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Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

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DNF SAFETY BOARD

OCT 3 1 2000

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 (IP) for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 98-2 as revised, the following provides information regarding the five (5) deliverables due October 2000.

- Commitment 4.2.1, "D&P Manual Chapter 11.8"—This is a new commitment as a result of the revision to 98-2. The Department acknowledged that one area where a high quality analysis could be achieved was through providing a consistent method for the labs to provide weapon response information and supporting documentation to Pantex. As a result, the Department tasked the design laboratories and the Pantex Operating Contractor to jointly develop a consistent approach to evaluating weapon response information and providing supporting documentation. The product is the enclosed D&P Manual Chapter 11.8, "Integration of Weapon Response into Authorization Bases at the Pantex Plant". Publication of the chapter represents completion of this commitment.

- Commitment 4.2.5, "Revision #2 to the Integrated Safety Management Authorization Manual"--This commitment is a follow-on from the original approved implementation plan actions associated with commitments 5.3.1 and 5.8.1. The result was the original publication of the referenced manual. The Department acknowledged that the original manual was adequate for initial application. However, there were areas that needed improvement such as integration of fire hazard analyses and tooling failure analyses with the overall safety analyses for nuclear explosive operations. The Pantex Operating Contractor prepared a draft Revision #2, but has not completed their internal review and comment incorporation. To allow time appropriate review, resolution of comments, and submission to AAO for approval, this deliverable is delayed by 60 days.

- Commitment 4.3.1, "DOE-approved BIO Module on Fire Protection and associated TSR and Develop a resource-loaded schedule for implementation of improved TSR controls for fire protection"—This is a new commitment as a result of the revision to 98-2. As a result of the efforts to implement ultraviolet (UV) detector activated deluge fire suppression, the Fire BIO is not ready for submission at this time. Technical issues remain with the sensitivity and zone coverage of the UV detectors that must be resolved prior to approval of the BIO. The Fire BIO, TSR revision, and implementation plan will be submitted within 30 days.

- Commitment 4.3.6, "Flammable Solvent and Combustible Material Reduction Plan"—This is a new commitment as a result of the revision to 98-2. Based upon the analytical work performed through several CHE weapon program HARs, the Department identified the need to place increased emphasis and priority to eliminate, minimize, or identify and implement suitable substitutes through a risk-cost benefit assessment for flammable solvents and combustible materials currently used in proximity to and in nuclear explosive operations. Enclosed is the memo from the AL Manager that communicates this priority and tasks the laboratories and the Pantex Plant operating contractor to continue pursuit of the Department's plan. Release of the plan represents completion of this commitment.

- Commitment 4.3.7, "Plan for Transportation Carts"—This is a new commitment as a result of the revision to 98-2. The Department is in process of developing a plan for the design, fabrication, and use of carts for partially assembled nuclear weapons affording protection against the range of potential hazards envisioned during transport at the Pantex Plant. Enclosed is the memo from the AAO Manager approving the project plan as a partial submittal. The complexity of the project and evolutionary nature of the design process dictates completion of the design which includes substantial national laboratory analysis prior to finalization of the implementation plan. As stated in the enclosed document, the final plan will be ready for submission by January 2001.

The Department proposes closure of those commitments indicated as complete. If you have any questions, please contact me at 505-845-6050, or have your staff contact Dan Glenn at 806-477-3182

R E Glass

R. E. Glass
Manager

Enclosure (3)

cc: See Page 3

cc w/enclosures:
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, DC 20004
Attn: J. McConnell, DNFSB Staff
Ann: W. Andrews, DNFSB Staff
M. Whitaker, S-3.1, HQ
D. Beck, DP-20, HQ

1.0 PURPOSE

The purpose of this chapter is to define the methodology for developing and applying weapon response information to the process of identifying and classifying controls for nuclear explosive operations (NEO) at the Pantex Plant. This chapter applies to the development of hazard analyses and control documentation at Pantex related to work on nuclear weapons or nuclear weapon components.

2.0 POLICY

It is U.S. Department of Energy (Department) policy that the risk of NEOs should be sufficiently defined in the authorization basis documentation and that an effective control set be established to prevent or mitigate hazards resulting in a residual risk that is deemed acceptable by the approval authority.

3.0 DEFINITIONS

See Section 11, Chapter 11.0

3.1 Control Classification Evaluation Guidelines:

Consequence and frequency values that the hazard analyst evaluates against to determine the adequacy of the selected controls. The guidelines are not indications of acceptable risk, but are used as a benchmark for comparison. *Note: The frequencies below are all based on a conservative assumption of 1000 operations per system occurring per year.* The guidelines are as follows:

- IND: Inadvertent Nuclear Detonation shall be controlled to a frequency less than 1×10^{-8}/year without respect to radioactive material dispersal consequences.
- HED/D or HEVR: High Explosive Violent Reaction or high explosive deflagration/detonation (see note in HED/D definition) shall be controlled to a frequency less than 1×10^{-7}/year without respect to radioactive material consequences.
- Radiological Release: Hazardous events with offsite exposure greater than 25 rem CEDE shall be controlled to a frequency less than 1×10^{-6} /year. Hazardous events with onsite exposure greater than 100 rem CEDE shall be controlled to a frequency less than 1×10^{-6}/year.
- Worker Safety: Hazardous events, other than standard industrial hazards, that result in a worker fatality or serious injury (permanent disability, loss of limb, etc.) shall be controlled to a frequency less than 1×10^{-6}/year

Note: When the above have been met, the hazard analyst shall determine if there are any other controls that should be selected based on their significant contribution to defense-in-depth. This evaluation does not have a frequency or consequence guideline..

4.0 HAZARDOUS EVENT IDENTIFICATION, CONTROL IDENTIFICATION, WEAPON RESPONSE, AND CONTROL CLASSIFICATION

An effective and defensible control set to reduce the risk of NEOs is established through the process of hazardous event identification, control identification, weapon response determination, and control classification. Refer to Figure 11.8-1.

4.1 Hazardous Event Identification

The laboratories will identify the required parameters (for example: drop height, weight of object, heat flux, distance from heat source, etc., to the surface of the NE or NE component) for the insults that will be used in describing the hazardous events. The development of the parameters will allow the Hazard Analysis Task Team (HATT) to 'roll-up' events that have the same configuration and insult. Additionally, the parameters will ensure the HATT provides the necessary and sufficient information to the laboratories in requesting weapon responses (see section 4.4 below).

Hazardous events (weapon configuration, insult, and consequence) include those that result from the internal hazards of the weapon as identified in the Weapon Safety Specification and the hazardous events that can occur during operations on a weapon. Hazardous events are listed in a hazard table. Existing hazard tables should be referenced to support the identification of the hazardous events to support completeness and to reduce required resources.

Hazardous insult and associated configuration combinations that cannot result in a weapon response are identified in a Weapon Safety Specification (WSS) screening table included in the WSS and are not required to be listed as a hazardous event in the hazard analysis. The WSS screening table shall include the weapon configuration and the insult parameters as well as rationale (or reference to appropriate and defensible documentation) for determining no weapon response. Refer to Table 11.8-1 for an example of a WSS Screening Table.

Hazardous events that have been identified, analyzed, and controlled at the site or facility level are discussed in the Hazard Analysis Report with reference

to the applicable section of the site or facility AB document, but are not listed in the hazard analysis. Any weapon specific controls relied upon in the facility AB must be included in the HAR and ABCD for the weapon program. The information provided must include the evaluation of how the control meets the safety function derived from the analysis.

Hazardous events will include the frequency of the event and the maximum potential consequence. The frequency of the event will be based on 1000 operations per system per year unless a different rate is justified based on the actual planned operations.

4.2 Identify Reasonable Potential Controls

The identification of potential controls for hazardous events starts with the HATT/Project Team (PT) listing possible defense in depth features that could be later selected as controls. These features can be either engineered or administrative in nature.

4.3 Derive Controls

Controls are selected based on the frequency and maximum consequence of the uncontrolled hazardous event. The minimum number of controls selected should be based on the Target Level of Controls criteria identified in Chapter 11.5 or the Control Classification Evaluation Guidelines. To follow the principle of first eliminating the hazard (i.e. remove the insult from the NE), controls are derived without consideration of weapon response.

To apply the Control Classification Evaluation Guidelines, the uncontrolled event frequency and maximum consequences are used. Then as controls are selected, the effectiveness of the control is determined. This effectiveness evaluation considers the reliability and availability of the control. The effectiveness evaluation determines the conditional probability that the control will fail. The justification for the control effectiveness is documented. The conditional probability of the control failing is multiplied by the event frequency to determine the new controlled event frequency. If multiple controls are applied, the controls must be independent in order to multiply the conditional probability of failure for each control. This process continues until either the Control Classification Evaluation Guidelines are met or until no additional controls can be identified.

4.4 Weapon Response Uncontrolled Scenarios

The HATT shall evaluate hazardous events to determine which events have a weapon response that cannot be screened based on laboratory provided WSS

screening tables. The weapon configuration and insult parameter for each selected event is documented in a weapon response request. The HATT forwards the weapon response request to the Project Team for review and approval. The design agency project team members will ensure all scenarios are appropriately addressed. All the scenarios requiring a response are to be provided to both Sandia National Laboratories (SNL) and the appropriate physics laboratory.

The laboratories develop a conditional probability using empirical data, expert judgment and analyses as required, with associated documentation that forms the basis for the weapon response. For hazardous events that can result in more than one weapon response, the conditional probability for each weapon response is provided. The Pantex Plant Operating Contractor participates in the review process for the weapon response to determine if the basis for the weapon response meets their needs. The conditional probability, as a minimum, is identified as a range of: anticipated, unlikely, extremely unlikely, beyond extremely unlikely, or sufficiently unlikely .

The laboratories will identify the conservative assumptions (e.g., which inherent weapon characteristics [e.g., IHE, bomb case] were credited) used in developing the weapon response.

The HATT in consultation with the PT may conservatively assign a conditional probability of 1 if they deem a lower probability estimate is not necessary.

4.5 Weapon Response Controlled Scenarios

When the controls identified in section 4.3 are mitigators that reduce the severity of the insult (e.g., HE can rim guard mitigates the mechanical insult to the HE), a new weapon response will need to be determined. If the parameters of the insult, considering the controls, are within those identified in the WSS screening table, then a reference to the WSS screening table will be made to justify that there is no weapon response. For all other hazardous events, the new insult parameters will be provided to the laboratories for a new weapon response evaluation. The process identified in section 4.4 above is followed using the newly identified mitigated results.

4.6 Classify Controls

The controls identified in Section 4.3 above will be classified as Technical Safety Requirement (TSR) or Important to Safety. The frequency of the event for control classification will be the uncontrolled frequency from Section 4.1 times the conditional probability of the weapon response from Section 4.4. This frequency will be used to determine the required TSR controls using

either the Target Level of Control criteria or the Control Classification Evaluation Guidelines

To apply the Control Classification Evaluation Guidelines, the event frequency as identified above (i.e., considering weapon response) and maximum consequences are used. Then as controls are applied, the conditional probability of the control failing is multiplied by the event frequency to determine the new controlled event frequency. This process continues until either the Control Classification Evaluation Guidelines are met or until all controls identified in Section 4.3 have been applied.

