Department of Energy
Washington, DC 20585

Jun 2, 1998

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

Dear Mr. Chairman:

The enclosed report is forwarded in response to your letter of December 5, 1997, requesting an evaluation of project management at the Department of Energy (DOE) and the Los Alamos National Laboratory (LANL).

We have made significant improvements in how we are managing projects at LANL, but there is still improvements yet to be made which the enclosed report reflects. You will note that Dr. Browne at LANL has taken positive steps to improve project management through organizational changes and initiation of an external advisory board with considerable project management experience. Because of the recent nature of these initiatives, LANL has not fully implemented the changes, and a full assessment of them by both LANL and DOE will be provided at a later date. In addition, an action plan on the activities we will be taking to improve project management will be provided. We expect to provide these in the July to August 1998 timeframe.

In the coming months, we will keep your staff fully informed of our progress in making the necessary improvements outlined in the enclosed report. Your continued advice and assistance in this area is welcomed. Should you have any questions, please contact me or your staff may contact Mr. Michael T. Mitchell at (301) 903-3085.

Sincerely,

Victor H. Reis
Assistant Secretary
for Defense Programs

Enclosure

cc w/Enclosure:
M. Whitaker, S-3.1

Department of Energy Report on Project Management at Los Alamos National Laboratory in Response to the Defense Nuclear Facilities Safety Board Letter of December 5, 1997

May 26, 1998

Department of Energy (DOE) Report
Response to the Defense Nuclear Facilities Safety Board (DNFSB) Letter of December 5, 1997

DOE Response Purpose and Summary

This report is provided in response to the December 5, 1997, letter from John T. Conway, DNFSB Chairman, to Victor H. Reis, Assistant Secretary for Defense Programs (DP), DOE, regarding DOE and Los Alamos National Laboratory (LANL) project management of the Capability Maintenance and Improvement Project (CMIP).

The Department agrees with the DNFSB that there are several deficiencies and open issues associated with project management of the CMIP. Furthermore, DOE and LANL acknowledge that many of these issues are systemic to DOE and LANL project management, and thus may affect several Stockpile Management (SM) projects. DOE is committed to addressing the issues and correcting the deficiencies that impact both DOE's and LANL's ability to effectively manage and execute projects.

The DOE has undertaken assessment activities to determine the root causes, corrective actions, and implementation strategies required to fully establish and maintain an effective construction project management program to ensure proper execution of the SM projects at LANL. These efforts resulted in the formation of the Nuclear Construction Projects Office (NCPO) within the Albuquerque Operations Office (AL). The NCPO was established to provide a single DOE line management field organization to establish required capabilities and operate under the basic principles cited below:

- Provide a focused, technically competent organization that is responsible, has authority, and is accountable for safe and cost-effective execution of LANL SM projects and which is aligned with the SM program office to assure integration of program, project, and safety requirements throughout the project life-cycle.
- Ensure all work is performed in accordance with Integrated Safety Management Principles.
- Ensure roles, responsibilities, and interfaces are clear and well defined, and a clear chain of authority exists and decision makers are accountable.
- Ensure required formality, rigor, and integration of project and operational needs is implemented to safely execute projects with ongoing nuclear operations.
- Establish and maintain a clearly understood, efficient, and documented project management system. Effectively transition from the requirements outlined in DOE Order 4700.1 to the performance based DOE Order 430.1 assuring that DOE contractual and project requirements are clearly documented and implemented.
- Ensure that project management performance is formally evaluated and improvements are implemented as required.

The NCPO is in place, completing required staffing, and already implementing many of the

actions required to meet the DOE objectives incorporating the aforementioned principles. However, the actions required to meet these objectives are in varying stages of development and implementation, and it is recognized that a continued and concerted DOE and LANL effort is required. To support this, the ongoing and planned DOE corrective actions are being captured in an NCPO Action Plan (AP) that is still under development. The AP will be formally tracked and managed by NCPO to complete required actions, some of which are summarized in this report. The high level roll-up activities that constitute the current NCPO draft AP are depicted as activities A-1.1 through A-6.1 in the draft AP summary provided in Table 1.

LANL has also already instituted some corrective actions to support improved execution of the SM projects. In addition, LANL has very recently initiated organizational changes and assessment activities that are designed to further strengthen LANL's institutional approach to project management. LANL has not completely developed or detailed these efforts for DOE review; and therefore, DOE is unable to fully evaluate the actions being implemented, potential actions resulting from ongoing assessments, or their effectiveness in addressing LANL project management deficiencies.

While these corrective actions are being implemented and assessment actions are ongoing, DP, NCPO, and LANL are employing a deliberate, incremental approach to the SM Construction Program activities at LANL. DOE and LANL readiness to initiate and complete project activities is evaluated and verified at each phase of a given project before follow-on work is authorized. This ensures that appropriate project management infrastructure is in place and implemented to support any project work authorized. These activities primarily consist of mutual DOE and LANL development of firm project baselines. This allows continued development and advancement of the SM projects at LANL to support critical safety and program objectives in a controlled manner.

Therefore, this report, as requested by the DNFSB letter, provides the methodology, status, and results of the DOE evaluation of the capability of the current CMIP program management at both DOE and LANL. Additionally, it describes the DOE and LANL actions to achieve overall improvements in the SM construction program at LANL with emphasis and detail placed on the four specific areas cited by the DNFSB. Two key efforts; (1) the NCPO AP, and (2) the results of the LANL reorganization, assessments, and subsequent DOE evaluation, represent work in progress, and could not be fully detailed in this report. The DOE and LANL are committed to completing these actions and they will be the subject of follow-on discussion and submittals to the DNFSB after they have reached appropriate levels of completion

Report Development and Format

The DOE has several ongoing efforts to improve project management which range from agency wide initiatives to project specific corrective action plans. Similarly, LANL has various project management assessment and improvement efforts underway. As such, and to meet the aforementioned report objectives, this report was developed and formatted as described below.

The report first provides a discussion of the DOE Evaluation and Action Plan that outlines the DOE actions that have been completed, are ongoing, or planned to improve project management for SM projects at LANL. As such, the actions described in this section apply not only to the CMIP, but also to other SM projects that have experienced problems and/or are critical to meeting SM missions at LANL. It is recognized that some issues require or involve LANL-wide actions, but the emphasis of the AP and this report is clearly placed on the SM projects. These actions are presented in the draft AP summary in Table 1.

The DOE Evaluation and Action Plan discussion is followed by eight attachments. *Attachments 1* through *4* contain more detailed responses corresponding to how DOE is addressing the following four focus areas cited by the DNFSB:

- Provide more focused, structured organizations augmented with personnel well experienced in the design and construction of major, complex, hazardous projects.
- Develop appropriate project management controls for CMIP per DOE Order 430.1 or equivalent.
- Develop safety design criteria before preliminary design begins.
- Develop a systematic life-cycle analysis fully considering health, safety, and environmental requirements, as well as mission needs.

Each of the above attachments discusses the issues, status, and the associated action plans and schedules to address the deficiencies identified by the DNFSB and DOE.

Attachment 5 contains a draft NCPO Program Management Plan (PMP) which is currently being developed to document how DOE will manage SM projects at LANL. This document is the key tool by which DOE will document organizational roles and responsibilities, describe interfaces within DOE and between DOE and external entities, and establish and maintain project management systems to control the projects and measure DOE and LANL performance.

To fully assess project management at LANL, NCPO issued a March 20, 1998, memorandum requesting LANL answer a series of questions regarding LANL program management capabilities. LANL submitted a response that due to ongoing organizational changes, project evaluations, and management assessments precluded a complete and detailed response. Because of these factors, a fully detailed DOE evaluation of LANL project management capabilities, incorporating the results of the ongoing LANL

initiatives, could not be completed to support a June 5, 1998 DOE submittal date. Therefore, after a preliminary evaluation, DOE requested that LANL revise their submittal to incorporate changes to organizations responsible for SM projects, and the results of LANL project management assessments to support a full DOE evaluation. *Attachment 6* provides: (1) a brief discussion of the current LANL organization(s) responsible for SM construction projects, (2) a summary of the ongoing LANL initiatives, (3) a description of the upcoming DOE evaluation, and (4) the associated NCPO and LANL correspondence and supporting documentation.

Attachment 7 provides a summary of the process, findings, conclusions, and recommendations of the DOE Chemistry and Metallurgy Research (CMR) Facility Upgrades Project Assessment. This assessment is key in that it initiated many of the actions to address project management issues within DOE and LANL.

Attachment 8 is the draft Integrated Review Plan (IRP) for Conceptual Design Reports for SM projects at LANL. This document was the review plan cited by the DNFSB letter, which was originally developed for the review of the CMIP Enhanced Conceptual Design Report in October 1997. However, with the delay of the start of the CMIP project until FY 2001, it was modified and reissued as a foundation document outlining the basic approach and processes that will be employed with a tailored and/or graded approach for all LANL SM project design reviews.

DOE Evaluation and Action Plan

Introduction

The DOE has a combination of activities completed, ongoing, or planned to identify and address DOE and LANL deficiencies within the project and program management of the SM construction projects at LANL. These activities have been developed incrementally as the deficiencies and associated corrective actions have been identified. Furthermore, these activities have expanded from a collection of project specific actions to a comprehensive approach aimed at addressing issues affecting the overall SM construction program at LANL. The ultimate goal of these activities is to establish and maintain a management system with the required decision authority, resources, systems, etc., to effectively execute the SM construction program at LANL.

As more of these activities have been completed, initiated, or planned, they have coalesced into a set of actions, from compensatory measures to long-term solutions, that will be managed to completion within the NCPO AP. The purpose of the AP is to capture, define, document, integrate, implement, and measure performance against the actions required to meet the aforementioned goal. The DOE has not completed all evaluation efforts, nor fully developed the AP; however, the draft AP will be completed shortly, and act as a key management tool and roadmap to ensure completion of the corrective actions. The discussion that follows provides an outline and status of the primary evaluation activities, the subsequent results, and the associated high level corrective actions and schedules within the AP.

Background and DOE Evaluation Summary

Over the last several years, problems have arisen with the several DOE projects, particularly at LANL. Several of these have been documented by the DOE and/or were the subject of reports from the external entities such as the Office of the Inspector General, DNFSB, etc. The issues that plagued both DOE and LANL project management became extremely evident with the CMR Facility Upgrades project which eventually resulted in the project's suspension on April 21, 1997. The DOE, Deputy Assistant Secretary for Military Application and Stockpile Management (DASMASM), requested that the AL conduct an assessment of the CMR Upgrades to determine the root causes behind the poor project performance and develop and implement the necessary corrective actions.

The assessment was conducted during the latter half of 1997, by DOE personnel representing the cognizant program and project organizations at Headquarters (HQ), AL, and the Los Alamos Area Office (LAAO). The basic conclusions of the assessment were the following:

- CMR Upgrades shortcomings were the result of a broad systemic breakdown of fundamental project management and engineering practices. Many of the root causes

of these failures were institutional and have been observed in varying degrees with other LANL projects.

- The practices and institutional issues which led to the shortcomings were of a recurring nature, had been documented several times, and solutions previously developed were superficial and ineffective.

These conclusions are borne out by the fact that many of the issues and deficiencies analyzed by the assessment team were the same as those identified nearly three years earlier by the DNFSB as documented in their correspondence dated November 25, 1994.

Excerpts of the presentations describing the process, findings, conclusions, and recommendations of the DOE CMR Upgrades Project Assessment which were briefed to DOE and LANL senior management from June through August 1997, are provided in *Attachment 7*. The DOE findings were substantiated in large part by LANL internal assessments.

The CMR Assessment coincided with DOE and LANL technical and/or decision reviews of the CMIP and the Nuclear Materials Storage Facility Renovation (NMSFR) project which surfaced similar issues. Furthermore, the 1997 DNFSB reviews of DOE and LANL project management noted systemic deficiencies which resulted in the December 5, 1997, letter and this response. Based on the similarities and the fundamental and institutional nature of the identified deficiencies, DP and AL senior management determined that broader action needed to be taken. As a result, Headquarters, AL, and LAAO program and project personnel were tasked to develop and implement an action plan to address project management deficiencies within DOE and LANL for not just the CMR, but for a specific set of SM projects at LANL. These projects include CMIP, CMR, NMSFR, the Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP) and the Technical Area-55 Fire Water Loop (FWL) Replacement Project.

The subsequent DOE evaluations of the SM construction program and their cumulative results validated the conclusions of the CMR Assessment by identifying deficiencies in the following major areas:

1. DOE and LANL project management organizational structure, personnel and resources were inadequate to effectively execute the SM construction program at LANL.
2. DOE and LANL project management systems in many cases did not contain, and were not being implemented with, the formality and rigor commensurate with the complexity and hazardous nature of the nuclear construction projects involved.
3. DOE and LANL did not effectively ensure the integration of program, project, and safety functions within project development, review, and decision processes.
4. DOE and LANL have institutional issues that hamper the abilities of both organizations to execute a single, clear, effective, and consistent approach to project management.
5. Previous DOE and LANL attempts to address these issues have resulted in corrective

actions that have not been consistently developed or implemented on a comprehensive basis.

6. DOE and LANL senior management mandates and attention have not always existed or been maintained which has often led to corrective actions that were not appropriately tracked, completed, or evaluated for effectiveness.

Action Plan Summary

Based on the aforementioned series of internal and external observations and assessments, a number of corrective actions were undertaken. Many were initiated at the time that assessment results and recommendations were provided to and accepted by DOE management eventually culminating in the comprehensive approach being developed within the AP. The AP, when completed, will establish the capabilities required to meet the DOE program and project management objectives previously discussed. What follows is a summary discussion of the corrective actions driven by the deficiencies which are directly attributable to one or more of the six primary areas previously noted. Because much overlap exists, additional discussion is provided where necessary to establish what specific deficiencies are addressed by each set of corrective actions. It should be understood that the draft AP is not complete and does not yet fully address all required actions identified pending the results of the LANL self assessment and subsequent DOE evaluation. A final AP will be prepared which will encompass all actions developed as a result these evaluations.

1. DOE and LANL project management organizational structure, personnel and resources were inadequate to effectively execute the SM construction program at LANL.

- DOE has established the NCPO at AL to provide management and oversight of the SM construction program at LANL. The NCPO program manager represents the single responsible management official for project direction between Defense Programs and LANL. NCPO is responsible for integrating the three key functional elements of program, project, and safety to successfully execute SM projects at LANL. To accomplish this, the NCPO has a staff consisting of four functional areas of integrated safety management, project engineering, project execution oversight, and technical support. The LAAO project personnel responsible for day-to-day on-site oversight of the SM projects now report to the NCPO program manager. The DOE organizational roles and responsibilities are fully documented in the NCPO PMP.

- DOE has completed several NCPO staffing actions to provide the project management personnel with appropriate levels of experience and expertise in nuclear construction. Although these actions have already increased the quality and quantity of the federal staff supporting the SM projects, AL and LAAO are completing further staffing actions to fully complement the NCPO management

functions. Additionally, DOE is evaluating NCPO needs for external expertise to serve in technical and management assessments, peer review activities, etc.

The DOE organization and staffing actions are detailed in *Attachment 1*. The NCPO PMP is presented in *Attachment 5*.

2. *DOE and LANL project management systems in many cases did not contain, and were not being implemented with the formality and rigor commensurate with the complexity and hazardous nature of the nuclear construction projects involved.*

   - DOE is reviewing the contractual mechanisms and formal agreements required to adequately convey DOE expectations to LANL, measure LANL performance, and establish clear responsibility and accountability for project execution within the DOE and LANL. Currently, the contract between DOE and the University of California (UC) does not sufficiently establish or address project management requirements. The NCPO is utilizing the project authorization system as the near-term formal process by which DOE expectations and requirements are met prior to authorization and funding of LANL project activities. All authorizations require approval of the NCPO program manager. DOE efforts are underway to develop contractual language to effectively implement DOE Order 430.1, Life Cycle Asset Management (LCAM). Additionally, DOE is evaluating and determining the best means by which formal, yet non-contractual, agreements can be established and maintained between DOE and LANL on a program-wide, or project specific basis. This approach will allow an umbrella process to be established to convey DOE expectations and requirements on a LANL-wide basis, yet provide a mechanism for implementing additional requirements where project performance, complexity, etc., warrants.

   - The NCPO PMP is currently being developed to document how DOE will manage SM projects at LANL as a single program. The PMP will document organizational roles and responsibilities, describe interfaces within DOE and between DOE and external entities, and establish and maintain project management systems to control the projects and measure DOE and LANL performance. Additionally, Project Execution Plans (PEPs) for each LANL SM project are being revised/developed and maintained to incorporate the new organizational and project management systems and processes and document baselines on a project specific basis.

   - DOE has improvement efforts underway on several key project management systems. The improvements fall into three basis categories: strengthening current systems already in use, developing new systems or processes where required, and enforcing strict DOE and LANL adherence to all project management requirements. These efforts are focusing on the following areas: work

learned, program and project direction, funds management, action tracking, validation, on-site oversight functions, status reviews, technical reviews, and delegation and decision processes.

The DOE project management system improvement initiatives, LCAM implementation, and DOE/UC contractual efforts are discussed in more detail in *Attachment 2*. The NCPO PMP is presented in *Attachment 5*.

3. *DOE and LANL did not effectively ensure the integration of program, project, and safety functions within project development, review, and decision processes.*

   - DOE is evaluating the processes by which SM project baselines are developed. DOE recognizes that many of the problems that arose within the SM projects were a direct result of inadequate up front development of project technical baselines. In many cases, technical baselines were not tied directly to clear mission and/or functional and operating requirements. Condition assessments and as-built drawings were not developed in advance of design work or commensurate with the age and condition of the facilities to be modified, and the inadequate nature of their configuration management program(s). Additionally, proper hazard analyses were not performed with regard to both the final configuration of systems and facilities and the associated authorization bases, nor the methods by which work would be accomplished within operating nuclear facilities. To address these issues DOE has required that certain development work be completed prior to initiation of Title I Design. Project technical baselines are being reanalyzed for many of the projects to modify them as needed and clearly define the tie to tangible requirements.

   - DOE is also evaluating the processes by which technical baselines are documented, controlled, and utilized to procure and define Architect-Engineer (AE) design services. This is particularly acute in defining nuclear safety design requirements which derive from facility hazards. In many cases, requirements could not be traced from mission to functional and operating requirements through hazard analysis and conceptual design into controlled baseline documents used to task the AE and eventual incorporation into preliminary and final designs. The processes and procedures that LANL used, and that DOE employed to review these activities were not well defined or consistently applied. Having well defined processes and procedures is particularly urgent as DOE transitions to a more performance based approach in DOE Orders. NCPO has just initiated a "benchmarking" effort to review available processes and procedures currently in use at other DOE sites, and if available, throughout the nuclear industry, to ensure that design requirements and criteria include a proper consideration of hazard analysis derived safety inputs. Once complete, the changes will be integrated into the NCPO PMP, and LANL implementing procedures as necessary.

   - DOE Headquarters, AL and LAAO jointly developed the IRP for Conceptual

Design Reports for SM projects at LANL, and NCPO issued it in draft on March 10, 1998. This review plan is an initial but important step in formalizing the DOE process for reviewing project documentation and ensuring that program, project, and safety functions are fully considered and integrated into the DOE decision process. It further serves to convey the DOE expectations to LANL regarding project documentation and the development required to adequately define project scope, cost, and schedule baselines. This review plan will serve as the foundation for other review efforts, such as the NMSFR 30% Title I Design Review Plan currently being finalized.

The actions to improve technical baseline development by clearly tying it to mission and operating requirements are provide in *Attachment 4*. The processes to appropriately incorporate, review, trace, and control hazard and safety analysis results, and code, standards and legal requirements through the design process is provided in *Attachment 3*. The IRP is provided as *Attachment 8*.

4. *DOE and LANL have institutional issues which can hamper the abilities of both organizations to execute a single, clear, effective, and consistent approach to project management.*

   - DOE is working with LANL to ensure the use of good project management principles and practices to support management to baselines within the Laboratory research and development environment. DOE has recognized that LANL has in many cases not emphasized or employed a disciplined approach to project management. This has affected the successful execution of the SM projects through LANL's continued development of alternatives, inability to define requirements and manage to established baselines.

   - DOE has taken action to simplify its project management organization and decision making structure, and is encouraging LANL to do likewise. Too often, more traditional and simple organizational models and processes have been unnecessarily convoluted and complicated within the LANL and DOE bureaucracies. Rectifying this is critical because DOE and LANL comprise several different organizations that can potentially have conflicting goals making the decision making process onerous.

   These issues are discussed in more detail in *Attachments 1* and *2* and will be a focus of DOE's evaluation of LANL's pending self assessment as discussed in *Attachment 6*.

5. *Previous DOE and LANL attempts to address these issues have resulted in corrective actions that have not been consistently developed or implemented on a comprehensive basis.*

and

6. *DOE and LANL senior management mandates and attention have not always existed or been maintained which has often led to corrective actions that are not appropriately tracked, completed, or evaluated for effectiveness.*

- As previously described, both the DOE and LANL undertook assessments to identify root causes for and corrective actions to address the systemic project management issues that resulted in the suspension of the CMR Upgrades. The results of these assessments were briefed to both DOE and LANL senior management and many of the initial corrective actions recommended were accepted and aggressively initiated at that time. Further assessment activities validated results, and reinforced the need to develop a comprehensive approach which is now being developed and formalized in the draft AP.

- The DOE has mandated that a deliberate incremental approach to initiating, restarting, or continuing SM project activities is warranted based on previous performance. This approach is being prescribed across the SM construction program. Work authorization and funding approvals will be provided on an incremental basis whereby LANL will initially only be authorized to work on a few tasks. After completion of these tasks, and verification of performance, LANL will be authorized to begin follow-on work. As performance is proven, LANL will be authorized to perform additional activities with an eventual ramp up to a full execution mode for all SM projects. This process allows the Laboratory and DOE to continue to make progress toward completing critical facility modifications and supporting mission requirements, but in a very methodical and deliberate manner to ensure the effectiveness of the corrective measures implemented.

- Both DOE and LANL have increased senior management attention and direct involvement in the area of project management at LANL. The LANL Director, Dr. John Browne, in recent Congressional testimony acknowledged the systemic LANL project management deficiencies and outlined LANL actions and commitments to resolve these issues. Likewise, DOE mechanisms, such as the AP, are being established to ensure senior management at LAAO, AL, and HQ are continuously informed of progress to date against the actions required to correct project management deficiencies.

These issues and resulting actions are addressed in more detail in *Attachments 1, 2, 5, 6* and *7*.

All required corrective actions will be managed within the AP. Actions will be developed based on identified deficiencies and presented as recommendations to DOE management for prioritization and inclusion within the AP. Specific corrective actions, resources, responsible parties, milestones and expected completion dates will be developed in detail, approved by DOE management and subject to change control to ensure their completion

and effectiveness in meeting DOE objectives. A summary matrix of the draft corrective actions is provided in Table 1.

Conclusions

In summary, DOE agrees with the DNFSB observations in their letter dated December 5, 1997. It is the position of the DOE that there have been, and still are, deficiencies within the DOE and LANL program management of the SM projects at LANL; however, real improvements have been made in many areas where basic project management infrastructure was either not in place or appropriately utilized within DOE and LANL. Furthermore, DOE recognizes that additional improvements are necessary and that management attention must be maintained to continue the processes outlined here. DOE is committed to identifying deficiencies, addressing them through aggressive corrective actions, and tracking the corrective actions through to completion in a formal and ordered manner. The evaluation and action plan activities summarized here are undergoing continued development and implementation, management attention and visibility is consistent and high, and a concerted and aggressive approach to completing the required actions to support successful execution of the SM projects is being maintained.

