The Secretary of Energy
Washington, DC 20585

April 22, 1999

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

Dear Mr. Chairman:

We are pleased to forward the Department of Energy implementation plan for addressing the issues raised in the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 98-2, "SAFETY MANAGEMENT AT THE PANTEX PLANT." The DNFSB Recommendation 98-2 is consistent with the Department's focus on the Pantex Plant safety management enhancements in the development of the Pantex Plant integrated safety management system as part of the Department's implementation plan for the DNFSB Recommendation 95-2, "SAFETY MANAGEMENT."

We understand that the objective of Recommendation 98-2 is to strengthen and simplify the Pantex Plant safety management and work practices. The primary objectives of this implementation plan are to ensure practical and timely implementation of safety improvements and to better allow for tailoring of Seamless Safety-21 principles. The activities delineated in the plan should simplify and standardize activity level safety management practices and processes for all work involving nuclear explosives at the Pantex Plant.

Mr. Gene Ives, Deputy Assistant Secretary for Military Application and Stockpile Management, is the responsible manager for this implementation plan. Mr. Ives can be contacted at 202-586-4879.

Yours sincerely,

Bill Richardson

Bill Richardson

U. S. Department of Energy
Implementation Plan

For

Accelerating Safety Management Improvements at the Pantex Plant

(Board Recommendation 98-2)

Washington, DC **20585**

Executive Summary

On November 20, 1998, the Department of Energy (DOE) accepted Defense Nuclear Facilities Board (DNFSB) Recommendation 98-2. The Recommendation addresses the need to accelerate safety improvements for nuclear explosive operations conducted at the Pantex Plant. Recommendation 98-2 represents a combination of issues raised in prior DNFSB Recommendations (e.g., 95-2) and issues identified through more recent staff observations of Pantex activities. The actions undertaken through this Implementation Plan are aimed at simplifying and standardizing activity level safety management processes for all work involving nuclear explosives at the Pantex Plant. Overall, the objective of this plan is to ensure practical and timely implementation of safety improvements and tailoring of the Seamless Safety for the 21st Century principles.

The Department first undertook implementation of the process referred to as "Seamless Safety for the 21st Century" (SS-21) for all nuclear explosive operations at the Pantex Plant in 1993. During the past six years, the SS-21 process has evolved, but the fundamental objective remains the same: eliminate hazards in assembly, disassembly, and testing of nuclear explosives through process and tooling design. Other substantial benefits to be derived from SS-21 include operational controls derived from a systematic analysis of the hazards, and implementation of the operational controls through improved procedures written in a format more conducive to production technician understanding and adherence. The SS-21 process was applied to several older weapon programs being dismantled (e.g., W56), resulting in marked improvements in safety. However, application of the SS-21 process to achieve the same benefits for all ongoing nuclear explosive operations at Pantex has been slow. The Department intends to improve the rate of SS-21 implementation by taking the following actions.

- The Department will more fully define the safety management process for nuclear explosive operations. The Department has recognized the lack of detail or definition contained in current directives has led to varying approaches in applying SS-21 to different nuclear weapon systems. The varying approaches have led to inconsistencies in the rate of implementation and the level of success. In conjunction with improving the level of system definition, the Department will simplify key elements of the process. For example, the number and types of formal reviews required by the Department prior to authorizing startup of a nuclear explosive operation will be made consistent with the approach used throughout the complex for nuclear facilities. Similarly, the Department will implement a process for preparation, review, and approval of safety documentation associated with nuclear explosive operations that closely parallels the approach used throughout the complex for nuclear facilities.
- The Department will strengthen the role of line management throughout the process. As the ultimate performer of the work, the Pantex operating contractor will clearly be responsible for leading the project team to develop the assembly/disassembly process, analyze the hazards, derive the operational controls, and ensure all tasks have been completed prior to an independent readiness review by the Department. The contractor will identify and recruit the requisite levels of experience and technical competence to manage complex projects. The contractor will take compensatory measures to ensure effective project management while strengthening the experience and technical competence base.
- In conjunction with the change in project team leadership, the Department will greatly reduce reliance upon and formal prescription for "task teams" to accomplish the actions necessary to implement SS-21. The Department considers the role of the design agencies crucial to ensuring adequate safety has been incorporated into a nuclear explosive operation. However, the primary responsibility for integration of design laboratory input into a proposed nuclear explosive operation rests with the Pantex operating contractor.
- These actions will enable the Department to strengthen the accountability of the Pantex operating contractor. The Department's role will be to establish a well-defined scope of work, including the requirements and expectations for implementing the SS-21 process. This will be accomplished

through the actions described above and an Integrated Weapons Activity Plan (IWAP). Once these requirements and expectations are established, the Department's role will be to oversee and integrate the work of the Pantex operating contractor with that of the contractors at the other nuclear weapon sites, shifting workload requirements, resources, or priorities where warranted. The Department recently established a Standing Management Team (SMT) consisting of senior managers within DOE, the Pantex operating contractor, and the design agencies. The SMT will serve in an advisory capacity to assist the Department in establishing balanced priorities within the IWAP.

- Line management will upgrade the quality of hazard analyses and operational controls for nuclear explosive operations at Pantex in a structured, integrated fashion. The operational controls currently contained in the Critical Safety Systems Manual (CSSM) and the Pantex Basis for Interim Operation (BIO) will be converted to Technical Safety Requirements (TSR), consistent in format and content with TSR used at other nuclear facilities within the complex. The hazard analyses serving as the technical foundation for the BIO will be upgraded through topical modules affecting multiple weapon systems and facilities (e.g., transportation, lightning protection). To augment the controls derived from the BIO, a hazard analysis report (HAR) will be developed for each specific weapon system. The scope of each HAR will encompass the full range of operations performed at Pantex for the weapon system. The HAR will build upon the analytical work contained in the BIO to form an integrated technical basis for operational controls. The focus of the HAR will be a systematic analysis of the assembly, disassembly, or testing process proposed for an individual weapon system. The HAR will incorporate key weapon response information provided by the cognizant design agencies. The operational controls derived from the HAR will be developed into TSR and contained in an activity based control document (ABCD). The controls in the ABCD (weapon-specific TSR), combined with the controls derived from the BIO (facility-specific TSR, or TSR applicable to multiple weapon programs), constitute the complete set of controls necessary to safely perform the work. The BIO, TSR, HAR, and ABCD will be developed by the Pantex operating contractor and will be approved by the Department. Once approved, these documents will constitute the authorization basis for nuclear explosive operations at Pantex. The Unreviewed Safety Question (USQ) process will be used to evaluate proposed changes, consistent with the approach used at other nuclear facilities within the complex.

- The Pantex operating contractor will identify and recruit the requisite levels of experience and technical competence to prepare high-quality authorization basis documents, on the accelerated schedule envisioned in the IWAP. The Department will identify and recruit the requisite levels of experience and technical competence to effectively review these documents. The objective of these staffing actions is to ensure the contractor and Department technical staffs have the capacity and capability to achieve the expected quality level for safety documents, on the planned schedule.

- The Department has altered the timing of nuclear explosive safety (NES) studies to occur after line management has performed a systematic hazard analysis and derived the operational controls. Master studies were historically structured to evaluate generic issues affecting multiple weapon systems (e.g., transportation). While preserving the same intent, the scope of future master studies has been aligned consistent with the scope of the upgraded BIO modules. Similarly, program studies will be performed after development of a HAR and ABCD for a given weapon system. In this manner, the NES review can serve the proper role of an independent review. The NES review will identify any NES deficiencies or shortcomings in the hazard analysis and operational controls, neither proposing nor dictating remedies. The NES review findings will be resolved by line management through modification of the hazard analysis or set of controls, as appropriate.

- The structure and membership of the nuclear explosive safety study group (NESSG) will be examined and the training and qualification requirements strengthened. The Department will

evaluate several models for NESSG structure and membership, including the Advisory Committee on Reactor Safeguards (ACRS) model used in the commercial nuclear industry.

- Review of proposed changes by nuclear explosive safety personnel will be integrated into the change control processes used by line management. As described above, for nuclear explosive operations having a HAR and ABCD, the Department will use the USQ process to evaluate proposed changes. For operations not yet having a HAR and ABCD, the Department will modify the change evaluation process currently used for nuclear explosive safety to ensure line management has reviewed and endorses a proposed change prior to seeking independent review. The change evaluation process relative to nuclear explosive safety will use criterion that allow tailoring of the review, commensurate with the scope of the proposed change and its relative effect on nuclear explosive safety.

- In developing this implementation plan, the Department worked with the Pantex operating contractor to also identify actions they can undertake to improve the rate and efficiency of SS-21 implementation. These are actions that require limited involvement by the Department and tend to be fully within the control of the operating contractor. The primary role of the Department will be to review contractor progress in completing these actions and to gauge their relative effectiveness in improving the rate of SS-21 implementation. The Pantex operating contractor plans to take the following actions.

  - A plant standard will be developed which defines the roles and responsibilities of the project team leader and other members of the project team (hazard analyst, tooling engineer, procedure writer, etc.). The contractor will complete job task analysis and modify job descriptions to ensure these roles and responsibilities are considered in recruitment and selection processes. Training will be provided on roles and responsibilities, the process/procedures to be used, and product expectations in order to strengthen the skills of the project team. In conjunction with these efforts, the processes for tooling development and procedure development will be revised.

  - Concurrent engineering and activity based tooling concepts will be applied to: (a) enable early iteration of process and tooling development with hazard analysis, (b) reduce non-productive time, and (c) improve the first time quality of products. Actions will be taken to reduce tooling development and procurement cycle times, and increase the transfer of common tooling concepts and hardware across multiple weapon systems. Technical writers will have an increased role in developing procedures with an expectation for fundamental understanding of the proposed process.