All controls applied to meet TLC or the Control Classification Evaluation Guidelines are classified as TSRs. All controls not classified as TSR will be classified as Important to Safety. TSR controls are further developed in an ABCD/TSR document while Important to Safety Controls are not included in the ABCD/TSR. All controls are listed in the HAR/BIO and are required to be flowed-down into implementing documents.

Inherent weapon characteristics (e.g., IHE, bomb case, etc.) are not to be identified as controls in the AB documents. If a weapon design feature (e.g., strong-link) is credited in developing the weapon response can exist in both "safe" and "unsafe" states, then verification of the "safe" state is required to be a TSR control.

4.7 Residual Risk

A discussion of the residual risk is provided to demonstrate that the hazard is adequately controlled for each hazardous event. If the TLC or Control Classification Evaluation Guidelines are met, a simple statement to that effect will be provided.

If the TLC or Control Classification Evaluation Guidelines cannot be met, a more detailed discussion of the residual risk is required. The residual risk discussion may include:

- A discussion of the limitations associated with the development of the weapon response. The laboratories may be contacted to provide information related to weapon response development and how the weapon response provides a conservative value. This may include identifying a conditional probability value or smaller range instead of the probability bins identified in section 4.4. Additionally, this may include a discussion of the distribution and mean value of the weapon response.
- A discussion of the actual effectiveness of some of the selected controls may be used to compare to the assumed effectiveness of administrative

controls and engineered features as defined in D&P Chapter 11.5, TLC. Note that this discussion is only applicable to those events that used the TLC criteria for evaluation.

- A discussion of weapon safety design features and their contribution to reduction of risk. The respective laboratories will provide a discussion of the additional reduction in event frequency that **may** be provided by the weapon safety design feature. In addition, the laboratories will provide a defendable estimate with known limitations of the risk reduction provided by the weapon design feature(s). This is to ensure that the Department approval authority has the best information possible before accepting the residual risk.

5.0 RESPONSIBILITIES

5.1 Project Team

1. Approves the weapon response request.
2. Approves the classification of controls

5.2 Laboratories

1. Establish the weapon insult parameters to be used in hazard event identification.
2. Develop a WSS screening table for each weapon and include this table in the Weapon Safety Specification.
3. Develop a process for establishing and documenting the justification for weapon response that meets the needs of the Pantex Plant Operating Contractor
4. Develop and document the uncontrolled weapon response and mitigated weapon response.
5. Provide input to residual risk justification when a discussion on weapon safety features is needed (section 4.7).

5.3 Hazard Analysis Task Team

1. Identifies the hazardous events associated with the nuclear explosive operation.
2. Identifies potential controls for each hazardous event.
3. Develops the insult parameters for each hazardous event.
4. Presents the weapon response request to the Project Team for approval.
5. Derives the controls for each hazardous event.
6. Develops new insult parameters for hazardous events with control that provide a mitigative function.
7. Classifies the derived controls.

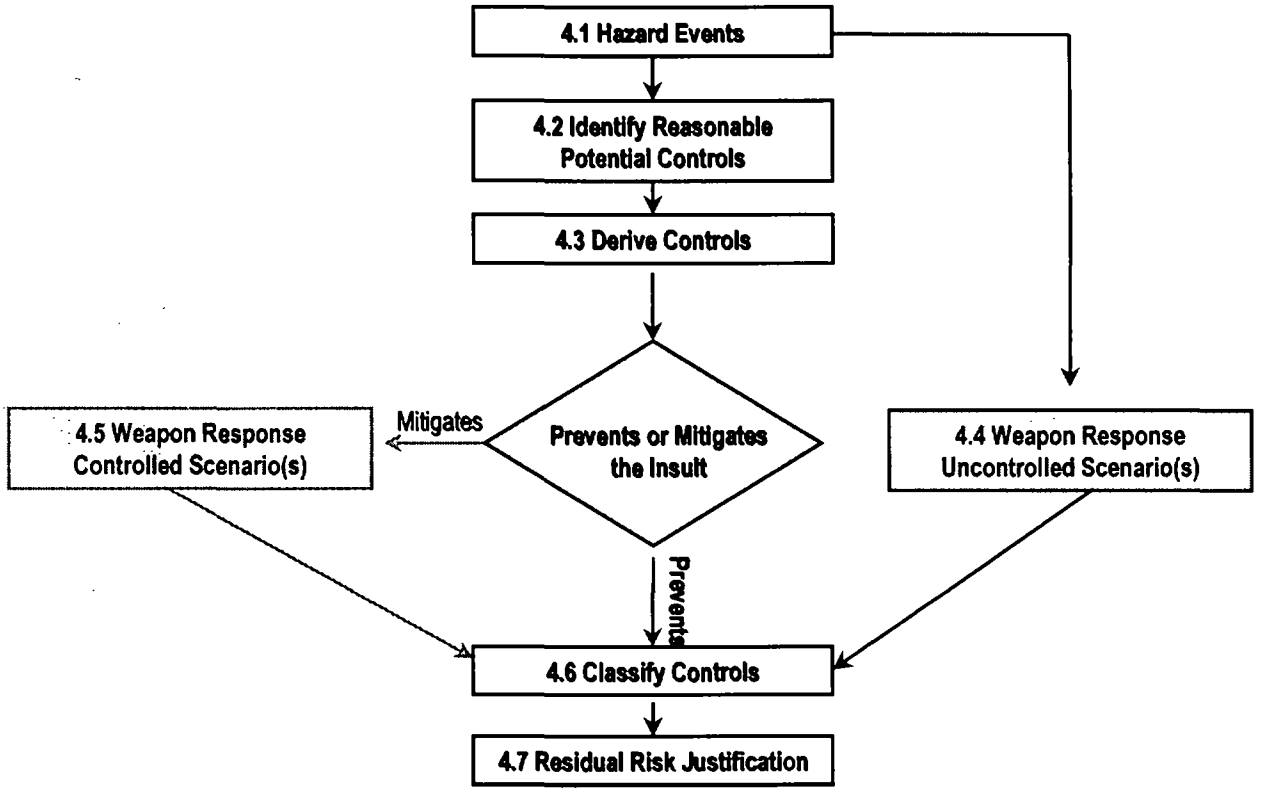

Figure 11.8-1: Weapon Response Process Flow:

Table 11-8-1: WSS Screening Table Example

Ref. #	Weapon Configuration	Affected Component	Insult Category	Insult Parameters	Comments
1	In Shipping Container	Main Charge HE	Mechanical Impact	300 lb. Object Falls 20 ft.	
2	In Shipping Container	Main Charge HE	Mechanical Drop	SC dropped 6 ft right side up	
3	Full up Weapon	Main Charge HE	Mechanical Impact	300-lb. object falls 20 ft.	
4	Full up Weapon	Main Charge HE	Mechanical Drop	Weapon dropped 6 ft. right side up	

The design, fabrication, and implementation of the ETC is a complex task utilizing a variety of inputs. The Project Team consists of engineers and scientists from MHC, DOE AAO, and the three national laboratories. The actual design function of the ETC will be performed by MHC. A conceptual design has been completed which utilizes two carts. ETC 1 will be used to transport the various partial assembly configurations of the weapons systems in the active stockpile (B61, B83, W62, W76, W78, W80, W84, W87, and W88). ETC 2 will be used to transport the physics packages of the weapons systems in the active stockpile. Two programs will not be considered for use with a new cart, the W56 and W79. Both programs are scheduled to be completed in the near term. The B53 is not currently considered for any transportation activity. The national laboratories will provide weapons response for the systems that are transported in the carts and provide other design analysis as required. The laboratories are also providing analysis for the systems scheduled for near term completion which will be not transported in an ETC. The project plan includes the analysis activities required to insure transportation of W56 and W79 partial assemblies can be performed within established guidelines. Fabrication of both the prototype and production carts will be competitively bid. MHC and the national laboratories will perform the acceptance testing for the proof-of-concept prototype cart. MHC will perform all receipt inspections of production carts. The Pantex Plant authorization basis documents will be revised prior to production use of the carts.

The Preliminary Plan, Phase 1 submitted to the DNFSB has the Work Breakdown Structure and the work activities defined that are required to accomplish the design, fabrication, and fielding of the carts. The Preliminary Plan, Phase II will be developed and delivered to DOE for approval in January 2001. This revision to the plan will include a detailed resource loaded project schedule and the project cost. MHC will develop the project schedule and obtain schedule concurrence from DOE and the national laboratories during November and December 2000. The Phase II plan will contain all the attributes required to satisfy Board Recommendation 98-2, Commitment 4.3.7 and will be forwarded to the DNFSB January 2001.

If you have any questions, please contact Norman Garrett of my staff at extension 3128.

Daniel E. Glenn
Area Manager

2 attachments
cc:
K. Boardman, DOE-AL/WPD
L. Eppler, MHC
cc: w/o attachment
D. Brunell
K. Waltzer
N. Garrett
File: 00-061.npg

United States Government Department of Energy

memorandum

Albuquerque Operations Office
Amarillo Area Office

DATE: OCT 27 2000

REPLY TO ATT. OF: AAO:ABS:NPG

SUBJECT: Approval of Pantex Plant Enhanced Transportation Cart Preliminary (Phase 1) Project Plan

TO: Larry L. Eppler, Senior Technical Advisor, Mason & Hanger Corporation (MHC)

Reference: Letter, Eppler/Brunell, *Enhanced Transportation Cart Project Plan*, dated October 25, 2000

The Amarillo Area Office (AAO) has reviewed the subject transmittal and approves the transmittal subject to comment. MHC is directed to submit the Preliminary (Phase II) Project Plan to AAO for review and approval by January 16, 2001. The project plan must include the resource loaded project schedule and cost.

Please provide your analysis of the impact of submitting the Preliminary (Phase II) Project Plan on the directed date and notify this office, in writing, within five (5) working days, if your analysis reveals that the cost impact is of a magnitude that requires revision to a Work Authorization Directive (WAD) or contract line item. In your analysis, please review other WADs and provide a recommendation(s) of work that could be delayed, with impacts, to allow for submitting the Preliminary (Phase II) Project Plan on the directed date.

If you have any questions, please contact Norman Garrett of my staff at extension 3128.