Table 1
Nuclear Construction Projects Office - Draft Action Plan Summary

Attachment - 1

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-1.1	NCPO Staffing Actions	Ongoing	OTSP/LAAO	Complete ES-5 Recruitment	Aug-98
A-1.2	Evaluate NCPO Resources	Ongoing	NCPO	Resource Load/Evaluate NCPO vs Draft AP	Aug-98

Attachment - 2

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-2.1	DOE/UC Contract Revision (Project Mgt. Orders)	Ongoing	AL/NCPO/LAAO	Finalize Near Term Contract Revision Strategy	Jul-98
A-2.2	Revise Project Execution Plans	Ongoing	NCPO/LANL	Revise NMSFR PEP	Jul-98
A-2.3	NCPO Action Plan	Ongoing	NCPO	Draft Action Plan Submittal to DOE Mgt.	Jul-98
A-2.4	Improve LAAO PE/O Project Assessment Function	Ongoing	NCPO	Develop Assessment/Report Format	Jul-98

Attachment - 3

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-3.1	NCPO "Benchmarking"	Early Scoping	NCPO	Develop Benchmarking Study Parameters	Jul-98
A-3.2	DOE/UC Contract Revision (Safety Orders)	Ongoing	AL/NCPO/LAAO	Finalize Near Term Contract Revision Strategy	Aug-98
A-3.3	NCPO ISM Project Evaluations	Pending	NCPO	Complete NMSFR ISM Plan Review	Jun-98

Attachment - 4

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-4.1	CMR Upgrades Baseline Establishment	Pending	NCPO/LANL	Reliability Upgrades Workshop	Jul-98
A-4.2	TMSE Baseline Establishment	Pending	NCPO	TMSE FY99 Activity Workshop	Jun-98
A-4.3	NMSF Baseline Establishment	Pending	NCPO	30 % Title I Design Review Complete	Jun-98
A-4.4	CMIP Baseline Establishment	Pending	NCPO	Prepare/Recommend Critical Decision 1	Oct-98
A-4.5	NMSSUP Baseline Establishment	Pending	NCPO	Prepare/Recommend Critical Decision 2	Aug-98

Attachment - 5

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-5.1	Complete NCPO PMP	Ongoing	NCPO	Complete Final Draft Review	Jun-98
A-5.2	Develop/Document NCPO Procedures	Ongoing	NCPO	Complete Review of PM Procedures for Adequacy	Aug-98

Attachment - 6

#	Activity Title	Status	Resp. Org.	Next Milestone	EC Date *
A-6.1	DOE Evaluation of LANL Project Management	Pending	NCPO/LANL	LANL Submittal of Revised Response	Jul-98

Note 2 - A-1.1 through A-6.1 Activities are Recommended Roll-up Actions that are being Detailed and Presented to DOE Management for Approval for Inclusion in the NCPO Action Plan.
* EC Dates Shown are for Expected Completion of the Next Milestone

Attachment 1

"Provide more focused, structured organizations augmented with personnel well experienced in the design and construction of major, complex, hazardous projects."

The DOE recognizes that the organizational structure, personnel and resources have, in some cases, not been effective in assuring successful execution of the SM construction projects at LANL. To address this concern, DOE has taken actions to: 1) clarify, streamline, and integrate the project, program and safety authorities and responsibilities for LANL SM projects under one accountable DOE line management organization; and 2) increase the DOE staffing and technical resources available to support the execution of the LANL SM projects. The following provides additional discussion regarding these actions.

Clarify, streamline, and integrate the project, program and safety authorities and responsibilities for LANL SM projects under one accountable DOE line management organization

The DOE project management structure for SM projects at LANL has been reorganized to simplify the lines of communication and authority for all aspects of the project planning and execution. The new structure consists of three organizational interfaces representing DOE Headquarters, DOE Field and LANL each with clear and defined responsibilities to execute project management. This streamlined approach will ensure responsibility and accountability for successful project implementation is maintained. This organizational structure is fully discussed within the NCPO PMP, *Attachment 5*.

Key to this new organizational approach is the creation of a dedicated DOE field projects office, NCPO, which has the responsibility and accountability for project execution for LANL SM construction projects. The NCPO provides an integrated, seamless organization which will manage interfaces between HQ, AL, LAAO, and LANL. The NCPO also serves to ensure that safety is adequately integrated with all areas of project design and construction. To accomplish this, the NCPO is comprised of AL and LAAO personnel organized into four functional areas: integrated safety management, project engineering, project execution oversight, and technical support. The NCPO is developing various processes/procedures (see *Attachment 2* and *3*) to effectively integrate and execute functional responsibilities. Additional discussion of these functional roles and responsibilities are provided in the NCPO PMP.

The DOE will evaluate the effectiveness of this organizational structure through NCPO performance metrics, and continued improvement efforts will be implemented as necessary.

Increase the DOE staffing and technical resources available to support the NCPO and effective execution of the LANL SM projects

DOE acknowledges that project management personnel with the appropriate levels of experience and expertise in nuclear facility design and construction are required. Prior to the NCPO, the number of DOE Field positions dedicated to the LANL SM projects was limited (approximately four), with most of the positions located at the LAAO. Following the creation of the NCPO, the DOE has more than doubled the number of technical professionals dedicated to these projects and is working aggressively to ensure unfilled positions are a priority. Recruitment has (and continues) to receive DOE senior management attention. The DOE criteria for these positions requires individuals with knowledge and experience in engineering, construction, project management and safety. With the exception of the NCPO Program Manager (currently being filled by the Office of Technology and Site Programs Deputy Assistant Manager) and a LAAO Project Officer position, the NCPO is fully staffed.

The NCPO has organized as indicated in the NCPO PMP, and is currently staffed by ten technical professionals, which includes the LAAO Project Officer positions that are integrated programmatically into the NCPO. The DOE will continue to evaluate the NCPO's performance, organizational responsibilities and staff resources as the SM projects progress to assure continued improvement from lessons learned.

In summary, the DOE agrees with the DNFSB that there has been a need to refocus its project management structure for LANL SM projects and ensure adequate and technically competent staff. The actions discussed above have been taken to address these concerns. With the creation of the NCPO, previously dispersed program, project, and safety management functions are under one organization to provide a simple, responsive and integrated organizational structure to manage stockpile management construction projects at LANL. The NCPO now represents the single responsible organization for project direction between DP and LANL. Moreover, the establishment of the NCPO has resulted in an increase in the competence and quantity of the federal staff supporting the SM projects at LANL. DOE will continue to evaluate the effectiveness of this organization to successfully implement these SM projects at LANL and make adjustments as required.

A summary schedule for *Attachment 1* actions is provided in Table 1.

Attachment 2

"Develop appropriate project management controls for CMIP per DOE Order 430.1 or equivalent."

The issues and deficiencies identified with the DOE project management system as applied to the management and oversight of the LANL SM projects fall into two major areas: (1) DOE establishment of clear requirements through contractual mechanisms and formal agreements with LANL, and (2) the adequacy, documentation, implementation and adherence to the project management systems, processes and controls established. The following discussion describes the current DOE issues in these two areas and associated corrective actions.

DOE establishment of clear requirements through contractual mechanisms and formal agreements with LANL.

DOE recognizes that the contract between DOE and the UC does not sufficiently address project management requirements. DOE acknowledges that project management requirements should be incorporated into the contract between DOE and UC/LANL. These would include the basic DOE agency-wide policies and requirements regarding program and project management such as DOE Orders 4700.1, Project Management System, 430.1, LCAM, and 2200.6, Cost Accounting, and the Joint Program Office Direction on Project Management (JPODPM), etc. These requirements will be established within the DOE/UC contract through direct incorporation of the Orders or through the addition of contractual language addressing the project management functional area requirements which references the applicable Orders or Policy documents.

Other expectations must be established through formal agreements between the responsible DOE and LANL management organizations. These would include additional or more specific project management measures driven by DOE Headquarters, AL, NCPO, or LAAO policies and requirements that are deemed necessary for the successful management of the SM construction projects at LANL. Examples are LANL requirements supporting implementation of the DOE project management systems, processes, and procedures such as project authorization, validation, status/technical reviews, change control, etc. These requirements will be established through mechanisms such as the NCPO PMP, project specific PEPs, and formal DOE direction memorandums. These two sets of provisions are complimentary in that the contractual language will be developed to support the enforcement of the second tier formal agreements. Collectively, these provisions will adequately convey DOE expectations to LANL, establish clear responsibility and accountability within DOE and LANL for project execution, and measure DOE and LANL performance using a graded approach commensurate with the varied size, complexity, and hazardous nature of the projects at LANL.

To establish these provisions DOE is undertaking a series of actions described below in the two categories of DOE/UC Contract Revisions and DOE/LANL Formal Agreements on Project Management.

DOE/UC Contract Revisions

DOE is establishing a working group including DOE Headquarters, AL, and LAAO representatives that will be tasked with implementing the near-term actions to address project management within the DOE/UC contract as well as developing the contractual language for incorporation into the contract as the long-term solution. This group has conducted early scoping sessions, and the next steps will be to conduct discussions with LANL and reach consensus on a final implementation strategy. The following describes the actions that are in place now as compensatory measures, and those planned or proposed to complete this task:

- The NCPO is utilizing the project authorization system as the near-term formal process by which DOE expectations and requirements are met prior to authorization and funding of LANL project activities. All authorizations require approval of the NCPO program manager. This action addresses the SM projects at LANL, the focus of this report; other projects employ similar measures.

- DOE may request that certain DOE Orders canceled by the implementation of LCAM be reestablished within the DOE/UC contract. DOE understands that the Orders that were deleted from the current contract should not have been canceled or deleted from the contract before the provisions for full LCAM implementation had been established. It is anticipated that at a minimum, DOE Order 4700.1 will be included in this action. The DOE working group is currently in talks with LANL to determine the ramifications of this action. It is believed that this will be a very near-term stop gap measure as functional requirements contractual language is developed.

- DOE has developed a series of draft Functional Requirements Documents (FRDs) for inclusion in the DOE/UC contract. These documents lay out the basic DOE requirements in many of the areas covered by Orders canceled by the implementation of LCAM such as project management, utilities, site planning, etc. The project management FRD is based on LCAM and the JPODPM implementation requirements. This document is currently being evaluated for adequacy. Additional requirements and provisions supporting the aforementioned formal agreements are still being incorporated, and the document is being finalized into a format consistent with its intended use as a contractually binding document. When incorporated, the FRD will supersede the previously mentioned contract incorporation of DOE Order 4700.1.

- DOE is continuing to develop the draft DOE Order 430.1A which includes a contractor requirements document. This order, which will be binding on contractor elements, can then be incorporated within the DOE/UC contract. The FRD will be modified as required, but will be maintained within the contract.

LANL has already developed and begun full utilization of the Laboratory Implementation Requirement and Guideline (LIR/LIG) process for Construction Project Management, and other project management related areas. Therefore, complete coordination between the outlined DOE efforts to contractually establish project management requirements and the LANL LIR implementation is critical. DOE does not have review and approval authority for LANL LIRs; however, the LANL LIRs are designed to meet both DOE and LANL requirements. Therefore, any requirements that DOE introduces into the contract can have an associated impact on the LANL-wide implementation of the LIRs. As such, each step in resolving the DOE/UC contract issue will be completed with the full understanding and involvement of DOE, LANL and UC to determine the ramifications of, and best means to implement each action.

DOE/LANL Formal Agreements on Project Management

DOE is evaluating and determining the best means by which formal, yet non-contractual, agreements can be established and maintained between DOE and LANL on a program-wide, or project specific basis. The following actions are completed, underway, or planned to formally convey additional program and project management requirements:

- Project direction to LANL for the SM projects in question is now provided solely through the NCPO program manager. Several clear directives have already been provided to LANL conveying project management requirements in such areas validation, project authorization, status/technical reviews, etc. Many of these measures are described later in the project management systems discussion. This will continue to be utilized as a means to establish both LANL SM construction program-wide and project specific requirements.

- The NCPO PMP is currently being developed to document organizational roles and responsibilities, describe interfaces within DOE and between DOE and external entities, and establish and maintain project management systems to control the projects and measure DOE and LANL performance. The draft PMP is provided as *Attachment 5*. This document is critical to DOE and its absence is a clear deficiency which must be remedied. Therefore, the NCPO has placed high priority on its completion. This document will clearly establish many DOE expectations and reference specific processes, procedures, etc., which will be employed to manage the SM construction program at LANL. The PMP will be complemented on a project specific basis by the PEPs.

- The PEPs for each LANL SM project are and will remain a critical formal agreement document between LANL, NCPO, and Headquarters. Currently, the PEPs for the NMSFR and CMR projects are being updated to incorporate the new organizational and project management systems and processes. The PEPs for the NMSSUP, CMIP, FWL, and the Transition Manufacturing & Safety Equipment projects will be developed in a similar fashion. In the past, PEPs have in many cases not been developed and updated properly and thus, emphasis on these documents must be elevated and maintained. The PEPs are being developed or revised in accordance with LCAM to document specific personnel and their associated responsibilities as well as project scope, cost, and schedule baselines. The PEPs will require both NCPO and LANL signature, with final approval authority resting with the DASMASM. The PEP will tier off of the PMP and complement the program management system defined.

This approach, consisting of both contractual and formal agreement provisions, will allow an umbrella process to be established to convey DOE expectations and requirements on a LANL-wide basis, yet provide a viable means for implementing additional requirements where project performance, complexity, etc., warrants. While emphasis in this discussion has been placed on basic project management, it is understood that similar provisions are needed in other areas which support project management such as safety. Some of these efforts are described in *Attachment 3*. All of these actions are being developed for implementation on a comprehensive basis. The interdependencies and the establishment of a systems approach to these actions is a challenge which will require a concerted and continuous effort.

Adequacy, documentation, implementation and adherence to the project management systems, processes and controls established.

DOE has several agency-wide project management improvement efforts underway based on issues that have arisen at several sites within the DOE complex, especially LANL. Among these are activities associated with the Federal Manager's Financial Integrity Act (FMFIA) annual reporting, LCAM improvements and implementation, National Academy of Engineers (NAE) independent assessments, and Field Management's (FM) "Managing to Baselines" initiatives. While these efforts exist and do impact LANL projects, they are only briefly described here as the focus for this discussion is the NCPO management improvements completed, ongoing, or planned relative to the SM construction projects at LANL.

The FMFIA requires annual reports within which DOE deficiencies or issues and associated corrective actions are described. DOE has cited project management as a deficiency area, and several commitments and corrective actions, some LANL specific, are identified. DOE is transitioning from a compliance based to a performance based approach to project management. The LCAM implementation has been problematic for DOE especially at sites where contracts are not incentivised. The development of the Good Practices Guides and the revised LCAM Order to include a contractor requirements element is aiding field offices in the successful execution of projects within the LCAM

approach. The fiscal year 1998 Congressional mandate for DOE to complete independent assessments of DOE projects and project management systems was a direct result of poor project management within DOE and its contractors. The NAE has initiated this process with planned assessments of many DOE projects including the NMSFR, CMR, and NMSSUP projects. DOE will be reviewing the results of these assessment activities for recommended corrective actions. The FM "Managing to Baselines" initiative includes several federal acquisition improvement efforts. Key among these is the potential change to when baselines would be established. This effort may result in project baselines being established at the completion of preliminary design. It is believed that this will allow a more complete development of, and thus better adherence to project baselines.

The NCPO project management systems improvement initiatives fall into three basic categories: strengthening current systems already in use, developing new systems or processes where required, and enforcing strict DOE and LANL adherence to all project management requirements. The goal is to have a well established, completely documented set of project management systems, processes, and controls available for DOE and LANL personnel. These systems in some cases are not completely developed or consistently implemented, and in most cases are not fully documented The NCPO has developed improvements in the following areas: work authorization/control, project controls and reporting, change control, lessons learned, program and project direction, funds management, action tracking, validation, on-site oversight functions, status reviews, technical reviews, and delegation and decision processes. Some of these efforts are summarized below:

- The AL project authorization system has been strengthened by instituting a new NCPO policy whereby project funding is only transferred to LANL with an approved authorization. Furthermore, authorizations have been significantly reduced to very specific and smaller increments of work. Authorizations are now more detailed and specific to adequately describe the work to be performed and provide supporting documentation of the funding required. The rigor and formality of the NCPO authorization request review and approval process has also been increased. LANL work to be completed under a previous authorization is reviewed prior to any authorization of follow-on work. All SM project authorizations are approved by the NCPO program manager.

- DOE now controls SM project contingency funds. This has been established in the near term through the implementation of the project authorization system. DOE will establish and formalize the authorities, thresholds, and controls for all forms of change control within the PEPs.

- DOE and LANL have established monthly informal and quarterly formal review meetings for the SM construction projects. Decisions made and actions taken at these meetings are documented in meeting minutes with distribution to LANL, LAAO, AL and HQ. This allows for tracking of LANL and DOE actions.

- DOE has undertaken several corrective actions which must be tracked to completion and then evaluated for their effectiveness. As previously discussed, the NCPO AP will be developed and utilized for this purpose. Each action will be assigned a lead, associated resources, completion schedule, and employ a feedback or evaluation process.

- The annual project validation process is being strengthened to include more detail on project tasks and required funding, describe project issues and required actions, and provide a formal review process supporting a NCPO program manager recommendation to DASMASM for validation approval.

- LANL SM project reporting is being continually assessed by NCPO for detail, accuracy, and timeliness. NCPO PE/O personnel at LAAO have recently been charged with providing a written assessment of the LANL project reports to accompany the subsequent report distribution to AL and HQ. When fully implemented, the LAAO personnel will be responsible for ensuring technical adequacy of LANL work as well as verifying their performance against the scope, cost, and schedule baseline as depicted in the project reports. This verification will be documented in their written assessments including the processes/methods used to validate LANL performance (e.g. physical walkdown to verify earned value claimed). The entire reporting process is being evaluated by LANL to determine where improvements can be made. DOE is participating in this process improvement activity. Additionally, the LAAO project personnel are evaluating the feasibility and effectiveness of having direct electronic access to the LANL project and financial management systems.

- Formality, frequency and detail of DOE project direction has been significantly increased. Project direction to LANL has been consolidated and is now provided solely through the NCPO Program Manager. Conversely, for SM projects, LANL responses, requests, documentation, etc., are currently directed from the LANL Nuclear Materials and Stockpile Management - Nuclear Component Readiness (NMSM-NCR) Program Manager to the NCPO Program Manager. This has resulted in increased effectiveness of communications between LANL and DOE as manifested in clear and formally documented conveyance of DOE expectations. These are the formally established lines of official project direction, and any changes in this policy will require official DOE and LANL notification.

- DOE Headquarters, AL and LAAO jointly developed the draft IRP for SM projects at LANL, and NCPO issued it in draft on March 10, 1998. The IRP is provided as *Attachment 8* and is the foundation of how DOE will conduct all design reviews for the SM projects at LANL.

- DOE has begun several initiatives to implement the principles of Integrated Safety Management within the development and execution of SM projects. This includes increasing the involvement of the AL and LAAO facility operations/safety organizations within the design and construction review processes. These efforts are more thoroughly described in *Attachment 3* and *4*.

- DOE is developing a lessons learned gathering and transferal process. This has already been established on a project specific basis such as the 7 Inch Impact Tester project completed at TA-55. Documentation of lessons learned needs to be improved; however, processes for transferring lessons learned have been built into the DOE review process within the IRP.

- The delegation and decision processes are being evaluated to provide the most responsive and accountable project management system. These initiatives are being developed on a project specific basis as DOE and LANL project performance warrants, and per agreement between Headquarters and NCPO. These agreements will be documented as project authorities in the PEPs.

- Finally, the DOE and LANL have agreed that a deliberate incremental approach to restarting and/or initiating the SM projects is warranted based on previous performance. This approach is being prescribed across the SM construction program, but the CMR Upgrades is provided as an example of a project restart which will follow this approach. The summary steps are as follows:

  CMR Upgrades technical baseline is being reevaluated to ensure that each proposed facility modification is directly tied to tangible safety and reliability requirements.

  Justification for each facility modification is mutually dispositioned by DOE and LANL.

  Each required facility modifications will be supported by condition assessments and engineering efforts that will be completed to establish firm baselines for DOE consideration.

  DOE will review and approve the design/construction scope, cost, and schedule baselines for each facility modification.

Each of these steps will be formally reviewed, approved, and funded on a subproject basis. Funding approvals will be provided on an incremental basis whereby LANL will initially only be authorized to work on a few tasks. After completion of these tasks, and verification of performance, LANL will be authorized to begin follow-on work. As performance is proven, LANL will be authorized to initiate the restart of additional subprojects with an eventual ramp up to full execution. This process allows the Laboratory and DOE to restart the Upgrades project and complete critical facility

modifications, but in a very methodical, deliberate manner to ensure the effectiveness of the corrective measures implemented.

Each of the above listed actions is being documented as required within the NCPO PMP, PEPs, or DOE procedures. As previously stated, these improvements are being implemented, but actions to ensure the consistent use and full documentation are not complete and thus represent a continued deficiency. The completion of the PMP, provided as *Attachment 5*, is the first priority, the tiered formal agreements such as the PEPs will follow, and then specific procedures will be revised or created where required.

A summary schedule for *Attachment 2* corrective actions is provided in Table 1.

Attachment 3

"Develop safety design criteria before preliminary design begins."

The management issues and concerns associated with the DOE capability to ensure that safety design criteria for LANL SM projects are identified/developed prior to the start of Title I, Preliminary Design, are the result of: (1) inconsistent/changing requirements basis (contractual) and lack of clear expectations for development, use, and control of these requirements; (2) inconsistent integration of safety with technical reviews such as project design reviews; and (3) availability of technical resources to support safety/design reviews. The following provides additional discussion regarding these issues/concerns, along with DOE actions already taken or planned to address these deficiencies.

Inconsistent/changing requirements basis (contractual) and lack of clear expectations for develop, use, and control of these requirements

As discussed in *Attachment 2*, the DOE/UC contract does not adequately address project management requirements, which include requirements to identify/develop, control and implement safety design criteria. The DOE requirements related to these activities are in current transition from DOE Orders 4700.1, Project Management Systems, and DOE Order 6430.1A, General Design Criteria, to DOE Order 430.1, Life Cycle Asset Management, and DOE Order 420.1, Facility Safety. Either set of Orders provide DOE expectations to ensure that design related safety criteria and requirements are identified and fully addressed in the project's design criteria. With the exception of 6430.1A, Division 13, none of the Orders are in the current DOE/UC Contract.

The AL has not yet completed development of the contractual requirements to implement the performance-based approach for project management and nuclear facility design that is contained within DOE Orders 430.1 and 420.1. Consequently, DOE is reviewing the option of re-establishing contractual requirements based on 4700.1 and 6430.1A, while supplemental implementation requirements for 430.1 and 420.1 are finalized and the DOE/UC contract is modified.

The DOE is also developing other formal mechanisms for establishing expectations and requirements for safety design criteria and other safety and design related activities for LANL SM projects. As discussed in *Attachment 2*, the NCPO is establishing these additional and/or project specific requirements through the NCPO PMP, project specific PEPs and formal DOE direction memorandums. These requirements would flow from and compliment LANL contractual requirements (proposed) and be implemented through project management systems such as project authorization, validation, status/technical reviews, change control, etc.

It should be noted that the projects currently underway within the NCPO are primarily renovations to existing facilities (mostly operational). This in most cases has increased the complexity of the construction work and will require close integration between the operations program and the project office to ensure both operational and construction safety are carefully integrated into the project plan, design, and construction. Moreover, since an authorization basis for these facilities already exists (excluding NMSF), a tailored approach to ensuring safety and design efforts are integrated is being implemented (e.g., see CMR Upgrades discussion in *Attachment 2* and *4*). In these cases, identification of safety design criteria are being closely coordinated with the needs and requirements in the existing approved authorization basis (including commitments made in the Safety Evaluation Report). These requirements will be implemented through various formal and contractual methods, including the project specific integrated safety management (ISM) plan (see discussion below).