  - A task force will define a comprehensive list of AB documents for each Pantex activity, develop format and content guides consistent with Departmental directives for all AB documents, develop an integrated change control process for AB documents, and establish AB training and qualification programs for plant personnel.

In conjunction with the actions planned by the Department to further define and simplify the safety management process for nuclear explosive operations, these actions should enhance the ability of the operating contractor to execute its primary responsibility for safety. The Department will closely review the effectiveness of the actions identified in this implementation plan as they are completed. The Department plans a comprehensive review upon completion of all actions to gauge our success and to serve as basis for recommending formal closure of the Recommendation.

This Implementation Plan is organized into seven sets of commitments:

1. Implement Effective Management Structure
2. Streamline Process and Tooling Development, and Improve Transfer of Safety Improvements
3. Improve Authorization Basis Structure and Approval Process
4. Streamline Review Processes and Ensure Proper Roles for Reviewers
5. Enhance NES Review Group Stature and Continuity
6. Improve Integration of NEO and ISM Initiatives
7. W62 Specific Recommendation

Figure 1 depicts the simplified process, identifying functions that will be modified or improved as a result of commitments within this implementation plan.

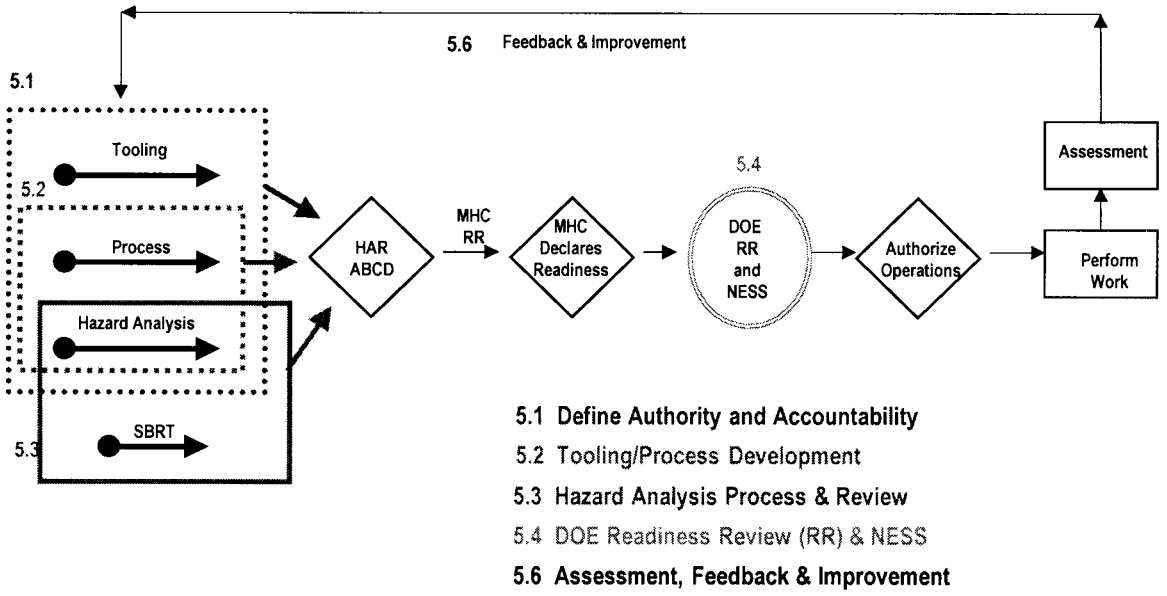
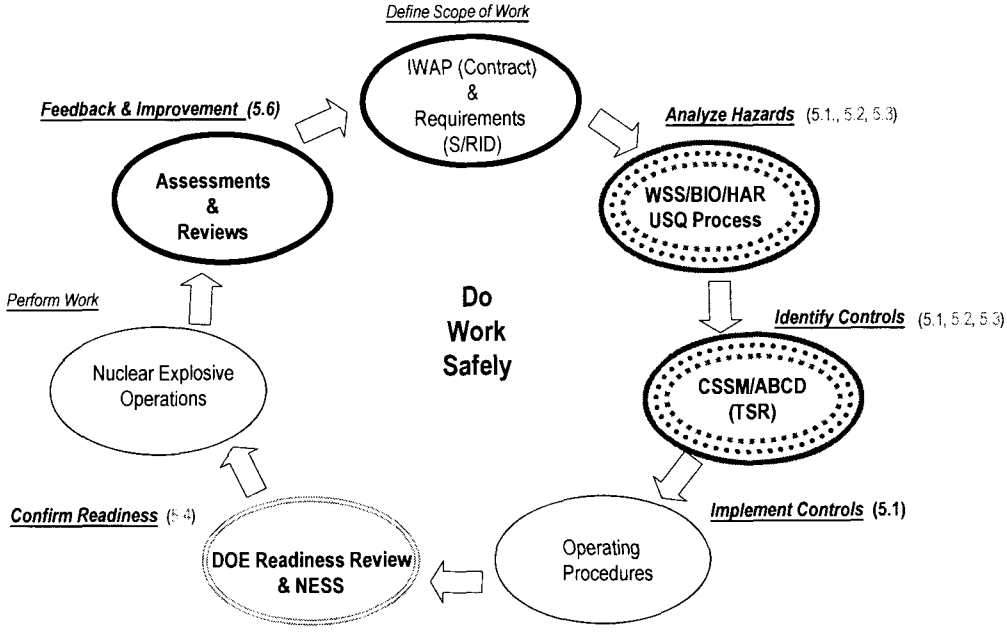


Figure 2 depicts the correlation of the implementation plan actions to the Pantex integrated safety management (ISM) model. The Pantex ISM model is based directly on the DOE 5-function model presented in the 95-2 Implementation Plan. The additional steps in the model are intended to focus attention on areas needing improvement.



5.1 Define Authority & Accountability
5.2 Tooling/Process Development
5.3 Hazard Analysis Process & Review
5.4 DOE Readiness Review (RR) & NESS
5.6 Assessment, Feedback & Improvement

Table of Contents

1.0 Background

Over the past six years, the Defense Nuclear Facilities Safety Board (hereafter referred to as "the Board") has transmitted a number of formal recommendations and observations to the Department of Energy (hereafter referred to as "the Department") related to the safety of nuclear explosive operations at the Pantex Plant. In some instances, the Board provided broad recommendations applicable to multiple sites within the Department (e.g., Recommendation 95-2). In other cases, the recommendations or observations were more directly related to nuclear explosive operations conducted at the Pantex Plant.

Appendix B, "Historical View: DNFSB Recommendations and Letters," discusses some of the prior Board recommendations and summarizes observations transmitted through correspondence to the Department during the past three years. These recommendations and observations provide insight to the "genesis" of DNFSB Recommendation 98-2 (hereafter referred to as "Recommendation 98-2" or "the Recommendation").

Recommendation 98-2 describes actions the Board considers necessary to improve the safety of nuclear explosive operations conducted at the Pantex Plant. The Board recommended:

1. *"A practice be instituted that delivers the principle benefits now sought from the SS-21 process, but that promises to consume less time and resources. Use of this practice should start as soon as possible for all activities involving nuclear explosives at the Pantex Plan and the W62 activities in particular. To the extent possible, the Nuclear Explosive Safety Study in this practice should include reevaluation of the basis for and the current validity of previous safety judgments in light of new understandings and expectations.*
2. *An administrative process be instituted, similar to the Unreviewed Safety Question process used elsewhere by DOE, that would offer to tailor the nuclear explosive safety process when a change is proposed in tooling, procedures, etc. that would enhance safety assurance. This should permit enabling improved safety measures developed for operations with one weapons system to be used (if appropriate) for another weapons system without the need for a new nuclear explosive safety study.*
3. *Practices for developing the authorization basis and associated control measures for an operation at Pantex be refined to ensure that the Pantex contractor assumes the position of the organization issuing the documentation and operational plan for operations at Pantex, and defending them before external review groups.*
4. *Instructions be issued that formal safety reviews by NESS groups should consider proposals for actions which have been made by the organization that will do the work and should advise as to perceived shortcomings but should not be empowered to dictate specific remedies. If a proposed action is not found by the independent review group to be acceptably safe, the organization making the proposal can always be requested to put forward an alternative for consideration.*
5. *DOE establish a standing committee of NESS reviewers to replace the ad hoc groups now used; the membership of this body being centered on individuals of emeritus status with experience and proven stature in the nuclear weapons field. This body would be expected to conduct the safety reviews of the future.*
6. *Work planning/safety planning processes for operations with nuclear explosives at the Pantex Plant be organized and pursued as linked components of Integrated Safety Management on the lines of implementation of the Board's Recommendation 95-2."*

2.0 Underlying Causes

The Department's assessment of the underlying causes is consistent with the Board's discussion in Recommendation 98-2.

- The SS-21 process has delivered concepts, tooling and procedures that vastly improve the safety of nuclear explosive operations. Implementation time has been too long and the cost too high.
- The change control process related to operations involving nuclear explosives has been solely reliant upon the nuclear explosive safety community to determine the relative safety merits of a proposed change in lieu of line management. The criterion used to evaluate proposed changes has been subjective with little latitude and authority provided to the Pantex Plant operating contractor to implement changes.
- Efforts to develop line-management accountability within Pantex Operating Contractor, as well as the Department, are moving in the right direction, although at an undesirably slow pace. These line organizations have relied too heavily on the nuclear explosive safety and risk assessment communities in the recent past, and they must take ownership for hazard analyses serving as the technical basis for operational controls. The organizational roles and responsibilities for hazard analyses and development of operational controls for weapon activities have not been clearly delineated in directive documents.
- The scope of NES reviews required have not been appropriately tailored and the expectations formally delineated for specific operations. NES reviews should evaluate the adequacy of processes and the safety basis established by line management, and develop an independent assessment of whether the proposed process is safe enough. Line management should resolve any deficiencies noted, or elevate issues to senior management for resolution.
- The qualified NES community is reaching retirement age. There needs to be a disciplined and structured process at each member agency to develop, train, and certify new NES members to fully support the future workload requirements. This process must also include requirements to assure continuous qualification and training.
- The Department has not clearly defined all of the elements for an integrated safety management process for nuclear explosive operations. This includes definition of organizational roles and responsibilities, adequate definition of the scope of work, and clear identification of the standards and criteria.
- As programmatic requirements have become more complex, the Department and the Pantex operating contractor did not recognize the need to enhance project management skills and organizational authorities to ensure capabilities match requirements. In addition, the Department and the contractor have not increased the technical staff performing authorization basis work to match the requirements of the increased workload associated with the transition to authorization basis documents meeting the expectations of DOE Orders.

