence likelihoods will be based on industry standards and prior analyses, while unmitigated consequence likelihoods will be provided by the Design

Agencies. The unmitigated likelihoods will not be supported through detailed quantitative analyses.

Only those controls at the TSR level that are tangible controls, and can be described as being effective and reliable with respect to their corresponding hazards will be included in the accident scenario characterization descriptions. TSRs derived from the controls in the HAR will be based on their ability to prevent or mitigate scenarios that meet or exceed NEO Evaluation Guidelines. Inadvertent nuclear detonation scenarios will have at least two primary controls (preferably as LCOs), or, if a lesser control set is selected, a justification for adequacy will be specifically addressed in the HAR. Positive measures will not be proposed during the HAR development process for those scenarios which can be screened through the W88 weapons response criteria.

MHC will evaluate the adequacy and effectiveness of the control set and then compare the proposed controls to the TLC guidance. For each control, the ABCD will document the basis statement for Safety Limits (SL), Limiting Conditions for Operations (LCO), and Surveillance Requirements (SR). The basis statement will describe how each requirement was derived from the hazard analysis and why it is an adequate control. The primary purpose for describing the basis for each requirement is to ensure that any future changes to the requirement will not affect the original intent or purpose.

A description of the residual risk associated with scenarios and controls will be provided. The residual risk discussion will be provided in terms of the consequence of the scenario and the likelihood of the scenario upon implementation of the identified controls. Residual risk will be determined using those controls proposed and developed as TSRs and not as a function of any defense in depth positive measures.

The accident scenario characterization descriptions will be presented to the W88 Project Team for concurrence. Upon concurrence by the W88 Project Team of HATT findings and agreed upon applicable control sets, the HATT will forward their accident scenario characterization description to the HAR Coordinator for inclusion in the HAR.

9.5 ABCD Development

The ABCD, when combined with the Pantex Plant TSR (CSSM), will establish a set of safety requirements. These requirements will provide reasonable assurance of adequate protection against the consequences of accident scenarios that could potentially meet or exceed the NEO Evaluation Guidelines. The ABCD will describe each control and provide the technical basis for selection of the control.

The ABCD will identify those controls that are relied upon to prevent or mitigate the consequences of the accident scenarios described in the HAR. The controls will be presented to clearly distinguish their relative level of importance to safety, using DOE Order 5480.22 and includes the following:

- Safety Limits (SL) - SL is reserved for a small set of extremely significant features that are essential to prevent potentially major offsite impact.

- Limiting Conditions for Operation (LCO) - LCO establishes the lowest functional capability or performance level of tooling / equipment / system / structure required for safe operations. Even if defense-in-depth controls failed, the set of LCOs will include the controls needed to maintain confidence in the safety of the operation.

- Surveillance Requirements (SR) - Those requirements relating to test, calibration, or inspection to assure that the necessary quality of systems, tooling, or equipment are maintained to ensure operations will be within Safety Limits and that Limiting Conditions for Operation will be met.

- Bases - A brief summary of the reasons for SL, LCO, and SR that demonstrates how each requirement was derived from the hazard analysis and why it is an adequate control. The primary purpose for describing the basis for each requirement is to ensure that any future changes to the requirement will not affect its original intent or purpose.

- Administrative Controls - Procedural requirements that ensure safety of operations.

MHC management will review the results and the preliminary HAR and ABCD for acceptance. The preliminary HAR and ABCD will then be provided to the PT for review and acceptance. Additionally, LANL and SNL will review these preliminary documents and provide comments to the PT for resolution.

Using the preliminary HAR and ABCD, the PT will perform a walk-through of the W88 processes, validate the hazards and accident scenarios, and evaluate the effectiveness of the derived controls. Upon completion of this evaluation, the PT will resolve concerns, such as need for additional analysis. The SBRT will concurrently review the preliminary W88 HAR and ABCD and provide comments to the PT for resolution.

A summary of the preliminary W88 HAR and ABCD will be presented to the SMT.

10 EORPP Review and Approvals

10.1 Periodic Presentations to SMT

The PT will provide periodic presentations to the SMT. These presentations will focus on the following:

- Project progress,
- Schedule status,
- Status of deliverables,
- SBRT and MHC management comment resolution,
- Specific SMT requests,
- Issues needing SMT resolutions, and
- Action items.

10.2 HAR & ABCD Review and Approval

As described previously, the PT will provide periodic updates to the SMT. After an internal MHC review of the W88 HAR and ABCD, the PT will conduct a final review to ensure that the final W88 HAR and ABCD have met the outlined objectives.

The HAR/ABCD will become a portion of the authorization basis to process future changes. The PT will determine when changes to the existing W88 process are mandatory for safety, quality or reliability reasons. Upon completion of the HAR/ABCD, the PT will make the mandatory changes. If the changes are not mandatory, the PT will maintain a list of enhancements identified and make a determination of their necessity at a later time. If the PT determines that these enhancements will be made, the PT will implement them using change control after the HAR/ABCD is in force.

The PT will present a summary of the final W88 HAR and ABCD to the SMT. The PT will then recommend approval of the final W88 HAR and ABCD to the DOE approval authority. Upon approval, the PT will document lessons learned from this activity.

The PT will ensure that the controls that are communicated (flowed-down) to the shop floor level are reviewed and concurred by the participating organizations.

10.3 Safety Basis Review Team (SBRT)

To ensure timely feedback and approval, the SBRT's review of the HAR and ABCD will be conducted in parallel with the development of the documents. The SBRT will provide comments to the PT for resolution.

The SBRT will independently provide an assessment of the final W88 HAR and ABCD to the DOE approval authority, along with a recommendation for approval or rejection. Upon completion of the comment resolution process, the SBRT will issue a Safety Evaluation Report (SER). SBRT activities that affect the W88 EORPP schedule are shown on the Gantt chart in Appendix A.

10.4 Integrated Review

An Integrated Review will be conducted, as required in the WPD tasking memorandum, which consists of a concurrent NESS Revalidation and a DOE Readiness Review. The process demonstration for the Integrated Review will be conducted in Building 12-15, Bays 1 and 5 (training facility) or in the production facilities. Comments from both reviews will be resolved simultaneously, and the PT will combine the process demonstrations into a concurrent walk-through.

10.4.1 Integrated Review Input Document

The documentation for the Integrated Review will consist of the same information required by line management for their review and approval to proceed with independent reviews. Specifically, the input documentation will consist of the WSS, the HAR, process flow charts, and the ABCD along with a plan of action. Should additional information be required to aid the review team, this additional information will be treated as supporting analysis for the authorization basis documents. A reference library containing appropriate supporting analysis (e.g., tooling and testers drawings) will be established at the Pantex Plant. If the Integrated Review Team identifies potential deficiencies with the authorization basis documents, the PT will resolve the issues and, if necessary, revise the documents to correct the deficiencies.

The NESS Revalidation portion of the Integrated Review will include the normal requirements of a NESS Revalidation plus additional information and activities. These include: briefings on the WSS, HAR, and ABCD; and a process demonstration in the production or training facilities. The NESS report will establish a current assessment of the adequacy of controls of the W88 operation to meet the Nuclear Explosive Safety standards.