Corrective Actions

Actions to further develop, formalize and implement NCPO safety requirements through both contractual and formal agreements are discussed below. Also note that *Attachment 2* proves additional discussion on specific contractual and formal agreements being currently developed and/or implemented.

- DOE is evaluating the processes by which technical baselines are documented, controlled, and utilized to procure and define A-E design services. This is a result of observed deficiencies in these processes which have been particularly acute in defining nuclear safety requirements. For some projects, design requirements could not be traced from mission to functional and operating requirements through hazard analysis and conceptual design into controlled baseline documents used to task the A-E. Additionally, the processes and procedures that LANL used, and that DOE employed to review these activities were not well defined or consistently applied. Consequently, as DOE transitions to a more performance based approach contained in the DOE Orders, having well defined processes and procedures is particularly urgent. Therefore, NCPO has initiated a "benchmarking" effort to review available processes and procedures currently in use at other DOE sites, and if available, throughout the nuclear industry to ensure that design requirements and criteria include proper consideration of hazards analyses derived safety requirements. Once complete, changes well be integrated into the NCPO PMP, and LANL implementing procedures as necessary.

- The NCPO in conjunction with AL and LAAO are examining the interim option of reinstating DOE Orders 6430.1A, in addition to DOE Order 4700.1, in the DOE/UC contract for nuclear construction projects. The Order will provide coverage while DOE and LANL negotiate necessary supplemental requirements (e.g., 420.1 Implementation Guide, 6430.1A, Division 13, etc.), interfaces, approvals, document requirements and control to implement DOE Order 420.1. These requirements will be

place in to a single FRD for inclusion into the UC/DOE contract, along with 420.1.

- The NCPO will require each LANL SM project to develop ISM project plans which will serve as the principle guide for how the project will implement safety requirements. Currently, the LANL NMSM-NCR Program Office requires these plans be developed for each major SM project. In most cases, the NCPO will review these plans prior to preliminary design. Currently, the NCPO will be reviewing the NMSFR ISM project plan during the 30% Title I Design Review.

- The NCPO will establish both contractual requirements and formal agreements for project design criteria, including safety related criteria, for LANL SM projects. This will include establishment of a formal review process and review acceptance criteria. The review process is expected to be an outgrowth of the integrated review process for conceptual design reports already developed in the draft IRP.

Inconsistent integration of safety with technical reviews such as project design reviews

As discussed in the DOE Response Summary, the integration of program, project, and safety functions within project development, review, and decision processes has not been effectively implemented. Inadequate safety integration during the conceptual design reviews has allowed some projects to proceed without a comprehensive set of design criteria, including safety related criteria. Examples of this include projects such as the original NMSF project, a 1984 line-item which due to major design and construction deficiencies never operated. Many of the project's deficiencies were a result of a poorly defined and controlled technical baseline, including safety and operational requirements. In addition, projects such as the CMR Upgrades Project, Phase 1, were allowed to proceed to Preliminary Design without a clear, defined set of design criteria developed during the conceptual design phase. This was, in part, a result of inadequate design management and review by the DOE.

The DOE processes employed for project design reviews have not always effectively promoted the appropriate level of integration between project, safety and program management organizations. Safety organizations responsible for the review/approval of facility safety authorization documents traditionally have focused their resources on the development, review and approval of the Preliminary Safety Analysis Report, Final Safety Analysis Reports, and other safety authorization basis documentation. Support for safety/design reviews, including design criteria reviews, has not always been consistently integrated. Additionally, the project management organizations responsible for the management and review of the conceptual design reports and design criteria have not consistently integrated the safety organization(s) nor established formal processes to ensure the required integration. Consequently, in the past, review of safety analysis documents proceeded, in some cases, without the appropriate integration with the design effort.

Compounding this problem has been the difficult transition to DOE Order 420.1, which

establishes and promotes a general philosophy that safety analysis should drive safety design, consistent with the principles of the Integrated Safety Management (ISM). This 420.1 philosophy means that instead of starting with a pre-defined requirements baseline, as provided in DOE Order 6430.1A, greater safety analysis is required earlier in the project to establish the technical baseline. Project/safety management functions and review processes must be revised to support the greater reliance and emphasis now being placed on the safety analysis processes to assure safety design criteria are established prior to the start of Title I.

Corrective Actions

A number of actions have been initiated to address concerns of safety, project and program management integration. DOE Headquarters, AL and LAAO have been working jointly to develop and implement organizational changes to support integration. Additional work has been completed and is on-going on an integrated review process for LANL SM projects. These efforts are discussed below:

- As presented in *Attachment 1*, AL has reorganized so that line program management has responsibility and accountability for the LANL SM projects. The NCPO has been created and given the responsibility, within delegated authority, for providing guidance and technical direction to the LANL on matters involving SM facility construction, renovation, and reconfiguration projects. The NCPO is responsible for assuring integration of all program, project, and safety functions for LANL SM projects.

- An ongoing initiative to address concerns regarding lack of a integrated review process has been the development and implementation of the IRP. DOE Headquarters, AL and LAAO jointly developed this plan, and NCPO issued it in draft on March 10, 1998. This plan is an initial but important step in formalizing the DOE process for reviewing project documentation, including design criteria, and ensuring that program, project, and safety functions are fully considered and integrated into the DOE decision process. This process and concept will be extended into preliminary and detailed design reviews. The Draft IRP is provided in *Attachment 8*.

Availability of technical resources to support safety/design reviews

DOE has not been able to consistently assure availability of technical resources to support design reviews for LANL SM projects, primarily as a result of the downsizing federal work force and reduction in the number of support contractors. The result has been an inconsistent level of review for some design documents, schedule impacts, and a fractured approach to design reviews. A consequence of these practices has been that design related safety criteria may have not received the appropriate level of review during the conceptual design phase of the project.

To address availability of technical qualified personnel, DOE has created the Core Technical Group to provide an infrastructure to support and supplement technical

expertise within field elements. AL has also reorganized its technical resources to support these project design/safety reviews. The NCPO is taking additional actions to assure consistent and technically qualified reviewers are utilized for design reviews. The following provide additional discussion.

Corrective Actions

- As discussed in *Attachment 1*, one of the NCPO functional areas is safety management. Currently, two technical professionals are dedicated to support this function and are responsible to assure that adequate technical personnel are available for the design/safety reviews. The NCPO has establish interfaces and informal arrangements with HQ, AL, and LAAO organizations to provide technical resources for these reviews.

- AL has reorganized its technical support personnel and created the Technical Analysis and Support Division (TASD). This organization is responsible for fostering technical expertise associated with nuclear facility design, construction and operations. NCPO has established agreements with TASD to provide support for LANL SM design/safety reviews.

These combined actions, including DOE/UC contractual modifications, DOE/LANL formal agreements, improved and integrated review processes, benchmarking proven design processes, and efforts to ensure availability of technically qualified reviewers, will enhance the DOE capability to assure identification/development of safety design criteria prior to preliminary design for LANL SM projects. These efforts lay the foundation such that appropriate refinement, control, and implementation of safety and design requirements are consistently applied throughout project design, construction and turnover.

A summary schedule for *Attachment 3* actions are provided in Table 1.

Attachment 4

"Develop a systematic life-cycle analysis fully considering health, safety, and environmental requirements, as well as mission needs."

DOE agrees that a systematic life cycle analysis which considers mission need, program and project constraints, and incorporates ISM principles should be utilized to support DOE decisions on LANL SM projects. This is consistent with the requirements established in both DOE Orders 4700.1 and 430.1, and described in the Good Practice Guide, GPG-FM-032A, Life Cycle Analysis. Life cycle analysis is implemented and evaluated through the DOE critical decision process governing the preconceptual, conceptual, execution, and closeout project phases. The critical decision process and requirements for each decision are documented in the aforementioned Orders, the JPODPM, and the draft PMP.

Life cycle analysis is particularly important during the preconceptual and conceptual design phases. It is during these phases that mission need is established and alternatives to meet these mission requirements are developed. Alternatives developed must be analyzed against the project's technical, cost, schedule, and safety objectives. These objectives are refined and detailed as the project progresses through its initial development and are manifested in the justification of mission need, functional and operating requirements, conceptual design report, hazard and safety analyses, and validation and critical decision approvals. Deficiencies have existed in the understanding and implementation of these processes as they relate to the SM projects at LANL. The deficiencies are primarily the result of, or are complicated by, four factors: (1) changing or unclear missions, (2) availability of and/or constraints on alternatives, (3) renovation/upgrades to aged and/or operating nuclear facilities, and (4) poor project baseline development.

Changing or Unclear Missions

Changing or unclear missions have contributed to DOE's difficulty in establishing a life cycle analysis for the SM projects. As the DOE weapons complex is consolidated and downsized, missions must be supported by fewer facilities. Several competing programs vie for the remaining limited nuclear space. This has influenced the development of the CMR Upgrades, CMIP, and NMSSUP projects. The CMR and TA-55 facilities are continually analyzed for their ability to support additional missions. Requirements for pit production and associated analytical chemistry have changed or are based on establishing capabilities versus specific production requirements. Mission requirements in these key facilities drive safeguards and security needs which are further complicated by changing threat guidance and security requirements. This creates a situation where the lifespan of missions or facilities cannot be completely specified rendering life cycle analysis difficult.

Availability of and/or Constraints on Alternatives

The availability of and/or constraints on alternatives has reduced the choices available to DOE and LANL to execute program missions. The Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM-PEIS) Record of Decision assigned the pit production mission to LANL. The SSM-PEIS was predicated on the downsizing and consolidation of the DOE complex. As such, DOE and LANL were relegated to the use of existing nuclear facility space to support the pit production mission. This resulted in the proposal to use a wing of the CMR to house missions displaced from the 300 Area of PF-4 to allow it to be used as dedicated pit production space. Based on changes in pit production requirements this proposal is being reevaluated as part of a revised pit production strategy. Another example was the proposed CMR facility replacement project, the Special Nuclear Materials Laboratory (SNML). This project entered conceptual design, but was deemed too expensive when combined with the near-term modifications required to support continued safe operations at CMR, CMR Upgrades (Phase 1), during the completion of the SNML, and inconsistent with projected reductions in program requirements. As a result, the SNML was canceled in 1995, and more extensive CMR Upgrades (Phase 2) to support life extension were approved. However, as mission requirements change and new project information is developed, constraints and previous alternatives may have to be revisited.

Renovation/Upgrades to Aged and/or Operating Nuclear Facilities

The type of construction projects in question has also hampered life cycle analysis activities. The age and condition of the facilities to be upgraded make the technical objectives and tradeoffs difficult with limited funding. The CMR Upgrades were established to address public and worker safety, maintain or improve reliability of facility infrastructure and systems, and provide program operations efficiencies. These are competing objectives which are not easily quantified to support life cycle analysis. Furthermore, each proposed facility modification must be fully analyzed to determine the appropriate extent of the renovation or upgrade with the known or projected lifespan of the given facility in mind.

Poor Project Baseline Development

Preconceptual and conceptual design activities, key to the development and comparative analysis of design alternatives, has not always been properly completed. The configuration management programs at LANL have been lacking and thus, the baselines developed for consideration did not accurately account for the true condition of the facilities or systems to be modified. Without these facts, life cycle analysis cannot be adequately developed. Therefore, additional studies, such as the seismic studies at TA-3 and TA-55, are underway to address unknowns which may impact facility operations, lifespan and associated project decisions. The results of these studies are required for DOE and LANL to fully understand and complete life cycle analyses.

DOE recognizes that many of the problems that arose within the SM projects were a direct result of inadequate up front development of project technical baselines. In many cases, technical baselines or work scope was not tied directly to clear mission and/or functional and operating requirements. Condition assessments and as-built drawings were neither available nor developed in advance of design work or commensurate with the age and condition of the facilities to be modified, and the inadequate nature of their configuration management program(s). Additionally, proper hazard analyses were not performed with regard to both the final configuration of systems and facilities and the associated authorization bases, nor the methods by which work would be accomplished within operating nuclear facilities. To address these issues DOE has required that certain development work be completed prior to initiation of Title I Design. Project technical baselines are being reanalyzed for many of the projects to modify them as needed and clearly define the tie to tangible requirements.

These measures are being implemented across the SM construction program, but the CMR Upgrades project is a prime example of the Departmental initiatives to adequately prepare the information required to support decisions which incorporate the four project objectives in a life cycle analysis framework. A summary of the steps being taken on the CMR project is described below. Additionally, the means to execute and control these actions are outlined in *Attachment 2*.

CMR project baselines are being reevaluated and developed based on specific facility safety, regulatory, operability, and reliability requirements. This is being accomplished by:

- DOE and LANL are updating the CMR facility safety authorization basis through the development of the Basis for Interim Operations (BIO) and Technical Safety Requirements (TSR) implementation plan. These documents, and their associated accident analyses and designated limited conditions of operation will specify the facility modifications required to maintain continued safe operations in CMR. The DOE and LANL have developed a joint working group consisting of the cognizant program, project, and facility operations/safety personnel and a formal decision process to develop, scrutinize, reach consensus on and incorporate the appropriate facility modifications into the CMR Upgrades project. This process has been utilized to yield a set of upgrades required to support the BIO and TSR implementation. The reliability-based facility modifications will undergo the same process before being recommended for inclusion within the CMR project.

- DOE has required, and LANL has agreed to, the completion of condition assessments and engineering efforts to adequately support a detailed rebaselining of each CMR Upgrades subproject. This work will fully document the facility/system

condition at restart of the project, define the endpoint and acceptance conditions, and develop realistic schedule and cost baselines required to complete design and construction within an operating nuclear facility. These activities will be completed prior to any Departmental decision to approve the new baselines for the project.

Similar processes are being utilized for the NMSFR, TMSE, CMIP, and NMSSUP. The goal is to tie all proposed project activities to a specific and tangible mission or safety requirement(s). These requirements will then be analyzed to determine the extent and adequacy of the proposed project solution. This will result in each system/facility modification having established operating requirements, including life expectancy, to support mission objectives. They will then be designed and constructed accordingly. The NMSFR project objectives are being evaluated as part of the Title I design review process. The TMSE is undergoing a process similar to that described for the CMR Upgrades. This will be completed prior to the critical decision approving design start. The revised CMIP will conduct a life-cycle analysis during conceptual design to support a design start in fiscal year 2001. The NMSSUP, Phase 1, conducted an alternative analysis as part of the CDR development. Phase 2 will undergo a life cycle analysis within conceptual design scheduled for fiscal year 1999.

In summary, the efforts described above for the CMR Upgrades and other SM projects illustrate DOE's commitment to more rigorous implementation of systematic life-cycle analyses that fully combine and address environment, safety and health (ES&H) requirements with well defined mission needs. In addition to these efforts, DOE must ensure appropriate life cycle analysis is conducted, results are analyzed against current ES&H and mission requirements, and changes or refinements are incorporated in accordance with a rigorous change control system throughout the project's life.

The proposed project development schedules for each project and the associated decision points are still being finalized, but the high level draft schedules are provide in Table 1.

PROGRAM MANAGEMENT PLAN

FOR

NUCLEAR CONSTRUCTION PROJECTS OFFICE

Albuquerque Operations Office
U. S. Department of Energy

May 1998

Draft

PROGRAM MANAGEMENT PLAN
For
NUCLEAR CONSTRUCTION PROJECTS OFFICE
Stockpile Management Projects

Recommended for Approval:

_____ _____

James J. Szenasi, Date
Acting Program Manager,
Nuclear Construction Projects Office,
Albuquerque Operations Office

Approved By:

_____ _____

Edwin E. Ives, Date
Deputy Assistant Secretary for
Military Application and Stockpile Management,
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Program Management Plan
Nuclear Construction Projects Office
Albuquerque Operations Office

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Program Management Plan
Nuclear Construction Projects Office
Albuquerque Operations Office

Section I
Overview

Introduction

The Nuclear Construction Projects Office (NCPO) has developed this Program Management Plan (PMP) to provide a framework for integrated management of the Stockpile Management (SM) projects, as outlined in the Department of Energy, Albuquerque Operations Office (AL) FY 1998 Strategic Plan. Two of the key objectives of this business unit are to: establish and maintain effective working relationships between the Department and the Contractor, Los Alamos National Laboratory (LANL), and to ensure efficient and effective project administration, oversight, and financial stewardship in executing SM projects essential to national Defense Program mission assignments.

The NCPO PMP is being developed to document how DOE will manage SM projects at LANL. This plan is the high level management tool by which DOE will document organizational roles, responsibilities, and authorities as well as describe interfaces within DOE and between DOE and external entities, and to establish and maintain project management systems for the management of SM projects from project conception to completion and subsequent operations. Project Execution Plans (PEP) will be used to document project specific baselines and requirements.

Basic Principles

To guide the development of the NCPO and this PMP, the following basic management principles were identified to assure that the key objectives identified above were met:

Provide a focused, technically competent organization that is responsible, has authority, and is accountable for safe and cost-effective execution of LANL Stockpile Management projects and which is aligned with the SM program office to assure integration of program, project and safety requirements throughout the projects life-cycle.

Ensure NCPO project management functions are performed using specified procedures/processes.

Ensure work is performed in accordance with Integrated Safety Management Principles.

Integrate the NCPO project management organization (comprised of AL and Los Alamos Area Office (LAAO) personnel) to improve interfaces and to avoid redundant or conflicting responsibilities.

Basic Principles (continued)

Ensure roles, responsibilities, and interfaces are clear and well defined, and a clear chain of authority exists and decision makers are accountable.

Recognize DP-20 as the line organization responsible for the program management and the implement NCPO as the field line organization responsible for day-to-day project execution from conception to operation.

Assure project resources (including budgets) are managed and allocated to assure efficient project execution.

Ensure required formality, rigor, and integration of projects and operational needs are implemented to safely execute projects with on-going nuclear operations.

Establish and maintain clearly understood and efficient project management systems. Effectively transition from the requirements outlined in DOE Order 4700.1 to the performance based DOE Order 430.1 assuring that contractual and project requirements are clearly documented and implemented.

Ensure that project management performance is formally evaluated and improvements implemented as required.

Scope

This plan describes the organization, roles and responsibilities, and systems, processes and procedures governing SM projects at LANL in the following format:

Section II contains a brief description of the projects currently covered by this plan.

Section III discusses the Defense Programs, NCPO, and LANL stockpile management project/program organizational structures. This section will also delineate project roles and responsibilities of DP, NCPO, and LANL to assure accountability for the complete life-cycle of the assigned projects.

Section IV identifies the major project life cycle actions and activities as well as discuss the management processes and procedures to be utilized by the NCPO to implement its responsibilities.

Section V identifies referenced documentation

Section II
NCPO Project Descriptions

The SM projects that are currently underway or planned at LANL and covered by this PMP include:

Nuclear Material Storage Facility Renovation (NMSFR)
This project provides necessary renovations to the Nuclear Materials Storage Facility that was completed in 1987 but never became operational due to design and construction deficiencies. This project will correct deficiencies in the building to provide a storage vault designed and constructed for intermediate and long term storage of LANL special nuclear materials (SNM).

Chemistry and Metallurgy Research Facility Upgrades (CMR)
This project will upgrade and replace major mechanical and electrical equipment that has reached the end of its design life in order to ensure continued safe and reliable operations supporting research, development and analytical work with plutonium, uranium and their alloys, and other materials in support of weapons, nuclear materials, and other Laboratory programs.

Transition Manufacturing and Safety Equipment (TMSE)
This project will install the more urgently required safety, operability, and manufacturing equipment in TA-55. This will also include infrastructure refurbishment and rearrangements to accommodate the pit manufacturing process.

Nuclear Material Safeguards and Security Upgrades Project (NMSSUP)
This project will upgrade and replace system deficiencies, outdated technologies, and provide reliable systems to ensure the protection of SNM, classified matter, and Departmental property supporting current missions at LANL.

TA-55 Fire Water Loop Replacement Project (FWL)
This project replaces the existing fire water loop surrounding the TA-55 area at LANL. The new fire suppression system fire water loop and support buildings will be upgraded to be capable of surviving a design basis earthquake.

Capability Maintenance and Improvement Project (CMIP)
This is a future project, currently planned as an FY 2001 new start, that will provide the equipment and infrastructure necessary to ensure continued safe and reliable operations at TA-55 and install pit manufacturing capabilities to support mission requirements.

Section III
Stockpile Management Project/Program
Organizational Structures, Roles and Responsibilities and Interfaces

Organizational Structure

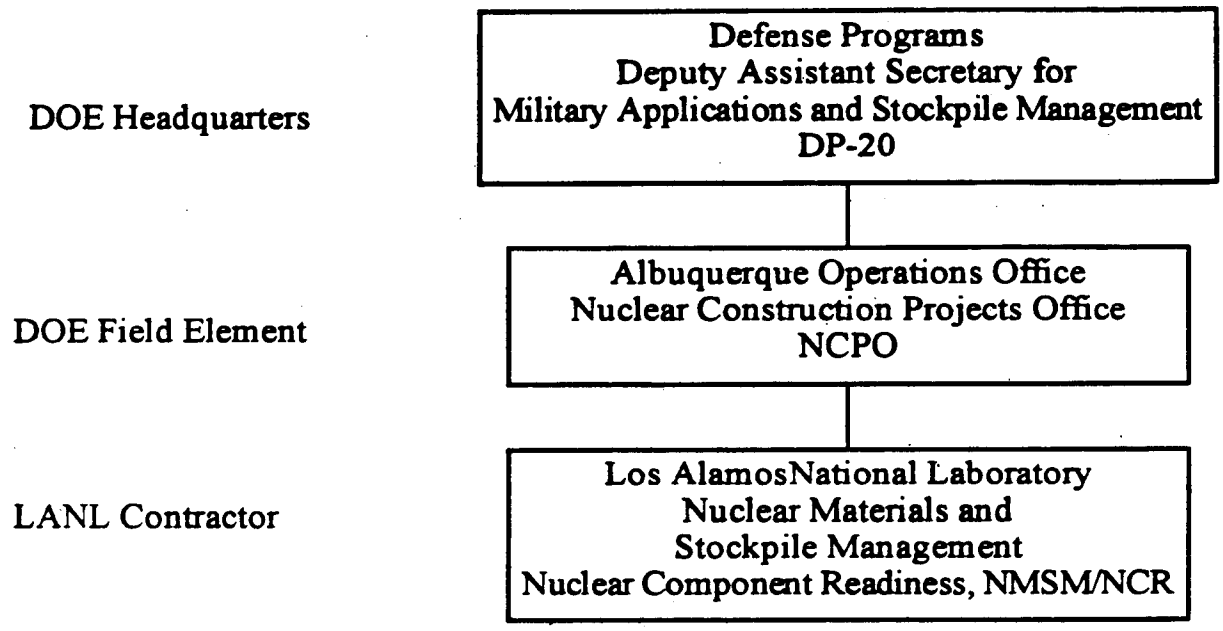


Figure 1. Line Management for Stockpile Management Programs/Projects

The organization for nuclear facility stockpile management program and projects is described below, including roles and responsibilities and key interfaces for DP, NCPO, and LANL.

DOE/HQ Organization

The Assistant Secretary for Defense Programs, DP-1, is the Acquisition Executive for all DP projects, except strategic systems, or where otherwise delegated. The authority for SM projects has been delegated to the Deputy Assistant Secretary for Military Application and Stockpile Management, (DASMASM or DP-20). The DASMASM is the key decision maker for all stockpile management projects assigned to the NCPO and covered by this PMP. As such, DP-20 is responsible for providing written guidance and direction to the NCPO for all policy associated with program related activities. DP-20 approves project baselines, monitors project implementation and provides funds to support project execution. DP-20 has approval authority for all Critical Decisions for the SM projects described in Section 1, unless otherwise delegated.