Donald C. Brunell
Authorization Basis Manager

cc:
K. Waltzer, 12-36
N. Garrett, 12-36

File: 00-060.npg

MASON & HANGER
CORPORATION

PANTEX PLANT
P.O. Box 30020
Amarillo, TX 79120-0020
(806) 477-3000

OCT 2 5 2000

Mr. Donald C. Brunell, Authorization Basis Manager
Amarillo Area Office
U.S. Department of Energy
Amarillo, Texas 79120

Re: Enhanced Transportation Cart Project Plan

Dear Mr. Brunell:

Attached is the second draft of the Enhanced Transportation Cart Preliminary (Phase I) Project Plan, Revision C. This version of the Preliminary Plan (Phase I) contains activities, scopes, responsible organizations, deliverables and durations. Revision C to the plan incorporates DOE and internal review comments. The labs have a deliverable of providing their durations to MHC on October 27, 2000.

Phase II of the Preliminary Plan will include the milestones and costs associated with each activity.

If you have any further questions please feel free to contact me at 477-6460.

Very truly yours,

Larry L. Eppler
Technical Advisor

sp

Attachments: As Stated

cc: K.E. Waltzer, DOE/AAO, 12-36
N.Garrett, DOE/AAO, 12-36
D.R. Swanson, ABD&M, 12-127
T.W. Dodson, ABD&M, 12-127

STA01-3128-371

Pantex Plant
Enhanced Transportation Cart
Preliminary (Phase I)
Project Plan

Rev. C
October 25, 2000

Prepared by:

AB Development and Management Department
Mason & Hanger Corporation

Change History

REVISION	DATE	SUMMARY
A	*October 2000*	*Original Issue*
B	*October 2000*	*Technical Advisor Review Comments Incorporation*
C	*October 2000*	*DOE/AAO Review Comments Incorporation*

Table of Contents

1. Introduction

The purpose of the Transportation Module is to identify and evaluate all hazards and established controls for all transportation activities between cells and bays in Zone 12, transportation in Zone 4, and transportation between Zone 4 and Zone 12, including loading and unloading operations. The facilities evaluated in the Transportation Module include the ramps, corridors, docks and roads. The Transportation Module is to be written in three phases. Phase One covers the transportation of full-up Nuclear Explosives Assemblies in shipping configuration. Phase Two includes the transportation of all partial configurations. Phase Three will cover the shipment of Nuclear Material.

As a part of the second phase, an Enhanced Transportation Cart (ETC) will be designed, fabricated and utilized as a control in the transportation of nuclear explosives not in full-up shipping containers (UU Packages). The ETC will be designed from criteria developed from environments in the existing hazards analysis, *Pantex Plant Transportation BIO Hazards Analysis For Weapons in Ultimate User (UU) Shipping Configurations*, RPT-SAR-292268, August, 2000.

The ETC Project addresses known weaknesses in the design of carts used to transport partially assembled nuclear weapons (partial assemblies). Partial assemblies are the primary assembly of a nuclear weapon (i.e., the pit and the main explosive charge), which are not in the full-up weapon configurations. These assemblies are commonly moved in the ramps between bays and cells in MHC designed transport carts.

The project plan will be developed in four phases. Phase One is the Preliminary Plan, Phase I, which develops the Work Breakdown Structure (WBS) and define the activities and durations for accomplishing the work. Phase Two will revise the Preliminary Plan to include the project schedule and costs. Phase Three will be the update of the plan based on the Conceptual Design Report (CDR). Phase Four will be to update the plan using the information in the Final Design Report (FDR).

1.1 Project Scope

The scope of the ETC Project Plan is to prepare a conceptual design, prototype test, prepare final design, fabricate and incorporate the ETC into operations. Following incorporation, a Nuclear Explosives Safety Study, Technical Assist, Contractor Readiness Assessment and DOE Readiness Assessment will be conducted to ensure readiness and complete the

implementation. The scope of the project also includes the effort to develop, maintain and update the ETC Project Plan including project management and status reporting.

The project effort is divided into five components in the WBS: (1) project management including developing and updating the project plan, (2) establish the ETC design criteria, (3) design and procure the ETC, (4) qualify weapons configurations, which will not use the ETC, and (5) incorporation of the ETC into operations at Pantex. Each area will be separately addressed by this plan.

1.2 Background and Prior Years Effort

In FY1999 a Transportation Project Team (PT) was formed to develop the Transportation BIO Upgrade Module at Pantex. The PT will upgrade the existing Basis for Interim Operations (BIO) with a hazard analysis and derived common controls for transportation activities. Development of the BIO will implement the Integrated Safety Process (ISP) through co-development by stakeholder organizations including the DOE, the Management and Operating Contractor, and National Design Agency technical and weapon specialists. The expectations of upgrading the BIO using ISP are to: (a) provide a more accurate definition of the basis for safe operations, (b) correct existing deficiencies, (c) identify common controls, (d) provide Nuclear Explosives Safety Study input, and (e) improve the overall quality of the safety documentation for these transportation activities.

Specifically, for the ETC, the PT will be used to provide a forum for requesting weapon responses to environments seen by the ETC, review design criteria of the ETC, review designs of the ETC, and provide assistance in resolving issues. The PT provides input to the development of the project plan in order to ensure that the schedule is developed in accordance with available resources.

In March 1999, a Transport Cart Upgrade Project Presentation provided Mason and Hanger Corporations (MHC) management and DOE with four transport cart modification options. The presentation was modified to address comments by the Standing Management Team for the BIO Upgrade Projects. This presentation and the subsequent DOE direction are the basis for these elements of the project plan.

Option 1 was selected to immediately address lightning protection hazards associated with the transportation of weapon assemblies in other than full-up configurations. The tasks for Option 1 are included in the Lightning Protection Project Plan. Option 4a of the project was

selected to address a more comprehensive list of natural phenomena and operational hazards (i.e., lightning strike, thermal, forklift puncture/crush, tornado missile impact, and gas cylinder impact) associated with partial assembly transportation in the ramps as defined in the hazards analysis for transportation of weapons. Option 4a tasks are addressed in this project plan.

To date the following effort towards the project plan has been accomplished:

- Completion of the draft of the design criteria and submission to the PT,
- Determination that two different types of ETC are required, (ETC I and ETC II)
- Decision of which configurations cannot be put into an ETC,
- Draft conceptual design drawing of ETC I.

1.3 FY2001 Planned Effort

The FY2001 effort includes development and revision of the Project Plan, approval of the ETC design criteria, completion of the CDR for both ETC types, preliminary design of the ETCs and procurement of the prototypes for testing.

1.3.1 ETC Project Plan

The ETC project plan will be developed in four phases. Phase One will develop the Work Breakdown Structure (WBS) and define the activities for accomplishing the work. For each activity the scope, input, deliverable, duration and responsibility will be described. Phase Two revises the plan to include milestones, costs and the project schedule. Phase Three updates the plan based on the Conceptual Design Report (CDR). Phase Four revises the plan according to the information in the Final Design Report (FDR).

The FY2001 deliverables for the TSR implementation are:

- Complete the Preliminary Plan, Phase I (10/31/00)
- Complete the Preliminary Plan, Phase II (TBD)
- Complete the CDR revision to the Project Plan (TBD)

The specific tasks for the ETC Project Plan are as follows:

Note: The activity numbers correspond to the WBS number.

1.1.1 Preliminary Plan (Phase I)

1.1.1.1 Draft Preliminary Plan (Phase I)

Scope:	Provide a project plan with scopes, activities, durations and responsible individuals.
Input:	Work Breakdown Structure and Project Team Commitments
Deliverables:	Project Plan
Duration:	7d
Responsibility:	Transportation BIO Project Manager

1.1.1.2 Preliminary Plan (Phase I) Review

1.1.1.2.1 Project Team Review of Preliminary Plan (Phase I)

Scope:	Project Team Review of the preliminary plan to determine if scopes, durations and responsibility for activities are correct. Laboratories will provide the durations for activities in which they have responsibilities.
Input:	Draft Preliminary Plan (Phase I)
Deliverables:	Review Comments and Durations
Duration:	4d
Responsibility:	LLNL, LANL, Sandia

1.1.1.2.2 DOE Review of Preliminary Plan (Phase I)

Scope:	DOE Review of the preliminary plan to determine if scope, durations and responsibility for activities are correct and meet DNFSB expectations.
Input:	Draft Preliminary Plan (Phase I)
Deliverables:	Review Comments
Duration:	4d
Responsibility:	DOE/AAO

1.1.1.2.3 Incorporation of Review Comments from Review of Preliminary Plan (Phase I)

Scope: Incorporate Review Comments from DOE and Project Team Review. Include the updated durations for activities. Submit the final plan to DOE.
Input: Draft Preliminary Plan (Phase I) and Review Comments
Deliverables: Final Preliminary Plan (Phase I)
Duration: 2d
Responsibility: Transportation BIO Project Manager

1.1.2 Preliminary Plan (Phase II)

1.1.2.1 Critical Path Schedule

1.1.2.1.1 Draft Preliminary Plan (Phase II)

Scope: Provide a project plan with scopes, activities, durations, milestones, resource requirements, costs and responsible individuals. Submit the plan to the laboratories and DOE.
Input: Preliminary Plan (Phase I)
Deliverables: Draft Preliminary Project Plan (Phase II)
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.1.2.1.2 Provide External Resource Loading of Preliminary Plan (Phase II)

Scope: Provide changes to milestones from draft preliminary plan to ensure laboratory support is available to meet commitments.
Input: Draft Preliminary Plan (Phase II)
Deliverables: Changes to Milestones
Duration: 10d
Responsibility: DOE, LLNL, LANL, Sandia

1.1.2.1.3 Update Preliminary Plan (Phase II)

Scope: Provide a project plan with scopes, activities, durations, milestones, resource requirements , costs and responsible individuals.
Input: Draft Preliminary Plan (Phase II) and Changes to Milestones
Deliverables: Updated Preliminary Plan (Phase II)
Duration: 5d
Responsibility: Transportation BIO Project Manager

1.1.2.2 Preliminary Plan (Phase II) Review

1.1.2.2.1 Project Team Review of Preliminary Plan (Phase II)

Scope: Project Team Review of the preliminary plan to determine if scopes, durations milestones and responsibility for activities are correct. Laboratories will provide changes to the milestones if necessary for activities in which they have responsibilities.
Input: Updated Preliminary Plan (Phase II)
Deliverables: Review Comments and Durations
Duration: 5d
Responsibility: LLNL, LANL, Sandia

1.1.2.2.2 DOE Review of Preliminary Plan (Phase II)

Scope: DOE Review of the preliminary plan to determine if scope, durations and responsibility for activities are correct and meet DNFSB expectations.
Input: Updated Preliminary Plan (Phase II)
Deliverables: Review Comments
Duration: 5d
Responsibility: DOE/AAO

1.1.2.2.3 Incorporation of Review Comments from Review of Preliminary Plan (Phase II)

Scope: Incorporate Review Comments from DOE and Project Team Review. Include the updated durations for activities. Submit the final plan to DOE.
Input: Updated Preliminary Plan (Phase II) and Review Comments
Deliverables: Final Preliminary Plan (Phase II)
Duration: 5d
Responsibility: Transportation BIO Project Manager