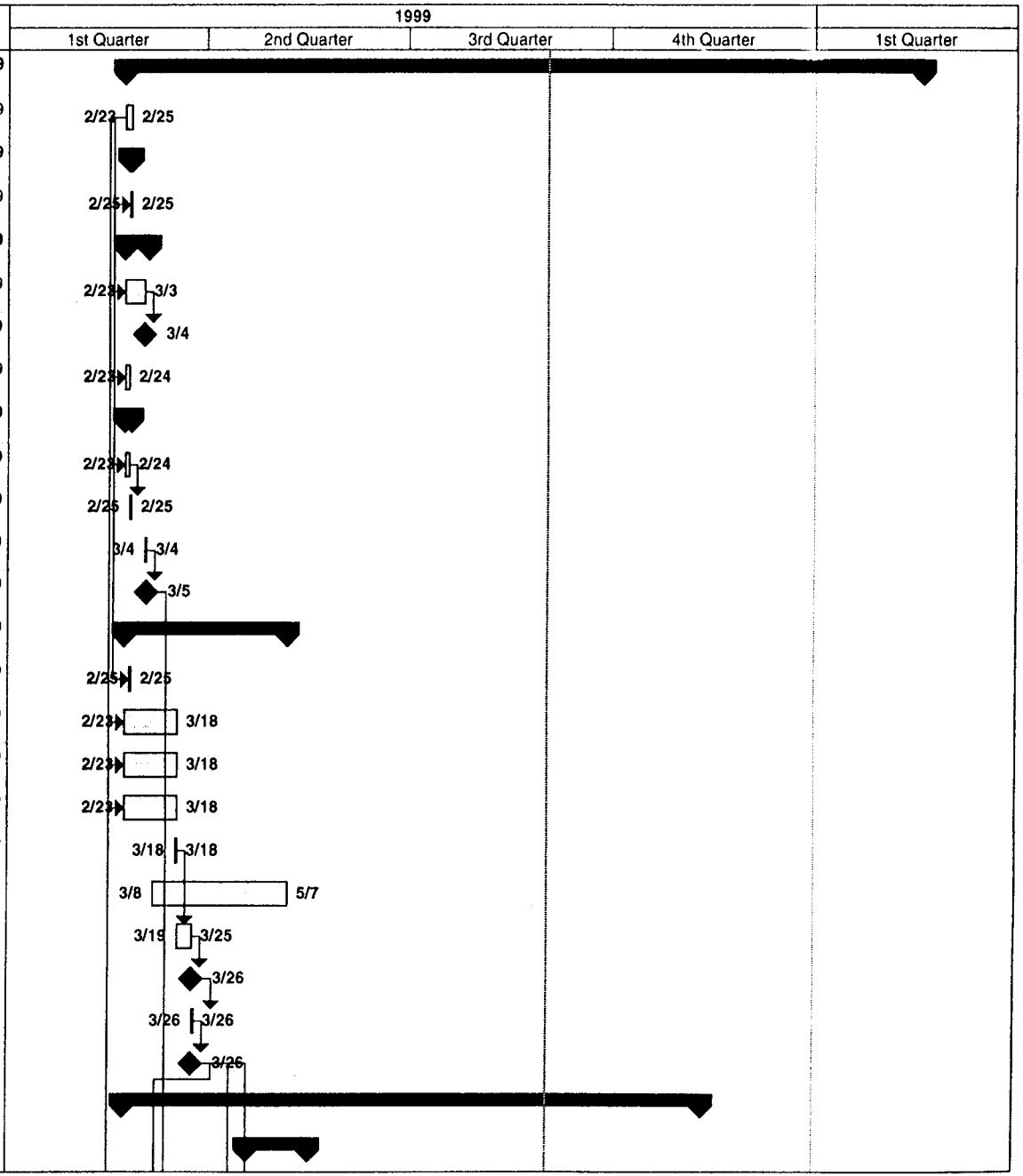
The scope of the DOE Readiness Review will consist of a review of the W88 operations and facilities to determine that all authorization basis document requirements have been implemented.

11 Reauthorization

Once the Integrated Review is completed, the final approval activities listed in the Gantt Chart will be completed, leading to reauthorization of W88 nuclear explosive operations.

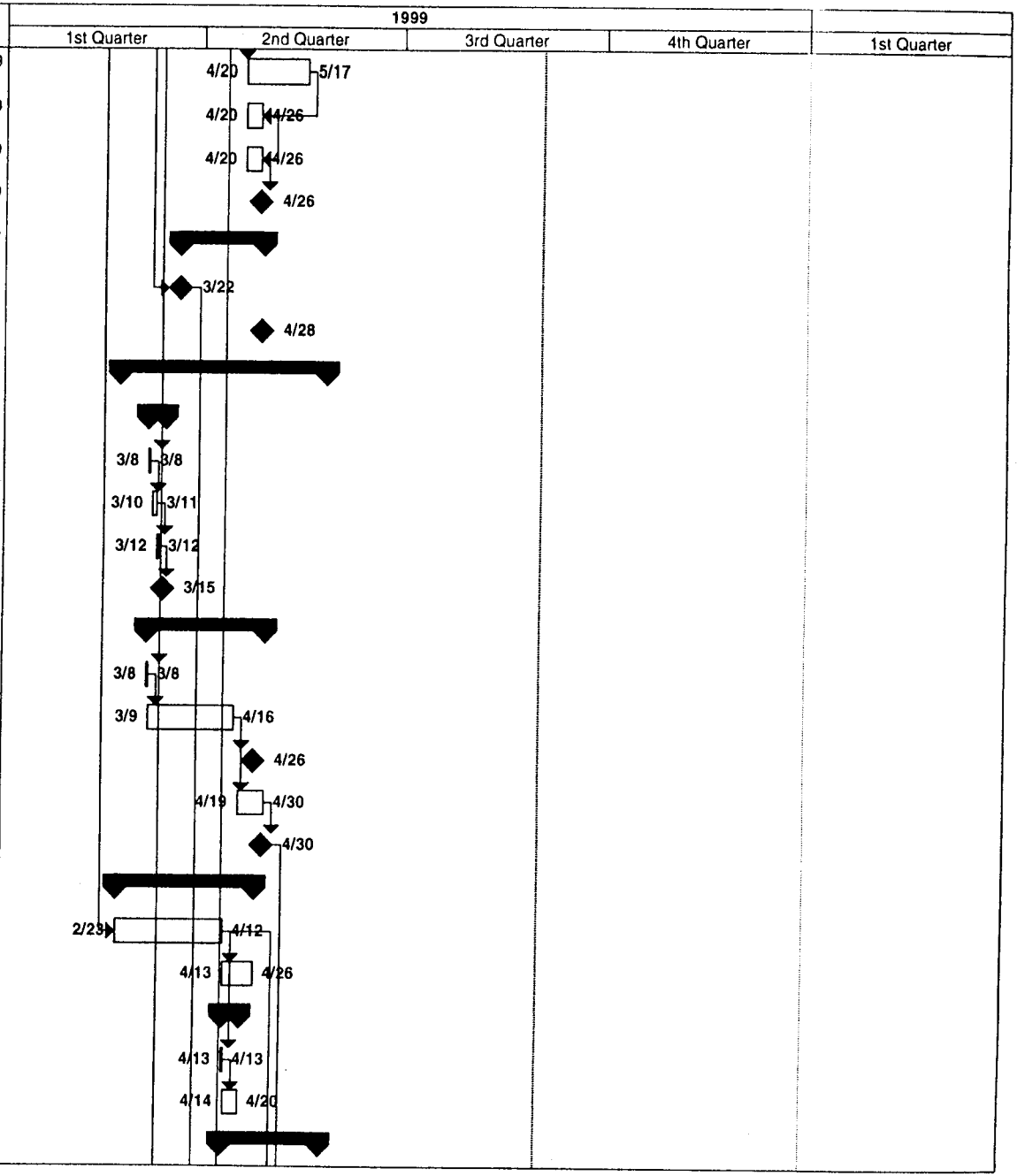
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
1	**W88 EORPP**	**252 days**	**Tue 2/23/99**
2	Planning Meeting	3 days	Tue 2/23/99
3	**Develop W88 EORPP Plan (Includes HA and ABCD methodology)**	**1 day**	**Thu 2/25/99**
4	List of Assumptions	1 day	Thu 2/25/99
5	**Milestone 0 Preparations**	**9 days**	**Tue 2/23/99**
6	Draft DOE/AL Tasking Letter for Project Team	7 days	Tue 2/23/99
7	DOE Tasking Letter - signed	1 day	Thu 3/4/99
8	Establish PT	2 days	Tue 2/23/99
9	**Facilities Review**	**3 days**	**Tue 2/23/99**
10	Facilities Identified	2 days	Tue 2/23/99
11	Freeze Facility upgrades as required	1 day	Thu 2/25/99
12	Coordinate W88 EORPP plan w/ Org team members & their Mgmt	1 day	Thu 3/4/99
13	Milestone 0 - SMT Approve Conceptual Plan	1 day	Fri 3/5/99
14	**Milestone 1 preparations**	**54 days**	**Tue 2/23/99**
15	Organization Responsibility Matrix	1 day	Thu 2/25/99
16	Define Basic Project Scope, Schedule & Org Assig	18 days	Tue 2/23/99
17	Rough estimate of resource requirements & impacts	18 days	Tue 2/23/99
18	Conceptual HA Plan	18 days	Tue 2/23/99
19	Provide Programmatic Risk & Potential Obstacles of EORPP Planning	1 day	Thu 3/18/99
20	SS21 Attributes Review	45 days	Mon 3/8/99
21	Coordinate W88 EORPP plan w/ Org team members & their Mgmt	5 days	Fri 3/19/99
22	Provide W88 EORPP to SMT	1 day	Fri 3/26/99
23	Changes in Scope and Requirements	1 day	Fri 3/26/99
24	Milestone 1 - SMT Approves Project Plan	1 day	Fri 3/26/99
25	**Milestone 2 Preparations**	**188 days**	**Tue 2/23/99**
26	**Resource Requirements**	**20 days**	**Tue 4/20/99**