DOE/HQ Organization (continued)

DP-20 concurs on the selection of the NCPO Program Manager (PM) and provides input into the NCPO PM performance appraisal.

The DASMASM plans to delegate to the NCPO PM project execution authority, within approved baselines or other project parameters to assure effective and efficient DOE project management in the Field by the NCPO.

The NCPO PM is the responsible management official for successful execution of assigned SM projects at LANL and is accountable to the DASMASM.

Frequent and informal communication between the NCPO/PM and the DASMASM is essential and encouraged for the day to day successful completion of assigned SM projects.

In addition, DP-20 is the principle interface with external organizations such as Congress, other DOE/HQ organizations, and the Defense Nuclear Facilities Safety Board (DNFSB).

DP-24, Office of Site Operations, is the DP-20 staff organization responsible for facilitating the implementation of the DASMASM responsibilities for nuclear facility SM projects. Therefore DP-24 is responsible for coordinating all DOE Headquarters activities and is the primary interface at DOE/HQ for the NCPO staff.

To accomplish its SM program office responsibilities, DP-20 is also supported by the following key Headquarters offices:

- Office of Nuclear Weapons Management, DP-22, provides program requirements to support weapons activities
- Office of Construction and Capital Projects, DP-40.1, provides construction project management support
- Office of Program Analysis and Financial Management, DP-41, provides budget development and financial management support
- Office of Technical and Environmental Support, DP-45, provides technical support as requested by either DP-20 or the NCPO

DOE/AL Organization

The AL has reorganized so that line program management (Office of Technology and Site Programs (OTSP)) has responsibility and will be accountable for implementation of assigned Stockpile Management programs and construction projects. The NCPO was established to provide an integrated, seamless organization to manage interfaces between HQ, AL, LAAO, and LANL for nuclear facility SM projects at LANL.

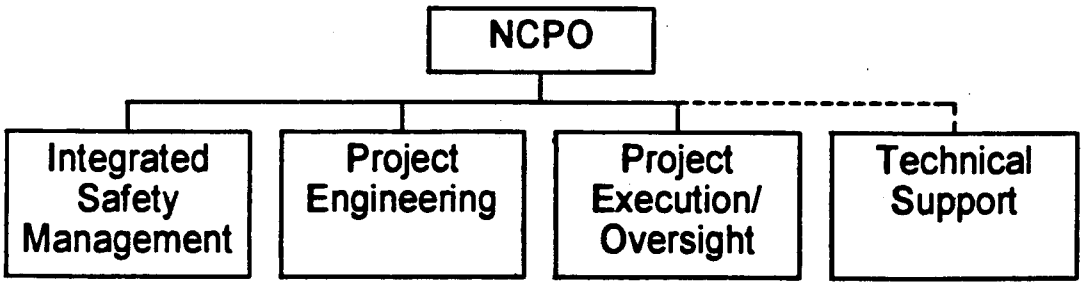
DOE/AL Organization (continued)

The NCPO organization shown below describes the integrated approach being taken by AL (which includes LAAO) to assure effective project implementation in support of program requirements.

Nuclear Construction Projects Office
The NCPO PM is the DOE field manager with responsibility and authority to implement Stockpile Management projects at LANL to assure that assigned SM projects meet programmatic requirements approved by DP-20. In executing the assigned project the NCPO/PM will:

- provide clear written direction and guidance to the LANL for project execution
- provide Critical Decision requests to DASMASM for decision
- assure that DP-20 is kept fully informed of project status, progress, issues, etc.
- assure that direction and guidance from DP-20 is fully and efficiently implemented
- maintain frequent and informal communications with DP-20 and senior LANL line officials
- assure that SM projects are implemented in accordance with DOE policy and requirements, as well as this PMP
- develop, support, and defend project budget requirements including project validation
- assure through coordination with SM program officials in AL that program requirements are incorporated into project development, planning, design, and execution
- assure that the NCPO is staffed, qualified, and organized to implement their responsibilities
- approve project changes within baselines and thresholds as approved by DP-20 and documented in the PEP(s)
- submit all project changes which exceed NCPO authority to DP-20 with sufficient documentation for resolution and decision by DP-20
- maintain adequate project records and reporting

The NCPO staff is organized into four functional areas with their principal areas of responsibilities as described below:



DOE/AL, Nuclear Construction Projects Office Organization (continued)

Integrated Safety Management
The ISM staff is responsible to the NCPO Program Manager for assuring that ES&H is integrated into the project from conception until final turnover for operations including:

- hazards analysis
- safety authorization basis development and review
- identification of design requirements and standards
- operational readiness and other start up reviews
- regulatory compliance; including National Environmental Policy Act (NEPA) and waste management
- coordinate DNFSB interface requirements
- integration of safety into design and construction
- communication with DP, AL, and LANL organizations to accomplish assigned areas of responsibility
- provide status and assessment reporting to the NCPO

Project Engineering
The PE staff is responsible to the NCPO Program Manager for project management support including project design and construction reviews, project management systems, cost analysis and validation, and planning and scheduling. Specific project engineer responsibilities include:

- preparation of the Critical Decision reviews
- lead and coordinate design reviews (CDR, Title I and II)
- develop project budgets and conduct project validation
- manage and coordinate work for the overall project
- implement requirements of DOE Order 430.1, Life Cycle Asset Management, DOE Order 4700.1, Project Management System, and DOE Order 5700.6C, Quality Assurance
- assure that DP program and pit production requirements are integrated into design requirements, criteria, and project specifications
- review and concur with project baseline activities
- manage the development of Project Execution Plan(s)
- provide status and assessment reporting to the NCPO management
- implement the quality assurance process, including design reviews and resolution of review comments
- communication with DP, AL, LAAO and LANL organizations to accomplish assigned areas of responsibility
- interaction with AL program personnel to ensure program requirements are addressed

DOE/AL, Nuclear Construction Projects Office Organization (continued)

Project Execution/Oversight

Project Execution/Oversight (PE/O) staff are LAAO the on-site representatives of the NCPO PM responsible for oversight and coordination of the LANL Stockpile Management construction projects and support to the NCPO. Project Officers will have specific assignments, such as; CMR, TSME, CMIP, NMSFR, NMSSUP, and FWL. Specific PO responsibilities include:

- prepare the PEPs (along with LANL) ensuring that DP program and project requirements are understood and documented for submittal to the NCPO PM
- maintain current, in-depth knowledge, awareness and understanding of project status
- participate in design and construction reviews
- lead project status reviews and participate in justification/validation reviews
- support Critical Decision requests and authorizations
- interface with other LAAO organizations to support SM project execution
- provide status reporting and assessment to the NCPO
- develop, coordinate and distribute project status reports
- perform construction oversight

Technical Support

Technical Support staff will be requested and tasked by the NCPO/PM when additional subject matter expertise is required. This support can come from the DOE Core Technical Group, other DOE organizations, or outside contractors. Although technical support will be required throughout the life cycle of NCPO projects, it is expected that services will be utilized on an as needed basis in the following areas:

- design reviews
- resolution of technical issues
- hazard and safety analysis reviews
- cost analysis support

LANL Organization

The Nuclear Materials and Stockpile Management (NMSM) Program Office is currently the designated single point of contact responsible for programmatic leadership of the Laboratory's activities supporting nuclear materials operations, maintenance, surveillance, and nuclear materials manufacturing performed in support of the nuclear weapons stockpile (see note below). For Stockpile Management projects, NMSM is responsible for programmatic direction and program funding. Within NMSM, the Nuclear Component Readiness (NCR) Program Office is responsible for activities required to implement pit manufacturing as well as associated facility modifications and is currently the single point of contact for all SM projects.

Formal project direction is sent directly from the NCPO PM to the NMSM-NCR Program Manager. To implement the SM projects, the NCPO will develop and/or revise (with LANL) PEPs for each of the SM projects. Important aspects of the PEPs include a defined project baseline, resource requirements and specific responsibilities for implementation and execution of the project baseline. Existing PEPs will be reviewed and revised as required, and new projects will require a PEP prior to Title I execution. All PEPs will be reviewed annually and updated as required.

NOTE: The LANL organization structure and responsibilities for executing projects is being reviewed by the Laboratory Director and pending any changes which may be implemented as a result of this review, the NCPO will continue to conduct its management interfaces as defined above.

Section IV
NCPO Policies/Systems/Processes/Procedures

In order for the NCPO to function efficiently, a comprehensive set of policies, systems, processes, and procedures will be implemented to assure that all team members, within the NCPO, work in a structured and coordinated manner to a prescribed procedure/standard. This section of the NCPO PMP first includes a responsibility matrix of Project Life Cycle Actions with the principal responsibilities identified for DP-20, the NCPO and LANL. This first section of the responsibility matrix identifies the key project activity requirements leading up to the Critical Decisions as specified in LCAM and JPODPM. It should be recognized that on any particular project or during a project execution phase that authorities may change based on the needs of the particular project. The responsibility matrix is intended to represent a "typical" project. In the case of a particular project delegation, it will be formal, clear, in writing and included in the individual PEPs along with any other requirements based on the needs of the project. The second section of the matrix identifies responsibilities and authorities for Continuing Actions (actions which will occur throughout the life of the project).

The responsibility matrix also indicates whether a procedure/standard exists which will be used by NCPO to carry out its responsibilities, or if a procedure/standard requires preparation or improvement. It is understood that the actions specified are not a complete listing. In the event that a new procedure/standard is required to perform project work, the NCPO is responsible to develop such a procedure prior to performing the work.

The responsibility matrix is followed by a brief description of each procedure/standard to be used, and where necessary, a description of the actions required to develop, improve or document a procedure/standard.

Stockpile Management Projects Responsibility Matrix

LIFE CYCLE ACTIONS	DP-20	NCPO	LANL	Process
Justification and Mission Need Statement	PA	RC	RC	E
Conceptual Design Plan	R	RA	P	E
Critical Decision #1 - Approval of Mission				
Conceptual Design Report (CDR)	A	RC	P	E
NEPA Documentation *				E
Project Execution Plan	A	PRC	PRC	E
Baseline Documentation	A	PRC	PRC	ID
Safety Documentation *				E
Critical Decision # 2 - Approval of Baseline				
Title I		RA	P	I
Title II		RA	P	I
Safety Documentation *				E
Critical Decision # 3 - Approval to Start Construction				
Construction / Procurement		RM	P	I
Safety Documentation *	RC	RC	P	E
DOE Readiness Assessments *				E
Critical Decision # 4 - Complete / Start of Operation				

CONTINUING ACTIONS	DP-20	NCPO	LANL	Process
Environmental Requirements	C	RA	P	E
Construction Project Data Sheet (CPDS)	S	PRA	P	E
Justification / Validation Reviews	A	B	S	E
Work Authorization / Funding Allocations	P	C	C	D
Project Authorization		RA	PB	I
Project Reporting - LANL	R	R	P	I
Project Reporting - NCPO	R	P		I
Baseline Change Control *				E
NCPO Records Management		P		D
External Requests	A	PS	PS	E
Corrective Action Tracking	R	PB	S	D
Performance Appraisal of LANL	R	PA		D
Performance Appraisal of NCPO	R	P		D

A = Approval
B = Request
C = Concur
E = Existing
D = To Be Developed
I = Improvement needed
P = Prepare
R = Review
S = Support
M = Monitor
*Approval at Appropriate Level

Life Cycle Actions

Justification of Mission Need Statement
This document will be prepared according to the guidance contained in DOE Order 4700.1. Preparation and approval of this action is generally a responsibility of the DP-20 Program Office. However, NCPO will support the preparation, review and approval of this document in accordance with DP-20 guidance.

Conceptual Design Plan
There is insufficient guidance in either the LCAM or JPODPM for preparation of this Plan which is the basis for CD#1. The NCPO will prepare a guidance document to be concurred on by DP-20, which will provide the necessary guidance to LANL.

Conceptual Design Report
This report is to be prepared by LANL and conform to the requirements of the JPODPM. The NCPO will develop and use an IRP to complete its review and concurrence responsibilities.

NEPA Documentation
This action will be completed in accordance with DOE procedures. The NCPO responsibilities and authorities for this action will depend on the level of NEPA required.

Project Execution Plan
The JPODPM and LCAM provide basic guidance for preparation and completion of this document. A PEP will be completed for each SM project and will include the project baseline, as defined below, and contain specific project and management requirements based on the needs, complexity, cost, sensitivity, etc. of the project. The PEP will be prepared by LANL and NCPO for each project with mutual review and concurrence. The PEP will be approved by DP-20.

Baseline Documentation
The NCPO will require that Baseline Documentation be accurately specified prior to and as part of receiving CD#2. This document, or set of documents, will be subject to change control throughout the life of the project and represent a clear set of requirements and agreements. As a minimum, it will include programmatic performance and technical specifications, work scope requirements, cost and schedule, and any other requirements determined to be critical to successful completion. This documentation will be incorporated by reference or otherwise in the PEP.

Safety Documentation
A brief procedure will be developed to clearly define the responsibilities of the function organizations within NCPO for these reviews. Depending on the level and type of safety documentation and approval level, NCPO will support review and approval.

Life Cycle Actions (Continued)

Title I and Title II
A brief procedure will be developed to clearly define the responsibilities of the functional areas within NCPO for design review, to identify review objectives and timing of reviews. Specific project design reviews will be conducted according to the IRP to be prepared by NCPO to meet individual project requirements including: complexity, importance to mission, safety and technical issues, cost etc.

Construction/Procurement
Existing procedures are inadequate and need improvement in this area of review. NCPO will be conducting regular monthly reviews as well as other workshops and reviews as deemed necessary to understand the progress and authorize the specific activity and the funding to complete the activities. This will be one of the more critical stages in improving the project management during the execution of the project. NCPO will develop processes and procedures to ensure the required oversight and successful completion of the project's construction phase.

DOE Readiness Assessment
The processes for this activity are currently in place and covers a wide variety of reviews and approvals from several functional areas.

Continuing Actions

Environmental Requirements
This action will be completed according to DOE procedures. The NCPO responsibilities and authorities for this action will depend on the level of environmental documentation or permitting that will be required.

Construction Project Data Sheet
The CPDSs will be prepared by LANL, reviewed and modified by the NCPO, and forwarded to Budget and Resources Management Division, AL for inclusion in the annual budget submittal. The Controller's annual UNICAL provides the requirements and format for CPDS preparation.

Justification/Validation Reviews
These reviews will be conducted by NCPO with coordination from HQ to include enough information for NCPO recommendation, DP-20 approval, and support inclusion in the annual budget process. The projects must be validated to be included in the Controller's Budget. The Office of Field Management has issued J/V guidance on an annual basis, modified to include any additional information required.

Continuing Actions (Continued)

Work Authorization/Funding Allocations
Work authorizations are prepared by DP-41 and are approved by the DP-20 designate to define tasks and provide the annual funding allotment to AL for the individual projects. This process is being further developed in HQ and will have new procedures prior to the FY 99 allotments. NCPO and LANL will concur on these work authorization prior to Project Authorization being approved.

Project Authorization
NCPO will coordinate and approve requests for project authorizations from LANL. The current project authorization process will be changed to accommodate the new rigor for this activity and will provide authorization and appropriate funding to accomplish specific tasks within the SM construction projects approved baseline requested by LANL.

Project Reporting (LANL)
NCPO will require regular project reporting on the status of each project and coordinate the project reviews for HQ and other interested organizations. Specific requirements will be included in the PEPs.

Project reporting (NCPO)
NCPO will report to DP-20 on the status of the projects as well as other reports and requirements that have been assigned. NCPO will prepare project office reporting requirements for review and approval of the DASMASM. NCPO will also report to OTSP on an as-required basis.

Baseline Change Control
NCPO will use the existing process described in memo dated May 24, 1991, "Field Implementation of Baseline Change Control for Defense Programs (DP) projects" to coordinate the Baseline Change Control process. Specific change control authorities will be documented in the PEPs.

NCPO Records Management
A project records management requirements and procedure will be established to retain all major project reports, authorizations, project documentation, and other review and tracking information.

External Requests
The DASMASM is the lead responsible organization for interfacing with external agencies such as the GAO, IG, and DNFSB on SM project related matters. NCPO will provide support to DASMASM in accordance with standard DOE procedures and guidance.

Corrective Action Tracking
A corrective action tracking system will be established in conjunction with the development and implementation of the NCPO Action Plan.

Continuing Actions (Continued)

Performance Appraisal of LANL
This process will be developed by NCPO to formalize project expectations and evaluate LANL performance for SM Construction Projects.

Performance Appraisal of NCPO
This process will be developed to evaluate the effectiveness of the NCPO organization and be performed by OTSP and DP-20 as required.

Section V
References

1. DOE Order 4700.1, Change 1, Project Management System, dated 6-2-92
2. DOE Order 430.1, Life Cycle Asset Management, Change 1, dated 10-26-95
3. DOE Joint Program Office Direction on Project Management, dated Jan 96
4. Good Practices Guides, GPG-FM-XXX, DOE Office of Field Management, March 1996.

Attachment 6

DOE Evaluation of the LANL Self Assessment and Project Management Initiatives.

The issues and deficiencies identified with DOE project management and detailed throughout this report have clear linkage to and corollary with what DOE views as similar project management organization, capability, interface, systems and performance weaknesses at LANL. To fully incorporate both DOE's and LANL's self assessment of their respective project management systems, DOE deliberately separated the DOE and LANL report preparation and development efforts. As such, LANL was formally tasked through a March 20, 1998 memorandum from the NCPO PM to the NMSM-NCR PM to answer a series of questions on project management to support ongoing DOE evaluations and this report. These questions were designed to fully address the four focus areas cited in the DNFSB letter, as well as additional issues of interest to the DOE.

The response to the NCPO memorandum was provided by LANL on April 29, 1998, and forwarded to the cognizant DOE and DNFSB staff. LANL's response was incomplete and lacked detail due to the ongoing LANL reorganization, project evaluations, and management assessment efforts. These efforts will impact current LANL project management processes, and thus prevent LANL from providing a complete picture of how they will execute their project management responsibilities in the future. Therefore, on May 14, 1998, the NCPO PM provided comment and requested that a more detailed response be developed to support a full DOE evaluation and subsequent DNFSB submittal. LANL acknowledged this direction with a May 21, 1998 memorandum conveying their commitment, and outlining their plans and schedules to complete the revised response.

Based on the current status of the ongoing LANL project management initiatives, forthcoming LANL response, and subsequent DOE evaluation, this attachment provides the following: (1) a brief discussion of the current LANL organization responsible for SM construction project management, (2) a summary of the ongoing LANL initiatives, (3) a description of the upcoming DOE evaluation, and (4) the associated NCPO and LANL correspondence and supporting documentation.

Current LANL Organization Responsible for SM Construction Project Management

In 1997, DOE and LANL developed a single clear line of management and direction for the SM projects between HQ, AL, LAAO and the Laboratory. This was clearly established through the DP and AL endorsed establishment of the NCPO, and the "Los Alamos Roles and Responsibilities for NMSM-NCR Projects" approved by LANL senior management in September, 1997. The key organizational interface between DOE and LANL, as described in the NCPO PMP, is the project direction from the NCPO PM to the NMSM-NCR PM. The NMSM-NCR is the LANL program office responsible for providing the funding and program/project direction to the LANL Technical Line

Organization having ownership of the facility to be upgraded, and responsible for project execution. The Nuclear Materials Technology (NMT) Division has ownership, and thus project execution responsibilities for all NCPO projects except the NMSSUP which was assigned to the Facilities, Security and Safeguards Division (FSS). On April 6, 1998, FSS was officially divided into two organizations having responsibility for safeguards and security (S Division) and facilities engineering (FE Division). Under this organizational construct, the NMSM-NCR PM provides direction to the project leader who resides within the facility owning division. FE maintains the LANL institutional project management and engineering capabilities, and thus supports the program office and the facility owning division as required in the execution of the given project. This official management interface is still in effect for the previously referenced SM projects. Furthermore, it will remain in effect until LANL or DOE officially changes it through written notification.

Summary of Ongoing LANL Project Management Initiatives

The LANL project management improvement initiatives that have been briefed to DOE consist of, or are impacted by four primary efforts; organizational changes, project evaluations, management assessments, and institutional project management infrastructure development.

Laboratory Director John Browne began implementation of a new management structure in January, 1998. The early results of this effort were briefed to DNFSB staff and DOE on May 12, 1998, and the subject presentation is provided at the end of this attachment. As presented in the briefing, the new LANL management structure will place responsibility for the SM projects within a new organization under the leadership of the Associate Laboratory Director for Nuclear Weapons (ALDNW). It will be the responsibility of the ALDNW to determine the best management structure to effectively execute the SM projects. The roles and responsibilities of the NMSM and NMT organizations with regard to project management have not yet been fully defined or officially conveyed to DOE.

The Laboratory Director has initiated internal project evaluations for many of LANL projects including the previously referenced SM projects. LANL senior management is currently reviewing the status of, and issues associated with each project to support future management decisions.

The Laboratory Director recently chartered a Project Management Advisory Panel (PMAP) to review and evaluate the LANL projects as well as the project management processes. This group held their initial meetings on May 19 and 20, 1998. Their efforts will result in a set of recommendations to the Director and a written report currently planned for September, 1998. The PMAP Charter is provided at the end of this attachment.

Institutional project management infrastructure development consists primarily of the

implementation of the LIR/LIG process previously noted in *Attachment 2*, and improvements to the FE capabilities supporting all LANL projects. The LIR for Construction Project Management (LIR 220-01-01.0) is currently planned to become effective on September 9, 1998. The LIR establishes the LANL minimum project requirements and describes the associated processes. The LIR also documents roles and responsibilities of the facility owning division, program office, facility project delivery group, environment safety and health and business operations divisions. However, it is not clear to the DOE how the requirements, processes, roles and responsibilities, etc., documented in the LIR may be impacted by the LANL reorganization, ongoing management assessments, or future management decisions.

DOE Evaluation

When LANL does complete their self assessment, DOE will perform an evaluation to further develop actions required to address project management deficiencies. this evaluation will be provided as a future submittal to the DNFSB. What follows is a summary description of the proposed focus areas of the DOE evaluation. These review areas were chosen based on DNFSB observations, DOE assessments, and LANL project management assessments and improvement initiatives. Some overlap exists, but the areas are broken out and depicted below for completeness:

- *DOE/UC Contract Revisions/Formal Agreements* - As previously discussed, DOE, UC and LANL must establish a formalized means by which expectations and requirements for project management, safety, etc., are firmly established by both contract (on a LANL-wide basis), and by formal agreement between the accountable senior DOE and LANL management (on a program or project specific basis.) DOE will review LANL's approach to meeting DOE requirements through these documented means.

- *Baseline Documentation/Architect-Engineer Tasking* - DOE will evaluate the means by which LANL intends to document and control the project baselines. A consistent approach has not yet been developed or submitted to DOE for approval. DOE intends to establish a simple yet comprehensive approach to documenting the program, safety, code, and legal requirements that form each project baseline, and then apply appropriate review, approval, and control as part of, and to support management to the project baselines. Furthermore, DOE will review how these documents will be utilized to contract for design and construction services.

- *Project Management Organization (Roles, Responsibilities, and Accountability)* - DOE will evaluate the new LANL organization and associated roles and responsibilities for those organizations or personnel that are, or will be responsible for the SM projects. DOE will examine: (1) which organizations will be responsible for development, integration, and execution of the SM projects; (2) how LANL internal interfaces will be managed; and (3) which organization will be the single point of

contact for future receipt of direction from the NCPO.