1.1.3 CDR Revision to Project Plan

1.1.3.1 Critical Path Schedule

1.1.3.1.1 Draft CDR Plan

Scope: Provide a project plan with scopes, activities, durations, milestones, resource requirements, costs and responsible individuals based on results of approved conceptual design. Submit the plan to the laboratories and DOE.
Input: Preliminary Plan (Phase II) and Approved CDR
Deliverables: Draft CDR Project Plan
Duration: 20d
Responsibility: Transportation BIO Project Manager

1.1.3.2 CDR Plan Review

1.1.3.2.1 Project Team Review of CDR Plan

Scope: Project Team Review of the CDR plan to determine if scopes, durations milestones and responsibility for activities are correct. Laboratories will provide changes to the milestones if necessary for activities in which they have responsibilities.
Input: Draft CDR Plan
Deliverables: Review Comments and Milestones
Duration: 15d
Responsibility: LLNL, LANL, Sandia

1.1.3.2.2 DOE Review of CDR Plan

Scope: DOE Review of the preliminary plan to determine if scope, durations and responsibility for activities are correct and meet DNFSB expectations.
Input: Draft CDR Plan
Deliverables: Review Comments
Duration: 15d
Responsibility: DOE/AAO

1.1.3.2.3 Incorporation of Review Comments from Review of Preliminary Plan (Phase II)

Scope: Incorporate Review Comments from DOE and Project Team Review. Include the updated durations for activities. Submit the final plan to DOE.
Input: Draft CDR Plan and Review Comments
Deliverables: Final CDR Plan
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.1.4 Final Design Revision to Project Plan

1.1.4.1 Critical Path Schedule

1.1.4.1.1 Draft Final Design Plan

Scope: Provide a project plan with scopes, activities, durations, milestones, resource requirements, costs and responsible individuals based on results of approved final design. Submit the plan to the laboratories and DOE.
Input: CDR Plan and Approved Final Design
Deliverables: Draft Final Design Project Plan
Duration: 20d
Responsibility: Transportation BIO Project Manager

1.1.4.2 CDR Plan Review

1.1.4.2.1 Project Team Review of Final Design Plan

Scope:	Project Team Review of the draft of the Final Design Plan to determine if scopes, durations milestones and responsibility for activities are correct. Laboratories will provide changes to the milestones if necessary for activities in which they have responsibilities.
Input:	Draft Final Design Plan
Deliverables:	Review Comments and Milestones
Duration:	15d
Responsibility:	LLNL, LANL, Sandia

1.1.4.2.2 DOE Review of Final Design Plan

Scope:	DOE Review of the preliminary plan to determine if scope, durations and responsibility for activities are correct and meet DNFSB expectations.
Input:	Draft Final Design Plan
Deliverables:	Review Comments
Duration:	15d
Responsibility:	DOE/AAO

1.1.4.2.3 Incorporation of Review Comments from Review of Final Design Plan

Scope:	Incorporate Review Comments from DOE and Project Team Review. Include the updated durations for activities. Submit the final plan to DOE.
Input:	Draft Final Design Plan and Review Comments
Deliverables:	Final Design Plan
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.3.2 Establish ETC Design Criteria

The activities associated with establishing the ETC design criteria are developing the criteria, obtaining a review of the criteria from the PT and DOE, and receiving approval of the criteria from the DOE.

The FY2001 deliverables for the ETC design criteria are:

- Develop the ETC Design Criteria (TBD)
- Conduct Project Team Review of the ETC Design Criteria (TBD)
- Approval of ETC Design Criteria (TBD)

The specific tasks for establishing the ETC design criteria are as follows:

Note: The activity numbers correspond to the WBS number.

1.2.1 Establish ETC Design Criteria

1.2.1.1 Develop ETC Design Criteria

1.2.1.1.1 Develop ETC Design Criteria

Scope:	Develop ETC Design Criteria using bounding events from all HA environments. **Assumption: No new events will arise during the development of the TBIO that will require design criteria changes.**
Input:	Hazard Analysis
Deliverables:	ETC Design Criteria
Duration:	15d
Responsibility:	Transportation BIO Project Engineer

1.2.1.2 Review and Approval of ETC Design Criteria

1.2.1.2.1 Project Team Review of ETC Criteria

Scope:	Present to Project Team the Draft ETC Design Criteria. Project Team review of the Draft ETC Design Criteria and submission of review comments.
Input:	Draft ETC Design Criteria
Deliverables:	Review Comments
Duration:	15d
Responsibility:	DOE, LLNL, LANL, Sandia

1.2.1.2.2 Incorporation of Comments from Review of ETC Design Criteria

Scope:	Incorporate Review Comments from Project Team Review. Submit the ETC Design Criteria to DOE for approval.
Input:	Draft ETC Design Criteria and review Comments
Deliverables:	ETC Design Criteria
Duration:	10d
Responsibility:	Transportation BIO Project Engineer

1.2.1.2.3 Approval of ETC Design Criteria

Scope:	Review and approve ETC Design Criteria. Provide letter to Transportation BIO Project Manager. **Assumption: Completion of Conceptual Design will complete 20 days after approval of ETC Design Criteria and preliminary Faraday cage analysis. No changes to ETC Design Criteria after approval will occur.**
Input:	ETC Design Criteria
Deliverables:	Approval Letter
Duration:	20d
Responsibility:	DOE/AAO

1.3.3 ETC Design and Procurement

An evaluation of configurations led to the decision that only two types of ETCs would be pursued. The first, ETC I would contain the partial configurations for all warheads except the dismantlement programs. The second, ETC II, would be designed to transport the physics packages.

The ETC design and procurement phase includes the effort to design and procure both ETC I and ETC II. The design phase will consist of a Conceptual Design Report (CDR), Preliminary Design Report (PDR) and Final Design Report (FDR). After the approval of the design criteria and the preliminary Faraday cage analysis, the Conceptual Design Report will be completed.

After approval of the CDR, the preliminary design phase will begin. To support the proof-of-concept testing the transportation carts, 2 prototypes for each ETC type will be fabricated and tested to ensure design criteria are met. The completion and approval of the PDR will allow MHC to procure the prototypes for testing.

The test results and any design modifications will be put into the FDR. Approval of the FDR will allow MHC to procure the production quantities of the ETCs.

The FY2001 deliverables for the implementation of controls for Partial Units are:

- Complete CDR for ETC I (TBD)
- Approve CDR for ETC I (TBD)
- Complete PDR ETC I (TBD)
- Approve PDR ETC I (TBD)
- Initiate Procurement of ETC I Prototype (TBD)
- Complete CDR for ETC II (TBD)
- Approve CDR for ETC II (TBD)
- Complete PDR for ETC II (TBD)
- Approve PDR for ETC II (TBD)
- Initiate Procurement of ETC II Prototype (TBD)

The specific tasks for the ETC design and procurement are as follows:

Note: The activity numbers correspond to the WBS number.

1.2.2 ETC Design and Procurement

1.2.2.1 Full-ups and Partial Configurations

1.2.2.1.1 Conceptual Design

1.2.2.1.1.1 Establish Configurations to be put into ETC I

Scope:	Qualify configurations that cannot be feasiblely placed in an ETC and present/submit results to DOE for review and approval. Receive DOE concurrence. **Assumption: The list of configurations to put into the ETC will not increase.**
Input:	List of configurations moved in ramps
Deliverables:	List of configurations to be put into ETC I
Duration:	5d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.1.2 Develop CDR

1.2.2.1.1.2.1 Generate Conceptual Design

Scope: Generate conceptual design for ETC I. **Assumption: Preliminary Faraday cage analysis does not cause a complete redesign of the ETC.**

Input: List of configurations to be put into ETC I and ETC Design Criteria and preliminary Faraday cage analysis

Deliverables: Conceptual Design Drawings

Duration: 30d - 20d after approval of ETC Design Criteria and Preliminary Faraday Cage Analysis

Responsibility: Tooling Design

1.2.2.1.1.2.2 Determine Cost/Schedule of Designing/Procuring ETC I

Scope: From Conceptual Design Drawings determine the cost of ETC I and revise schedule for completing design, testing, procurement and receiving of items.

Input: Conceptual Design Drawings

Deliverables: Cost/Schedule

Duration: 10d

Responsibility: Transportation BIO Project Manager

1.2.2.1.1.2.3 Prepare CDR

Scope: Develop draft of CDR

Input: Conceptual Design Drawings and Cost/Schedule

Deliverables: Draft CDR

Duration: 15d

Responsibility: Transportation BIO Project Manager

1.2.2.1.1.3 Perform Preliminary Faraday Cage Review

Scope: Perform preliminary Faraday cage analysis of ETC I based on draft conceptual design drawings. Provide results to Transportation BIO Project Manager

Input: Draft Conceptual Design Drawings

Deliverables: Preliminary Faraday Cage Analysis

Duration: 5d after receiving the draft conceptual design drawings

Responsibility: Sandia

1.2.2.1.1.4 CDR Review and Approval

1.2.2.1.1.4.1 MHC Internal Review of CDR

1.2.2.1.1.4.1.1 Perform MHC Review of CDR

Scope: Perform an MHC internal review of the CDR for ETC I. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC I
Input: Draft CDR
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.1.1.4.1.2 Incorporation of Comments from MHC Review of CDR

Scope: Incorporate Review Comments from MHC review of CDR. Make design modifications as necessary. Submit revised CDR to Project Team for review.
Input: Draft CDR and Review Comments
Deliverables: Updated CDR
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.1.1.4.2 External Review of CDR

1.2.2.1.1.4.2.1 Perform External Review of CDR

Scope: Perform an project team review of the CDR for ETC I. This review will include DOE and project team.
Input: Updated CDR
Deliverables: Review Comments
Duration: 10d
Responsibility: DOE, LLNL, LANL, Sandia

1.2.2.1.1.4.2.2 Incorporation of Comments from External Review of CDR

Scope:	Incorporate Review Comments from external review of CDR. Make design modifications as necessary. Submit revised CDR to Project Team for sign off.
Input:	Updated CDR and Review Comments
Deliverables:	CDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.1.4.2.3 Sign off CDR by Project Team

Scope:	Present CDR to Project Team and receive Project Team signatures. Submit to DOE and SMT.
Input:	CDR
Deliverables:	CDR with Project Team Signatures
Duration:	20d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.1.4.2.4 DOE/SMT Review of CDR

Scope:	Present CDR to SMT with Project Team Sign off. Receive SMT and DOE comments. **Assumption: SMT will be scheduled and attended during the time frame of the project schedule.**
Input:	CDR with Project Team signatures
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.1.4.2.5 Incorporation of DOE/SMT Review of CDR Comments

Scope:	Incorporate Review Comments from DOE/SMT review of CDR. Make design modifications as necessary. Obtain Project Team concurrence. Submit revised CDR to DOE/SMT for approval.
Input:	Review Comments
Deliverables:	Baseline CDR
Duration:	25d
Responsibility:	DOE