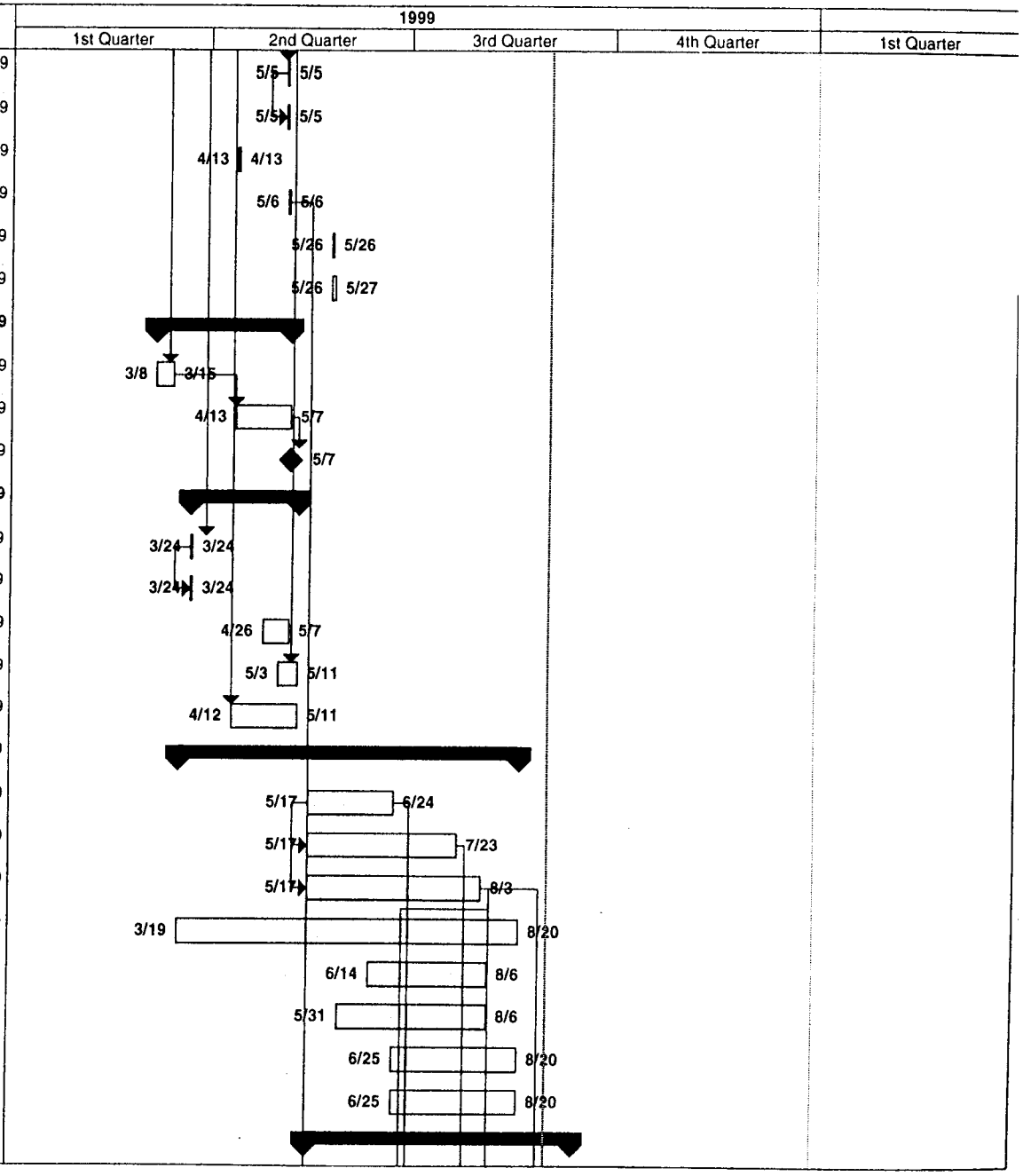
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
27	Assignments/resources	20 days	Tue 4/20/99
28	Cost estimates	5 days	Tue 4/20/99
29	Resource & Schedule Impacts	5 days	Tue 4/20/99
30	Schedule is resource loaded	0 days	Mon 4/26/99
31	**WSS**	**28 days**	**Mon 3/22/99**
32	Final Draft of WSS to all Project Team Members	1 day	Mon 3/22/99
33	Issue WSS	1 day	Wed 4/28/99
34	**HA Preparations**	**68 days**	**Tue 2/23/99**
35	**Tooling**	**6 days**	**Mon 3/8/99**
36	Identify W88 Special Tooling list	1 day	Mon 3/8/99
37	Identify schedule impacts of special tooling enhancements	2 days	Wed 3/10/99
38	Special Tooling review to PT	1 day	Fri 3/12/99
39	Freeze implementation of special tooling upgrades as	1 day	Mon 3/15/99
40	**Procedures**	**40 days**	**Mon 3/8/99**
41	Identify all W88 NEOPs & procedures	1 day	Mon 3/8/99
42	Identify & update NEOP EORPP enhancements	29 days	Tue 3/9/99
43	Procedure Review to PT	1 day	Mon 4/26/99
44	Freeze & Publish Procedures	2 wks	Mon 4/19/99
45	Finalize Procedures	1 day	Fri 4/30/99
46	**Video**	**45 days**	**Tue 2/23/99**
47	Film Video	35 days	Tue 2/23/99
48	Make copies of video	2 wks	Tue 4/13/99
49	**Trainer Implementations**	**6 days**	**Tue 4/13/99**
50	Proposed Trainer requirements / enhancements	1 day	Tue 4/13/99
51	Replace/Repair W88 Trainer parts	5 days	Wed 4/14/99
52	**Training of Project Team, SBRT, HATT**	**33 days**	**Tue 4/13/99**