- *Project Management Activities and Processes to Establish Definitive and Achievable Baselines* - DOE will evaluate the mechanisms that LANL will employ to ensure that appropriate up front development work is completed to adequately identify requirements, examine alternatives, set priorities, and reach agreement on project baselines and how they will be executed.

- *Laboratory Implementation Requirements (LIR) for Construction Project Management* - LIR 220-01-01.0 and associated Laboratory Implementation Guides, Handbooks, Procedures, etc., will be thoroughly reviewed for content versus DOE requirements. DOE intends to have an open dialogue with LANL on the contents, continued development and implementation of these documents and their potential applicability to or use as elements of the DOE/UC contract or formal agreements.

- *Rigor and Consistent Implementation of Project Management Systems* - DOE will evaluate what efforts LANL is making to effectively implement appropriate project management systems and controls. DOE is particularly interested in the LANL-wide and project specific quality assurance processes, and how LAAO personnel fulfilling the Project Execution/Oversight function for NCPO will have access to and/or interface with these processes.

- *Integration and Traceability of Program, Safety, Code, and Legal Requirements throughout Project Life Cycle* - DOE will evaluate the LANL processes to fully identify, develop, integrate, and control project design requirements. DOE is particularly interested in how LANL's processes will meet the integration and traceability review requirements that were conveyed in the Integrated Review Plan acceptance criteria.

- *Use of Traditional and Simplistic Project Management Processes and Systems* - DOE will review the LANL project management organization, system and process approach to determine the degree to which traditional and/or proven methods are being utilized to simplify, and increase efficiency and accountability of project management.

- *Incorporation of Lessons Learned Within and Between LANL Projects* - DOE will review the processes by which lessons learned will be shared throughout LANL and incorporated into their management, technical, and/or readiness reviews.

- *Sustained Commitment and Involvement of Senior LANL Management* - DOE will examine the reporting and review processes that senior management will use to remain informed about and responsive to project status and issues.

- *Formalized Development, Tracking, Completion, and Measured Effectiveness of Corrective Actions* - DOE will evaluate the processes by which all project actions will be managed. DOE will have specific interest in the consistency, formality, timeliness,

and accountability attributes of the corrective action system implemented. Furthermore, DOE will review the applicability and use of these processes and the associated results as a key LANL performance measure.

- *LANL Institutional Technical and Management Capabilities to Support Project Management* - DOE will evaluate LANL's actions to improve basic capabilities supporting project management. Emphasis will be placed on understanding the institutional role of the Facilities Engineering organization and the support and design services function of corporate partner Fluor Daniel Incorporated.

The DOE evaluation will be completed by the cognizant program, project and safety/facility operations personnel representing HQ, AL and LAAO.

Associated NCPO and LANL Correspondence and Supporting Documentation

The following correspondence and documentation is included to provide additional clarification, and can be found at the end of this attachment:

- March 20, 1998, Memorandum from NCPO to NMSM-NCR; "Response to the Defense Nuclear Facilities Safety Board (DNFSB) Regarding Project Management Concerns for the Capability Maintenance and Improvement Project"
- May 14, 1998, Memorandum from NCPO to NMSM-NCR; "DOE Evaluation of the Los Alamos National Laboratory (LANL) Response"
- May 21, 1998, Memorandum from NMT to NCPO; "Response to Defense Nuclear Facility Safety Board Concerns Regarding Project Management"
- "Los Alamos Roles and Responsibilities for NMSM-NCR Projects," September, 1997
- Project Management Advisory Panel Charter, LANL, May 3, 1998
- "Los Alamos National Laboratory Construction Project Management Status," LANL presentation, April 12, 1998

In summary, The DOE believes that LANL has the primary role and responsibility for successful execution of the SM projects. As the managing and operating contractor, they must own and operate the technical and managerial resources, capabilities and disciplines as well as the practices, processes, systems, etc., required for effective project management. A principled, disciplined and priority emphasis on project management must be developed and fully endorsed and/or adopted throughout the LANL organizations, and associated subcontractors. DOE believes that it will require increased and continued LANL senior management attention to ensure that a solid set of proven project management tools are available, and a regimented and accountable implementation approach is effectively engrained as a working institutional philosophy and policy.

The Department is responsible to ensure completion of SM missions at DOE owned sites and stewardship of taxpayer dollars. Thus, DOE has and will continue their project

management improvement activities; however, the Department recognizes that affecting real change at LANL is the key to addressing deficiencies and implementing safe and effective project management.

To accomplish this, DOE is committed to working very closely with LANL to assist where possible and establish near term compensatory measures commensurate with a given project's complexity, performance, etc. However, DOE will not mandate or preempt LANL organizational changes and project management initiatives. It is the position of the DOE that a primary success factor is that LANL management must develop and implement the solutions themselves. DOE will then determine whether these solutions have incorporated internal and external observations and requirements. LANL management has already taken some critical steps in recognizing deficiencies and addressing project management issues, but much work lies ahead.

The action plan and high level schedules for actions required to complete the LANL self assessment, follow-on DOE evaluation, and subsequent submittal to the DNFSB are provided in Table 1.

United States Government | Department of Energy

memorandum

Albuquerque Operations Office

DATE: MAR 20 1998

REPLY TO ATTN OF: OTSP: RD (845-6736)

SUBJECT: Response to the Defense Nuclear Facilities Safety Board (DNFSB) Regarding Project Management Concerns for the Capability Maintenance and Improvement Project

REFERENCE: December 5, 1997, Memorandum from John T. Conway, Chairman DNFSB, to Victor H. Reis, Assistant Secretary for Defense Programs

TO: TJ Trapp, Program Manager, Nuclear Materials and Stockpile Management - Nuclear Component Readiness Program Office, Los Alamos National Laboratory (LANL)

Department of Energy (DOE) staff from Defense Programs and the Albuquerque Operations Office (AL) have discussed a proposed draft response to the referenced memorandum with DNFSB staff members and senior officials within Defense Programs. Based on these discussions, we have determined that the draft response, which also included input from LANL, was not adequate. Based on additional guidance from the Deputy Assistant Secretary for Military Application and Stockpile Management, AL has been directed to take the lead and prepare a revised response. Defense Programs management will coordinate a revised submission schedule with the DNFSB.

The purpose of this memorandum is to request that LANL provide additional input for the revised response which will be incorporated as an appendix to the DOE response. The input must be sufficiently detailed to stand alone, and must be coordinated between the principal organizations responsible for development, execution and subsequent operation of Stockpile Management (SM) construction projects. It should be understood that LANL senior management will be asked to present this input to DOE senior management and the DNFSB. Input is requested in the following areas:

1. A description of the LANL organization(s) responsible for project development, design, construction, test and turnover for SM construction projects. LANL is requested to provide organization chart(s), organizational roles and responsibilities, existing and planned staffing including an evaluation of the qualifications and expertise required to successfully manage SM projects as compared to existing staff. It is also requested that LANL assess the adequacy of the existing organization and staffing to implement SM projects. This assessment should include strengths and weaknesses, and any substantive current plans LANL may have to address identified weaknesses, as well as how these plans may be impacted by the impending LANL reorganization. The LANL organizational description and discussion should be sufficiently detailed to allow the reader to understand the LANL management structure to implement SM projects from conception to operation.

2. A description of the process to identify and develop safety requirements (i.e. general design standards and design specific codes and standards) for the SM construction projects and how these requirements are revised, maintained and integrated into the design as a project progresses from conceptual design through to design, construction and operation. Describe how the safety requirements are linked to provide clear and concise expectations for the design to the Architect-Engineer, including how the hazards assessment process, standards/requirements identification, system design descriptions, etc., are related and implemented to ensure these expectations are met. Describe the current implementation status of the process overall, and in relation to each of the major SM construction projects. This section of the response should also discuss the relationship between development and control of the safety requirements and the Work Smart Standards recently incorporated into the DOE contract with the University of California.

3. Provide the criteria and bases LANL used to develop the schedule and scope for the program elements contained within the Transition Manufacturing and Safety Equipment project and the revised Capability and Maintenance and Improvement Project. This section of the LANL response should discuss in detail the programmatic requirements, facility requirements and other planning assumptions used to support a life cycle analysis, as well as, the accompanying processes used by LANL to develop schedule and scope.

4. Identify and describe the current LANL project management systems, controls and standards for implementation of SM projects. These systems should cover the entire life cycle of a project from conception to operation. It is understood that DOE Order 4700.1, Project Management System, was to be superseded with the contractual implementation of DOE Order 430.1, Life-Cycle Asset Management (LCAM), and that neither Order is currently in the DOE/University of California (UC) contract. As such, AL will continue to use, and expect the LANL project management system to support the requirements in DOE Order 4700.1 pending full implementation of the LCAM Order and its placement within the DOE/UC contract. Therefore, LANL should provide a status of the implementation of the current project management systems, a description of any ongoing initiatives to improve/modify these systems, and a summary assessment of LANL's current ability to execute these systems to meet both LANL and DOE project management expectations. In addition, provide updated information relative to the commitments made by LANL in response to the attached DNFSB letter of November 25, 1994.

5. Provide a description of the management/technical support services to be provided to LANL via the "partnering" portion of the overall Architect-Engineer services arrangement with Fluor, Daniel Inc. (FDI). This description should also address the steps that LANL and FDI will take to assure independence of these support services from the more traditional design and construction services supporting the SM construction program.

6. Provide any other relevant information which LANL believes is pertinent to its capability to successfully manage SM projects.

In developing the LANL response, it is understood that improvements and changes to the existing organization, processes and systems are planned. LANL should identify, to the extent possible, these changes and provide to the Department for informational purposes only, commitments to implement these changes and planned completion dates. In addition, the Department will also prepare an appendix to the basic summary response which will address very similar information with respect to the DOE organization, standards development and review, program requirements, and project controls. Consequently, I encourage the Laboratory to work with the Department to assure a consistent and integrated response.

A DNFSB staff trip to LANL has been scheduled for April 15-16, 1998. The status of the DOE and LANL response to the DNFSB letter of December 5, 1997 will be on the agenda. Therefore, it is requested that LANL provide the first draft of the input requested by April 13, 1998, to support the briefings to the DNFSB staff. The final LANL submittal should receive the concurrence of the LANL Director, Dr. John Browne and is expected by April 27, 1998.

In addition, it is anticipated that separate correspondence will be sent from the AL Manager, Bruce Twining, to the LANL Director requesting a briefing on the overall strategy to address LANL project management as well as the specific LANL response to this memorandum. A tentative date for the briefing is anticipated in mid-April, 1998.

If you have any questions or require further information, please contact me or Roger Dintaman, Nuclear Programs Division, at 845-6736.

James J. Szenasi
Deputy Assistant Manager for
Technology and Site Programs

Attachment

cc w/attachment:
M. Mitchell, DP-24, HQ
E. Whiteman, OTSP, AL
R. Dintaman, NPD, AL
R. McKay, NPD, AL
T. Sena, NPD, AL
J. Leeman, PFMD, AL

J. Jackson, DDIR, LANL
P. Cunningham, NMSM-DD, LANL
D. Erickson, ESH-DD, LANL
R. Matthews, NMT-DD, LANL
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Joseph J. DiNunno
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625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400

November 25, 1994

The Honorable Victor H. Reis
Assistant Secretary for Defense Programs
Department of Energy
Washington, D.C. 20585

Dear Dr. Reis:

The Defense Nuclear Facilities Safety Board (Board) is interested in the process(es) implemented at the Los Alamos National Laboratory (LANL) in the design and construction of new facilities and major upgrades. Board staff and outside experts have reviewed preparations at LANL for the "Safety Testing of Pits Under Thermal Stress," also known as the "Fire Resistant Pit Test Program." The primary objective of this program is to study reactions of molten plutonium with other materials within full-sized pits from dismantled nuclear weapons. For this program, LANL began upgrading the structural capability of a portion of its Chemistry and Metallurgy Research building and had been constructing experimental apparatus. Subsequent to the Board staff review, the Department of Energy (DOE) informed the staff that it is canceling this program; however, observations concerning the design process are still of interest.

Based on Board staff observations documented in the attached report, it appears that even though the contract for the building upgrade had been placed and experimental apparatus was being built, LANL may not have fully identified the potential hazards associated with this program and had not demonstrated that the foreseeable hazards were addressed in the design process. No clear analytical process involving identification and mitigation of potential hazards was apparent. Thus, the analytical process was not consistent with the guidance of DOE Order 5480.23, *Nuclear Safety Analysis Reports*, which requires identification of all hazards associated with a facility and establishment of design and operational means to mitigate them. The Board staff also noted a lack of clear lines of responsibility and accountability concerning this project.

DOE is planning major facility upgrades and new defense nuclear facilities at LANL, as announced in the "Advance Notice of Intent to Prepare a Site-Wide Environmental Impact Statement for Continued Operations at LANL." It appears, at present, that design and construction processes at LANL may not be sufficiently well-defined and formalized to ensure that new and upgraded facilities will meet health and safety requirements. In particular, it is important that design process(es) followed by LANL include a thorough identification of hazards and that, where possible, the means to mitigate hazards be developed early in the design process.

Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests that DOE provide the following report:

- A report identifying the formal process(es) LANL is following in the design, construction, and preparation for operation of new and upgraded defense nuclear facilities to identify those steps of the process(es) which are intended to identify and mitigate hazards. This report should also identify related technical management structure(s) including, in particular, lines of responsibility and accountability.

The Board requests that the above report be submitted within 60 days of receiving this letter. If you need any further information in this connection, please let me know.

Sincerely,

John T. Conway,
Chairman

c: The Honorable Thomas P. Grumbly, EM-1
Mr. Mark Whitaker, EH-6

United States Government **Department of Energy**

memorandum

Albuquerque Operations Office

DATE: MAY 14 1998

REPLY TO ATTN OF: NCPO: JL/RM (845-6059)

SUBJECT: DOE Evaluation of the Los Alamos National Laboratory (LANL) Response

REFERENCE: March 20, 1998, Memorandum from James J. Szenasi Regarding Response to the Defense Nuclear Facilities Safety Board (DNFSB) Regarding Project Management Concerns for the Capability Maintenance and Improvement Project

TO: TJ Trapp, Program Manager, Nuclear Materials and Stockpile Management - Nuclear Component Readiness Program Office (NMSM-NCR), LANL

The Department of Energy (DOE) has completed a preliminary evaluation of the NMSM-NCR submittal "Response to Defense Board Questions" dated April 29, 1998. As your response indicates, detailed information regarding the organizational and staffing plans for managing the stockpile management construction projects at LANL are not yet available due to the recent reorganization and new management structure being implemented by the Laboratory Director. I also understand that the Director has initiated external project management assessments and that these cumulative actions may have subsequent impacts on other subject areas discussed in your response. Consequently, the LANL submittal does not contain sufficient detail to support a full DOE evaluation and subsequent response to the DNFSB, due June 5, 1998.

Additionally, while the response outlines the general project management systems and processes, more information detailing LANL's assessment of the current status of these systems and controls affecting stockpile management projects is required. Therefore, I request LANL develop a revised, detailed response to the referenced memorandum which will support completion of a full DOE evaluation and development of actions necessary to resolve current project management concerns at both DOE and LANL. Attached are the summary results of the DOE preliminary evaluation to aid you in the development of your revised response. This response should be provided to my office as soon as possible in order for DOE to fully understand LANL's current direction and efforts to address these project management concerns.

In the interim, please provide a written response to this memorandum conveying the LANL commitment to address these issues as well as any plans and schedules to complete the revised LANL response. I request that your response letter be submitted to my office no later than May 22, 1998, so that it can be included in the June 5, DOE response to the DNFSB.

If you have any questions or require further information, please contact me or Joel Leeman at 845-6059.

James J. Szenasi

James J. Szenasi
Acting Program Manager for
Nuclear Construction Projects Office

cc w/attachment:
M. Mitchell, DP-24, HQ
W. Clark III, DP 40.1, HQ
R. Frenck, DP-40.1, HQ
R. Dintaman, NPD, AL
J. Szenasi, NCPO, AL
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cc w/o attachment:
E. Whiteman, OTSP, AL
D. Glenn, LAAO
H. Ledoux, LAAO
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Los Alamos National Laboratory

Nuclear Materials Technology Division
P.O. Box 1663, Mail Stop E500
Los Alamos, New Mexico 87545
(505) 667-2556 / FAX: (505) 667-7966

Date: May 21, 1998
Refer to: NMT-DO:(U)98-108

James Szenasi
Acting Program Manager
For Nuclear Construction Projects
Department of Energy
Albuquerque Operations Office

SUBJECT: RESPONSE TO DEFENSE NUCLEAR FACILITIES DEFENSE BOARD CONCERNS REGARDING PROJECT MANAGEMENT

Dear Mr. Szenasi:

Reference:

1. Memorandum, J. Szenasi to T. Trapp, "DOE Evaluation of the Los Alamos National Laboratory (LANL) Response", dated May 14, 1998
2. Letter, T. Trapp to J. Szenasi, "Response to Defense Board Questions", dated April 29, 1998

Reference 1 requested additional information to supplement the Reference 2 discussion of project management at LANL. This additional information will be provided by June 30, 1998.

As has been discussed with AL and the DNFSB staff, the Laboratory Director has recently reorganized his senior management staff. This has resulted in clearer responsibilities for nuclear projects. Some details remain to be settled and these will be discussed in the June 30 letter. In the interim, we are transitioning to operate in accordance with upcoming revisions to the Laboratory Implementing Requirements for Construction Projects.

We have also discussed the Director's Project Management Advisory Panel with AL and DNFSB staff. This group held their first meeting on May 19 and 20, and are already well immersed in evaluating our project's practices. The panel intends to verbally present its results to the Director on August 26 and 26, and is to deliver a written report in September. We will provide you a copy upon receipt.

Regards,

R. Bruce Matthews
NMT Division Director

RBM/pd

Cy: Steve Younger, ALDNW, MS A105
Paul Cunningham, NMSM-PO, MS A102
James Jackson, DIR, MS A100
William Hamilton, FE-DO, MS P913
NMT-DO File

Los Alamos Roles and Responsibilities for NMSM-NCR Projects

Purpose and Scope

This document describes general roles and responsibilities of Los Alamos National Laboratory organizations and personnel for the execution of stockpile management construction projects in support of nuclear material operations and pit component fabrication. Projects include the Chemical and Metallurgy Research (CMR) Building Upgrades, the Nuclear Material Storage Facility (NMSF) Renovation, the Capability Maintenance and Improvement Project (CMIP), the Fire-Water Loop Replacement at TA-55, and the Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP). Other projects will be added as appropriate.

As these projects vary widely in complexity, a graded approach can be used at the project level with regards to project roles and responsibilities as described in this document. These graded roles and responsibilities will be described in project-specific documentation.

Overview of Organizational Roles

Los Alamos National Laboratory is organized relative to three major capabilities - program, technical, and support. These capabilities are linked through the communication of programmatic expectations and the allocation of funding. Interactions with the Department of Energy and other external organizations are the responsibility of the Program Offices: programmatic direction and funding for program and project execution comes from Program Offices. Project execution is carried out at the direction of the Program Offices by Technical Line Organizations. Technical Line Organizations maintain technical capabilities in terms of personnel and equipment, are responsible for the upkeep and operation of facilities, and are responsible for safe operations within facilities. Support Line organizations, such as the Facilities, Security and Safeguards Division, the Business Operations Division, and the Environment, Health, and Safety Division, and their associated specialty groups, maintain the auxillary support capabilities needed to support the technical and programmatic goals at Los Alamos National Laboratory.

Management and execution of NMSM-NCR construction projects requires clearly defined roles and responsibilities between the Program Office, the Technical Line Division with responsibility for the facility being modified, the Support Line organization that provides facilities engineering and construction management skills, and other support organizations.

Organizational Roles and Responsibilities

The Nuclear Materials and Stockpile Management Program Office (NMSM) is responsible for programmatic leadership of the Laboratory's activities for nuclear materials operations, and maintenance, surveillance, and manufacturing operations in support of the nuclear weapons stockpile. The NMSM Nuclear Component Readiness (NCR) Program Office is responsible for activities required to implement pit manufacturing as well as associated facility modifications. The NMSM Program Office jointly appoints Project Leaders with the Technical Line Organizations.

The NMSM-NCR Program Manager will provide funding and project direction to the Technical Line Organization with responsibility for the construction project. The NMSM-NCR Program Office is responsible for generating a Program Requirements Document (PRD), describing programmatic deliverables to the Technical Line Organization. The NMSM-Program Manager is also responsible for concurring on the Functional and Operational Requirements (F&OR) Document and approving a project baseline that upholds the programmatic deliverables.

The NMSM-NCR Program Manager is the single point of contact for formal communication with the DOE, and will negotiate project deliverables with input and support from the Technical Line Organization. Working with DOE, the NMSM-NCR Program Manager will obtain: 1) concurrence on programmatic direction, 2) programmatic approval, and 3) funding support for construction project work. The NMSM-NCR Program Manager will also function as the single point of communication with the DOE of changes to project scope, cost, and schedule.

Commitments. All formal commitments from Los Alamos will be documented and issued through the NMSM-NCR Program Manager. The NMSM-NCR Program Manager will obtain concurrence from the appropriate Technical Division Directors for major commitments. Formal reporting on project status will take place through the NMSM-NCR Program Office. The NMSM-NCR Program Office will be responsible for obtaining internal Los Alamos validations on the Construction Project Data Sheet (CPDS) and transmitting to DOE the CPDS for all stockpile management projects. As the Project Execution Plan (PEP) will be the implementing document for the interfaces of program and project requirements between Los Alamos and the DOE, approval of the document will come from the NMSM-NCR Program Manager before transmission to DOE.

Change Control. Changes to the project baseline will be controlled through a formal change control process. This tiered change control process will be described in the document "Change Control for NMSM-NCR Construction Projects". The NMSM-NCR Program Manager has the responsibility of adhering to the tiered change control procedures as described in this document. The NMSM-NCR Program Manager will nominate members of the project Baseline Change Control Board (BCCB). Baseline Change Proposals (BCPs) will be transmitted to DOE through the NMSM-NCR Program Manager.

Funding Flow. All authorizations and funding for stockpile management construction projects will be sent from DOE through the Laboratory Controller to the NMSM Program Office, and all funding for NMSM-NCR construction projects will be allocated through the NMSM Program Office to the Technical Line Organization responsible for the facility and the project execution. The NMSM Program office will be responsible for allocating stockpile management operating and capital funding consistent with the individual project authorizations and the scope as described within the project-specific PEP.

Integration Responsibilities. The NMSM-NCR Program Manager will be responsible for integrating projects, programs, and processes for all NMSM-NCR construction projects. This integration between all NMSM-NCR construction projects will be ensured through common planning and the utilization of certain common support groups and functions for all projects. Common functions encompass: integrated planning including master schedules and budget strategies, systems analyses from the Technology and Safety Assessment Division (TSA) to help define and integrate requirements with programmatic deliverables, and integrated safety assessments.

The NMSM-NCR Program Manager is also responsible for convening and utilizing **Technical Advisory Groups** and **Independent Review Teams** to advise NMSM-NCR management on issues related to the establishment of a pit fabrication mission at Los Alamos, and to provide a high level of overview and peer review of stockpile management construction projects. The functions of these groups and teams will include **Project Risk Analyses, Internal Project Validation Reviews, and Design and Construction Initiation Reviews.**

The Technical Divisions are responsible for implementing projects that meet the needs as defined by the NMSM Program Office. The commitment of the appropriate Technical Division Directors to support major project activities will be obtained prior to formal laboratory agreement with DOE. The Technical Divisions have the primary responsibility for project leadership and execution. There are three main components of the project implementation package: 1) Project management; 2) Safety, including the facility safety envelope; and 3) User Requirements. Currently, the Nuclear Materials Technology (NMT) Division and the Chemical Sciences and Technology (CST) Division are lead divisions for most of the NMSM stockpile management construction projects with line management and execution responsibilities for the NMSF Renovation (NMT), the CMIP (NMT), the Fire-Water Loop Replacement at TA-55, (NMT) and the CMR Building Upgrades (CST).