1.2.2.1.1.4.2.6 DOE/SMT Approval of CDR

Scope:	Present CDR to SMT with Project Team Sign off. Receive SMT and DOE approval. DOE prepare letter to proceed with final design.
Input:	Baseline CDR
Deliverables:	Approval Letter from DOE
Duration:	10d
Responsibility:	DOE

1.2.2.1.2 Final Design and Testing

1.2.2.1.2.1 Preliminary Design

1.2.2.1.2.1.1 Preliminary Design Report (PDR)

1.2.2.1.2.1.1.1 Generate Preliminary Design

Scope:	Generate preliminary design for ETC I. **Assumption: Faraday cage analysis and weapon responses do not cause a major redesign of the ETC.**
Input:	Baseline CDR, Faraday Cage Analysis and Weapon Response
Deliverables:	Design Drawings
Duration:	40d - 20d after Faraday Cage Analysis and Weapon Response
Responsibility:	Tooling Design

1.2.2.1.2.1.1.2 Determine Cost/Schedule of Designing/Procuring ETC I

Scope:	From Design Drawings determine the cost of ETC I and revise schedule for completing design, testing, procurement and receiving of items.
Input:	Preliminary Design Drawings
Deliverables:	Cost/Schedule for Project Plan Change
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.3 Prepare Draft PDR

Scope:	Develop draft of Final Design Report
Input:	Design Drawings and Cost/Schedule
Deliverables:	Draft PDR
Duration:	15d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.4 Perform Faraday Cage Analysis

Scope:	Perform Faraday cage analysis of ETC I based on design drawings. Provide results to Transportation BIO Project Manager
Input:	Design Drawings
Deliverables:	Faraday Cage Analysis
Duration:	5d after receiving the draft preliminary design drawings
Responsibility:	Sandia

1.2.2.1.2.1.1.5 Perform Weapon Response

Scope:	Analyze Weapon Response of ETC I based on design drawings. Provide results to Transportation BIO Project Manager
Input:	Design Drawings
Deliverables:	Weapon Response
Duration:	5d after receiving the preliminary design drawings
Responsibility:	LLNL, LANL, Sandia

1.2.2.1.2.1.1.6 Perform MHC Review of PDR

Scope:	Perform an MHC internal review of the PDR for ETC I. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC I
Input:	Draft PDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.7 Incorporation of Comments from MHC Review of PDR

Scope:	Incorporate Review Comments from MHC review of PDR. Make design modifications as necessary. Submit revised PDR to Project Team for review.
Input:	Draft PDR and Review Comments
Deliverables:	Updated PDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.8 Perform External Review of PDR

Scope:	Perform an project team review of the PDR for ETC I. This review will include DOE, project team, Tri-Lab personnel. **Assumption: External review does not cause a major redesign of the ETC.**
Input:	Updated PDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	DOE, LLNL, LANL, Sandia

1.2.2.1.2.1.1.9 Incorporation of Comments from External Review of PDR

Scope:	Incorporate Review Comments from external review of PDR. Make design modifications as necessary. Submit revised PDR to Project Team for sign off.
Input:	Updated PDR and Review Comments
Deliverables:	PDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.10 Sign off PDR by Project Team

Scope:	Present PDR to Project Team and receive signatures. Submit to DOE and SMT. **Assumption: Project Team Meeting will be scheduled and attended during the time frame of the project schedule.**
Input:	PDR
Deliverables:	PDR with Project Team Signatures
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.1.1.11 DOE/SMT Review of PDR

Scope: Present PDR to SMT with Project Team Sign off. Receive SMT and DOE comments. **Assumption: SMT will be scheduled and attended during the time frame of the project schedule.**
Input: PDR with Project Team signatures
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.1.2.1.1.12 Incorporation of DOE/SMT Review of PDR Comments

Scope: Incorporate Review Comments from DOE/SMT review of PDR. Make design modifications as necessary.
Input: Review Comments
Deliverables: PDR for Prototype Fabrication
Duration: 15d
Responsibility: DOE

1.2.2.1.2.1.2 Test of Prototype

1.2.2.1.2.1.2.1 Develop Test Plan

Scope: Develop Test Plan to test prototypes of ETC. Inputs will be from MHC and Laboratories
Input: Design Criteria and PDR
Deliverables: Prototype Test Plan
Duration: 90d
Responsibility: Tooling Design

1.2.2.1.2.1.2.2 Perform Prototype Tests

Scope: Perform test on prototypes as defined in prototype test plan.
Input: Prototype Test Plan
Deliverables: Test Results
Duration: 30d
Responsibility: Tooling Design

1.2.2.1.2.1.2.3 Incorporation of Prototype Test Results

1.2.2.1.2.1.2.3.1 Modify ETC I Design Based on Prototype Test Results

Scope: Modify design of ETC I based on prototype test results.
Input: PDR and Prototype Test Results. **Assumption: Prototype test results, Faraday Cage Analysis and Weapon Reaponse do not cause a major redesign of the ETC.**
Deliverables: FDR
Duration: 30d - 20d after Faraday cage analysis and weapon responses
Responsibility: Tooling Design

1.2.2.1.2.1.2.3.2 Perform Faraday Cage Analysis

Scope: Perform Faraday cage analysis of ETC I based on design modifications after prototype testing. Provide results to Transportation BIO Project Manager. **Assumption: Faraday cage analysis does not cause a major redesign of the ETC.**
Input: FDR
Deliverables: Faraday Cage Analysis
Duration: 5d
Responsibility: Sandia

1.2.2.1.2.1.2.3.3 Perform Weapon Response

Scope: Analyze Weapon Response of ETC I based on design modifications after prototype testing. Provide results to Transportation BIO Project Manager. **Assumption: Weapon Response does not cause a major redesign of the ETC.**
Input: FDR
Deliverables: Weapon Response
Duration: 5d
Responsibility: LLNL, LANL, Sandia

1.2.2.1.2.2 Procurement of Prototypes

1.2.2.1.2.2.1 Develop Specifications for Prototype Procurement of ETC I

Scope: Develop procurement specifications for prototype of ETC I
Input: FDR
Deliverables: Procurement Specifications
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.2.2.2 Request Bids for Procurement of Prototype of ETC I

Scope: Release Bid package for procurement of prototype of ETC I
Input: Procurement Specifications
Deliverables: Bid Package
Duration: 30d
Responsibility: Tooling Design

1.2.2.1.2.2.3 Award Contract for Procurement of Prototype of ETC I

Scope: Award contract to fabricate 2 ETC I prototypes.
Input: Proposals
Deliverables: Contract
Duration: 25d
Responsibility: Tooling Design

1.2.2.1.2.2.4 Fabricate Prototype of ETC I

Scope: Fabricate 2 ETC I prototypes.
Input: Contract and Specifications
Deliverables: 2 ETC I prototype carts
Duration: 50d
Responsibility: Tooling Design

1.2.2.1.2.2.5 Receive and Inspect ETC I Prototypes

Scope:	Perform R&I of ETC I Prototypes. Send one cart to Sandia.
Input:	2 ETC I Prototypes
Deliverables:	1 ETC Prototype to Pantex and 1 ETC Prototype to Sandia
Duration:	15d
Responsibility:	Tooling Design

1.2.2.1.2.3 FDR Review and Approval

1.2.2.1.2.3.1 Perform MHC Review of FDR

Scope:	Perform an MHC internal review of the FDR for ETC I. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC I
Input:	Draft FDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.3.2 Incorporation of Comments from MHC Review of FDR

Scope:	Incorporate Review Comments from MHC review of FDR. Make design modifications as necessary. Submit revised FDR to Project Team for review.
Input:	Draft FDR and Review Comments
Deliverables:	Updated FDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.3.3 Perform External Review of FDR

Scope:	Perform an project team review of the FDR for ETC I. This review will include DOE and the project team. **Assumption: External review does not cause a major redesign of the ETC.**
Input:	Updated FDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	DOE, LLNL, LANL, Sandia

1.2.2.1.2.3.4 Incorporation of Comments from External Review of FDR

Scope:	Incorporate Review Comments from external review of FDR. Make design modifications as necessary. Submit revised FDR to Project Team for sign off.
Input:	Updated FDR and Review Comments
Deliverables:	FDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.3.5 Sign off FDR by Project Team

Scope:	Present FDR to Project Team and receive Project Team signatures. Submit to DOE and SMT.
Input:	FDR
Deliverables:	FDR with Project Team Signatures
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.3.6 DOE/SMT Review of FDR

Scope:	Present FDR to SMT with Project Team Sign off. Receive SMT and DOE comments.
Input:	FDR with Project Team signatures
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.1.2.3.7 Incorporation of DOE/SMT Review of FDR Comments

Scope: Incorporate Review Comments from DOE/SMT review of PDR. Make design modifications as necessary. Submit to Laboratories for Engineering Release.
Input: Review Comments
Deliverables: FDR
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.2.3.8 Receive Laboratory comments for Engineering Release of FDR

Scope: Review FDR and provide comments to receive engineering release.
Input: FDR
Deliverables: Comments to get Engineering Release
Duration: 15d
Responsibility: LLNL, LANL, Sandia

1.2.2.1.2.3.9 Incorporation of Laboratory Review Comments for Engineering Release

Scope: Incorporate Review Comments from review of FDR. Make design modifications as necessary. Submit to Laboratories for Engineering Release.
Input: FDR
Deliverables: Review Comments
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.2.3.10 Receive Laboratory comments for Engineering Release for FDR

Scope: Review FDR and provide comments to receive engineering release.
Input: Review Comments
Deliverables: FDR for procurement of ETC I
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.2.4 Update Hazard Analysis
Scope: Update the TBIO Hazard Analysis with ETC I information.
Input: TBIO Hazard Analysis and FDR
Deliverables: Hazard Analysis
Duration: 15d
Responsibility: Transportation BIO Project Engineer

1.2.2.1.3 Procurement of ETC I

1.2.2.1.3.1 Develop Specifications for Procurement of ETC I
Scope: Develop procurement specifications for ETC I
Input: FDR
Deliverables: Procurement Specifications
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.3.2 Request Bids for Procurement of ETC I
Scope: Release Bid package for procurement of ETC I
Input: Procurement Specifications
Deliverables: Bid Package
Duration: 25d
Responsibility: Tooling Design

1.2.2.1.3.3 Award Contract for Procurement of ETC I
Scope: Award contract to fabricate ETC I.
Input: Proposals
Deliverables: Contract
Duration: 15d
Responsibility: Tooling Design

1.2.2.1.3.4 Fabricate ETC I
Scope: Fabricate ETC I.
Input: Contract and Specifications
Deliverables: ETC I
Duration: 90d
Responsibility: Tooling Design

1.2.2.1.3.5 Receive and Inspect ETC I

Scope: Perform R&I of ETC I.
Input: ETC I
Deliverables: ETC I for line use
Duration: 15d
Responsibility: Tooling Design