3.0 Baseline Assumptions

The Department made the following assumptions in developing this Implementation Plan:

- The Department has an obligation to national security to support the enduring stockpile. In addition, the Department has made substantial investments in the programs to dismantle W56 and W79 units. The Department intends to meet its national security obligations and also protect the investment made in the programs to dismantle W56 and W79 units. The Department will maintain both programs active, provided the Department remains confident that the work is being conducted safely. The Department will continue to balance the priority of these programs against

desired process and safety analysis improvements. The Department believes continued dismantlement of older weapon systems improves to the overall safety posture for the weapons program.

- This Implementation Plan establishes commitments to institutionalize improved safety management processes. The Department will manage these commitments in accordance with the processes described in Section 6.2. This implementation plan also refers to schedules for implementation of SS-21 processes for specific weapon systems and improving hazard analysis and controls for all weapon systems.

4.0 Summary of Completed and Near-Term Actions

The Department has recognized the need for effective leadership in setting priorities, defining work scope detail, controlling changes to scope, and making the judgments about when a task reaches the point of diminishing return for the effort invested. The Department has also recognized the responsibility for various aspects of nuclear explosive operations vested in different organizations are not adequately defined. The Department is redefining these roles to ensure the Pantex operating contractor is responsible for site operations and the associated safety analysis, the design agencies are responsible for evaluation of weapon design and response, and the Department is responsible for risk acceptance decisions.

The Department did not have an effective mechanism in place to enable leadership of this multi-organizational effort. To address this need, the Department established a Standing Management Team (SMT) consisting of senior managers from DOE, the design agencies, and the Pantex operating contractor. The intent is for representatives from the laboratories and operating contractor to serve both as advisors and as representatives to provide institutional commitments on behalf of their organizations. The Chairman of the SMT is the Director, Weapon Programs Division (WPD). The Co-Chairman is the Area Manager, Amarillo Area Office (AAO). The SMT is designed to provide the DOE line managers (WPD Director for weapon processes, AAO Area Manager for site operations) with a mechanism to execute their line management responsibilities for both safety and balanced priorities. The SMT Charter was codified through issuance of D&P Manual (AL SD 56XB) Chapter 11.1 on March 10, 1999.

The primary objectives of the SMT include achieving substantial improvements in planning, prioritization and execution of nuclear explosive operations at the Pantex Plant. The Department, using SMT input, has developed an Integrated Weapons Activity Plan (IWAP) as a tool to improve the planning and prioritization aspects of these objectives, as well as to accomplish a number of other internal objectives. Expectations for the IWAP were codified through issuance of D&P Manual Chapter 11.2 on March 10, 1999.

The IWAP consists of project plans for each BIO upgrade activity and each weapon process improvement activity, in addition to a resource loaded schedule defining when these improvement initiatives will complete. The Department will use the IWAP project plans to set clear expectations for each improvement initiative early in the development process, and obtain organizational commitments to these expectations from the weapons laboratories and the Pantex contractor through the SMT. The Department expects each SMT member to ensure tasks are not modified unless submitted through a formal change control process.

The Department will use the IWAP schedule to establish the priority of improvement initiatives. The Department will sequence weapon process tasks using a model based on the type of high explosive in the weapon, the level of intrusion of the work, and the quantity or frequency of the work. The Department will also sequence facility authorization basis tasks, with those tasks providing the largest potential safety improvements scheduled earliest. The Department is using the IWAP to identify

resource conflicts for these tasks, and the SMT Chair and Co-Chair will make judgements on which work to complete first.

The Department has also restructured the review process for HAR and ABCD development. The review team now works directly for the approval authority (i.e., Director, WPD). This approach enables the approval authority to provide timely direction and guidance to the review team, and to quickly resolve professional differences of opinion between the document developers and the reviewers. This approach is also intended to provide continuity and build upon lessons learned through each development and review process. The product of the review is a Safety Evaluation Report (SER). D&P Chapter 11.4, "Authorization Basis for Pantex Plant Nuclear Explosive Operations" has been completed and submitted for publication review.

A Nuclear Explosive Safety (NES) Study Effectiveness Workshop was held at DOE-AL in May 1998. DP-20 also commissioned an independent assessment regarding effectiveness of the NES review processes. As a result of these efforts, a number of focus areas were identified and are in various stages of being addressed by the Department. DOE-AL has consolidated these focus areas as individual tasks in the *"NES Initiative Project Plan"*, issued January 6, 1999. The commitments described in Section 5 represent an extension or modification to actions the Department had planned or were underway as part of the *"NES Initiative Project Plan."*

Department of Energy Acquisition Regulations, {48 CFR 970.5204-2, "Integration of environment, safety, and health into work planning and execution"} require the Pantex Plant operating contractor to submit documentation of its safety management system for review and approval. The Department conducted a review between July 27 and August 29, 1998, as documented in *"Integrated Safety Management System Verification – Phase I & II, Final Report for Pantex Plant, October 1998."*

The ISMSV review confirmed the Department's conclusion that the process for integration of safety into nuclear explosive operations at Pantex has been inefficient. Organizational roles and responsibilities have not been fully established to enable clear understanding and result in an integrated effort among the department, the design agencies, and the Pantex operating contractor.

The Department and the Pantex operating contractor have developed corrective actions to address the recommendations stemming from the ISMSV review. A number of the corrective actions relate to issues identified in the Recommendation and have been included as formal commitments in Section 5.

5.0 Safety Issue Resolution

The actions defined in this section are designed to obtain the benefits of SS-21 faster, with less money and fewer people. However, the Department recognizes the need to increase staffing and capability for critical skills as an essential element of the plan to reduce the number of people and the amount of time. By investing the additional resources into doing the project management and safety analysis work right the first time, the Department can and will reduce the overall cost and duration of the projects. If the staffing actions defined in section 5.8 are not accomplished successfully, the remaining commitments in the Implementation Plan will not be sufficient to accomplish the overall objectives.

To achieve the benefits of SS-21 faster, with less money and fewer people:

- The Department will replace the management model defined in Engineering Procedure (EP) 401110 with a streamlined management structure that eliminates multiple groups and committees, creates a short and well defined chain of line management authority and accountability, and significantly reduces the complexity of making decisions on operational

and safety issues. The end-state vision associated with this management structure change and the actions to achieve the end-state are defined in Section 5.1.

- The Department will work with the Pantex operating contractor to simplify concept development for processes and tooling, design and procurement for tooling and equipment, and requirements for transfer of safety improvements among various programs. The end-state vision associated with these changes and the actions to achieve the end-state are defined in Section 5.2.
- The Department will work with the Pantex operating contractor and the design agencies to simplify hazard analysis and control development for new and existing processes. The end-state vision associated with these changes and the actions to achieve the end-state are defined in Section 5.3.
- The Department will streamline the review processes associated with nuclear explosive operations, and ensure the integrity of the review processes are maintained by clearly separating line management authority to establish controls or determine actions from the reviewers' obligation to evaluate the adequacy of the proposed controls or actions. The end-state vision associated with these changes and the actions to achieve the end-state are defined in Section 5.4.
- The Department will enhance the stature and continuity of individuals who perform the independent evaluation of adequacy for nuclear explosive operations. The end-state vision associated with these changes and the actions to achieve the end-state are defined in Section 5.5.
- The Department will improve the integration of initiatives to enhance processes associated with nuclear explosive operations with initiatives to develop and implement the Pantex Plant Integrated Safety Management (ISM) System. The end-state vision associated with this changes and the actions to achieve the end-state are defined in Section 5.6.
- The Department will address other specific issues raised by the Board in the Recommendation. Actions to address these specific issues are discussed in Section 5.7.
- The Department will augment the technical staff at the Pantex operating contractor and affected DOE offices to ensure the capability exists to accomplish the program management, hazard analysis preparation and hazard analysis review tasks on the accelerated schedule envisioned in the IWAP. Actions to address these staffing concerns are discussed in Section 5.8.

5.1 Implement Effective Management Structure

End-State Vision

The Department needs to make several changes to organizational roles in order to achieve clear definition of authority for development of processes at Pantex, and preparation of the safety documents for these processes:

The WPD Program Managers will define what work must be done on a specific weapon system and when the work is needed. The Program Manager will provide direction to the Pantex operating contractor through the AAO Manager.

The WPD Director will define safety improvements associated with weapon processes at Pantex and set priorities among those. The AAO Manager will establish BIO upgrade expectations. The WPD Director and the AAO Manager will set these expectations within the IWAP program plans and schedules, acting with the advice of the Standing Management Team (SMT). The AAO Manager will issue the final program plans as contractual expectations for the operating contractor.

The Pantex operating contractor will manage Project Teams with the requisite authority and resources for successful process development, preparation of safety basis documents, and other activities related to Pantex operations. The operating contractor will have the authority to organize the Project Team work as needed to be effective.