Project Management. The Technical Line Organization is accountable for developing and recommending a project baseline for approval by the NMSM-NCR Program Manager and then maintaining that approved project baseline in terms of scope, cost, and schedule. The Technical Line Organization is responsible for identifying, and jointly appointing with the NMSM Program Office a **Project Leader**. The Technical Division is also responsible for maintaining informal communications with the DOE, however, all project direction will come from the NMSM-NCR Program Office and not from the DOE directly.

Technical Line Organizations also have the responsibility for convening and utilizing Technical Advisory Groups and Independent Review Teams to advise them on project management issues.

The **Project Leader** is responsible for the execution of the project. As the representative of the facility owner (Technical Division Director), the Project Leader reports organizationally to the Technical Line Organization and programmatically to the NMSM-NCR Program Manager. The Project Leader will originate a project baseline that supports programmatic and user requirements. The Project Leader is one of the approvers of the (P&OR) document. The Project Leader is responsible for identifying construction project

support requirements and then contracting with Support Divisions for personnel with appropriate skills and expertise as needed for successful completion of the stockpile management construction projects. The Project Leader directs the implementation of the requirements of the user, the facility managers, and current regulations through the design, construction, and startup activities into a useable, operating facility. The Project Leader participates in integration planning and review activities as required by the NMSM-NCR Program Manager.

The Project Leader is accountable for the adherence of the entire project to the scope, schedule, and cost baselines as defined within the PEP and other project documents and is responsible for the implementation of Quality Assurance processes throughout construction.

Change Control. Certain changes will be resolved at the project level through the BCCB with the proper process documentation, record keeping, and communication. Levels of change that can be resolved at the project level are described in the document "Change Control for NMSM-NCR Construction Projects". All members of the project team have the responsibility for following change control procedures. The Project Leader has the responsibility of convening the BCCB when appropriate to the needs of the project. The Project Leader also assesses the need for outside approvals to proposed change to scope, schedule, and cost according to the document "Change Control for NMSM-NCR Construction Projects" and the project PEP.

Facility Safety. Technical Line Organizations are accountable for safety in the facility for operations and construction. The Project Leader through the Division Director, is accountable for safety in the construction project and works with Facility Manager to ensure safety and adherence to facility requirements. The Project Leader will work with the Facility Manager as required in the development and implementation of any new or updated SAR. Complex projects may require a Commissioning Project Leader in addition to the Project Leader and the Facility Manager to transition from the project to the user.

The Facility Manager is responsible for the maintenance of the facility safety and operating envelope (authorization basis) before, during, and after the construction project. The Facility Manager works with the Project Leader and the Design and Construction Project Leader to integrate construction activities under the facility operating envelope. In addition, the Facility Manager communicates the requirements for facility operations to the Project Leader and the Technical Project Leader (for the Functional and Operational Requirements - F&OR) and provides construction acceptance criteria to the Project Leader and the Design and Construction Project Leader. As ultimate owner of any updated Safety Analysis Report (SAR), the facility manager is responsible for the generation of a new or updated SAR and will work with the Design and Construction Project Leader, the Division Director and the Program Office in the development and implementation of this document.

The Commissioning Project Leader is responsible for the start-up of the facility, including acceptance tests and readiness reviews as needed. The Commissioning Project Leader works with the Project Leader, Design and Construction Project Leader, and Facility Manager to set and communicate appropriate standards of acceptance for a finished product. This position could also be the role of a Facility Manager or their designee.

User Requirements. Technical Line Organizations have the responsibility for identifying and jointly appointing with the NMSM Program Office a Technical Project

Leader. The Technical Project Leader is responsible for specification of Functional and Operational Requirements (F&OR) to the Project Leader thus helping to ensure the usability of the constructed product. The Technical Project Leader leads the **Technical Steering Committee**, through which is generated the F&OR document, describing the finished product.. The F&OR is a Los Alamos-owned document that is also approved by the Project Leader, the Technical Project Leader, and the Executive Steering Committee, and concurred to by the NMSM-NCR Program Manager. It is the communication interface between the programmatic, technical, and operational requirements of the users and operators of the facility and the facility construction project that ensures proper facility operability. The Technical Project Leader is the owner of the F&OR document; changes to the F&OR document must be approved by the members of a BCCB. The Technical Steering Committee will meet as required, and can be convened by the Technical Line Organization or the NMSM Program Office. It is the responsibility of the Technical Project Leader to lead meetings of the Technical Steering Committee.

Fulfilling the requirements of the F&OR will represent successful completion of the project from a user standpoint. The Technical Project Leader must ensure that the scope of the F&OR incorporates the needs and constraints imposed by facility requirements, ES&H, and programmatic operations. Changes in the user requirements will be communicated to the project through modifications in the F&OR; modifications will go through the formal change control process.

The Facilities, Safeguards, and Security (FSS) Division (through FSS-6) is responsible for identifying and assigning to the project those skilled personnel that have the engineering, construction, and project controls expertise necessary to support the needs of the project and the Project Leader, including the **Design and Construction Project Leader.** In addition, the Facilities Project Delivery Group (FSS-6) is responsible for providing the common background documentation, procedures, and processes needed for effective project management and control to meet nuclear construction standards. The contract between Los Alamos and the Architect Engineer (A/E) for all nuclear construction projects is managed by FSS-6.

The **Design and Construction Project Leader** oversees the design, procurement, engineering and construction activities and accepts assignments from the Project Leader. The Design and Construction Project Leader is the interface between the construction project and the services of the A/E.

FSS-6 personnel are responsible for generation of common background documentation, procedures and processes that include, for example, project controls procedures, unified project reporting, design validation, and construction inspection. Lessons learned on one project will be transmitted to other projects through FSS-6.

The Business (BUS) Division is responsible for providing skilled personnel with contracting, procurement, and financial tracking and reporting expertise necessary to support the needs of the project and the Project Leader.

Other Support Divisions such as the Environment, Health and Safety Division (ES&H) and others, are responsible for providing personnel that have the necessary expertise to support the needs of the project and the Project Leader.

Project Execution Plan

The Project Execution Plan (PEP) will be the implementing document for the interfaces for program and project requirements between Los Alamos and the DOE. There will be an overall PEP for all NMSM-NCR construction projects and a project-specific PEP for individual projects. It is the responsibility of the Project Leader to generate the project-specific PEP in consultation with members of the project team; the appropriate Technical Division Director and the NMSM-NCR Program Manager shall approve the document. Ultimate approval shall come from the DOE. All PEPs will be updated at least yearly.

Any differences in the general roles and responsibilities described in this document and any special project requirements and circumstances will be described in the PEP. The PEP will contain a project-specific organizational chart naming key project individuals from both Los Alamos and DOE and an explanation of their specific roles and responsibilities.

Formal agreement with DOE on project scope will be contained within the PEP. Any formal DOE direction to the NMSM-NCR Program Office and thence to the project will be implemented in a timely fashion through a formal change control process and then incorporated into the PEP during the next yearly update.

The PEP will describe the product that Los Alamos is expected to deliver. Included in the PEP will be control-level work package deliverables (including their associated products, costs and schedules), a master project schedule (including key milestones and products), and project costs (including the total project cost and the baseline funding profile). Frequency and timing of formal reports to the DOE will be defined in the PEP. The PEP will also include performance measures based on key milestones and products, keyed to goals appropriate for timely, dependable assessments.

The project-specific PEP will define and maintain the project baseline and will list the documents, standards, and orders that are implicit to the baseline. Changes to the documents, standards, and orders will trigger PEP-defined change control process in the same way that others change would impact the project. The PEP will set the change control levels in terms of baseline, cost, and schedule.

The PEP will also document the processes and procedures for assigning use of contingency and management reserve funds.

Executive Steering Committee

The **Executive Steering Committee**, with representation from the Program Office, the Technical Line Division Director, the Facilities, Safeguards and Security Division Director and other Support Division Directors as appropriate, will provide overall policy guidance to the project and approve or disapprove of certain changes in the project. Membership in the Executive Steering Committee is determined by the lead Technical Line Division Director, the Program Director of NMSM, and the Division Director of FSS. Other members will be approved by the base committee. DOE will be represented by an advisory member. The Executive Steering Committee will approve the F&OR. Levels of change requiring Executive Steering Committee approval will be project-specific and will

be set by the project PEP. The Executive Steering Committee will meet on a quarterly basis: it is the responsibility of the NMSM-NCR Program Office to convene the quarterly meetings.

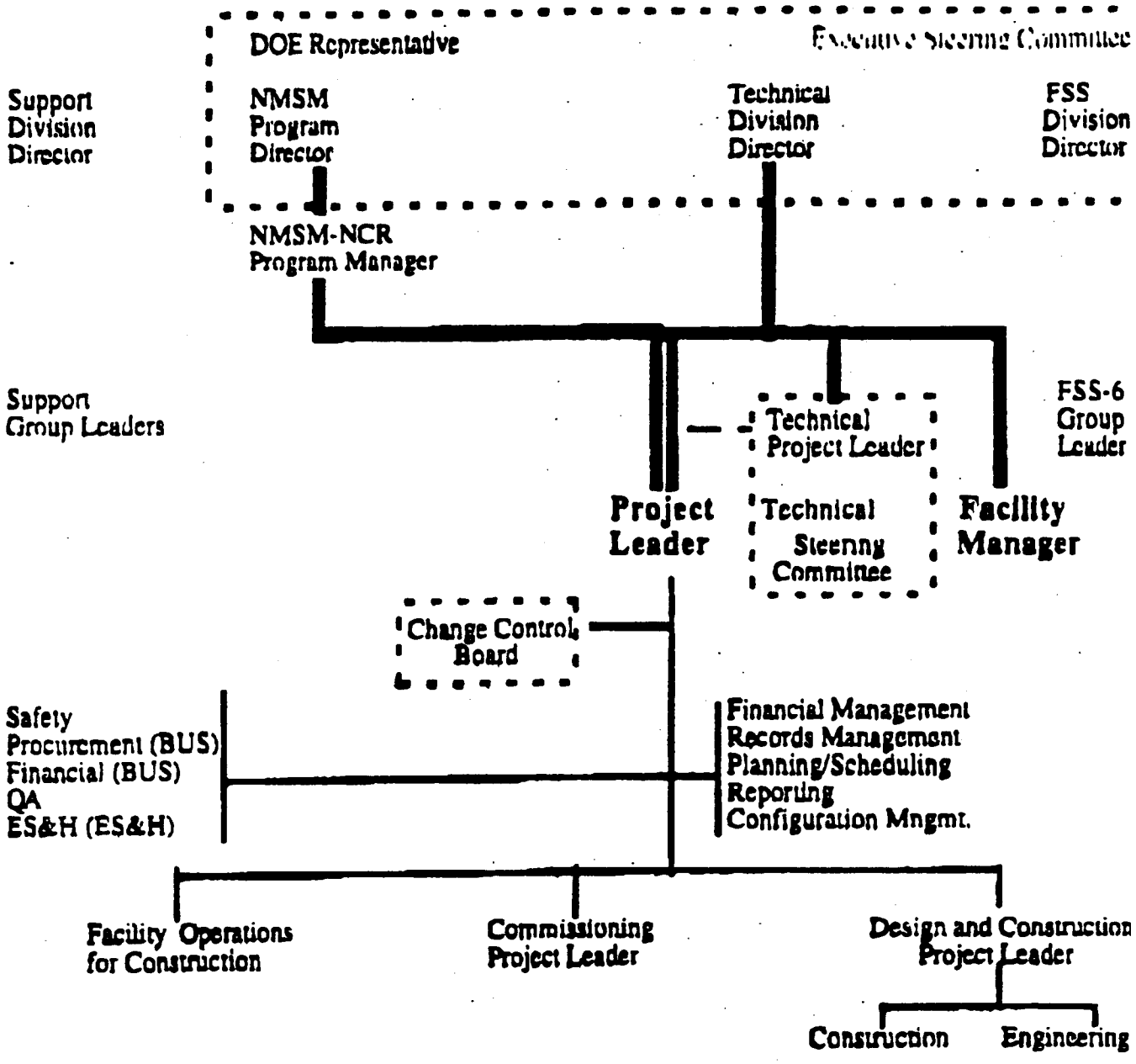
Change Control Board and the Change Control Process

The membership of each **Baseline Change Control Board** (BCCB) will reflect organizations impacted by the construction project. As a primary affected organization, the Technical Line Organization will have membership on the BCCB. Members will be nominated by the NMSM-NCR Program Manager, and approved by the Executive Steering Committee. The BCCB will be convened by the Project Leader to determine the disposition of change requests in accordance with the document "Change Control for NMSM-NCR Construction Projects", and to approve or disapprove changes that lie within the project-specific PEP thresholds for the individual projects.

General Roles and Responsibilities

A General project management and interface chart is shown on the next page. A project-specific organizational chart that documents key individuals and their responsibilities will be generated by individual project organizations and will appear in the respective Project Execution Plans (PEP) for each project. Specific charts will be held under formal change control. Critical to the success of NMSM-NCR projects is the clear understanding of roles and responsibilities intrinsic in these organizational structures.

Programmatic Direction and Funding
Line Management and Safety



Los Alamos Roles and Responsibilities for NMSM-NCR Projects

Approved by:

P. T. Cunningham — 9/11/97

Paul T. Cunningham
Program Director, Nuclear Materials and Stockpile Management

Alexander Gancarz — 9-10-97

Alexander Gancarz
Division Director, Chemical Sciences and Technology

R B Matthews — 9/7/97

R. Bruce Matthews
Division Director, Nuclear Materials Technology

9/11/97

Bernard J. van der Hoeven
Division Director, Facilities, Security and Safeguards

9/13/97

James F. Jackson
Deputy Director

Project Management Advisory Panel Charter

Los Alamos National Laboratory

Purpose
Ensure successful management of the planning and execution of major construction and infrastructure projects at the Los Alamos National Laboratory.

Goal
Review and evaluate major construction and infrastructure projects, current and planned, at Los Alamos, including planning, execution, programmatic interfaces (external and internal), policy, DOE requirements, training, and support systems, and make recommendations to the Laboratory Director.

Objectives

- Review planning processes, particularly integration of scope, deliverables, milestones, and budget, to support programmatic needs and requirements.
- Review major construction and infrastructure projects from the perspective of evaluating strengths and weaknesses of the current construction project management approach, and identify potential systemic improvements, as appropriate.
- Examine management, organization, and roles and responsibilities, as they impact the planning and execution of these construction projects.
- Review adequacy of policies, procedures, control systems, self assessments, and underlying processes and support systems required for good project management.
- Examine the impact of DOE requirements, practices, and interfaces on successful project performance.

Scope
The scope of this project is limited to definition and recommendation of management and organizational approaches, and mechanisms and processes to enhance performance on construction and infrastructure projects.

Guidelines

- The Project Management Advisory Panel reports to John Browne, Director, Los Alamos National Laboratory.
- The major focus will be on construction and infrastructure project management.

Additional insight and recommendations on innovative approaches to construction projects and their management are also desired.

- Planned initial duration of this project is 4 months, with final recommendations delivered to the Director by August 31, 1998.

- Infrastructure projects refer to major facility upgrades and renovations, and involve safety, operation and maintenance, safeguards and security, waste management, and environmental compliance issues.

Members
Mr. J. Michael Hart (Senior Vice President, Duke Engineering and Services, Inc.)
Mr. Edward S. Keen (Retired, Bechtel)
Mr. Peter J. Offringa (Executive Vice President, ICF Kaiser International, Inc.)
Mr. Paul Rice (Contracting Consultant)
Dr. L. Edward Temple (US/CMS Project Manager, Fermi Laboratory)

Panel Support (Los Alamos):
Dr. Walter L. Kirchner, Executive Secretary
Ms. Anselma I. Kaufman, Administrative Assistant

Los Alamos National Laboratory Construction Project Management Status

[redacted] *LANL Is Implementing a Plan to Ensure Effective Construction Project Management (CPM)*

- Established clear line management focus and accountability
  - Deputy Director for Operations
  - Facilities Engineering Division
  - Associate Directors where program/line issues close
- Formally established Laboratory policy by issuing a Construction Project Management LIR (Laboratory Implementation Requirement)
- Ensure effective CPM procedures, practices, and skill base
  - Detailed plan being implemented
- Conduct regular Senior Management reviews of all major projects and hold managers accountable for performance
- Gain future guidance from senior level Project Management Advisory Panel

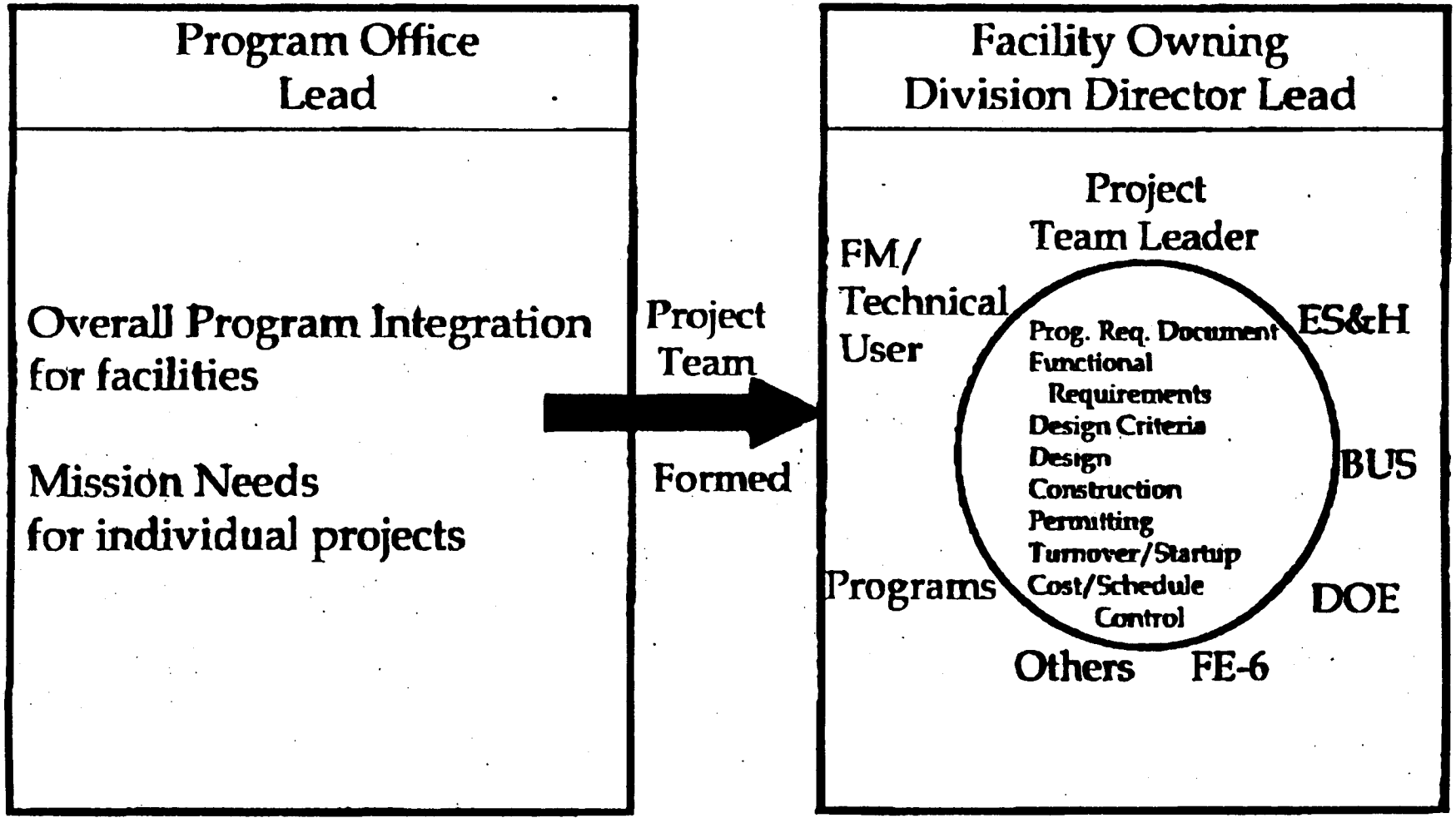
Project Management Advisory Panel

- Senior level panel advising the Laboratory Director
- Will review the Laboratory's policies and practices and make recommendations to ensure effective management, controls, and supporting systems are in place
- Panel Members
  - » J. Michael Hart, Senior Vice President, Duke Engineering & Services, Inc.
  - » Edward S. Keen, Retired, Bechtel Corporation
  - » Peter J. Offringa, Executive Vice President, ICF Kaiser International, Inc.
  - » Paul Rice, Contracting Consultant
  - » Dr. L. Edward Temple, UC/CMS Project Manager, Fermi Laboratory
- Deliver initial recommendations by September, 1998

LIR Has Established Laboratory Policy for CPM

- Clear roles and responsibilities
  - » Line ownership of projects
  - » Project team used to focus efforts
- Baseline content requirements specified
- Approach for including safety requirements is included
- Change control on scope/schedule/budget required

CPM LIR Requirements are:



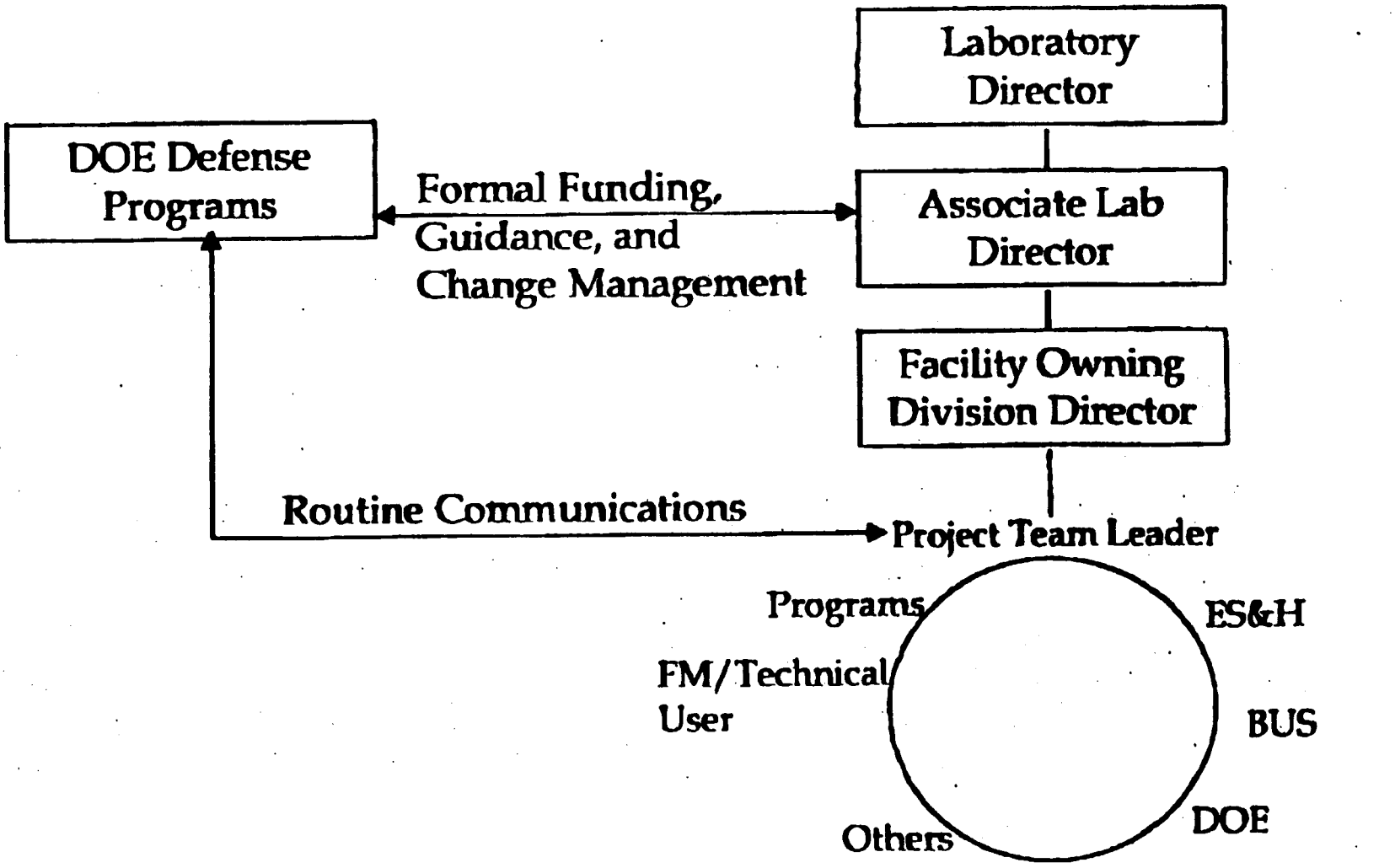
The LIR Specifies Responsibilities for the Facility Owning Div. Director