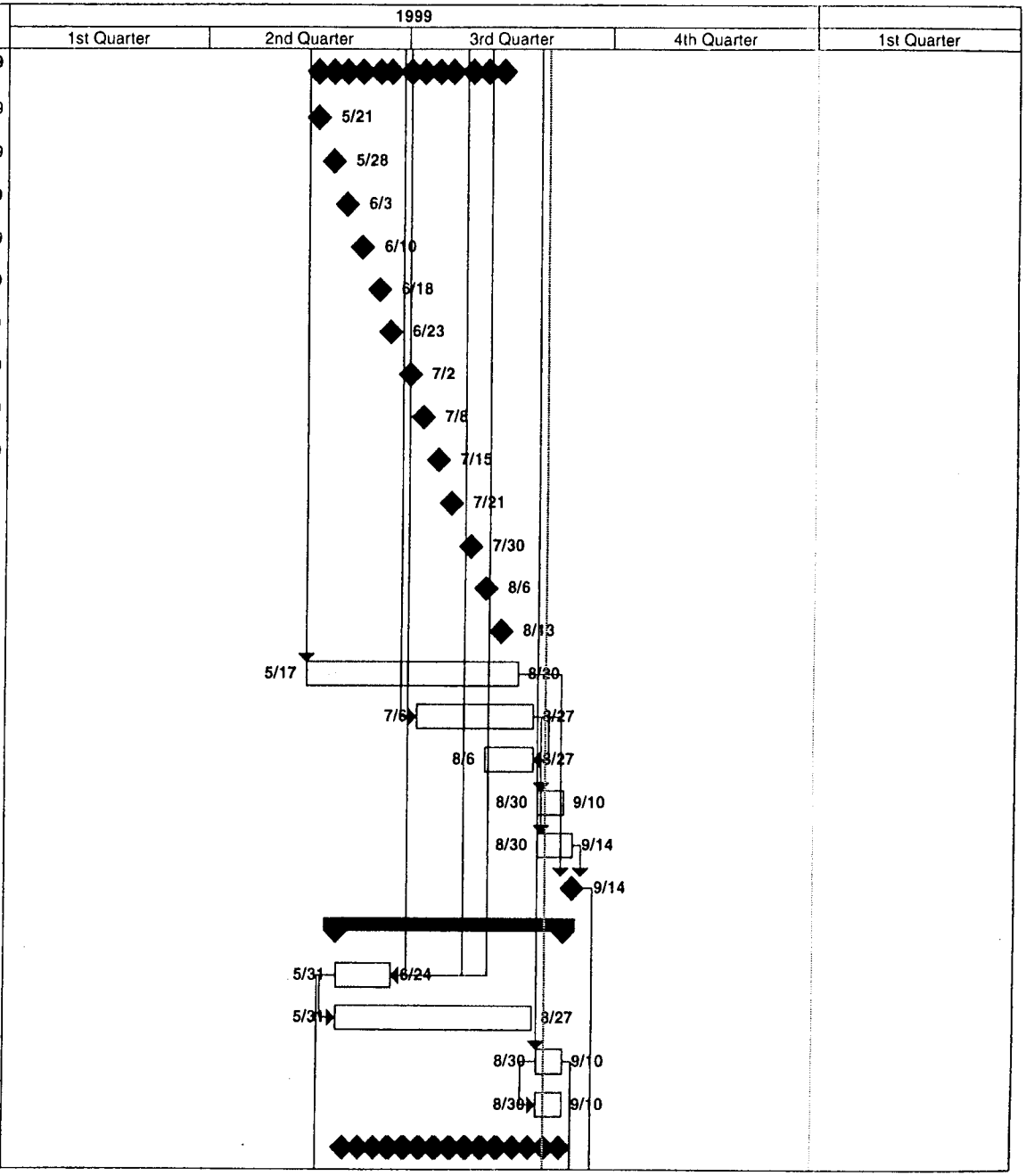
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
53	Basic Hazard Eval Techniques & approaches	1 day	Wed 5/5/99
54	TSR/ABCD Training	1 day	Wed 5/5/99
55	Lessons Learned (W56, W87, W76, W62, W69, W79)	1 day	Tue 4/13/99
56	W88 Nuclear Weapon Design overview	1 day	Thu 5/6/99
57	Facilities Orientation for HATT& PT	1 day	Wed 5/26/99
58	W88 Process Overview (includes viewing of video)	2 days	Wed 5/26/99
59	**Testers**	**45 days**	**Mon 3/8/99**
60	Identify W88 Testers	6 days	Mon 3/8/99
61	PT review tester upgrades	19 days	Tue 4/13/99
62	Document tester review rationale	0 days	Fri 5/7/99
63	**HA Pre-cursors**	**35 days**	**Wed 3/24/99**
64	Process Flow Diagram/Description	1 day	Wed 3/24/99
65	Scope/Depth Chart Design	1 day	Wed 3/24/99
66	Develop Weapon Response Screens	10 days	Mon 4/26/99
67	Prescreen Procedures	7 days	Mon 5/3/99
68	Identify & document which W88 Ops covered by	22 days	Mon 4/12/99
69	**Hazards Analysis**	**111 days**	**Fri 3/19/99**
70	Previous Comparison Analysis	5.8 wks	Mon 5/17/99
71	Bay Analysis	10 wks	Mon 5/17/99
72	Cell Analysis	57 days	Mon 5/17/99
73	Fire Hazards Analysis	111 days	Fri 3/19/99
74	Tooling Seismic Analysis	39 days	Mon 6/14/99
75	Facility Seismic Analysis	10 wks	Mon 5/31/99
76	SNL ESD Analysis	8.2 wks	Fri 6/25/99
77	SNL Tester Analysis	8.2 wks	Fri 6/25/99
78	**HAR Development**	**87 days**	**Mon 5/17/99**