1.2.2.2 Physics Packages

1.2.2.2.1 Conceptual Design

1.2.2.2.1.1 Establish Configurations to be put into ETC II

Scope: Qualify configurations that cannot be feasiblely placed in an ETC and present/submit results to DOE for review and approval. Receive DOE concurrence. **Assumption: The list of configurations to put into the ETC will not increase.**
Input: List of configurations moved in ramps
Deliverables: List of configurations to be put into ETC II
Duration: 5d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.2 Develop CDR

1.2.2.2.1.2.1 Generate Conceptual Design

Scope: Generate conceptual design for ETC II. **Assumption: Preliminary Faraday cage analysis does not cause a major redesign of the ETC.**
Input: List of configurations to be put into ETC II and ETC Design Criteria and Preliminary Faraday Cage Analysis
Deliverables: Conceptual Design Drawings
Duration: 30d - 20d after approval of ETC Design Criteria and Preliminary Faraday Cage Analysis
Responsibility: Tooling Design

1.2.2.2.1.2.2 Determine Cost/Schedule of Designing/Procuring ETC II

Scope: From Conceptual Design Drawings determine the cost of ETC II and revise schedule for completing design, testing, procurement and receiving of items.
Input: Conceptual Design Drawings
Deliverables: Cost/Schedule
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.2.3 Prepare CDR

Scope: Develop draft of CDR
Input: Conceptual Design Drawings and Cost/Schedule
Deliverables: Draft CDR
Duration: 15d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.3 Perform Preliminary Faraday Cage Review

Scope: Perform preliminary Faraday cage analysis of ETC II based on draft conceptual design drawings. Provide results to Transportation BIO Project Manager
Input: Draft Conceptual Design Drawings
Deliverables: Preliminary Faraday Cage Analysis
Duration: 5d
Responsibility: Sandia

1.2.2.2.1.4 CDR Review and Approval

1.2.2.2.1.4.1 MHC Internal Review of CDR

1.2.2.2.1.4.1.1 Perform MHC Review of CDR

Scope: Perform an MHC internal review of the CDR for ETC II. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC II
Input: Draft CDR
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.4.1.2 Incorporation of Comments from MHC Review of CDR

Scope: Incorporate Review Comments from MHC review of CDR. Make design modifications as necessary. Submit revised CDR to Project Team for review.
Input: Draft CDR and Review Comments
Deliverables: Updated CDR
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.4.2 External Review of CDR

1.2.2.2.1.4.2.1 Perform External Review of CDR

Scope: Perform an project team review of the CDR for ETC II. This review will include DOE and project team.
Input: Updated CDR
Deliverables: Review Comments
Duration: 10d
Responsibility: DOE, LLNL, LANL, Sandia

1.2.2.2.1.4.2.2 Incorporation of Comments from External Review of CDR

Scope: Incorporate Review Comments from external review of CDR. Make design modifications as necessary. Submit revised CDR to Project Team for sign off.
Input: Updated CDR and Review Comments
Deliverables: CDR
Duration: 20d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.4.2.3 Sign off CDR by Project Team

Scope: Present CDR to Project Team and receive Project Team signatures. Submit to DOE and SMT.
Input: CDR
Deliverables: CDR with Project Team Signatures
Duration: 20d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.4.2.4 DOE/SMT Review of CDR

Scope: Present CDR to SMT with Project Team Sign off. Receive SMT and DOE comments. **Assumption: SMT will be scheduled and attended during the time frame of the project schedule.**
Input: CDR with Project Team signatures
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.1.4.2.5 Incorporation of DOE/SMT Review of CDR Comments

Scope: Incorporate Review Comments from DOE/SMT review of CDR. Make design modifications as necessary. Receive Project Team concurrence of changes. Submit revised CDR to DOE/SMT for approval.
Input: Review Comments
Deliverables: Baseline CDR
Duration: 25d
Responsibility: DOE

1.2.2.2.1.4.2.6 DOE/SMT Approval of CDR

Scope: Present CDR to SMT with Project Team Sign off. Receive SMT and DOE approval. DOE prepare letter to proceed with final design.
Input: Baseline CDR
Deliverables: Approval Letter from DOE
Duration: 10d
Responsibility: DOE

1.2.2.2.2 Final Design and Testing

1.2.2.2.2.1 Preliminary Design

1.2.2.2.2.1.1 Design Report

1.2.2.2.2.1.1.1 Generate Preliminary Design

Scope: Generate preliminary design for ETC II. **Assumption: Faraday cage analysis and weapon responses do not cause a major redesign of the ETC.**
Input: Baseline CDR, Faraday Cage Analysis and Weapon Response
Deliverables: Design Drawings
Duration: 40d - 20d after Faraday Cage Analysis and Weapon Response
Responsibility: Tooling Design

1.2.2.2.2.1.1.2 Determine Cost/Schedule of Designing/Procuring ETC II

Scope: From Design Drawings determine the cost of ETC II and revise schedule for completing design, testing, procurement and receiving of items.
Input: Design Drawings
Deliverables: Cost/Schedule for Project Plan Change
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.2.1.1.3 Prepare Draft PDR

Scope: Develop draft of Final Design Report
Input: Design Drawings and Cost/Schedule
Deliverables: Draft PDR
Duration: 15d
Responsibility: Transportation BIO Project Manager

1.2.2.2.2.1.1.4 Perform Faraday Cage Analysis

Scope:	Perform Faraday cage analysis of ETC II based on design drawings. Provide results to Transportation BIO Project Manager
Input:	Design Drawings
Deliverables:	Faraday Cage Analysis
Duration:	5d
Responsibility:	Sandia

1.2.2.2.2.1.1.5 Perform Weapon Response

Scope:	Analyze Weapon Response of ETC II based on design drawings. Provide results to Transportation BIO Project Manager
Input:	Design Drawings
Deliverables:	Weapon Response
Duration:	5d
Responsibility:	LLNL, LANL, Sandia

1.2.2.2.2.1.1.6 Perform MHC Review of PDR

Scope:	Perform an MHC internal review of the PDR for ETC II. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC II
Input:	Draft PDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.1.1.7 Incorporation of Comments from MHC Review of PDR

Scope:	Incorporate Review Comments from MHC review of PDR. Make design modifications as necessary. Submit revised PDR to Project Team for review.
Input:	Draft PDR and Review Comments
Deliverables:	Updated PDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.1.1.8 Perform External Review of PDR

Scope:	Perform an project team review of the PDR for ETC II. This review will include DOE and the project team. **Assumption: External review does not cause a major redesign of the ETC.**
Input:	Updated PDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	DOE, LLNL, LANL, Sandia

1.2.2.2.2.1.1.9 Incorporation of Comments from External Review of PDR

Scope:	Incorporate Review Comments from external review of PDR. Make design modifications as necessary. Submit revised PDR to Project Team for sign off.
Input:	Updated PDR and Review Comments
Deliverables:	PDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.1.1.10 Sign off PDR by Project Team

Scope:	Present PDR to Project Team and receive signatures. Submit to DOE and SMT. **Assumption: Project Team Meeting will be scheduled and attended during the time frame of the project schedule.**
Input:	PDR
Deliverables:	PDR with Project Team Signatures
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.1.1.11 DOE/SMT Review of PDR

Scope: Present PDR to SMT with Project Team Sign off. Receive SMT and DOE comments. **Assumption: SMT will be scheduled and attended during the time frame of the project schedule.**
Input: PDR with Project Team signatures
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.2.1.1.12 Incorporation of DOE/SMT Review of PDR Comments

Scope: Incorporate Review Comments from DOE/SMT review of PDR. Make design modifications as necessary.
Input: Review Comments
Deliverables: PDR for Prototype Fabrication
Duration: 15d
Responsibility: DOE

1.2.2.2.2.1.2 Test of Prototype

1.2.2.2.2.1.2.1 Develop Test Plan

Scope: Develop Test Plan to test prototypes of ETC. Inputs will be from MHC and Laboratories
Input: Design Criteria and PDR
Deliverables: Prototype Test Plan
Duration: 90d
Responsibility: Tooling Design

1.2.2.2.2.1.2.2 Perform Prototype Tests

Scope: Perform test on prototypes as defined in prototype test plan.
Input: Prototype Test Plan
Deliverables: Test Results
Duration: 30d
Responsibility: Tooling Design

1.2.2.2.2.1.2.3 Incorporation of Prototype Test Results

1.2.2.2.2.1.2.3.1 Modify ETC II Design Based on Prototype Test Results

Scope: Modify design of ETC II based on prototype test results.

Input: PDR and Prototype Test Results. **Assumption: Prototype test results, Faraday Cage Analysis and Weapon Response do not cause a major redesign of the ETC.**

Deliverables: Draft FDR

Duration: 30d - 20d after Faraday cage analysis and weapon responses

Responsibility: Tooling Design

1.2.2.2.2.1.2.3.2 Perform Faraday Cage Analysis

Scope: Perform Faraday cage analysis of ETC II based on design modifications after prototype testing. Provide results to Transportation BIO Project Manager. **Assumption: Faraday cage analysis does not cause a major redesign of the ETC.**

Input: Draft FDR

Deliverables: Faraday Cage Analysis

Duration: 5d

Responsibility: Sandia

1.2.2.2.2.1.2.3.3 Perform Weapon Response

Scope: Analyze Weapon Response of ETC II based on design modifications after prototype testing. Provide results to Transportation BIO Project Manager. **Assumption: Weapon Response does not cause a major redesign of the ETC.**

Input: FDR

Deliverables: Weapon Response

Duration: 5d

Responsibility: LLNL, LANL, Sandia

1.2.2.2.2.2 Procurement of Prototypes

1.2.2.2.2.2.1 Develop Specifications for Prototype Procurement of ETC II
- Scope: Develop procurement specifications for prototype of ETC II
- Input: FDR
- Deliverables: Procurement Specifications
- Duration: 15d
- Responsibility: Tooling Design

1.2.2.2.2.2.2 Request Bids for Procurement of Prototype of ETC II
- Scope: Release Bid package for procurement of prototype of ETC II
- Input: Procurement Specifications
- Deliverables: Bid Package
- Duration: 30d
- Responsibility: Tooling Design

1.2.2.2.2.2.3 Award Contract for Procurement of Prototype of ETC II
- Scope: Award contract to fabricate 2 ETC II prototypes.
- Input: Proposals
- Deliverables: Contract
- Duration: 25d
- Responsibility: Tooling Design

1.2.2.2.2.2.4 Fabricate Prototype of ETC II
- Scope: Fabricate 2 ETC II prototypes.
- Input: Contract and Specifications
- Deliverables: 2 ETC II prototype carts
- Duration: 50d
- Responsibility: Tooling Design

1.2.2.2.2.5 Receive and Inspect ETC II Prototypes

Scope: Perform R&I of ETC II Prototypes. Send one cart to Sandia.
Input: 2 ETC II Prototypes
Deliverables: 1 ETC Prototype to Pantex and 1 ETC Prototype to Sandia
Duration: 15d
Responsibility: Tooling Design