- Primary owner for project leadership and delivery of a quality project
- Responsible for preparing and controlling the Functions and Operational Requirements to meet Mission Need
- Primary project leader for conceptualizing, designing, permitting, safely constructing, and starting up projects on schedule and within approved budgets
- Responsible for establishing the project team and appointing the team leader
- Responsible for interacting with DOE to achieve project success within the constraints of the overall technical and funding plans

LIR Specifies Responsibilities for the Program Office

- Provide program management in support of projects
- Translate the overall Laboratory vision & mission into specific & integrated facility mission needs
- Be the primary interface with DOE to integrate funding needs for projects

Interface With DOE Will Be Clear



We Believe DARHT And NMSF Are On Track

DARHT

- Scope/cost increases due to changing circumstances
- Facility owning division fully engaged and in charge
- LIR being implemented
- Strong project management in place

NMSF

- Project is now Title I design only
- LIR being implemented, Facility owner in charge
- Expect to be successful with current scope
- Work beyond Title I not defined

Revised Actions are Necessary for CMRU/CMIP

- Transfer projects to facility owning division using LIR procedures
- Complete approved actions
  - CMR: two maintenance actions
  - CMIP: design studies
- Establish agreement on total project scope/schedule/budget as soon as possible

DOE Can Help LANL

- Establish scope/schedule/cost agreement on several major projects
- Achieve faster Baseline Change approvals (recent actions should help)
- "Control" audits and assessments
- Participate on project teams

Conclusion

- We are changing our CPM "Culture"
  - » People
  - » Procedures
  - » Management
- We are working specific project issues
- We need some DOE help

We believe our path will lead to excellent CPM performance in FY99

Attachment 7

DOE CMR Upgrades Project Assessment Summary

Overview

DOE review of the CMR Upgrades Project was initiated on May 8, 1997, through the formation of a LANL Stockpile Management Construction Program Review Team by the Assistant Manager for Technology and Site Programs, AL. The specific purpose of the Review Team was to provide to the AL Manager an assessment of the project management systems at AL, LAAO and LANL, specifically limited to the LANL Stockpile Management Construction Program. The Team was also chartered to produce a report that would document the assessment process, findings, and recommendations that would serve as a primary component of an overall AL recommendation to the Deputy Assistant Secretary for Military Application and Stockpile Management. The primary driver for this assessment was the CMR Upgrades Project that had reached a crisis point and was placed on hold by LANL on April 21, 1997. This action was taken due to several problem indicators including; large cost overruns, scope issues, inaccurate reporting, and poor engineering and project management practices. The Review Team consisted of HQ, AL and LAAO personnel who have experience with and/or responsibility for the CMR Upgrades Project and Stockpile Management and Stewardship construction programs at LANL.

Although initially focused on performance issues associated with the CMR Upgrades Project, the assessment was expanded to analyze both project specific and institutional findings related to DOE and LANL project management, identify root causes, and develop corrective action recommendations applicable to the entire LANL SM Construction Program.

Process

The DOE Assessment Team used a performance-based methodology and a phased approach in the completion of the assessment which included the following activities:

- Reviewed LANL and DOE CMR Upgrades Projects records in depth.
- Conducted interviews of LANL & DOE project, program, facilities and self-assessment personnel.
- Assessed LANL & DOE weaknesses in executing project management at LANL.
- Reviewed and assessed LANL and DOE responsiveness to problems.
- Reviewed LANL audit results and corrective actions.
- Reviewing LANL draft proposed Baseline Change Proposals.
- Preparing a report to document activities, findings, recommendations and corrective actions.

During the conduct of the assessment, interim status briefings were presented to senior DOE and LANL management as well as the Defense Nuclear Facilities Safety Board. Excerpts of these briefings are provided below.

Findings

The main findings of the DOE assessment were:

- LANL and DOE Project Management was inadequate to maintain control of the projects.
- LANL engineering and project management shortcomings resulted in cost overruns and schedule delays.
- Inaccurate LANL project reporting prevented timely LANL and DOE issue resolution.
- LANL mismanaged project contingency.
- LANL cultural and organizational issues led to constantly evolving project definition, a failure to integrate projects among all stakeholders, ineffective management, and a lack of accountability.

Conclusions

The conclusions reached by the DOE Assessment Team were:

- The CMR Upgrades Project failures are the result of a broad systemic breakdown of fundamental project management and engineering practices. Many of the root causes of these failures were institutional and had been observed in varying degrees with other LANL projects.

- The practices and institutional issues which led to these failures were of a recurring nature, have been documented several times, and solutions previously developed have been superficial and ineffective.

The DOE Assessment Team presented the following as a bottom line:

- DOE and LANL must develop a solution which minimizes risk by increasing controls, authorizing small incremental project steps, measuring true performance, and reassessing the solution in the near future.

- This will require a sustained effort with high-level management involvement.

Recommendations

The following corrective actions were developed by the DOE Assessment Team and have been briefed as recommendations to AL and DP Management:

- Strengthen basic Engineering and Project Management Capabilities.
- Clearly define and validate project baselines by completing all required development work with the understanding and agreement of all stakeholders before the project proceeds.
- Establish effective accountability by formally designating responsible management official(s) who have authority to ensure execution of the SM projects at LANL.
- Establish effective internal self-assessment process and corrective actions systems.
- Establish and verify the use of project management systems including independent project status reporting.
- DOE should authorize the use of contingency.
- Employ an incremental step approach to SM project activities including increased controls and continually assess the management approach.

The above recommendations were presented to AL and DP management as an overall approach to increase DOE and LANL chances for success on SM projects based on the following:

- Incremental approach to project activities with limited, specific tasks should be manageable in the interim, and provide indicators of performance.
- Increased management involvement coupled with additional controls will provide visibility, enhance issue resolution, and increase accountability.
- Organizational changes are providing the necessary resources and proper focus.
- This effort is being managed as a long-term program that requires a sustained effort.
- DOE will control contingency, evaluate project management processes, and track corrective actions to assess performance.
- Conditional approach allows time to fully develop other options yet proceed to meet programmatic objectives in the near term.

INTEGRATED REVIEW PLAN

FOR

STOCKPILE MANAGEMENT PROJECT'S CONCEPTUAL DESIGN REPORTS AT LOS ALAMOS NATIONAL LABORATORY

Albuquerque Operations Office
U.S. Department of Energy

March 1998

Draft 2.1

INTEGRATED REVIEW PLAN
For
Stockpile Management Project's
Conceptual Design Reports

Recommended for Approval:

Xxxx Xxxxxx, NCPO, PMO Project Management Plan Lead Project Review Team Lead	Date
Xxxx Xxxxxx, NCPO Safety Review Plan Lead	Date
Xxxx Xxxxxx, NPD Program Review Plan Lead	Date

Approved By:

Xxxxx Xxxxx, NCPO Program Manager	Date

Table of Contents

Introduction

The Integrated Review Plan (IRP) was a collaborative effort involving subject matter experts in the areas of project, safety, and program management from DOE Headquarters, Albuquerque Operations Office, and the Los Alamos Area Office. This effort represents a milestone toward the DOE goal of full integration of project, safety and program requirements into the design and construction of nuclear facilities at LANL. Moreover, this integrated plan will serve as a foundation for DOE review activities for subsequent project stages, such as preliminary and detailed design.

Purpose

The purpose of the IRP is to assure a consistent, rigorous and systematic review of Conceptual Design Reports (CDR), and associated deliverables, prepared for Stockpile Management projects at LANL. The IRP documents the scope (breadth and depth), requirements, performance objectives, acceptance criteria, review approaches, and personnel qualifications for each of three focus areas; project management, safety and program.

The objective of the review is to validate that the conceptual design adequately addresses programmatic, operating, and statutory requirements; assures project feasibility and attainable performance levels; develops reliable cost estimates and realistic schedules; and sufficiently addresses:

- project criteria and design parameters;
- applicable codes and standards
- quality assurance requirements
- environmental studies
- materials of construction, space allowances, energy conservation features;
- health and safety, safeguards, and security requirements; and
- any other features or requirements necessary to describe the project

Three separate teams will be established to perform these reviews, which will culminate in an integrated set of comments and a determination of overall acceptability of the CDR and baseline regarding project management, safety, and programmatic requirements.

Scope

The technical scope of the CDR review will be jointly determined based on the project scope (functional and operational requirements) and DOE requirements and expectations for design, construction/modification and safe operations of nuclear facilities. To this end, review acceptance criteria have been established reflecting these expectations. The criteria are included in the Functional Review Plans for each of the three focus areas (project, safety and program).

Review Process

The review process is primarily governed by the Functional Review Plans, presented in detail below. The purpose of these plans is to direct the review for each of the focus areas. The review plans detail the review objectives, review acceptance criteria, review team composition, coordination of review team actions, and team and team member responsibilities. General responsibilities are outlined below:

- Review Team Members are expected to conduct a thorough review of the document(s) and should focus their efforts on their areas of responsibility.
- Integration Team Members are responsible for consolidating comments from within their organizations to ensure completeness, consistency, and eliminate redundancy.
- Review Team Members are responsible for ensuring that all comments are unclassified, and for coordinating their comments with an Authorized Derivative Classifier.
- Integration Team Members will consolidate comments into an integrated comment package and issue the package for discussion during the validation meetings.
- Integration Team Members will conduct the comment validation meetings for each focus area to discuss and resolve issues.
- Integration Team Members are responsible for developing the official CDR review comment package.
- Review Team Leads, members of the integration teams, are responsible for writing their portions of the Recommendation for Approval Letter w/ input from the Integration Team and Review Team Members.
- Integration Team Members are required to provide concurrence concerning the adequacy of the CDR through the Recommendation for Approval Letter (RAL).
- Any Team Member may submit a minority opinion on any unresolved issue, the minority opinion will be noted in the RAL and forwarded through the approval process with the approval memorandum.
- Observations of the review process will be used as lessons learned to improve future reviews.

Roles and responsibilities between the review team leads, integration team, and the subject matter experts are shown in Figure 1.

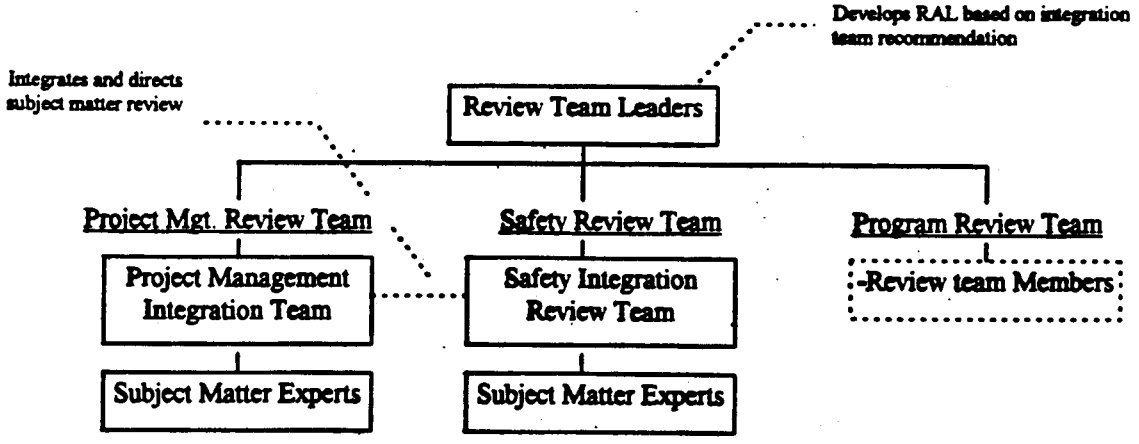


Figure 1

The precise breadth and depth to which a specific area of the project is reviewed will depend upon that area's associated risk as determined by the review team and reflected in the tailoring of the acceptance criteria. Since the criteria will be used to evaluate design documentation of multiple projects, at various stages of development, for facilities having different types and levels of hazards, their utilization must be tailored to specific project/facility conditions. In addition, the criteria should not be used as a checklist, but as a guide by reviewers to determine potentially important aspects of the design.

To determine the applicability and scope of the review criteria for a review area, several factors should be considered, including:

- Safety-significance
- Importance to mission achievement
- Cost and schedule importance and impacts
- Technical challenges
- Potential for experiencing manufacturing/construction/operation or maintenance problems.

Comment Process

The review team comments should be limited to specific concerns and issues associated with the review team's focus area, and should be linked to the acceptance criteria. Comments must also suggest a path for resolving the issue in question. The decision whether to include a comment should be based on whether resolution of the comment would enhance the ability of the conceptual design to address programmatic, operating, and statutory requirements; project feasibility; cost estimates and schedules; and/or design aspects of the project. The following is general guidance for the review teams, more specific guidance is found in the Functional Review Plans:

- The comment should not ask a question.
- Provide separate comments for each distinct issue; do not combine multiple issues.
- Provide consolidated comments for common issue.
- Comments should be written succinctly and in a way that facilitates contractor response.
- Reviewers may provide general and specific comments by chapter and appendix.
- Reviewers are expected to pursue clarification prior to preparing comments
- Reviewers may provide guidance on resolution of comment.
- Editorial comments, such as those directed toward the documentation itself (including misspelling, mislabeling, sentence structure, and so on) will not be provided.

Comments will be provided in a standard format. Two types of comments will be provided to the CDR preparers. The most important type of comment will be identified as Essential. Essential comments will be used to indicate failure of the conceptual design and/or supporting information to satisfy one or more of the acceptance criteria. Essential comments will require a formal response and action statement from the CDR preparers. Essential comments will be tracked through resolution to closure by the review teams. Other review comments will be identified as Suggested. These comments will not require a response from the CDR preparers.

The Comment/Resolution Form will be used for all CDR comments (see attached). An electronic version will be provided to each review team and CDR preparers. Comments and responses are to be submitted electronically using MS Word or Word Perfect versions of the Comment/Resolution Form.

The Comment box on the form will contain the narrative statement for each comment. For essential comments, the narrative statement will identify one or more unsatisfied criteria from those established for the review. The narrative statement will also provide one or more options or recommendations for

resolving the comment. The Response box of the form will be completed by the CDR preparer in response to each Essential comment. Once complete, the appropriate integration team will either accept or reject the response, or will forward the response to the DOE subject matter expert for determination of acceptance or rejection.

The Comment/Resolution Form will become record when the review team signs and dates the form, indicating that the comments have been adequately resolved. The Comment/Resolution form will be a controlled document throughout the review.

One final note on comments: If resolution between the DOE subject matter expert and the CDR preparers can not be reached, the issue/concern is elevated to the Integration Team for that focus area. These individuals will have the final decision on the disposition of the comment. If either party (CDR preparer and/or DOE subject experts) do not agree with the decision, they can prepare a minority opinion for inclusion into the DOE Recommendation for Approval Letter, discussed below.

Approval Process

Once the comments from each review team have been addressed as discussed above, the Review Team Leaders are responsible for preparing a Recommendation for Approval Letter (RAL). This letter will identify why the CDR should be approved and possible risks associated with approving the project. The letter should also discuss lessons learned and areas for improvement. This document can require corrective actions to be completed by the CDR preparer prior to completion of Title I. The documentation will be an attachment to the approval memorandum from the DOE.

Approval Authority

A. E. (Earl) Whiteman, Assistant Manager for the Office of Technology and Site Programs, is the approval authority for most conceptual design reports submitted for Stockpile Management Projects at LANL. (Note: Approval authority for a specific project may vary; consequently, this authority will be verified and documented prior to the issuance of a project specific IRP.)

Functional Review Plans

The purpose of the Functional Review Plans is to direct the review for each of the three focus areas (project management, safety and program). The review plans detail the review objectives, review acceptance criteria, review team composition, coordination of review team actions, and team and team member responsibilities. A key component of the review plans is the review acceptance criteria. These criteria represent the DOE's expectations regarding conceptual designs for Stockpile Management Projects at LANL. As discussed above, the criteria should be used in an approach tailored to the specific project, facility, and work and hazards. Moreover, the criteria are a guide to reviewers to determine potentially important aspects of the design and should not be used as a checklist.

It is also important to note that the acceptance criteria, contained within the Functional Review Plans, are the numbered questions listed in the criteria sections. The bullets and lower-tier questions are only examples of items the reviewer may use to consider whether the criteria are adequately addressed.

The Functional Review Plans below are prepared in a generic fashion and do not represent the final form of the documents. Consequently, in addition to possible modification of team members and responsibilities for a specific CDR review, the plans will also include additional process information pertaining to each focus area. This information includes:

- critical review issues;

- ☐ required readings;
- ☐ key meetings;
- ☐ review approval schedules/milestones; and
- ☐ additional comment or format instructions.

Project Management Review Plan

Project Management Review Plan Objective

The purpose of the Project Management Review Plan (PMRP) is to describe the process to conduct a systematic and integrated review of the CDR. The DOE needs this review to verify that an adequate definition of the functions required to support project management requirements are presented. The project management review team will conduct a thorough review of the conceptual design and planned management approach to ensure that appropriate consideration has been given to project management requirements and issues. The objectives of the CDR project review are as follows.

- Determine whether the project, as planned and presented, is cost effective and will meet mission need requirements.
- Determine whether there is an acceptable probability (such as 80 percent or greater) that the cost, schedule, and technical baselines that are being proposed can be achieved.

Project Management Review Acceptance Criteria

The purpose of the review acceptance criteria is to ensure thorough, effective, and consistent reviews of LANL stockpile management program/projects conceptual design documentation. Additionally, the acceptance criteria establish DOE expectations for the quality and content of conceptual design.

1. **Baseline Reliability**

1.1. Was the technical baseline formulated through the development of a hierarchical set of quantitative objectives that involved all parties?

- Do the Functional and Operational Requirements (F&OR) encompass the following basic elements?
  - ◊ Mission need
  - ◊ User/Stakeholder requirements
  - ◊ Federal/State statutes/regulations
  - ◊ DOE orders, rules, standards
  - ◊ Operational constraints
    - Permits
    - Safety authorization basis
    - Standard Operating Procedures (SOPs)

- Operating contract & Los Alamos National Laboratory (LANL) standards

☐ Is there evidence of participating review and/or approval by operations, user, program, designers, and project management organizations?

☐ Are F&ORs presented in a format that facilitates the development of acceptance criteria that will be used to measure achievement of project objectives?

☐ Have design specific safety requirements (based on hazard analysis and mission/work requirements) been incorporated into the F&OR?

☐ Are the design solutions traceable back to specific F&ORs and Preliminary Hazard Analysis (PHA) results (crosswalk)?

☐ Does the CDR adequately describe the basis used for assessing and documenting facility and pre-existing conditions (such as, as built, condition assessments, configuration management [CM], and so on)?

☐ Is there evidence that constructability, operability, reliability, and maintainability have been considered, documented and are reflected in the baseline?

1.2. Have the principle technical and managerial challenges been identified, correctly analyzed, and appropriately dispositioned?

☐ Access (such as, security, physical)
☐ Operations continuity (such as, outages, programmatic impact)
☐ Interfaces/interdependencies
☐ State of technology
☐ Budget cycle demands
☐ Resource limitations
☐ Facility modification versus new construction
☐ Waste management/pollution prevention
☐ Safety implementation/integration

1.3. Have the structures, systems and components been identified, defined, and engineered to an adequate depth? Is there sufficient detail available or presented to support?

☐ Reliability determinations
☐ Cost estimating (quantities, specifications)
☐ Safety classifications

1.4. Have the conditions and constraints under which the project will be conducted been fully investigated and properly taken into account?

- ☐ Access
- ☐ Funding/budget
- ☐ Procurement lead times
- ☐ Decision process
- ☐ External reviews
- ☐ Defense Nuclear Facilities Safety Board (DNFSB) impacts
- ☐ FOCI - Foreign Ownership and Control restrictions
- ☐ Buy American Restrictions
- ☐ Environmental Restrictions

1.5. Are the project and program assumptions valid?

- ☐ Are the assumptions identified, documented, and justified?
- ☐ Are associated risk and potential impacts identified for each assumption?
- ☐ Does the baseline reflect uncertainties inherent with stated assumptions?
- ☐ Do the assumptions present a complete, thorough and realistic bounding of project baseline?
- ☐ Is the list of stated assumptions sufficient (such as, implied assumptions versus stated assumptions)?
  - ◊ M and O contract status
  - ◊ Stable workforce availability
  - ◊ Site boundary for offsite dose calculations
  - ◊ Active versus passive safety systems

1.6. Has contingency been defined, developed, and documented in a systematic manner appropriate to the risks associated with project?

- ☐ Are cost and schedule contingency traceable to individual risk assessments?

- ☐ Were contingency allowances based on sound risk analysis? Did they considered the following:
  - ◊ Decision process delays
  - ◊ Budget/funding delays
  - ◊ Programmatic delays (failure to obtain research and development results)
  - ◊ Operational interface delays
  - ◊ Conflicting demands on key personnel
  - ◊ Field change requests
  - ◊ Design errors
  - ◊ Natural phenomenon
  - ◊ Resource availability
  - ◊ Contractual changes
  - ◊ Changing market conditions
  - ◊ Evolving regulations (overhead rates, and so on)

- ☐ Was contingency used to compensate for unknowns for which there is/should be a design/management solution at the current stage of the project development?

1.7. Are the management procedures and systems that will be required over the life of the project in place and functional? These include:

- ☐ Project Execution Plan
- ☐ Change/contingency control
- ☐ Configuration management
- ☐ Design reviews
- ☐ Interface control
- ☐ Hazard analysis & safety review
- ☐ Environmental consideration
- ☐ Personnel qualifications & training
- ☐ Project validation
- ☐ Funds management including operating funds
- ☐ Performance measurement and status reporting
- ☐ Issues tracking/resolution
- ☐ Quality assurance/quality control
- ☐ Lessons learned
- ☐ Work authorization and control
- ☐ Systems engineering

1.8. Are the financial (both operating and capital) and human resources that will be needed over the course of the project (including operations) defined and available?

- ☐ Operating Resources
  - ◊ Are operating requirements well defined against specific activities/tasks with appropriate funding determinations and estimates?
  - ◊ Are operating funded tasks identified (Refer to Department of Energy [DOE] cost guide, Chapter 6) including OPC management oversight?
  - ◊ Are the operating funding requirements appropriately planned against existing budget projections and ceilings - five-year budget?