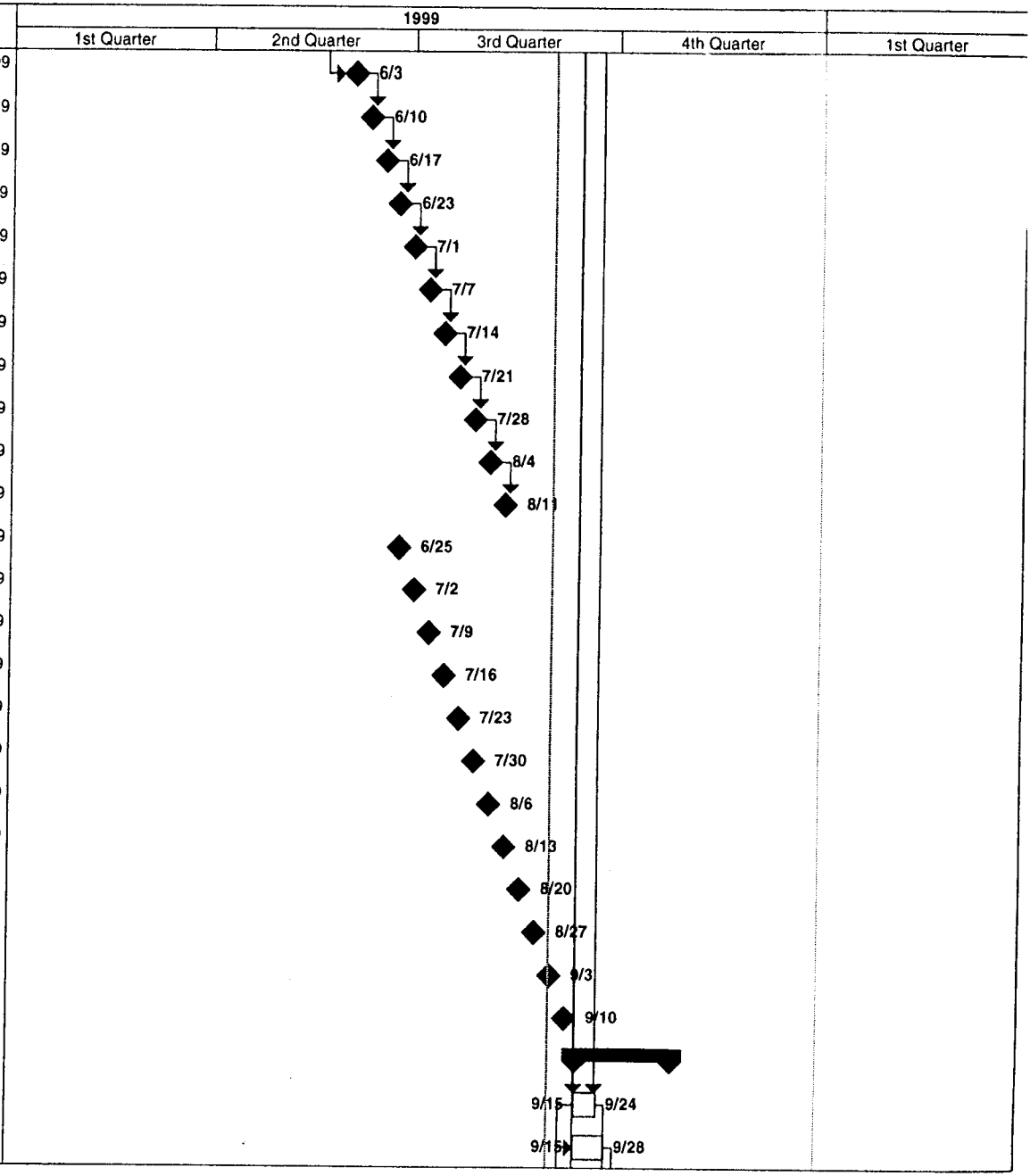
Appendix A to W88 Existing Operations Reauthorization
Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
79	**PT Evaluation of HA progress**	**60 days**	**Fri 5/21/99**
80	PT Evaluation of HA progress 1	0 days	Fri 5/21/99
81	PT Evaluation of HA progress 2	0 days	Fri 5/28/99
82	PT Evaluation of HA progress 3	0 days	Thu 6/3/99
83	PT Evaluation of HA progress 4	0 days	Thu 6/10/99
84	PT Evaluation of HA progress 5	0 days	Fri 6/18/99
85	PT Evaluation of HA progress 6	0 days	Wed 6/23/99
86	PT Evaluation of HA progress 7	0 days	Fri 7/2/99
87	PT Evaluation of HA progress 8	0 days	Thu 7/8/99
88	PT Evaluation of HA progress 9	0 days	Thu 7/15/99
89	PT Evaluation of HA progress 10	0 days	Wed 7/21/99
90	PT Evaluation of HA progress 11	0 days	Fri 7/30/99
91	PT Evaluation of HA progress 12	0 days	Fri 8/6/99
92	PT Evaluation of HA progress 13	0 days	Fri 8/13/99
93	Develop Chapters 1-3	70 days	Mon 5/17/99
94	Develop Chapter 4 (Characterizations)	39 days	Tue 7/6/99
95	Verify Process Flow & Oper Proc adequacy for final HAR	16 days	Fri 8/6/99
96	HATT final walkthru using trainer	10 days	Mon 8/30/99
97	Develop Executive Summary	12 days	Mon 8/30/99
98	Draft HAR issued	0 days	Tue 9/14/99
99	**ABCD Process**	**75 days**	**Mon 5/31/99**
100	Propose initial set of controls for ABCD	19 days	Mon 5/31/99
101	Verify initial ABCD controls are adequate (PT review of	65 days	Mon 5/31/99
102	Write Draft ABCD	10 days	Mon 8/30/99
103	Write Draft PACMAN	10 days	Mon 8/30/99
104	**PT Evaluation of ABCD progress**	**70 days**	**Thu 6/3/99**