1.2.2.2.2.3 FDR Review and Approval

1.2.2.2.2.3.1 Perform MHC Review of FDR

Scope: Perform an MHC internal review of the FDR for ETC II. This review will include AB, Operations, Engineering, ESH and other personnel as needed to verify safety and operability of ETC II
Input: Draft FDR
Deliverables: Review Comments
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.2.3.2 Incorporation of Comments from MHC Review of FDR

Scope: Incorporate Review Comments from MHC review of FDR. Make design modifications as necessary. Submit revised FDR to Project Team for review.
Input: Draft FDR and Review Comments
Deliverables: Updated FDR
Duration: 10d
Responsibility: Transportation BIO Project Manager

1.2.2.2.2.3.3 Perform External Review of FDR

Scope:	Perform an project team review of the FDR for ETC II. This review will include DOE, project team, Tri-Lab personnel. **Assumption: External review does not cause a major redesign of the ETC.**
Input:	Updated FDR
Deliverables:	Review Comments
Duration:	10d
Responsibility:	DOE, LLNL, LANL, Sandia

1.2.2.2.2.3.4 Incorporation of Comments from External Review of FDR

Scope:	Incorporate Review Comments from external review of FDR. Make design modifications as necessary. Submit revised FDR to Project Team for sign off.
Input:	Updated FDR and Review Comments
Deliverables:	FDR
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.3.5 Sign off FDR by Project Team

Scope:	Present FDR to Project Team and receive Project Team signatures. Submit to DOE and SMT.
Input:	FDR
Deliverables:	FDR with Project Team Signatures
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.3.6 DOE/SMT Review of FDR

Scope:	Present FDR to SMT with Project Team Sign off. Receive SMT and DOE comments.
Input:	FDR with Project Team signatures
Deliverables:	Review Comments
Duration:	10d
Responsibility:	Transportation BIO Project Manager

1.2.2.2.2.3.7 Incorporation of DOE/SMT Review of FDR Comments

Scope: Incorporate Review Comments from DOE/SMT review of FDR. Make design modifications as necessary. Submit to Laboratories for Engineering Release.
Input: Review Comments
Deliverables: FDR
Duration: 15d
Responsibility: Tooling Design

1.2.2.2.2.3.8 Receive Laboratory comments for Engineering Release of FDR

Scope: Review FDR and provide comments to receive engineering release.
Input: FDR
Deliverables: Comments to get Engineering Release
Duration: 15d
Responsibility: LLNL, LANL, Sandia

1.2.2.2.2.3.9 Incorporation of Laboratory Review Comments for Engineering Release

Scope: Incorporate Review Comments from review of FDR. Make design modifications as necessary. Submit to Laboratories for Engineering Release.
Input: FDR
Deliverables: Review Comments
Duration: 15d
Responsibility: Tooling Design

1.2.2.2.2.3.10 Receive Laboratory comments for Engineering Release for FDR

Scope: Review FDR and provide comments to receive engineering release.
Input: Review Comments
Deliverables: FDR for procurement of ETC II
Duration: 15d
Responsibility: Tooling Design

1.2.2.2.2.4 Update Hazard Analysis
- Scope: Update the TBIO Hazard Analysis with ETC II information.
- Input: TBIO Hazard Analysis and FDR
- Deliverables: Hazard Analysis
- Duration: 15d
- Responsibility: Transportation BIO Project Engineer

1.2.2.2.3 Procurement of ETC II

1.2.2.2.3.1 Develop Specifications for Procurement of ETC II
- Scope: Develop procurement specifications for ETC II
- Input: FDR
- Deliverables: Procurement Specifications
- Duration: 15d
- Responsibility: Tooling Design

1.2.2.2.3.2 Request Bids for Procurement of ETC II
- Scope: Release Bid package for procurement of ETC II
- Input: Procurement Specifications
- Deliverables: Bid Package
- Duration: 25d
- Responsibility: Tooling Design

1.2.2.2.3.3 Award Contract for Procurement of ETC II
- Scope: Award contract to fabricate ETC II.
- Input: Proposals
- Deliverables: Contract
- Duration: 15d
- Responsibility: Tooling Design

1.2.2.2.3.4 Fabricate ETC II
- Scope: Fabricate ETC II.
- Input: Contract and Specifications
- Deliverables: ETC II
- Duration: 90d
- Responsibility: Tooling Design

1.2.2.2.3.5 Receive and Inspect ETC II

Scope:	Perform R&I of ETC II.
Input:	ETC II
Deliverables:	ETC II for line use
Duration:	15d
Responsibility:	Tooling Design

1.3.4 Qualification of Configurations not in the ETC

A determination was made as to what current configurations could be put into an ETC and those that operationally or logistically could not. The following configurations would not be put into an ETC: B53, W56, W79, B83 Center Case Assembly and B61 Center Case Assembly.

This section of the project plan describes the activities for those configurations not being put into an ETC. For those configurations, weapon responses will be requested for the environments they encounter and a qualification would be made as to the risk of transporting them without the protection of an ETC. Upon determination of the risk, any configurations with high risk would have additional controls applied.

The FY2001 deliverables for the BIO Upgrade for nuclear material are:

- Provide Configurations of Assemblies not in ETC for Weapon Response (TBD)
- Provide Weapon Response (TBD)
- Resolve High Risk Issues (TBD)

The specific tasks for qualification of configurations not in the ETC are as follows:

Note: The activity numbers correspond to the WBS number.

1.2.3 Configurations not in ETC

1.2.3.1 Provide Configurations of Assemblies not in ETC

Scope:	Provide Laboratories with the environments and configurations of weapons not in ETC.
Input:	ETC Design Criteria (From WBS 1.2.1.2.3)
Deliverables:	List of configurations not in ETC and bounding environments configurations will experience
Duration:	15d
Responsibility:	Transportation BIO Project Engineer

1.2.3.2 Provide Weapon Response for Configurations not in ETC

Scope:	Provide weapon response and credited design features of configurations of weapons not in ETC to the Transportation BIO Project Manager.
Input:	List of configurations not in ETC and bounding environments configurations will experience
Deliverables:	Weapon Response and Credited Design Features
Duration:	15d
Responsibility:	LLNL, LANL, Sandia

1.2.3.3 Resolve High Risk Issues

Scope:	For configurations above EGs, determine additional controls needed to reduce frequency of events. Incorporate into BIO.
Input:	Hazard Analysis
Deliverables:	Additional controls or recommendations to accept risk and BIO update
Duration:	45d
Responsibility:	Transportation BIO Project Manager

1.3.5 Incorporation of ETC and High Risk Controls into Operations

The implementation of the ETC and other controls will be accomplished through the development of a detailed implementation plan. The major activities involved in the implementation of the ETC are included below. The ETC will be implemented on a program by program basis until all configurations have been covered. The steps below will be repeated for each weapon program.

The FY2001 deliverables for the development of the implementation plan for nuclear material controls are:

- Develop Implementation Plan in accordance with IWAP (TBD)

The specific tasks for the ETC Project Plan are as follows:

Note: The activity numbers correspond to the WBS number. "X" in WBS indicates for each weapon program.

1.2.4 Incorporate ETC and High Risk Controls into Operations (Done by Weapons Program)

1.2.4.X.1 Revise Operations Documents

1.2.4.X.1.1 Revise AB Documents

Scope:	Revise Authorization Basis Documents (BIO, TSR, ABCD and HAR) to include ETC and new Controls
Input:	Revised Transportation BIO and Implementation Plan and Weapon Response (From 1.2.3.3)
Deliverables:	Revised AB Documents
Duration:	45d
Responsibility:	ABD&M Business Group Manager

1.2.4.X.1.2 Revise Procedures

Scope:	Revise Operations Procedures to include ETC and High Risk Controls
Input:	Revised Transportation BIO and Revised AB documents
Deliverables:	Revised Procedures
Duration:	60d
Responsibility:	Program Manager

1.2.4.X.1.3 Training Personnel

Scope:	Train personnel on revised procedures and new transportation controls
Input:	Revised Procedures
Deliverables:	Updated training matrix and training records
Duration:	15d
Responsibility:	Program Manager

1.2.4.X.2 Conduct Technical Assist Validation

Scope:	Conduct Technical Assist Validation to ensure controls are in procedures, personnel trained and equipment modifications meet BIO/TSR/ABCD requirements.
Input:	BIO, TSRs, ABCD, procedures and training records.
Deliverables:	Technical Assist Report
Duration:	30d
Responsibility:	Weapons Program Manager

1.2.4.X.3 Conduct Contractor Readiness Assessment

Scope:	Conduct Contractor Readiness Assessment to ensure controls are in procedures, personnel trained and equipment modifications meet BIO/TSR/ABCD requirements.
Input:	CRADs
Deliverables:	CRA Report
Duration:	30d
Responsibility:	Weapons Program Manager

1.2.4.X.4 Change Authorization Agreement

Scope:	Change Authorization Agreement to include update AB documents
Input:	List of Updated AB Documents
Deliverables:	Updated Authorization Agreement
Duration:	5d
Responsibility:	ABD&M Business Manager

1.2.4.X.5 Conduct NESS

Scope:	Conduct NESS on ETC and Transportation Controls
Input:	SIID
Deliverables:	NESS Report
Duration:	60d
Responsibility:	Operations Directorate

1.2.4.X.6 Conduct DOE Readiness Assessment

Scope:	Conduct Contractor Readiness Assessment to ensure controls are in procedures, personnel trained and equipment modifications meet BIO/TSR/ABCD requirements
Input:	CRA Report
Deliverables:	RA Report
Duration:	30d
Responsibility:	DOE

2. Project Costs

Project Costs will be incorporated into Phase II of the Preliminary Plan.