Resolution Approach

The WPD Program Manager's are currently assigned the role to establish the work scope and schedule needs for their weapon systems. The Program Managers have performed this role in the past by providing direction to the WPD Project Team Lead. With transfer of the Project Team Lead role to the Pantex operating contractor, the Program Manager's role will be revised to provide direction on the work scope and schedule needs to the operating contractor management, through the AAO Manager as appropriate. In turn, the Project Team Lead must be able to provide, and report against, program plans with sufficient detail on scope, schedule, and resources to allow confidence that the program plan is well defined and is being successfully executed. The Department's expectations for the relationship among the WPD Program Managers, the Pantex operating contractor management and the Project Team Lead will be defined in Revision 1 to D&P Manual Chapter 11.1.

The roles of the WPD Director and AAO Manager in setting and managing expectations are defined in D&P Manual Chapter 11.1. However, a number of actions must be completed in the near term to achieve the SMT objectives of setting clear expectations for Pantex operational requirements for each program.

With the advice of the SMT, the WPD Director must:

- Approve project plans for each weapon system that clearly define expectations for process development and hazard analysis for each weapon program,
- Resolve resource conflicts as a result of weapon system priorities for approved project plans, and
- Approve the schedule for accomplishment of the weapon process and authorization basis improvements.

With the advice of the SMT, the AAO Manager must:

- Concur on Pantex operating contractor developed project plans for each weapon system.
- Approve project plans for initiatives to upgrade the Pantex facility authorization basis,
- Ensure project plans milestones and deliverables are within the contract scope of work,
- Resolve resource conflicts for initiatives to improve the facility authorization basis, and
- Ensure contract performance measures are revised to emphasize IWAP initiatives.

The WPD Director and AAO Manager must use all appropriate tools to resolve the resource conflicts, including management of scope, reallocation of funding and reassignment of people from other tasks, and adjustment of schedules.

A number of actions are needed to accomplish an orderly transition of Project Team leadership role to MHC:

- The correct roles of the Pantex operating contractor staff must be defined to ensure the assigned Project Team Lead is accountable to the contractor management for the success of the program. In this way, the contractor management will be directly accountable to the Department management for program success.
- The Pantex operating contractor must establish a breadth of authority for the Project Team Lead that provides high confidence in the ultimate success of the program.

- The Department must clearly define the roles of the DOE Project Team members as solving problems for and monitoring the performance of the Project Team, but not directing the work of the Project Team.
- The design agencies must clearly define the roles for design agency members of the Project Team as providing service to the Project Team Lead for support needed by the Team (weapon response analysis), and as having the authority and accountability for the adequacy of other work done by design agencies.

The management structure defined in EP401110 that creates multiple task teams working for the Project Team will be revised to provide a clear definition of the authority and accountability of the Pantex operating contractor and the Project Team Lead. The authorities assigned to the operating contractor will include the ability to determine the management approach most likely to achieve success. The EP401110 will be revised as described and converted into Technical Business Practice (901).

Deliverables/Milestones

Commitment 5.1.1:	Revise MHC internal documents to reflect the Project Team Lead breadth of authority, and accountability to the operating contractor management.
Lead Responsibility:	AAO Area Manager with MHC General Manager
Deliverable:	Issue Plant Standard 7401 and update Plant Standard 7403.
Due Date(s):	May 1999

Commitment 5.1.2:	Redefine roles for Project Team members and expected relationship among DOE Program Managers, the Pantex operating contractor, and the Project Team,
Lead Responsibility:	WPD Director
Deliverable:	Issue D&P Manual Chapter 11.1, Rev 1.
Due Date(s):	June 1999

Commitment 5.1.3:	Replace EP 401110 with TBP 901 to define roles of design agency Project Team members and to eliminate mandated sub-teams.
Lead Responsibility:	WPD Director
Deliverable:	Issue TBP 901.
Due Date(s):	August 1999

Commitment 5.1.4:	Issue project plans with improved project definitions for each weapon program and BIO improvement initiative. Resolve scope and resource conflicts. Issue schedule for Pantex operational improvement initiatives.
Lead Responsibility:	Director, WPD
Deliverable:	Project plans and schedules
Due Date(s):	June 1999 The Department will continue to update both the project plans and schedules, and will provide copies to the Board.

5.2 Streamline Process and Tooling Development, and Improve Transfer of Safety Improvements

End-State Vision

The Department will revise the SS-21 process requirements as needed to eliminate the mandatory structure of functional sub-teams.

The Pantex operating contractor will implement concurrent engineering and activity based tooling concepts to:

- Streamline process and tooling development,
- Improve integration of hazard analysis with process and tooling development, and
- Reduce non-productive time in the process and tooling development, and
- Improve the first time quality of these development efforts.

The Pantex operating contractor will reduce the cycle time for tooling development, procurement and authorization, and improve transfer of tooling improvements among programs.

Resolution Approach

The Department will issue D&P Manual Chapter 11.3 setting the high level expectations for SS-21. Sandia National Laboratory will facilitate development of TBP 901 to replace EP401110. These documents will improve the definition of expectations for SS-21 by incorporating experience of using EP401110 for several years, but they will not mandate use of functional sub-teams.

Under the Pantex operating contractor direction, the Project Team will be expected to begin HAR work using tooling concepts and drawings instead of waiting for finished tooling to start the analysis. A continuous feedback process to update analysis work as the tooling matures will be required. Similarly, concurrent engineering principles will require a collaboration effort in HAR and procedure development to ensure the program engineers, tooling engineers, risk management specialists and Design Agency representatives concur early in the project. Concurrent involvement of manufacturing line personnel will provide the linkage from concept to floor activity. The Pantex operating contractor will also implement activity based tooling design, multi-program use tooling and built-in reviews to further streamline the SS-21 process.

The Pantex operating contractor will:

- Move key personnel to institute built-in review processes,
- Assess Activity Based Tooling Design impacts to IWAP and modify associated plant documentation prior to training on the new procedures,
- Conduct staffing analysis on the number of teams and impacts associated with concurrent engineering prior to identifying a pilot program and implementing for other weapons programs,
- Revise project manager training matrices for risk management, authorization basis, readiness process and concurrent engineering personnel,
- Train Project Team Leads on roles, responsibilities and expectations,
- Increase Project Team Lead oversight within MHC management,
- Develop Plans of Instruction for risk management, authorization basis, concurrent engineering and readiness process courses,
- Increase the project management experience base among Project Team Leads, and
- Increase the weapons experience base in the Project Team Lead cadre.

In addition, the Pantex operating contractor will simplify tooling design, procurement, evaluation and authorization processes.

Deliverables/Milestones

Commitment 5.2.1:	Issue updated definition of DOE expectations for SS-21 and laboratory/contractor implementation guidance.
Lead Responsibility:	Director, WPD
Deliverable:	1. Issue D&P Manual Chapter 11.3. 2. Issue TBP 901.
Due Date(s):	1. April 1999 2. August 1999

Commitment 5.2.2:	Implement concurrent engineering, activity based tooling design, multiple program-use tooling and improved built-in review processes.
Lead Responsibility:	AAO Manager with MHC General Manager
Deliverable:	Modify associated plant documents to meet the new TBP 901 standards.
Due Date(s):	November 1999

Commitment 5.2.3:	Complete an assessment of Pantex practices for tooling design, tooling procurement and procedure development. Issue a report with recommendations and implement adopted actions.
Lead Responsibility:	Area Manager, AAO
Deliverable(s):	1. Review report with recommendations. 2. Implement process improvements.
Due Date(s):	1. May 1999 2. August 1999

5.3 Improve Authorization Basis Structure and Approval Process

End-State Vision

For nuclear explosive operations, the Department has defined expectations for authorization basis documents in DOE Order 452.2, DOE Standard 3016-99, and AL SD 56XB (D&P Manual Chapter 11.4, upon publication). These documents provide substantially improved clarity in the definition of the objectives for each authorization basis document.

The actions discussed in 5.1 above will establish clear authority with the Pantex operating contractor for preparation and defense of all Pantex authorization basis documents. The Pantex operating contractor will develop a standards based process for development of facility and activity specific controls, tailored to the hazards involved. This process will flow down from Department standards and directives, and it will integrate all Pantex authorization basis work. The defined framework will cover all authorization basis tasks: development, management approval, and recommendation for Department approval, implementation, readiness evaluation and maintenance.

For nuclear explosive operations having a HAR and ABCD, the Department will use the USQ process to evaluate proposed changes. For operations not yet having a HAR and ABCD, the Department will modify the change evaluation process currently used for nuclear explosive safety to ensure line management has reviewed and endorses a proposed change prior to seeking independent review. Where the HAR and ABCD are not yet in place, the change control process will be structured to accomplish the same objectives as the USQ. This process will take into account the lack of

authorization basis documents against which to judge incremental increase in risk or whether the proposed change represents a hazard not previously analyzed. These expectations will be established initially in Revision 1 to D&P Manual Chapter 11.4.

In addition, recent practices have evolved to where project teams "ask the NESS" to decide whether it is safe enough to make a proposed change. DOE-AL Supplemental Directive 452.2A will also establish clear expectations for a line management determination that a proposed change is programmatically needed, is within the approved authorization basis (in the form it currently exists), and is safe enough using a USQ-like decision process. The Department will continue to screen changes to nuclear explosive operations through a NES change evaluation process, after line management establishes the basis for why the change in acceptable, to provide a safety net that could possibly have nuclear explosive safety implications.

The Department will establish technical capability and delegate authority as needed to allow operating contractor recommendations on the authorization basis documents to be submitted directly to the Department approval authority. The Project Team will develop the documents and defend their adequacy to contractor management. Once the contractor management determines the documents are technically acceptable, they will recommend approval directly to AAO or WPD, as appropriate.

Resolution Approach

To ensure transition to contractor leadership is successful, the operating contractor has formed an Authorization Basis Task Force to evaluate problems associated with authorization basis work for nuclear explosive operations. The Task Force will generate an evaluation report, with recommendations. Contractor management will develop a focused action plan to correct weaknesses. Based on preliminary reviews, the Task Force deliverables will include:

- A comprehensive list of authorization and safety basis documents,
- Form and content guides for all authorization basis documents, as defined in D&P Manual Chapter 11.4, prepared by the operating contractor,
- An integrated authorization basis change control and unreviewed safety question program, and
- Authorization basis training and qualification programs for risk analysts, Project Team members, reviewers and the plant population.