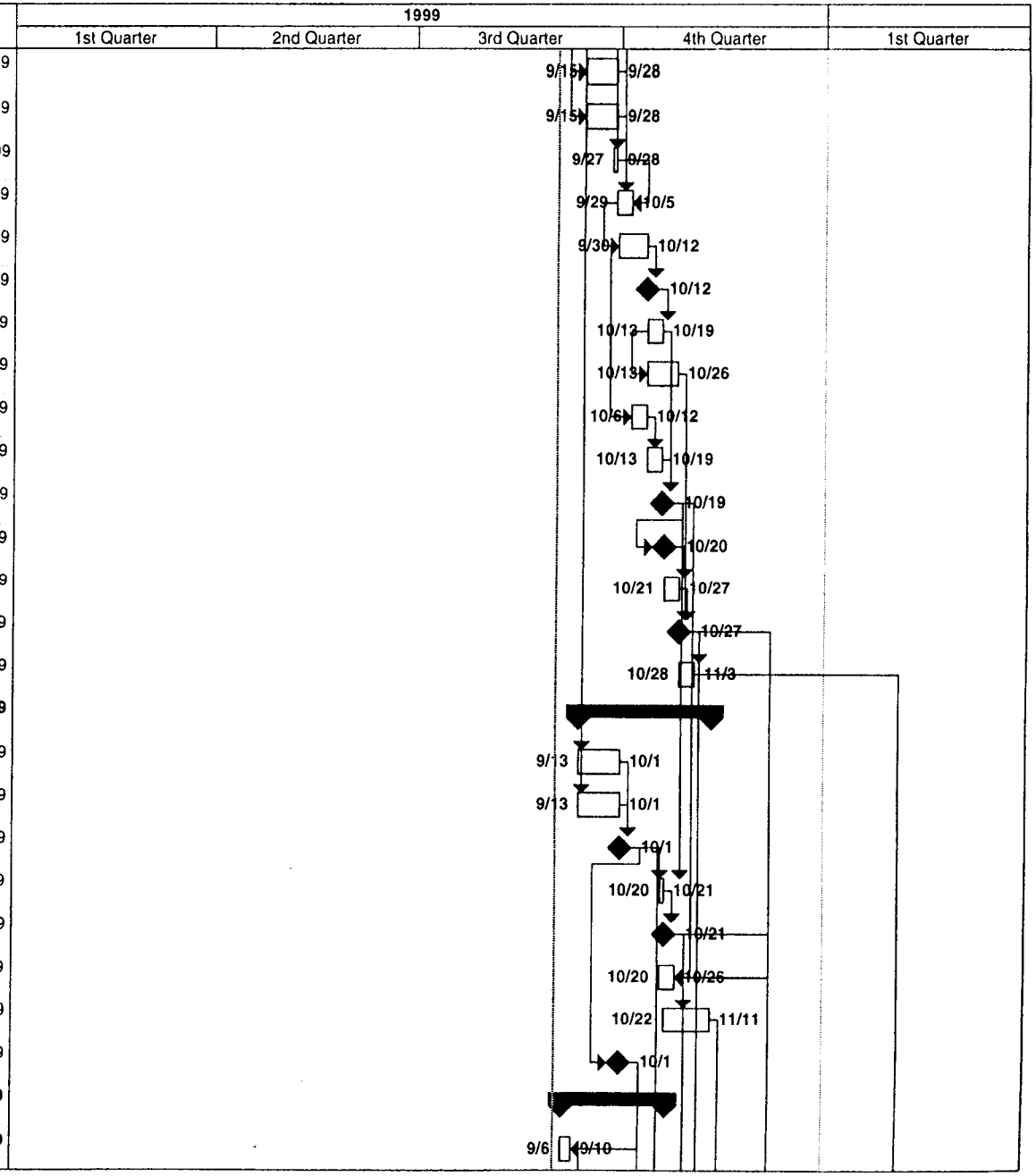
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
105	PT Evaluation of ABCD progress 1	0 days	Thu 6/3/99
106	PT Evaluation of ABCD progress 2	0 days	Thu 6/10/99
107	PT Evaluation of ABCD progress 3	0 days	Thu 6/17/99
108	PT Evaluation of ABCD progress 4	0 days	Wed 6/23/99
109	PT Evaluation of ABCD progress 5	0 days	Thu 7/1/99
110	PT Evaluation of ABCD progress 6	0 days	Wed 7/7/99
111	PT Evaluation of ABCD progress 7	0 days	Wed 7/14/99
112	PT Evaluation of ABCD progress 8	0 days	Wed 7/21/99
113	PT Evaluation of ABCD progress 1	0 days	Wed 7/28/99
114	PT Evaluation of ABCD progress 2	0 days	Wed 8/4/99
115	PT Evaluation of ABCD progress 3	0 days	Wed 8/11/99
116	PT Evaluation of ABCD progress 4	0 days	Fri 6/25/99
117	PT Evaluation of ABCD progress 5	0 days	Fri 7/2/99
118	PT Evaluation of ABCD progress 6	0 days	Fri 7/9/99
119	PT Evaluation of ABCD progress 7	0 days	Fri 7/16/99
120	PT Evaluation of ABCD progress 8	0 days	Fri 7/23/99
121	PT Evaluation of ABCD progress 9	0 days	Fri 7/30/99
122	PT Evaluation of ABCD progress 10	0 days	Fri 8/6/99
123	PT Evaluation of ABCD progress 11	0 days	Fri 8/13/99
124	PT Evaluation of ABCD progress 12	0 days	Fri 8/20/99
125	PT Evaluation of ABCD progress 13	0 days	Fri 8/27/99
126	PT Evaluation of ABCD progress 14	0 days	Fri 9/3/99
127	PT Evaluation of ABCD progress 15	0 days	Fri 9/10/99
128	**HAR/ABCD Reviews**	**31 days**	**Wed 9/15/99**
129	Project Team & MHC Risk Mgmt Review	8 days	Wed 9/15/99
130	SBRT review Draft HAR/ABCD response	10 days	Wed 9/15/99



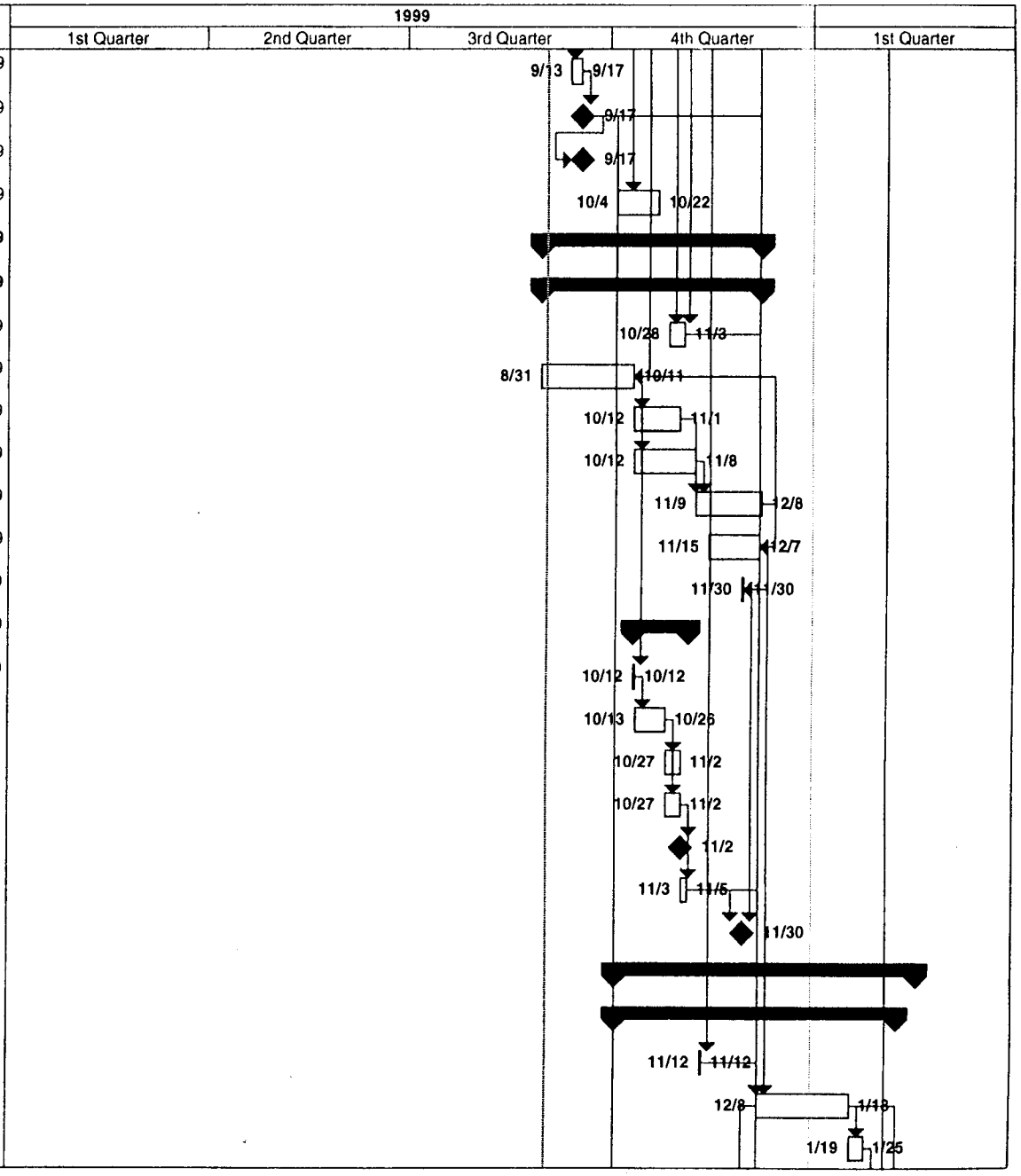
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
131	Lab Review	10 days	Wed 9/15/99
132	Centralized Review System (CRS)	10 days	Wed 9/15/99
133	MHC MRDR Board	2 days	Mon 9/27/99
134	PT resolution of comments	5 days	Wed 9/29/99
135	HAR/ABCD Revision	9 days	Thu 9/30/99
136	MHC Release HAR/ABCD to PT	0 days	Tue 10/12/99
137	PT review final revision	5 days	Wed 10/13/99
138	SBRT review	10 days	Wed 10/13/99
139	Develop AB Implementation Plan	5 days	Wed 10/6/99
140	Auth Basis Change Control Committee (ABCCC) Review	5 days	Wed 10/13/99
141	Release Final issue of HAR/ABCD	0 days	Tue 10/19/99
142	PT recommends HAR/ABCD approval	0 days	Wed 10/20/99
143	SMT Review period	5 days	Thu 10/21/99
144	WPD Director HAR/ABCD Approval	0 days	Wed 10/27/99
145	Draft Authorization Agreement (AA)	5 days	Thu 10/28/99
146	**Implement HAR/ABCD review comments/ procedural changes**	**44 days**	**Mon 9/13/99**
147	Finalize changes to Prod procedures	15 days	Mon 9/13/99
148	Finalize changes to Facility procedures	15 days	Mon 9/13/99
149	Freeze Procedures	0 days	Fri 10/1/99
150	Revise Draft PACMAN	2 days	Wed 10/20/99
151	Release Final Issue of PACMAN	0 days	Thu 10/21/99
152	IRR input document for NESS	5 days	Wed 10/20/99
153	Prepare Prod Techs for NESS based on HAR/ABCD	15 days	Fri 10/22/99
154	Milestone 2 - Acceptance of Process Flow	0 days	Fri 10/1/99
155	**Post Milestone 2 work**	**35 days**	**Mon 9/6/99**
156	Write Plan of Action (PoA)	5 days	Mon 9/6/99