- ☐ Capital
  - ◊ Are capital requirements well defined against specific activities/tasks with appropriate funding determinations and estimates?
  - ◊ Are the capital funding requirements appropriately planned against existing budget projections and ceilings - five-year budget?

- ☐ Human Resources
  - ◊ Does the CDR present the cumulative impact of the project, program, and site human resource requirements (DOE, contractor, subcontractor, architecture and engineering [A&E], labor, etc.) over the life of the project?

- Escorts/access
- Radiation protection
- Security
- Users
- Facility management
- Review activities support
  - Design reviews
  - Peer reviews
  - Program reviews
  - Subject Matter Experts
- Maintenance/technicians
- Crafts
- Project management personnel
- Construction Management personnel
  - DNFSB Interfaces
  - Training activities support

1.9. Does the project define or reference the human resources capabilities required to execute the project?

- ☐ Qualifications
- ☐ Training plans
- ☐ Site specific/access training

2. Project Management

2.1 Are the organization and work breakdown structure (WBS) clearly defined?

- ☐ Are objectives manageable at each assigned level, and major efforts of each department clearly support the organization's top level goals and objectives?
- ☐ Are responsibilities and authorities of all positions within the organizational structure defined and documented?
- ☐ Have organizational responsibilities for WBS elements been established in a responsibility assignment matrix?
- ☐ Does the structure of the project team and each participant organization match the work to be performed?
- ☐ Are appropriate LANL management level determination completed to ensure that the line responsibility for quality assurance (QA) is clearly defined, documented, and effective?
  - ◊ QA organization/management has direct access to line management at a level where action can be effected.
  - ◊ QA Manager reports to a high-enough management level to assure he/she has the necessary authority.
  - ◊ QA Manager has authority for review and concurrence of the QA programs of sub-tier organizations.

2.2 Does the Project Management Strategy provide effective mechanisms for the following?

- ☐ Making trade offs between conflicting objectives

- Achieving integrated safety management
- Demonstrating that management performance-to-date indicates readiness to proceed to the next phase
  - Leadership
  - Teamwork
  - Communications
  - Vision

2.3 Were appropriate estimates and scheduling techniques employed and correctly applied?

- ☐ Was historical data, labor quotes, and prototyping (where appropriate), used to validate the cost estimate?
- ☐ Were appropriate productivity factors incorporated into the cost estimate?
- ☐ Were appropriate burden and overhead rates incorporated into the cost estimate for both capital and operating activities?
- ☐ Was availability of vendors/suppliers factored into the cost estimate?
- ☐ Was appropriate data/specifications provided to vendors for development of vendor quotes?
- ☐ Do the schedules reflect reasonable resource loading?
- ☐ Do the project schedules reflect inter and intra-project dependencies?
- ☐ Do the project schedules reflect expected productivity factors?
  - ◊ Security/access
  - ◊ Radiation areas
  - ◊ Availability of labor pools
- ☐ Does the cost estimate and project schedule incorporate QA requirements for the work to be performed?
  - ◊ Procurement
  - ◊ Inspection
  - ◊ Testing
  - ◊ Certification
  - ◊ Documentation

3. Cost Effectiveness

3.1. Do project costs (total project cost [TPC], total estimated cost [TEC], and work breakdown structure level 3) compare reasonably with similar undertakings at the same site, at other DOE sites, and in the private sector?

3.2. Did the estimators and schedulers have adequate information to arrive at reasonable baselines?

3.3. Have alternative designs, business strategies, and process concepts been evaluated from a life cycle cost (LCC) standpoint? Was the lowest LCC option selected?

3.4. Was the constructability, operability, reliability, and maintainability of the design adequately taken into consideration? (i.e., construction versus operational impacts trade offs)

3.5. Was a graded approach followed in the development of requirements and tasks?

3.6. Have standard design approaches been utilized wherever possible to: a) avoid the need for research and development; b) minimize learning curves; and c) avoid unnecessary risk?

3.7. Have all aspects of the project been kept as simple as possible?

- ☐ Project management
- ☐ Documentation
- ☐ Decision making process
- ☐ Organizational structure
- ☐ Elimination of intra and inter dependencies
- ☐ Review process

3.8. Does the design provide adequate flexibility to accommodate future changes and is this flexibility properly justified?

3.9. Will the project management approach and procurement strategy force cost effectiveness?

- ☐ Incentive contracts
- ☐ Fixed-price contracts
- ☐ Adherence to baseline
- ☐ End product mentality - goal oriented
- ☐ Controlled execution/milestone achievement
- ☐ Self assessments/lessons learned/historical data

Project Management Review Team

The Project Management Review Team will consist of Joel Leeman (Lead, AL/NPD) and

Figure 1 - Example Only
Project Review Team

	Project Management	Construction	Cost Estimating/Contingency	Budget Strategy	Environmental	F&ORs	Risk Analysis
PMIT							
Joel Leeman	X	X		X		X	X
Roland Frenck	X		X	X		X	X
Juan Griego	X	X		X	X	X	X
Subject Matter Experts							
Willy Clark	X	X	X	X		X	X
Frank White		X	X			X	X
Everett Trollinger	X					X	
Patrick Edgerton				X			
Ron Ater				X			
James Nunz					X		
AL/EPD representative					X		
Armando Chavez			X				
Arnold Epstein					X		
FM/Burns & Roe			X				

subject matter experts from DOE/Headquarters (HQ), Albuquerque Operations Office (AL), and Los Alamos Area Office (LAAO), as shown in the sample chart on this page. The chart shows technical background of all reviewers, as well as specific review assignments for subject matter experts. The review team members represent specific skills important to accomplishing the project management review. Reviewers have a technical/engineering background, understanding of the LANL Stockpile Management Program/Projects, project management expertise, and/or knowledge of the specific LANL projects, facilities and operations of concern.

The Project Management Integration Team (PMIT) members are Joel Leeman (DOE/AL/NPD), Roland Frenck (DOE/DP-40) and Juan Griego (DOE/LAAO). They will conduct a comprehensive review of all project management aspects, and will use subject matter expert advice to support their conclusions and determinations of appropriateness of comments. The PMIT is responsible for the following:

- reviewing the design outputs for integration of regulatory, mission, project, and operational constraints;
- ensuring that conceptual design meets mission need objectives from a project management perspective by completing a review in accordance with the acceptance criteria identified in section 2;
- leading comment deliberations and assuring that the results are documented and available for review; and
- recommending DOE acceptance or rejection of the CDR.

As PMIT Lead, Joel Leeman (DOE/AL/NPD), has the following additional responsibilities:

- assuring that the results of PMIT deliberations are documented and available for review;
- writing the Recommendation for Approval Letter in conjunction with other the Review Team Leaders and based on integration team input;
- dispositioning comments when PMIT consensus or resolution with subject matter experts is not forthcoming;

- ensuring that all essential comments are tracked through to resolution; and
- serving as the point of contact with other review teams and LANL.

Subject matter experts are responsible for the following:

- reviewing the design outputs (F&OR, CDR, PHA, and previous CDR review comments) and providing comments respective to project management review criteria; and
- providing comprehensive review in their assigned functional areas.

The Project Management Review Team will emphasize areas that have been sources of difficulty on previous projects. Cognizant LANL and architect/engineer employees will be provided with an opportunity to read the team's findings and confirm the factual accuracy of the data before the report is finalized. Space will be provided in the report for the presentation of dissenting viewpoints if an agreement cannot be reached between the parties.

The Project Management Review Team will formally determine if the issues raised in previous reviews were addressed in the current proposal. This effort will be extremely broad in scope and will cover:

- Earlier document reviews
- Project management process reviews
- Maintenance reviews
- Condition assessments

Particular attention will be directed towards issues which have appeared in more than one past review and may be institutional in nature.

Project Management Review Process

The Project Management Review Plan has been prepared in a generic fashion and does not represent the final form of the document. Consequently, in addition to possible modification of team members and responsibilities for a specific CDR review, the plans will also include additional process information pertaining to this focus area. This information includes, but is not limited to:

- critical review issues;
- required readings;
- key meetings;
- review and approval schedules/milestones; and
- additional comment or format instructions.

Safety Review Plan

Safety Review Objectives

The purpose of the Safety Review Plan is to describe the process to conduct a systematic and integrated review of the CDR and preliminary hazard analysis (PHA). The DOE requires this review to determine whether the CDR has adequately integrated the results of the hazard/safety analysis contained within the PHA with the conceptual design. The review will also examine the scope, methods, and results of the hazard/safety analysis contained with the PHA to ensure adequate protection is afforded to the public, worker and the environment.

It is understood that safety analysis is an iterative process and the focus of this and future reviews is to maintain and promote the interaction and synergistic relationship between the design phase (e.g., CDR, Title I, Title II and Title III) and the development and approval of the safety authorization basis (PHA, PSAR, and FSAR). The final goal of the safety authorization basis is an integrated description of the functions required for facility safety that is based upon the results of acceptable safety analysis and describes a facility that can realistically satisfy safety requirements in the conduct of its mission.

To accomplish this review, a Safety Review Team staffed by DOE engineers and scientists (and supplemented by support contractors as needed) has been established. A top-level Safety Integration Review Team (SIRT), made up of three representatives, one each from the AL Nuclear Programs Division, DP Engineering/ Design Support Team (DP-45), and LAAO, will interface directly with CDR and PHA prepares. The detailed technical review will be completed by subject matter experts.

The Safety Review Team will conduct a thorough technical review of the design to assure that appropriate consideration has been given to safety issues, especially nuclear safety issues. The focus of the DOE safety review is to determine whether the CDR and PHA provide adequate information for the proposed design to proceed to Title I. The objectives of the CDR/PHA safety review are as follows.

- Determine whether appropriate safety design criteria have been selected and/or developed and are consist with the requirements contained within the F&OR document.
- Determine whether hazards/safety analysis results have been effectively integrated into the conceptual design.
- Determine whether the facility design can safely fulfill its mission.
- Determine whether appropriate codes and standards for nuclear, facility, and worker safety are selected and appropriately applied.

The review team will also determine if the CDR is consistent with DOE O 420.1, *Facility Safety*,

its associated Draft Implementation Guide (Non reactor Nuclear Safety Design Criteria and Explosive Safety Criteria, Revision 6, September 1995), and appropriate DOE and industry technical standards.

Programmatic and significant safety issues will be considered in developing comments on the CDR and PHA. Comments and the resolution thereof from previous reviews will be used as background and input for this review. Subject matter expert comments must address substantive technical and/or performance elements of the conceptual design as compared to the F&OR. An integrated, systems-engineering approach will be used to achieve objective and constructive input to the design. The mission, efficiency, construction, and cost aspects of the CDR will be addressed by other project and program review teams.

The remainder of this plan outlines the safety review acceptance criteria; the review team's responsibilities, composition, qualifications; and review process.

Safety Review Acceptance Criteria

The purpose of acceptance criteria is to assure thorough, effective and consistent reviews of LANL stockpile management program/projects conceptual design documentation. These acceptance criteria will facilitate building quality into the review process. An acceptance criterion that is not met will be covered by an essential comment.

1. Hazard Analysis Process and Methodology

1.1. Does the hazards analysis (HA) process follow the guidance in Chapter 3 of DOE-STD-3009-94?

1.2. Is a recognized HA methodology used?
e.g.: a methodology recommended in "Guidelines for Hazard Evaluation Procedures, Second Edition with Worked Examples" from the Center for Chemical Process Safety.

1.3. Is the methodology used appropriate for the type of facility/process, types of hazards, and level of analysis needed?

2. Completeness of the Hazard Analysis

2.1. Have all applicable types of hazards been addressed in the HA?

2.2. Have technical baseline requirements (i.e., mission requirements and operating and safety constraints specified in the F&OR and associated documentation) been adequately integrated into the HA?

2.3. Have all applicable release initiators been addressed?
- ☐ Internal/process
- ☐ External
- ☐ Natural Phenomena

2.4. Have forms and quantities of all hazardous materials been identified?

2.5. Are all processes and operations identified and clearly described?

3. Evaluation of Accident Classes

3.1. Has an appropriate set of appropriate accident types been identified and characterized?

3.2. Have the unmitigated consequences been accurately determined?

- ☐ Consequences above Evaluation Guideline
- ☐ Consequences below Evaluation Guideline

4. Safety Structures and Systems

4.1. Have appropriate safety-class structures and systems been identified?

4.2. Have appropriate safety-significant structures and systems been identified?

5. Safety Structure and System Definition

5.1. Are safety function(s) defined for each safety structure and system in agreement with the guidance in DP SIL 96-04?

5.2. Have all functions required for facility safety been apportioned/assigned to specific and uniquely identifiable systems or structures?

5.3. Have the scope and boundaries of every safety system and structure been delineated?

5.4. Have major subsystems and components been associated with and defined as part of a specific safety system or structure?

5.5. Have interfaces between safety systems and structures and non-safety systems and structures been identified and described?

5.6. Are support and supporting systems identified?

5.7. Are accidents, situations, and/or modes for which a system's or structure's safety function is required identified and linked to the safety analysis?

6. Functional Requirements

6.1. Has a set of functional requirements for each safety system and structure been defined?

6.2. Are functional requirements derived from the safety analysis?

6.3. Do functional requirements support fulfillment of the system or structure's safety function?

6.4. Are both active and passive functions identified?

6.5. Have normal, abnormal and accident conditions for which safety system and structures must perform their identified safety functions been estimated based on results of the safety analysis?

6.6. Are plant or process parameters that need to be monitored as part of the operation of safety systems identified and understood?

6.7. Are required plant, process, and system responses that are required as part of the operation of safety systems identified and understood?

6.8. Does the decision of whether manual and/or automatic controls are provided reflect results of safety analysis?

7. Codes and Standards

7.1. Have appropriate sources for criteria-based requirements (e.g., EDCN-0001 Design Considerations and/or Implementation Guide for DOE O 420.1) been identified?

7.2. Are the safety design criteria identified and/or developed consistent with the F&OR?

7.3. Are the selected safety design criteria reasonable and complete, and do they encompasses applicable aspects of design and construction at an appropriate level?

7.4. Is the extent to which and manner in which the selected safety design criteria will be applied defined?

7.5. Has the process by which design requirements are to be developed and implemented from the selected criteria been defined and documented?

Safety Review Team

The Safety Review Team will consist of the Safety Integration Review Team (SIRT) and subject matter experts, shown below. The chart shows technical background of all reviewers, as well as specific review assignments for subject matter experts. Reviewers represent specific skills important to accomplishing the safety review. SIRT members will have a technical/engineering background, as well as in-depth understanding of the LANL Stockpile Management Program/ Projects, authorization basis, preliminary hazard analysis, and/or the specific LANL facilities and operations of concern. Subject matter experts will have a technical/engineering background, safety/preliminary hazard analysis expertise, and/or specific functional area expertise.

Figure 2 - Example Only
Safety Review Team

	Structural (seismic)	Mechanical	Electrical/Control Systems	Nuclear (criticality)	Chemical/metallurgical	Security (EOM)	Waste Mngmt	Occupational Safety	Radiation Protection	Fire Protection	Operations/Maintenance
SIRT											
Rob McKay				x					x		
Jeff Kimball	x										
Chris Steele				x							x
Subject Matter Experts											
Dave Adair			x								x
Anthony Baca		x									
Bill Bell				x							x
Pat Copp		x			x	x				x	x
Michael Davister	x										
John Fredlund			x								
William Froh										x	
John Hall				x	x		x	x			x
Victor Loczi		x									
Chuck Miller	x										
Willy Molina			x								
Louis Restrepo	x			x	x						
Rob Vrooman					x						

SIRT members are: Isaac Valdez and Rob McKay (DOE/AL/NCPO), Jeff Kimball (DOE/DP-45), and Chris Steele (DOE/LAAO). The SIRT will conduct a comprehensive review of all safety aspects, and will use subject matter expert advice to support their conclusions and determinations of appropriateness of comments. They are responsible for the following:

- reviewing the design outputs for integration of regulatory, mission, safety, and operational constraints;
- reviewing all comments by subject matter experts for consistency and appropriateness;
- resolving outstanding issues relative to specific comments with CDR preparers; and
- recommending DOE acceptance or rejection of the CDR.

As SIRT Lead, Isaac Valdez (DOE/AL/NCPO), has the following additional responsibilities:

- assuring that the results of SIRT deliberations are documented and available for review;
- dispositioning comments when SIRT consensus or resolution with subject matter experts is not forthcoming;
- writing the Recommendation for Approval Letter in conjunction with other the Review Team Leaders and based on integration team input;
- ensuring that all essential comments are tracked through to resolution; and
- serving as the point of contact with the DOE Project Manager and LANL

The subject matter experts are responsible for the following:

- reviewing the design outputs (CDR, PHA, and previous CDR review comments) for specific regulatory, mission, safety, and operational issues pertinent to the operation or function of structures, systems, and components;

- resolving with SIRT members outstanding issues relative to specific comments to the maximum extent possible without intervention by the SIRT Lead;

- consolidating comments within each functional area, as necessary; and

- providing comprehensive review in their assigned functional areas.

Safety Review Team members are required to be technically qualified consistent with the intent of the DOE Technical Qualification Program (TQP). The candidate members must additionally meet the following requirements:

- SIRT members are required to be knowledgeable in the broad technical concepts relevant to the design and should approach their critique of all comments from that perspective; and

- subject matter experts shall have detailed technical knowledge in the functional area to which they are assigned.

Safety Review Process

The Safety Review Plan has been prepared in a generic fashion and does not represent the final form of the document. Consequently, in addition to possible modification of team members and responsibilities for a specific CDR review, the plans will also include additional process information pertaining to this focus area. This information includes, but is not limited to:

- critical review issues;
- required readings;
- key meetings;
- review and approval schedules/milestones; and
- additional comment or format instructions.

Program Review Plan

Program Review Objective

The objective of this Program Review Plan is to describe the process to conduct a systematic review of the LANL CDR. The DOE needs the review to conclude whether the CDR presents an adequate definition of the functions required to support program and operational requirements.

The Program Review Team will conduct a thorough review of the conceptual design to assure that appropriate consideration has been given to program and operational issues. The objectives of the CDR program review are as follows:

- Determine whether LANL CDR incorporates the mission requirements and includes a profile by systems and components of how mission objectives will be achieved.
- Determine whether there is an appropriate level of confidence in the ability to achieve the mission.
- Determine whether key operational requirements have been planned.

Broad, technical, and significant program issues will be considered in developing comments on the CDR. Comments and the resolution thereof from previous reviews will be used as background and input for this review. The project, cost, and safety aspects of the CDR will be addressed by other project and safety review teams.

Program Review Criteria

The purpose of these acceptance criteria is to ensure thorough, effective and consistent reviews of LANL stockpile management program/projects conceptual design documentation. Additionally, the acceptance criteria establish DOE expectations for the quality and content of conceptual design.

1. Ability to Achieve Missions

1.1 Have mission needs have been validated by joint DOD/DOE long-range planning assessment for production requirements for the next 15-25 years through the *Stockpile Memorandum Greenbook*?

1.2 Are project missions and requirements, and the implementation of the missions and requirements, understood and have they been incorporated into the design documentation?

- Have end products and need dates related to missions been understood and identified?

- ☐ Are required prebuilds properly scheduled, planned, and budgeted?

- ☐ Are the following items included in the design documentation?
  - ◊ Justification of Mission Needs (JMN)
  - ◊ Project Charter
  - ◊ Mission Need Statement
  - ◊ Relationship/interface with other construction projects
  - ◊ Relationship/integration with ongoing missions
    - • interference with ongoing missions

- ☐ Is there evidence of review and/or approval by appropriate participants such as operators, users, customers, program offices, and designers?

- ☐ Are the F&ORs presented in a format/manner that facilitates determination that mission requirements have been and can be met?

- ☐ Are resources planned and budgeted for facility operations during transition periods (operations of redundant systems, new, and old)?

- ☐ Are process developments schedules in master schedules and processes milestoned and validated?

- ☐ Are program interruption planning impacts and schedules, and prebuild requirements planned and budgeted?

1.3 Are design solutions found in the design documentation traceable back to mission requirements and mission need, and the implementation of the missions and requirements?

- ☐ Are design solutions feasible?
- ☐ will design solutions achieve the required missions?
- ☐ Are design solutions efficient and are alternatives presented?
- ☐ Are there design solutions required to achieve missions (crosswalk with JMN)?

1.4 Are condition assessments in place identifying available technologies/equipment, and if required, justification for new design solutions/equipment? Are replacements and upgrades justifiable?

1.5 Have programmatic issues/challenges been identified, correctly analyzed, and appropriately dispositioned?

- ☐ Interference with ongoing mission/access issues
- ☐ Operations continuity
- ☐ Interfaces/interdependencies between projects
- ☐ Resource limitations
- ☐ Lack of proven technologies

1.6 Have programmatic issues been integrated with project management (schedule, cost, and so on) issues and with safety issues?

1.7 Does design incorporate means for adjusting to anticipated changes in mission (such as, production increase, product specification adjustments, etc.)?

2. Level of Confidence in Ability to Achieve Mission Requirements

2.1 Is there documentation of past experience?

- ☐ Have facility and personnel had appropriate experience/qualification/certification for each planned system to meet similar missions?

- ☐ Is efficiency and cost effectiveness in meeting missions demonstrated?
  - ◊ Are benchmarks for efficiency and effectiveness presented?
  - ◊ Are required resources (cost, personnel) per unit documented?

- ☐ Have lessons learned been incorporated into design documentation?

2.2 Are life cycle costs developed and reasonable for new facilities?

2.3 Are operations costs planned and budgeted in outyear budgets?

2.4 Has displacement of personnel been planned due to production down time been planned for (other work, relocation, layoff, etc.)?

2.5 Are technology feasibility and assessments addressed?

- ☐ Existing Technologies
  - ◊ Is technology feasibility to meet mission requirements demonstrated?
  - ◊ Is there comparison to past experience with technology, including scale of technology?

- ☐ New Technologies
  - ◊ Have new technologies to be incorporated into design been identified?
  - ◊ Is it demonstrated that these technologies are feasible (including scale of technology)?
  - ◊ Have use of new technology required to meet mission, and alternative existing technologies been assessed?
  - ◊ Have project contingencies and risks been identified?
    - Failure to meet mission requirements
    - Mitigation plan in place

2.6 Are vulnerability of facility and availability of back-up systems addressed?

- ☐ Is there analysis of facility to meet mission needs during outages?
- ☐ Is there availability of back-up facilities and systems to meet mission needs?

Program Review Team

The Program Review Team will consist of Teresa Sena (Lead, AL/NPD) and Mike Mitchell (DP-24), who have technical/engineering background as well as in depth understanding of the LANL Stockpile Management Program/Projects and the specific LANL facilities and operations of concern. They are responsible for the following:

- reviewing the design outputs for integration of regulatory, mission, program, and operational constraints and developing essential comments;
- ensuring that all essential comments are tracked through to resolution; and
- recommending DOE acceptance or rejection of the CDR.

As Program Review Team Lead, Teresa Sena (DOE/AL/NPD), has the following additional responsibilities:

- assuring that the results of team deliberations are documented and available for review;
- writing the Recommendation for Approval Letter in conjunction with other team member input;
- serving as the point of contact with other review teams and LANL.

Program Review Process

The Program Review Plan has been prepared in a generic fashion and does not represent the final form of the document. Consequently, in addition to possible modification of team members and responsibilities for a specific CDR review, the plans will also include additional process information pertaining to this focus area. This information includes, but is not limited to:

- critical review issues;
- required readings;
- key meetings;
- review and approval schedules/milestones; and
- additional comment or format instructions.