The Department will issue a revision to D&P Manual Chapter 11.4 defining expectations for change control activities on programs that do not have an implemented HAR and ABCD. This Chapter will reinforce the existing requirement for use of the USQ process defined in DOE Order 5480.21. The will also issue AL SD 452.2 to establish DOE expectations for line management in the change control activities. The Department will combine these requirements into one manual in the future, but is attempting to first implement these expectations in documents that already address the topics. This approach is in response to previous lessons learned that addressing the same topic in different documents leads to more confusion than clarity.

As discussed in section 4.0, the Department changed the process used for independent evaluation of contractor proposed authorization basis documents. The Department will evaluate the effectiveness of the new review approach for both weapon process and facility authorization basis documents.

Deliverables/Milestones

Commitment 5.3.1:	Complete Task Force and Management Action Plan.
Lead Responsibility:	Area Manager, AAO with MHC General Manager
Deliverable:	1. Task Force Report 2. Action Plan 3. Action Complete
Due Date(s):	1. May 1999 2. June 1999 3. August 1999

Commitment 5.3.2:	Issue AL SD 452.2A to establish the line management role (see 5.4) in change control activities. Revise D&P Manual Chapter 11.4 with expectations for 'USQ' process.
Lead Responsibility:	Director, WPD
Deliverable:	1. Issue AL SD 452.2A 2. Revise D&P Manual Chapter 11.4 3. Combine requirements in one manual.
Due Date(s):	1. June 1999 2. July 1999 3. April 2000

Commitment 5.3.3:	Assess effectiveness of review process for proposed authorization basis documents.
Lead Responsibility:	1. Director, WPD 2. Manager, AAO
Deliverable:	1. Assessment for review of W88 HAR. 2. Assessment for review of transportation BIO upgrade.
Due Date(s):	1. November 1999 2. November 1999

5.4 Streamline Review Processes and Ensure Proper Roles for Reviewers

End-State Vision

The Department has reduced the number of independent reviews conducted for nuclear explosive operations to four. These reviews are the DOE review of proposed authorization basis documents, the contractor readiness review (DOE Order 425.1), the DOE readiness review (also DOE Order 425.1), and the Nuclear Explosive Safety (NES) review. The Department will approve authorization basis documents based on a recommendation from the Pantex operating contractor and an independent assessment of adequacy performed by a safety basis review team. Once DOE approves the controls, the contractor will have time to complete implementation and conduct the contractor readiness review. The contractor will declare readiness for external review after resolution plans are in place for findings from the contractor readiness review. The Department will then conduct the NES and DOE readiness reviews.

The NES and DOE readiness reviews will be performed at the same time with coordination among the reviews. The purpose of the readiness review will be the same as defined in DOE Order 425.1, which is to validate the DOE approved controls are effectively implemented. The Office of Safety and Security (DOE-AL) will lead the readiness review. The purpose of the NES is to question whether the

proposed operation is adequately controlled, providing an additional layer of defense to both the approval of the control set and implementation of the controls. This approach is intended to be fully consistent with DOE requirements for nuclear facilities, with the addition of the NES review as an additional layer of defense for activities with potential nuclear explosive safety consequences.

In support of the IWAP schedule, the NES review process will be streamlined and effective in providing independent evaluations of nuclear explosive operations at the Pantex Plant. The reviews will focus on the operations and the facility hazards that have NES implications, to identify any deficiencies in the line management safety basis. Consistency will be applied from one review to the next to avoid redundancy and ensure continuity over the various studies.

Consistent with the organizational and role changes instituted by line management to provide the safety basis for operations and facilities, the NES reviews will focus on an independent evaluation of the proposed operation and identify any deficiencies but will not make specific recommendations on the resolution of these findings. Line management will change the nuclear explosive operation to resolve the identified NES deficiencies. The NES review group chairman will present the independent review findings to the Authorizing Official. If line management disagrees with a NES finding, line management will have ample opportunity to present its perspective to the Authorizing Official before a final decision is made on the resolution of the finding. The final NES review report generated for the Approving Official will be specific to the scope of the study, will identify findings resulting from the study, but will not dictate specific solutions.

With the improvements in the WSS, HAR, and ABCD for a process, these will be the primary input documents for the NES review. Supplemental documentation will be identified on an as needed basis specific to the study scope and issues. The input documentation will specifically identify the hazards and control set to eliminate or mitigate the hazards. The consistent approach for the development of these documents by line management will provide continuity of safety philosophy and features from one program to the next. As a result, this will help the NES review group provide consistency and continuity in their independent evaluations and avoid revisiting issues that have been studied previously.

Resolution Approach

The Department will replace D&P Manual Chapter 3.7 readiness reviews with a new Chapter 11.6 that defines the three reviews conducted after approval of the authorization basis controls. As previously discussed, DOE expectations for the safety basis review will be defined in D&P Manual Chapter 11.4.

The Department is modifying safety management processes to significantly enhance the line management safety basis for nuclear explosive operations. The enhanced safety basis will allow the Department's line management to assert readiness before requesting an independent NES and readiness reviews. This approach will allow the NES review to evaluate whether the proposed operation meets the intent of the NES Standards, instead of establishing a basis for why the operation is safe enough. The approach will also allow the readiness review to independently evaluate whether the approved authorization basis controls are effectively implemented. The Department also recognizes the need to discontinue the NES re-validation process, and establish criteria defining when a NES review is required. The Department will alter the requirements for the review process to assess the adequacy of the line management safety basis. These changes will be made through revisions to DOE Order 452.2, DOE Standard 3015, and D&P Manual Chapter 11.6.

The Department also recognizes the need to structure the NES review scopes to match the line management safety basis scopes, instead of developing a report to establish the basis for why the operation is safe enough. The Department has granted temporary relief to NES expiration dates for systems with insensitive high explosive, and restructured the current scope of NES Master Studies to

align with the scope of programmatic elements established in the Pantex BIO. The Department will revise guidance relative to performance of NES Master Studies consistent with this approach.

Deliverables/Milestones

Commitment 5.4.1:	Establish expectations for four review processes used to validate controls and implementation for nuclear explosive operations.
Lead Responsibility:	Director, WPD
Deliverable:	D&P Manual Chapter 11.6
Due Date(s):	June 1999

Commitment 5.4.2:	Define changes to NES and readiness review processes.
Lead Responsibility:	1. Director, WPD 2. Director, WPD 3. DP-21
Deliverable:	1. Initial issue of DOE-AL SD 452.2 2. Submit revisions to DOE Order 452.2 3. Issue Revised DOE Order 452.2
Due Date(s):	1. June 1999 2. June 1999 3. October 1999

Commitment 5.4.3:	1. Develop changes to NES process and report requirements 2. Issue changes to NES process, report requirements and other process attributes.
Lead Responsibility:	1. WSD 2. DP-21
Deliverable:	1. Develop process change(s) and provide recommendations 2. Revise DOE-STD-3015
Due Date(s):	1. July 1999 2. November 1999

5.5 Enhance NES Review Group Stature and Continuity

End-State Vision

The qualification of the NES review group is key to addressing quality and consistency of the studies. The NES review group will be lead by a DOE-AL chair and have membership from the three design agencies, DP-21, and other members as appropriate. These individuals will have a broad and diverse range of experience and knowledge of nuclear explosive safety and nuclear weapons surety design and will provide the breath of experience across the study. The technical advisors will be subject matter experts in specific areas of weapon design, operations, facilities, and hazards from the three design agencies, universities and industry. They will provide the depth of knowledge to ensure that no critical issue is overlooked because of a lack of knowledge. A core of these advisors will be expected to participate in all studies to provide the continuity through the various studies.

The NES review group members will be trained and qualified to a comprehensive qualification standard. Through this qualification process, the members will be continually updated on the latest NES issues and study findings to ensure that the studies are not revisiting old issues that had previously been resolved. Also, an annual NES workshop will be conducted to update the community on current issues.

The design agencies bring the world's leading experts in technical disciplines associated with nuclear weapons such as high explosives, criticality, nuclear materials, electrical and mechanical component design and performance, lightning and seismic. These individuals participate and share unclassified information with their peers from universities and industry. The Department takes advantage of this knowledge and expertise in the evaluation of nuclear explosive operations. The Department also recognizes the benefit to bringing outside experts into the independent review processes to obtain an unbiased opinion and perspective.

Already improvements and efficiencies have been realized from the changes in the role of line management and their development of the safety basis for operation, which has resulted in efficiencies in the independent review process. The NES review group expects to see further efficiencies and continuity in study results as line management transitions completely into their new role. The qualification of the NES review group is key to addressing quality and consistency of the studies.

Resolution Approach

The Department will conduct an evaluation of the overall structure and membership requirements for NES reviews, and will include consideration of other expert panel models. DOE-AL will coordinate with the NES review community to identify membership options with pros and cons, and develop an DOE-AL recommendation. DOE-HQ will then incorporate perspectives from NV, OAK, DNFSB and advisors with other experience. A DP-20 decision on NES review membership will be promulgated in a revision to DOE-STD-3015.

In addition, the Department recognizes the existing pool of qualified and experienced members of the NES review group is diminishing. Independent of the membership model selected, the Department must consider ways to assure continuity of weapon safety expertise. This issue must be addressed in an expeditious manner to assure expertise is continually available for the future workload. The Department intends to ensure that continued nuclear explosive safety study expertise is maintained within the weapons complex by strengthening requirements for qualification and training.