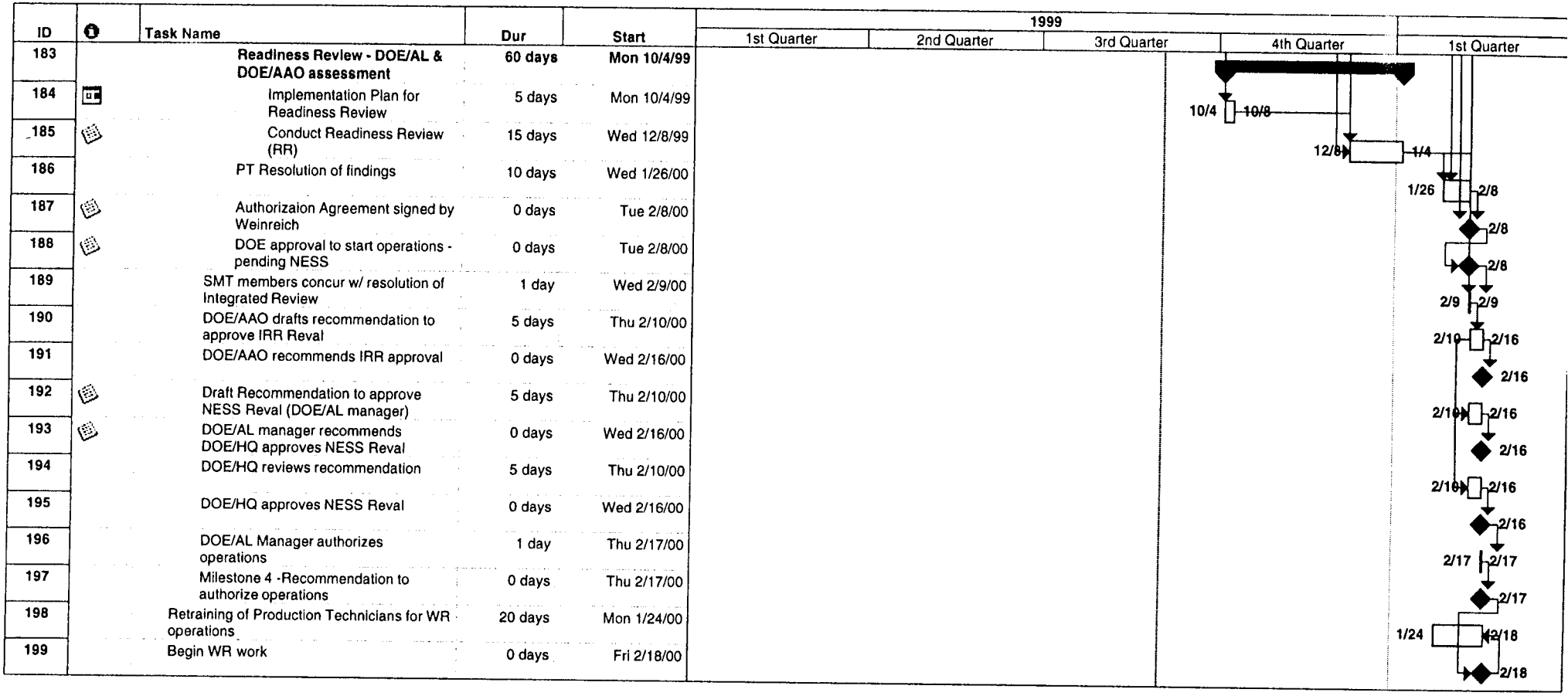
Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
157	DOE approves PoA	5 days	Mon 9/13/99
158	Issue PoA	0 days	Fri 9/17/99
159	Memo from WPD regarding Concurrence to proceed to	0 days	Fri 9/17/99
160	Review EORPP for changes in Scope and Requirements	15 days	Mon 10/4/99
161	**Milestone 3 Preparations**	**70 days**	**Tue 8/31/99**
162	**NESS Preparations**	**70 days**	**Tue 8/31/99**
163	Safety Evaluation of Procedure Changes	5 days	Thu 10/28/99
164	Prep for Reval (Review Process Change Comparisons)	30 days	Tue 8/31/99
165	Validate Oper Proc w/ Positive Verificalton Tryout using trainers	15 days	Tue 10/12/99
166	Prod Techs refresher training	20 days	Tue 10/12/99
167	Filming of Video for NESS	4 wks	Tue 11/9/99
168	Prepare/Coordinate Presentation	15 days	Mon 11/15/99
169	Dry Run of Reval presentation	1 day	Tue 11/30/99
170	**MHC Readiness Reviews**	**19 days**	**Tue 10/12/99**
171	Readiness to Proceed memo	1 day	Tue 10/12/99
172	Contractor Readiness Assessment	10 days	Wed 10/13/99
173	Contractor final report	5 days	Wed 10/27/99
174	Corrective Actions	5 days	Wed 10/27/99
175	Readiness to Proceed Memo	0 days	Tue 11/2/99
176	DOE review of contractor paperwork	3 days	Wed 11/3/99
177	Milestone 3 complete	0 days	Tue 11/30/99
178	**Milestone 4 Preparations**	**92 days**	**Mon 10/4/99**
179	**Integrated Review Process**	**85 days**	**Mon 10/4/99**
180	Ensure that Ops Personnel are trained and documentation is in	1 day	Fri 11/12/99
181	NESS Reval	25 days	Wed 12/8/99
182	NESS report to DOE/AL manager	5 days	Wed 1/19/00



Appendix A to W88 Existing Operations Reauthorization Project Plan (EORPP) Rev 1A, August 13, 1999