3. Risk Assessment

Project risks and mitigation strategies are identified in Table 3 below:

PROGRAM RISKS	*MITIGATION STRATEGY*	*RISK*
Some of the technical work involves the use of contractor supplied personnel. A decision to move personnel to another project would require retraining of replacement personnel.	*Although the loss of contractor personnel is not always in the control of MHC, efforts will be made for the subcontractor to notify ASAP about the personnel change and provide replacements as early as possible to start the retraining effort.*	*Low*
Nonstandard hazard analysis techniques would cause increased time in conducting hazard analysis.	*Most of the hazard analyses have been conducted on full-up units and it is not expected that new techniques will be used. If new techniques are required, MHC will provide that knowledge through the use of subcontractors.*	*Low*
Funding cutbacks could reduce effort.	*The project plan is designed and costed at each task. If reductions in funding are identified, DOE will be notified and approval obtained of scope changes.*	*Medium*
Implementation costs could exceed initial estimates.	*High cost items will be handled on a case by case basis. Change control will be handled as defined in the plan.*	*Medium*
Several tasks of the project plan are being done by agencies out of MHC control. The output of this work is usually the input of the next task. If tasks are not completed on time, the milestones could be delayed.	*The outside agencies of concern are National Laboratories and DOE. This project plan is being written to provide as much lead time as possible to task managers and get concurrence on the schedule and output. Additionally, MHC will work closely with outside agencies and report the result of delays as soon as they are known.*	*High*
The transportation cart design cannot support all design requirements.	*Submittal of design to DOE for approval would include residual risk estimates.*	*High*
Original schedules provided in the plan for the implementation of controls phase of the project are based on current knowledge. It is with certain surety that these initial implementation schedules will not be correct.	*Original schedules for implementation of controls were done for budget and scheduling purposes. The development of an implementation plan is included in the project and it will be incorporated into the plan when approved. This will allow NESSs and Readiness Assessments to be planned with greater accuracy.*	*High*

4. Project Control and Reporting

4.1 Change Control

Changes to any assumption defined in this plan will result in a change to the baseline of the plan. Change Control Requests will be submitted as necessary. Change approval authority for program and project activities is outlined in Table 4 below.

MILESTONE	*CHANGE APPROVAL AUTHORITY*
Level 1	*AAO - Scope/Milestones/Budget*
Level 2	*MHC Senior Technical Advisor - Scope/Milestones/Budget*
Level 3	*MHC Program Manager - Scope/Milestone/Budget*

Level 1 milestones are those which are tasks assigned to agencies outside the control of MHC. Level 2 milestones are those tasks, which are within MHC but outside the control of the MHC Program Manager. Those tasks within the control of the MHC Program Manager are Level 3 milestones. All changes to Level 1 scope, schedule and budget activities will be submitted to DOE and documented formally. Change requests will provide, at a minimum, a justification and impact to schedule, scope and/or budget. MHC will maintain a change control log which tracks and retains all levels of change requests (approved or not) to the project. No changes can be approved by one level, which affect a higher level milestone.

4.2 Reporting

Reports will be issued to the MHC Senior Technical Advisor by the 15th of the preceding month that provide the status of the project. The report will provide current status and issues. Variance reports will be issued whenever the following thresholds are exceeded:

- Cost variances of greater that 10% estimates
- Schedule variances of greater than 14 days to MHC controlled milestones
- Changes to scope as identified in the project plan

Project and/or program level emerging issues will be raised and discussed within the agenda of the existing biweekly AAO ABS and MHC interface meeting.

5.0 Project Schedules

5.1 Deliverables and Milestones

A summary of deliverables and milestones will be provided in Phase II of the Preliminary Plan.

5.2 Project Schedule

A project schedule will be provided in Phase II of the Preliminary Plan.

United States Government | Department of Energy

memorandum

Albuquerque Operations Office

DATE: OCT 27 2000

REPLY TO ATTN OF: WPD:SRS (505-845-4823)

SUBJECT: Flammable Solvent and Combustible Material Reduction Plan (DNFSB 98-2 Commitment 4.3.6)

TO: Benjamin Pellegrini, General Manager, Pantex Plant
John Browne, Director, Los Alamos National Laboratory
C. Paul Robinson, Director, Sandia National Laboratories
C. Bruce Tarter, Director, Lawrence Livermore National Laboratory

The Department is committed to systematically reducing the usage of flammable solvents and combustible materials used in proximity to and in nuclear explosive operations. As such, the Department had directed the Pantex Plant M&O contractor to defend the use of isopropyl alcohol for the W76 and W88. The initial support received by both the plant and laboratories to reduce or eliminate the use of isopropyl alcohol on the W76 is appreciated.

To ensure that our expectations are communicated and we succeed in this endeavor, attached is a Flammable Solvent and Combustible Material Reduction Plan. The plan is provided in two phases—Phase One for reduction or elimination of flammable solvents and combustible materials and Phase Two for substitution of flammable solvents.

In order to support the attached plan, I request that your respective agencies implement and report progress on this endeavor. Specifically, it is requested that your respective agencies provide the necessary support to evaluate whether reduction or elimination of the currently used flammable solvent(s) is feasible on all weapons systems during the Integrated Safety Process activities including Step 1 activities.

Although flammable solvent substitution is not implementable at this time, the Department would like your respective agencies to state the feasibility in pursuing the substitution of the currently used flammable solvent(s). Such a statement should include cost benefit analyses, testing, etc.

Your staff may direct any questions regarding the attached plan to Hector L. Chavez of my staff at 505-845- 5432, hchavez@doeal.gov, or Daniel E. Glenn, Manager, Amarillo Area Office at 806-477-3182, dglenn@pantex.doe.gov.

R. E. Glass
Manager

Attachment

cc: w/attachment:
See Page 2

cc: w/attachments
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Rob McKay, WPD, AL
Bill Mullen, WPD, AL
Patricia Berglund, WPD, AL
Gene Rodriguez, WPD, AL
Robert King, WPD, AL

U. S. Department of Energy

Flammable Solvent and Combustible Material Reduction Plan

Albuquerque Operations Office **20585**

As part of the Department's Defense Nuclear Facilities Board (DNFSB) 98-2 Implementation Plan, Revision 1, Commitment 4.3.6, this plan outlines actions to reduce the usage of flammable solvents and combustible materials.

Specifically, the referenced commitment states—
" Develop a plan to systematically reduce the usage of flammable solvents and combustible materials used in proximity to and in nuclear explosive operations through a risk-cost benefit assessment of solvent and combustible material elimination, minimization or substitution. The plan will require identification of operations where those flammable solvents and combustible materials used in proximity to and in nuclear explosive processes for two weapon programs on a trial basis. Based upon a risk-cost benefit assessment, the plan will then provide proposed actions that will need to be initiated to eliminate, minimize or substitute those flammable solvents and combustible materials."

As a result, the following actions are to be undertaken to support this plan:

Phase 1—Flammable Solvent and Combustible Material Elimination/Minimization

Each Project Team for weapon systems undergoing Integrated Safety Process (ISP) activities will identify where flammable solvent and combustible materials are used in the operation and evaluate whether these materials can be eliminated, minimized, or substituted in the operation.

1. During ISP for weapon systems, a safety criterion will be added to reduce the usage of flammable solvents and combustible materials. The Development and Production Manual (AL SD 56XB) Section 11, Chapter 11.1, will be revised and will identify the safety criterion. Through this criterion, the Project Team (Pantex Plant Management and Operating (M&O) contractor and responsible design laboratories) for weapon systems undergoing ISP activities will assess the usage of flammable solvents and combustible materials and promote the reduction of such material wherever possible. This chapter is under revision and has a planned publication by January 2001.

2. Until the Chapter 11.1 is formally published, the Pantex Plant M&O contractor and the responsible design laboratories are expected to pursue and support reduction of flammable solvents and combustible materials for weapon systems undergoing ISP. For example, the Department has required the Pantex Plant M&O contractor to defend the need to use alcohol in the presence of nuclear explosives for those steps currently identified in the W76 disassembly process. The Pantex Plant M&O contractor has identified 6 instances where isopropyl alcohol was eliminated through the use of a non-flammable cleaning agent and dry, cleaning material (reference B. J. Pelligrini, General Manager/D. E. Glenn, Area Manager, AAO, letter, Response to Condition of Approval #3 on Revision 1 of the W76 Program Authorization Basis Documents, dated June 15, 2000). For the W88, the Pantex Plant M&O contractor has committed themselves to enacting the same Condition of Approval (reference B. J. Pelligrini, General Manager/D. E. Glenn, Area Manager, AAO, letter, *Transmittal of Authorization Basis (AB) Change Proposal AB-99-0040-RI "W88 Safety Evaluation Report (SER) Revision*, dated April 13, 2000). We expect that further elimination of flammable solvents can be accomplished on future weapon systems undergoing ISP activities.

Phase 2—Solvent Substitution

A Sandia National Laboratory (SNL) Report, SAND20000-1084, Chemical Substitution for Nuclear Weapons Maintenance Operations – Phase I Report, has been issued to the DOE community. Through this report and based on favorable results of the testing activities conducted, SNL and Pantex M&O contractor representatives recommended Hypersolve npb as a replacement solvent for flammable solvents currently being used at Pantex.

1. The Standing Management Team (SMT) was asked to evaluate the results of the report to determine what, if any, further evaluations would be required to enact the recommended flammable solvent substitution. An assessment of the report would provide the SMT and the Department information to assess the feasibility of implementing and funding these activities to support the proposed flammable solvent substitution. It is expected that the SMT will qualitatively assess the outcome of these evaluations to ensure that cost/benefit objectives such as minimizing risks, maximizing achievement of mission objectives, and maximizing return on investment are met for this flammable solvent substitution (npb).

   The first interagency meeting among the Department, the laboratories, and the Pantex Plant M&O contractor was conducted on June 1, 2000. The path forward was to:
   - Identify a weapon system for each of the nuclear laboratories that can be used as a baseline process to introduce the flammable solvent substitution;
   - Identify for each selected weapon system those operations that would be impacted by the flammable solvent substitution;
   - Identify additional evaluations required to gain confidence that the flammable solvent substitution would not degrade quality or reliability of the weapon system – Los Alamos National Laboratory(LANL); Lawrence Livermore National Laboratory (LLNL), and SNL;
   - Identify required resources to complete the evaluations utilizing a qualitative risk-cost benefit assessment; and
   - Present this information to the SMT.

   On a trial basis, the Department has informally requested that the Pantex M&O contractor begin evaluating where flammable solvent can be further eliminated or substituted for the W87 and W76. Currently, the Pantex M&O contractor have developed matrices that propose where flammable solvent elimination or substitution may occur for the W76 and are planning to develop similar matrices for the W87.

   At this time, the laboratories do not endorse npb as an acceptable solvent substitution. Both LANL and LLNL require additional information on whether npb will adversely affect the reliability and quality of the weapon system and possibly affect the health of personnel when in use. SNL has stated that the risk to stockpile functionality and the cost to achieve acceptable confidence is high, and that the current process controls can mitigate safety concerns. SNL, however, did agree to examine the proposed testing matrices derived by LANL. LANL, LLNL, and the Pantex M&O contractor are working toward establishing what further testing requirements must be conducted to demonstrate that npb does not adversely affect the reliability and quality of the weapon system and to establish that there is no adverse impacts to health of personnel.

2. During the interagency meeting conducted on October 5, 2000, LANL, LLNL, SNL, and the Pantex Plant M&O Contractor did agree that chemical substitution initiatives should move forward in identifying a suitable candidate for substitution of flammable solvents. The

interagency representatives have agreed to develop a protocol for down-selecting possible future candidates for substitution of flammable solvents. These interagency representatives have also agreed that the proper personnel, resources and activities should be available to accomplish the effort in selecting a suitable candidate for substitution of flammable solvents.

The implementation and results of both Phase 1 and Phase 2 of this plan shall be formally documented and submitted to the Department for acceptance.