Deliverables/Milestones

Commitment 5.5.1:	1. Provide recommendations for NES review group structure and membership. 2. Provide a senior level workshop to discuss & review recommendations. 3. Issue a report documenting DP-20's decision. 4. Issue revised requirements.
Lead Responsibility:	1. WSD 2. DP-21 3. DP-21 4. DP20
Deliverable:	1. Provide recommendations 2. Senior level workshop 3. Decision Report 4. Issue DOE-STD-3015.
Due Date(s):	1. May 1999 2. June 1999 3. July 1999 4. November 1999

Commitment 5.5.2:	1. Provide training and qualification standard recommendations along with the certification process for establishment and maintenance of NES review expertise. 2. Revise and issue Standard 3015
Lead Responsibility:	1. WSD 2. DP-20
Deliverables:	1. Recommendations 2. Revise and issue DOE Standard 3015
Due Date(s):	1. May 1999 2. November 1999

5.6 Improve Integration of NEO and ISM Initiatives

End-State Vision

As described in section 5.1 through 5.4, the Department will further define and simplify the process for integrated safety management of nuclear explosive operations. The Department and the Pantex operating contractor will institute processes and concepts for nuclear explosive operations that parallel or build upon approaches used at other nuclear facilities (e.g., hazard analysis review, TSR, readiness reviews). These changes will be integrated into the existing safety management system for all work at the Pantex Plant. The Department will issue new or revised directives related to nuclear explosives that are incorporated into the contract for operation of the Pantex Plant. The Pantex operating contractor will develop new or revised documents to enable "flow-down" of these requirements.

Resolution Approach

The Department has an ISMSV review planned at the Pantex Plant to evaluate corrective actions taken in response to the earlier review. The Department plans to structure the ISMSV review to verify all elements of an integrated system are in place, including the changes relative to nuclear explosive operations resulting from this implementation plan. To this end, the Department will schedule the ISMSV, Phase I review to occur after the necessary actions have been taken to fully define the safety management process for nuclear explosive operations. After the Department has approved the MHC ISMS description, the ISMSV Phase II review will be structured to verify satisfactory "system" performance. Again, the timing of the Phase II review will be scheduled to afford implementation of the process changes made as a result of this implementation plan.

In order to gauge the effectiveness of the process changes discussed in this Implementation Plan, the Department will complete several demonstration tasks. For facility authorization basis tasks, the Department will complete the Critical Safety System Manual (CSSM) to Technical Safety Requirement (TSR) conversion, as well as the lightning and transportation BIO upgrade modules in accordance with the IWAP schedules. For weapon process improvement, the Department will complete re-authorization of the existing W88 process, with compensatory measures as defined in the project plan, to demonstrate improvement of hazard analysis and control develop activities. The Department will complete authorization of the W78 SS-21 process to demonstrate improvement to tooling and process development activities. Both of these tasks will be done in accordance with the IWAP schedules. The assessments performed at the completion of each of these tasks will evaluate the SS-21 process for improvements and will also assess the Departments ability to support the other IWAP activities conducted in parallel with the W88 and the W78. These reviews will provide feedback and improvement on the Departments ability to implement process improvements for multiple programs simultaneously."

While these commitments will provide important insight into the effectiveness of changes to individual process elements (e.g., hazard analysis, readiness reviews), they will provide limited insight to the

overall system performance. To gauge the effectiveness of all actions taken, the Department will conduct a summary or final assessment. This assessment may be combined with or performed in conjunction with reviews conducted for other purposes (e.g., annual review required of the ISMS description and performance measures). Upon satisfactory results of the assessment, including correction of any weaknesses noted, the Department will propose closure of the Recommendation.

Deliverables/Milestones

Commitment 5.6.1:	Develop a plan for Pantex Plant ISMSV Phase I review. Conduct the ISMSV Phase I review and issue a report. Upon satisfactory results from the ISMSV Phase I review, approve the ISMS Description.
Lead Responsibility:	1. Area Manager, AAO 2. Area Manager, AAO 3. Manager, DOE-AL
Deliverables:	1. ISMSV Phase I Review Plan 2. ISMSV Phase I Review Report 3. Approved ISMS Description
Due Dates:	1. July 1999 2. September 1999 3. Scheduled based on results of 2.

Commitment 5.6.2:	Develop a plan for ISMSV Phase II review. Conduct ISMSV Phase II review
Lead Responsibility	Area Manager, AAO
Deliverables	1. ISMSV Phase II Review Plan 2. ISMSV Phase II Report
Due dates	1. March 2000 2. June 2000

Commitment 5.6.3:	Demonstrate implementation of the safety management process by approving the TSR conversion and BIO Upgrade modules.
Lead Responsibility:	Area Manager, AAO
Deliverable:	1. CSSM to TSR conversion. 2. Approved BIO/TSR Upgrade for lightning hazards. 3. Approved BIO/TSR Upgrade for transportation hazards.
Due Date(s):	1. May 1999 2. October 1999 3. November 1999

Commitment 5.6.4:	Demonstrate implementation of the safety management process established for nuclear explosive operations. Evaluate effectiveness of safety management process improvements.
Lead Responsibility:	Director, WPD
Deliverables:	1. Re-authorization of the existing W88 process in accordance with the tasks and schedule identified in the IWAP. 2. Authorization of an SS-21 process for the W78 in accordance with the tasks and time interval identified in the IWAP.
Due Date(s):	1. August 1999 2. April 2001

Commitment 5.6.5	Assess effectiveness of actions taken to address concerns addressed in Recommendation 98-2.
Lead Responsibility:	Manager, DOE-AL
Deliverables:	1. Review plan and criteria for final assessment. 2. Final report.
Due Date(s):	1. Upon completion of W78 SS-21 process development 2. Two months after concurrence to review plan for final assessment

5.7 W62 Specific Recommendation

End-State Vision

The second part of sub-recommendation 1 describes the Board's concerns relative to the attempt to revalidate the NES Study for the W62. The Department has approved a project plan for the W62 program with two objectives:

- Step 1 is intended to allow resumption of operations with compensatory measures, in time to meet flight test requirements. The compensatory measures include implementation of selected tooling improvements, approval and implementation of a HAR and ABCD controls, contractor and DOE readiness reviews, and a NES review with complete process walk downs and a current assessment of whether the W62 controls satisfy the objectives of the NES Standards.
- Step 2 is intended to achieve full SS-21 process development. Step 2 will start upon completion of Step 1, and is planned for a 20 month duration.

Resolution Approach

The Department is implementing compensatory actions of Step 1 to obtain part of the potential SS-21 benefits as soon as possible on the W62. The Department expects the hazard analysis will demonstrate the W62 process is controlled effectively. If the hazard analysis identifies concerns that cannot be addressed effectively with nominal modification to the existing process or controls, the Department will re-evaluate the benefit of completing Step 1.

The Department intends to develop an optimized SS-21 process for the W62, with tooling and procedures developed using an iterative hazard analysis to eliminate rather than control hazards. This development will start upon reauthorization of the existing process.

Deliverables/Milestones

Commitment 5.7.1:	Implement compensatory measures identified in the Step 1 Project Plan for the W62 program.
Lead Responsibility:	Director, WPD
Deliverable:	Reauthorization of existing W62 processes in accordance with IWAP project plan.
Due Date(s):	October 1999

5.8 Enhance Capacity to Complete Program Management and Safety Analysis Tasks

End-State Vision

The Pantex operating contractor will staff all Project Team Lead positions with individuals, who have the authority, experience, capability and attitude needed to provide high confidence in the ultimate success of each program. Pending completion of actions to achieve this objective, the contractor will implement compensatory actions to strengthen project management based on the results of the assessment of weaknesses.

The Pantex operating contractor will enhance the capacity and capability of its technical staff to prepare the required documents, and the ability of its technical leadership to manage this work. Pending completion of actions to achieve this objective, the contractor will implement compensatory actions to strengthen project management based on the results of the assessment of weaknesses.

The Department will enhance the capacity and capability of its technical staff to effectively review and approve the documents.

Resolution Approach

The Pantex operating contractor will perform Strengths, Opportunities, Weaknesses, and Threats analyses for the project management staff needed to effectively address all IWAP objectives for improvement of weapon processes. The operating contractor will enhance the capability of the technical staff that prepares the documents and management that provides leadership for this effort.

The Pantex operating contractor will also perform Strengths, Opportunities, Weaknesses and Threats analyses for the technical staff and the senior technical leadership needed to effectively address all IWAP objectives for development and improvement of safety basis documents. The operating contractor will enhance the capability of the technical staff that prepares the documents and management that provides leadership for this effort.

The Department will complete actions related to nuclear explosive operations, as previously committed in the Technical Staffing Analysis performed in response to Recommendation 93.3. These actions are:

- Staff authorization basis review positions at AAO.
- Staff technical discipline positions that serve multiple sites in SASD.
- Complete qualification for technical staff.
- Complete qualification for managers who approve authorization basis documents.

The Department will also complete qualification of the authorization basis review staff in accordance with standards and schedules defined through the revised Technical Qualification Program.

The Department will place technical positions at the Area Office, when appropriate. The Department will first attempt to meet the needs identified above from sources within DOE, primarily AL, DP and EH, either by transferring individuals to the higher priority tasks or by establishing a reporting relationship to managers at the site.