ID	Task Name	Dur	Start
183	**Readiness Review - DOE/AL & DOE/AAO assessment**	**60 days**	**Mon 10/4/99**
184	Implementation Plan for Readiness Review	5 days	Mon 10/4/99
185	Conduct Readiness Review (RR)	15 days	Wed 12/8/99
186	PT Resolution of findings	10 days	Wed 1/26/00
187	Authorizaion Agreement signed by Weinreich	0 days	Tue 2/8/00
188	DOE approval to start operations - pending NESS	0 days	Tue 2/8/00
189	SMT members concur w/ resolution of Integrated Review	1 day	Wed 2/9/00
190	DOE/AAO drafts recommendation to approve IRR Reval	5 days	Thu 2/10/00
191	DOE/AAO recommends IRR approval	0 days	Wed 2/16/00
192	Draft Recommendation to approve NESS Reval (DOE/AL manager)	5 days	Thu 2/10/00
193	DOE/AL manager recommends DOE/HQ approves NESS Reval	0 days	Wed 2/16/00
194	DOE/HQ reviews recommendation	5 days	Thu 2/10/00
195	DOE/HQ approves NESS Reval	0 days	Wed 2/16/00
196	DOE/AL Manager authorizes operations	1 day	Thu 2/17/00
197	Milestone 4 -Recommendation to authorize operations	0 days	Thu 2/17/00
198	Retraining of Production Technicians for WR operations	20 days	Mon 1/24/00
199	Begin WR work	0 days	Fri 2/18/00



since 1827
MASON & HANGER CORPORATION

AUG 27 1999

Mr. D. D. Schmidt
Assistant Area Manager
for Weapon Operations
Amarillo Area Office
USDOE
Amarillo, Texas

Re: DNFSB Recommendation 98-2 Implementation Plan Task 5.8.1.c; Report of Completion

Dear Mr. Schmidt:

The subject task required that a long-term project management personnel plan based on the SWOT analysis be prepared. The required plan is attached for your information. Therefore, 98-2 Implementation Task 5.8.1.c is reported complete.

Very truly yours,

J. W. Angelo, Division Manager
Mission Programs

ps

Attachment: As Stated

cc: W. A. Weinreich, Gen. Mgr., 12-69
J. M. Bernier, DOE/AAO, 12-36
H. S. Berman, Deputy Gen. Mgr., 12-69
K. M. Herring, MPD, 12-69
A. J. Dionizio, MPD, 12-69
L. L. Mayes, MPO, 12-69
G. E. Pool, MPO, 12-69
J. C. Drummond, IAA&Q, 12-6

REFERENCE DOCUMENTS:

DNFSB 98-2 Recommendations
DOE Implementation Plan for 98-2

APPROVALS:

Responsible Manager: L. L. Mayes — Date: 8/26/99

Responsible Division Manager: J. W. Angelo — Date: 8/26/99

DOE/AAO: J. Bernier — Date

DNFSB 98-2 Recommendation

DOE Implementation Task 5.8.1.c

Long-Term Program Management Personnel Plan

STATEMENT OF CONCERN:

The Strength, Weakness, Opportunity, and Threat (SWOT) analysis for Weapons Program Managers indicated a need to a long-term program management personnel plan.

STATEMENT OF ACCEPTANCE:

MHC agrees that a long-term program management personnel plan should be provided based on the SWOT analysis for Weapons Program Managers.

CAUSE ANALYSIS

A SWOT analysis for the Weapons Program Managers had not been completed. A clear definition of the required skills needed to effectively and efficiently lead projects was not well defined in the training, qualification, and employment documentation. The flow down of the required skills outlined in the Technical Qualification Standard (TQS) were not sufficiently linked to employment documentation as the Program Management Department was formed. A Position Information Questionnaire (PIQ) needed to be completed for the Weapons Program Manager position.

GENERIC IMPLICATIONS:

This deficiency is inclusive of all weapon project/program managers in the Mission Programs Office. For the purpose of this action plan, the terms Program Manager, Weapons Project Manager and Weapons Project Team Leader are all equivalent.

TECHNICAL RATIONALE FOR CORRECTIVE ACTION:

The Mission Program Office is developing a new Technical Qualification Standard (TQS) that will clearly define the required skill set for the Weapon Programs Director and all Program Managers. This skill set will include general management skills and project management skills. The requirements defined in the TQS will flow down to a PIQ for Weapon Program Managers.

CORRECTIVE ACTIONS:

ID	TASK	DATE	RESPONSIBLE INDIVIDUAL
1	Complete PIQ for Weapons Program Manager I, II, and III	Complete	Mayes / Angelo
2	Obtain funding for PMI certification for all Program Managers	Complete	Mayes
3	Assign a Readiness Assistant to Weapon Program Director	Complete	Angelo
4	hire new Program Manager with significant experience to serve as a mentor to the Program Managers	Complete	Angelo
5	Hire two temporary Program Managers from other DOE sites to augment Weapons Program Management	11/1/99	Mayes
6	Hire a Cost Account Manager	11/1/99	Mayes
7	Change performance evaluation policy for Key Project Team Members to include input from Program Managers as well as Functional Manager	10/1/99	Angelo / Rowe
8	Institutionalize an annual review of Program Management organization by Program Director	11/1/99	Mayes

COMPLETION CRITERIA:

1. PIQ's approved and in place in Employment Department.
2. Funding identified for training for Program Managers to obtain/maintain PMI certification.
3. Readiness Assistant transferred from Readiness organization to Weapons Program Management.
4. New Program Manager in place and serving as mentor.
5. Two Program Managers from other DOE sites hired into Weapons Program Management.
6. Cost Account Manager position defined and candidate hired.
7. Revision of Plant Standard 7401, "Weapons Program Project Team," defining Key Team Members, and Plant Standard 2537, "Performance Appraisal," defining percentage input to Key Team Members' performance reviews to be obtained from Program Management.
8. Revision of Plant Standard 7403 to include an annual review of Program Management organization.

since 1827

MASON & HANGER CORPORATION

AUG 27 1999

Mr. D. D. Schmidt
Assistant Area Manager
For Weapon Operations
Amarillo Area Office
USDOE
Amarillo, Texas

Re: DNFSB Recommendation 98-2 Implementation Plan Task 5.8.2.b; Report of Completion

Dear Mr. Schmidt:

The subject task required that actions necessary to strengthen the experience level of Pantex Team Leads be complete. The following actions have been completed (or status is otherwise shown):

1. Several Program Managers have been reassigned and replaced with Program Managers who have demonstrated success as a Project Leader.

2. A Pantex-specific Project/Risk Management Course of Instruction has been developed and distributed.

3. Qualification due dates have been formally established.

4. Formal Qualification Boards have been established for final Program Manager qualification.

5. Ten performance metrics have been established to monitor project performance across all programs.

6. Two Program Manager candidates will be selected from two other DOE sites by September 15, 1999 to augment the existing cadre of Program Managers.

7. Several Standards have been developed to formalize project management as follows:

   a. D&P 11.3, Seamless Safety Process (SS-21)

   b. Plant STD-7401, Weapons Program Project Team

   c. MPO IOP-707, Achieving Readiness for Weapon Programs

8. A qualification program has been developed with enhanced technical requirements which include authorization basis and technical weapon training.

9. Certification in PMI is now a funded requirement.

10. Monthly Program Management Training seminars are now conducted.

11. Weekly Program Reviews are conducted.

12. Weekly reports and a statement of the next four weeks of objectives are sent to the General Manager and support staff.

13. All Program Managers have been combined under a single Director.

14. A Plant-Manager-served-Weapons Program Manager was hired to serve as a Program Manager and as a mentor to Program Managers.

15. Key Project Team members will have 40% of their performance evaluation determined by Program Managers beginning in FY2000.

16. We have begun training support staff in Prima Vera operations to improve planning tools.

Based on the above actions, 98-2 IP Task 5.8.2.b is reported as complete.

Very truly yours,

J. W. Angelo, Division Manager
Mission Programs

ps

99-0165 JWA