Deliverables/Milestones

Commitment 5.8.1:	Complete a Strengths, Weaknesses, Opportunity and Threats analysis for project management skills. Prepare a long-term project management personnel plan.
Lead Responsibility:	AAO Manager with MHC General Manager
Deliverable:	1. SWOT analysis 2. Compensatory measure action plan 3. Long term personnel plan for project management.
Due Date(s):	1. May 1999 2. June 1999 3. August 1999

Commitment 5.8.2:	Strengthen skills and experience level of Pantex Team Leads.
Lead Responsibility:	AAO Manager with MHC General Manager
Deliverable(s):	1. Revise training programs and complete training. 2. Complete defined actions.
Due Date(s):	1. June 1999 2. August 1999

Commitment 5.8.3:	Complete Strengths, Weaknesses, Opportunity and Threats analysis for skills needed to prepare authorization basis documents. Prepare a long-term project management personnel plan.
Lead Responsibility:	AAO Manager with MHC General Manager
Deliverable:	1. SWOT analysis 2. Compensatory measure action plan 3. Long term personnel plan for project management.
Due Date(s):	1. May 1999 2. June 1999 3. September 1999

Commitment 5.8.4:	Staff authorization basis review positions at AAO and DOE-AL. Complete qualification for individuals with authority to approve authorization basis documents.
Lead Responsibility:	Assistant Manager, OSS
Deliverable:	1. Complete staffing actions. 2. Complete Qualification Standards 3. Complete qualification.
Due Date(s):	1. December 1999 2. December 1999 3. April 2000

6.0 Organization and Management

6.1 Organization

The Department has designated the Deputy Assistant Secretary for Military Applications and Stockpile Management (DP-20) as the responsible manager for the Recommendation 98-2 Implementation Plan.

DP-20, in conjunction with the DOE-AL Manager, has assigned the lead for coordination of the IP 98-2 development to the DOE-AL Assistant Manager for the Office of National Defense Programs (ONDP). Responsibilities for development of this IP 98-2 and execution of commitments identified in the Project Plan are assigned to senior managers responsible for the specific activity:

Area Manager, AAO
- Development of actions associated with site operations and execution of associated commitments.

Director, Weapons Program Division (WPD), DOE-AL
- Development of overall plan and tracking of all commitments.
- Development of actions associated with weapon processes and execution of associated commitments.

Director, Weapons Surety Division (WSD), DOE-AL
- Development of actions associated with the NES review processes and execution of associated commitments.

Director, Office of Weapons Surety, DP
- Development of actions associated with NES aspects of HQ directives and execution of associated commitments.

Director, Office of Site Operations, DP
- Development of actions associated with site operations of HQ directives and execution of associated commitments.

6.2 Management Systems

6.2.1 Change Control

Complex, long-range plans require sufficient flexibility to accommodate changes in commitments, actions, or completion dates that may be necessary due to additional information, improvements, or changes in baseline assumptions. The Department's policy is to:

1. bring to the Board's attention any substantive changes to this IP 98-2 as soon as identified and prior to the passing of the milestone date;
2. have the Secretary approve all revisions to the scope and schedule of plan commitments; and,
3. clearly identify and describe the revisions and bases for the revisions.

Fundamental changes to the plan's strategy, scope, or schedule will be provided to the Board through formal revision of the IP 98-2. Other changes to the scope or schedule of planned

commitments will be formally submitted in appropriate correspondence approved by the Secretary, along with the basis for the changes and appropriate corrective actions.

The Department previously provided information copies of several action plans to give the Board additional insight to the approach the Department is taking to address safety management concerns at Pantex. The Department will continue to provide the Board with periodic updates of these plans.

6.2.2 Reporting

To ensure that the various Department implementing elements and the Board remain informed of the status of plan implementation, the Department's policy is to provide periodic progress reports until IP 98-2 commitments are completed. For this plan, the Department will provide quarterly briefings to the Board and/or its staff, within 1 month of the close of each quarter during plan implementation. Quarters will coincide with the calendar and fiscal year quarters: January-March, April-June, July-September, and October-December. The DOE-AL Manager will transmit the quarterly status report to the Board.

The Department's senior managers (e.g., WPD Director, WSD Director, and AAO Area Manager, DP-21 Director, DP-24 Director) will provide quarterly briefings to the Board on their initiatives to improve safety management at Pantex and progress on implementation plan commitments. These briefings will include participation of senior management from the Pantex operating contractor and the design agencies, as appropriate.

The frequency of reports and briefings may be revised pursuant to mutual agreement of the parties.

Deliverables/Milestones

Commitment 6.2.1:	Quarterly Briefings & Reports
Lead Responsibility:	Director, WPD
Deliverable:	Briefing & Written Report
Due Date(s):	Every quarter beginning July 1999

7.0 Recommendation 98-2 Crosswalk

Crosswalk with Plan Commitments, ISMSV Recommendations, Prior Board Recommendations, and Letters

98-2 Sub-Recommendation (Synopsis)	Implementation Plan Commitment(s)	Related ISMSV Recommendation	Related Prior Board Recommendation	Related Board Letter(s)
1. Slow progress in achieving safety benefits from the SS-21 process	5.1.4;5.2.1; 5.2.2; 5.2.3; 5.6.4; 5.7.1; 5.8.1; 5.8.2	2	93-1	4/19/96; 4/30/96; 3/14/97; 7/25/97; 8/8/97; 9/5/97; 9/16/97; 12/5/97; 11/30/98; 1/6/99; 1/15/99; 3/12/99
2. Efficacy of the change control process for nuclear explosive safety	5.3.2	2	93-1	12/31/97; 6/1/98;
3. MHC responsibilities in hazard analyses and control development	5.1.1; 5.1.2 5.3.1; 5.3.3; 5.6.1; 5.8.3; 5.8.4	1 & 2	93-1	11/30/98; 3/12/99
4. Inappropriate role of NES review members in dictating remedies to concerns they identify	5.4.2; 5.4.3	N/A	93-1	11/30/98
5. Establishment of a standard group to perform NES reviews with composition and qualification to sustain a needed core competency	5.5.1; 5.5.2	N/A	93-1 93-3 93-6	4/30/96; 3/12/99
6. Processes for planning and executing nuclear explosive operations as linked components of ISM at Pantex	5.1.3; 5.4.1 5.6.2; 5.6.3 5.6.5	1 & 2	93-1 95-2	3/12/99

8.0 Appendices

8.1 APPENDIX A: Abbreviations and Acronyms

AAO	Amarillo Area Office
ABCD	Activity Based Control Document
AL	Albuquerque Operations Office
BIO	Basis for Interim Operation
CSSM	Critical Safety Systems Manual
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DP	Office of Defense Programs
D&P	Development & Production (Manual)
EH	Office of Environment, Safety and Health
HAR	Hazard Analysis Report
ISMS	Integrated Safety Management System
ISMSV	Integrated Safety Management System Verification
ISP	Integrated Safety Process
IWAP	Integrated Weapons Activity Plan
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
MHC	Mason and Hanger Corporation
MIC	Management, Integration and Control
NES	Nuclear Explosive Safety
NV	Nevada Operations Office
OAK	Oakland Operations Office
SBRT	Safety Basis Review Team
SD	Supplemental Directive
SIRR	Single Integrated Readiness Review
SMT	Standing Management Team
SNL	Sandia National Laboratory
S/RID	Standards/Requirements Identification Document
SS-21	Seamless Safety for the 21st Century
TBP	Technical Business Practice
TSR	Technical Safety Requirements
WPD	Weapon Programs Division, AL
WSD	Weapons Surety Division, AL
WSS	Weapon Safety Specification

8.2 APPENDIX B: History--DNFSB Board Recommendations and Letters

This appendix provides additional background on Board recommendations and correspondence issued before and after the Department's acceptance of Recommendation 98-2.

Previous Board Recommendations

Elements of Recommendation 98-2 are closely related to several earlier recommendations made by the Board.

- Recommendation 93-1, *Standards Utilization in Defense Nuclear Facilities*, was transmitted by the Board on January 21, 1993, and was accepted by the Department on February 2, 1993.
  - In the Implementation Plan to Recommendation 93-1, the Department committed "to undertake a formal program to evaluate and enhance, where appropriate, the standards that govern nuclear weapon assembly, disassembly, and testing operations."
  - The Department has completed all of the specific actions committed to in response to Recommendation 93-1.

- Recommendation 93-3, *Improving DOE Technical Capability in Defense Nuclear Facilities Programs*, was transmitted by the Board on June 1, 1993, and was accepted by the Department on July 23, 1993. The Board stated "*the most important and far reaching problem affecting the safety of DOE defense nuclear facilities is the difficulty in attracting and retaining personnel who are adequately qualified by technical education and experience to provide the kind of management, direction and guidance essential to safe operation of DOE's defense nuclear facilities.*"
  - Through the Implementation Plan for Recommendation 93-3, the Department is revising technical qualification programs for Federal employees that will increase confidence that these employees have competence commensurate with responsibility. Recommendation 93-3 is directly related to Recommendation 98-2 because Department actions to establish a training and qualification standard for personnel performing NES reviews have not been completed.

- Recommendation 93-6, *Maintaining Access to Nuclear Weapons Expertise*, was transmitted by the Board on December 10, 1993, and was accepted by the Department on February 2, 1994. Among the eight sub-recommendations made by the Board under Recommendation 93-6, three were precursors to similar elements in Recommendation 98-2. Under Recommendation 93-6, the Board identified the following needs:
  - *"(1) A formal process be started to identify the skills and knowledge needed to develop or verify safe dismantlement or modification procedures specific to all types of U.S. nuclear weapons (retired, inactive, reserve, and enduring stockpile systems). Included among the skills and knowledge should be the ability to conduct relevant safety analyses...*
  - *(4) DOE and its defense nuclear contractors negotiate the continued availability (through retention, hiring, consulting, etc.) of those personnel scheduled to depart whose skills and knowledge have been determined to be important in accordance with the above...*
  - *(6) Procedures for safe disassembly of weapons systems be developed while the personnel with system-specific expertise on the original development of the weapons are still available. Likewise, analyses of the possibility of hazard from degradation of remaining nuclear weapons with time should be expedited, while these individuals are available. In addition, the current participation of design laboratory experts in the safety aspects of disassembly of weapons at the Pantex Site should be strengthened."*

Through the Implementation Plans for Recommendations 93-1 and 93-6, the Department established a formal process (known as Seamless Safety for the 21st Century or "SS-21") that specifies the safety criteria for developing weapon operation processes. However, the pace of SS-21 implementation has been slow and affected in part by the lack of clear standards and criteria, as identified under Recommendation 93-1. Additionally, the Department has struggled to integrate the design laboratory personnel into appropriate roles for the hazard analysis process.

- Recommendation 95-2, *Safety Management*, was transmitted by the Board on October 11, 1995, and accepted by the Department on January 17, 1996. In response to Recommendation 95-2, the Department established a model for integrated safety management consisting of five core functions:
  - define the scope of work,
  - analyze the hazards,
  - develop and implement hazard controls,
  - perform work within controls, and
  - provide feedback and continuous improvement.

- The Department established the following guiding principles related to integrated safety management:
  - line management responsibility for safety,
  - clear roles and responsibilities,
  - competence commensurate with responsibilities,
  - balanced priorities,
  - identification of safety standards and requirements,
  - hazard controls tailored to work being performed, and
  - operations authorization.

The Department conducted an Integrated Safety Management System Verification (ISMSV) review at the Pantex Plant on July 27-31, and August 17-28, 1998. The purpose of the review was to verify that the Mason and Hanger Corporation (MHC) ISMS:

- fulfilled the expectations of the DOE-AL Manager,
- met the requirements of the Department of Energy Acquisition Regulations (DEAR) and the DOE Policy for Safety Management Systems, and
- is implemented, through selected sampling of facilities and activities.

A number of opportunities for improvement were identified as a result of the review. The opportunities for improvement that were identified during the ISMSV are consistent with the Recommendation. The actions described in this implementation plan are intended to be sufficient to address the fundamental findings of the ISMSV relating to nuclear explosive operations.

Prior Board Letters to the Department

The following letters (with staff trip reports identified where applicable) include several issues closely related to Recommendation 98-2 and indicate precursor interest by the Board. The letters are listed in chronological order from earliest to the most recent. The excerpts are provided to illustrate their relevance in establishing the basis for Recommendation 98-2.

- April 19, 1996 - The letter summarizes Board observations on the revalidation of prior Nuclear Explosive Safety Study (NESS) for W76 and B61 modification 3/4/10 operations at Pantex. *"Revalidation, as presently implemented, does not provide a technical review of the potential impact of changes that have occurred since the last NESS and does not appear to consistently require resolution of potential safety issues before operations are authorized to continue.*

- April 30, 1996 – The letter summarizes Board observations relative to Department actions taken to improve the Nuclear Explosive Safety Study (NESS) process. *"Although corrective measures have been developed, they have not been implemented. The Board urges that the identified improvements in the nuclear explosive operations safety management process, including the NESS, be implemented expeditiously. Implementing actions needed include the issuance of revised Orders, standards, and guides that govern the integrated safety of nuclear explosive operations."*

- March 14, 1997 – The letter transmitted Board comments on the application of interagency engineering procedure (EP) 401110, Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons. *"It is not clear that all organizations with a role in developing a weapon process and its safety basis are represented on the SS-21 project/task teams or at the Milestone Reviews. It is also not clear how the process will ensure that all appropriate organizations provide institution-level commitment to, rather than simply representation during, the process. ... The EP does not clearly state that an expectation of the hazard analysis is to provide data that would allow line management to make informed decisions on the development of controls, such as tooling and equipment design and procurement requirements."*

- July 25, 1997 – The letter summarizes Board observations regarding the W69 authorization basis. *"The performance of the hazard analysis needs to be better integrated into the SS-21 process... The interface between the activity-based (HAR) and facility-based (Safety Analysis Report/Basis for Interim Operations) hazard analysis documents needs to be better defined. Taken together, the HAR and the SAR/BIO would constitute the authorization basis for the activities, and ideally would identify a complete set of controls that need to be implemented for safe operation."*

- August 8, 1997 - The letter summarizes Board observations based upon a review of the W69 Dismantlement Hazard Analysis Report (HAR). *"First, the performance of the hazard analysis does not appear to have been smoothly integrated into the SS-21 process. As a result, the HAR does not appear to have the support of all the different agencies involved in its production. Second, some potentially significant hazards in the W69 dismantlement process were not fully analyzed. Without a comprehensive analysis, it is uncertain whether the appropriate set of safety controls has been identified."*

- September 5, 1997 - The letter summarizes Board observations concerning the Single Integrated Readiness Review (SIRR) for the W79 dismantlement program. *"It was clear that the Project Team for the W79 Dismantlement Program had declared its readiness to proceed (prior to the SIRR) without adequate validation ... appears to have undermined the utility of the SIRR as a confirmatory review. The hope that time might be saved through coincident reviews clearly was not realized; the Board believes that such a finding would be common, and this belief underlies the Board's emphasis on the preference for serial processes."*

- September 16, 1997 - The letter summarizes Board observations on the W78 SS-21 Milestone I review. *"The DOE-AL Assistant Manager recognized that there was a great deal of variation in the understanding and knowledge of guidance contained in EP 401110, Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons, among meeting participants..."*

- December 5, 1997 - The Board expressed a general concern with the rate of progress in implementing improved directives for nuclear explosive operations. In the letter, the Board expressed specific concern with the lack of progress in the development and implementation of a hazard analysis report (HAR) standard referenced by the 452-series directives.

- December 31, 1997 – The letter summarizes Board concerns with the Nuclear Explosive Safety Evaluation (NESE) process. *"However, in using this NESE process, the Albuquerque Operations Office has created a new type of nuclear explosive safety study group evaluation that is inconsistent with both DOE Order 452.2A and DOE Standard 3015-1997, Nuclear Explosive Safety Study Process."*

- June 1, 1998 - The Board requested additional information on the process by which the Department performs change control for its nuclear explosive operations at the Pantex Plant. *"The DOE-AL memorandum authorizing the plan to use the NESE [Nuclear Explosive Safety Evaluation] process states that the complexity of a proposed change is to be the criterion for determining whether an NESE is the appropriate vehicle for evaluating and recommending approval of a new process or piece of equipment for a nuclear explosive operation. However, a very simple change could have a dramatic impact on nuclear explosive safety, whereas a relatively complex change could have no effect. Therefore, complexity is questionable as the sole criterion for selecting the level of analytical rigor and approval authority against which a change will be evaluated. ... The Board believes a USQ-like process for evaluating the nuclear explosive safety implications of proposed changes to weapons activities is appropriate and necessary."*

Subsequent Board Letters to the Department

Subsequent to the issuance of Recommendation 98-2, the Board transmitted the following letters to the Department:

- November 30, 1998 - The letter summarizes Board observations relative to the ongoing W87 and W62 disassembly and inspection operations, and the Nuclear Explosive Safety Master Study of the electrical equipment control program. *"During the study, it appeared that Mason & Hanger Corporation (MHC) was abdicating its line management responsibilities to the nuclear explosive safety study group by asking them to perform a line management function. In passing issues to the nuclear explosive safety study group, line management appeared to have been uncertain about the adequacy of the authorization basis for the electrical control program. This compromises the independence of the nuclear explosive safety study group. ...The major issues appear to be (1) lack of clear guidance from the Department of Energy (DOE) on what an authorization basis for nuclear explosive operations should contain, and (2) a lack of sufficient technical expertise at MHC to perform the analysis. ... The Board notes that a number of the specific issues discussed in the enclosed reports relate to more fundamental issues previously communicated in the Board's Recommendation 98-2, Safety Management at the Pantex Plant."*

- January 6, 1999 – In this letter, the Board re-iterated their concerns relative to the Department's progress in issuing a standard for Hazard Analysis Reports for nuclear explosive operations. *"This standard is critical to ensuring a comprehensive, defensible, and repeatable hazard analysis process for the selection and preservation of the operation-unique controls needed to define the authorization basis for nuclear explosive operations at Pantex and the Nevada Test Site."*

- January 15, 1999 – The letter transmitted Board observations concerning the readiness review program at the Pantex Plant. *"The Board's staff noted that both reviews [readiness reviews for W56 and W87] were conducted prior to satisfying the Department of Energy (DOE) prerequisites for starting the reviews. ...This situation is inconsistent with the intent of DOE Order 425.1, Startup and Restart of Nuclear Facilities, which applies to the readiness review process for nuclear explosive operations. ...Thus, this W56 and W87 experience should be considered by DOE in defining plans for addressing issues raised by Recommendation 98-2 and in strengthening the readiness review process at Pantex."*

- March 12, 1999 - The letter transmitted three trip reports containing staff observations related to nuclear explosive operations at the Pantex Plant. The reports raise issues with certain elements of the integrated safety process: identification of hazards, derivation of controls, and readiness assessment. *"In general, the Board's staff concluded that the HA [hazard analysis] process did not adequately meet its objective – it did not provide systematic assurance that the hazards associated with the W62 D&I [disassembly and inspection] had been identified in a manner that would allow development of a comprehensive integrated set of controls.... The staff's principal concern with the W56 dismantlement program involved the process of deriving, characterizing, and preserving the controls for this activity. An Activity Based Controls Document (ABCD) was*

initially developed that included hundreds of controls derived from the hazard analysis. This first set of controls did not place any special emphasis on those controls upon which the greatest reliance is placed... Derivation of controls should be an iterative process in which controls for each category of risk are identified and evaluated to assess whether the control effectively reduces the estimated risk to acceptable levels....."DOE has not consistently applied a process to develop, validate, and start nuclear weapon dismantlement activities...The documentation governing the Integrated Safety Process is ad hoc and vague in its description of the necessary line management reviews, as well as the scope of independent readiness reviews...The Pantex contractor was not involved intimately enough or early enough in the development of the W79 Dismantlement Program, even though it performs the dismantlement operations and is the sole contractor responsible for assembly and disassembly of nuclear weapons at Pantex...In contrast, it is a principle of integrated safety management that those doing the work should plan the work and identify the hazards."