Department of Energy
Washington, DC 20585

96-0003038

July 31, 1996

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

Dear Mr. Chairman:

Enclosed is the "Uranium Hexafluoride (UF_6) Cylinder Program Management Plan (PMP)" dated July 1996. This document represents the fourth deliverable as detailed in Secretary O'Leary's October 16, 1995, Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 95-1.

The plan addresses work to be accomplished in fiscal year 1996 through fiscal year 2002. It defines the roles and responsibilities of the Department of Energy and Lockheed Martin Energy Systems for the technical management of program activities. It also provides the work breakdown structure with cost and schedule estimates to achieve identified milestones.

This document is unclassified and suitable for placement in the public reading room.

Sincerely,

Ray A. Hunter

Ray A. Hunter, Deputy Director
Office of Nuclear Energy,
Science and Technology

Enclosure

K/TSO-30

LOCKHEED MARTIN

UF_6 CYLINDER PROGRAM MANAGEMENT PLAN

JULY 1996

EM AND ENRICHMENT FACILITIES TECHNICAL SUPPORT ORGANIZATION

MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-13675 (6 6-95)

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UF_6 CYLINDER PROGRAM MANAGEMENT PLAN

EM AND ENRICHMENT FACILITIES TECHNICAL SUPPORT ORGANIZATION

JULY 1996

Prepared by the:
Environmental Management and Enrichment Facilities
Technical Support Organization
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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U. S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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ACRONYMS

ALARA	as low as reasonably achievable
ASME	American Society of Mechanical Engineers
BIO	Basis for Interim Operation
CCB	Configuration Control Board
CII	Computerized Inspection Interface
CM	configuration management
DAD	Detailed Activity Directive
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DU	depleted uranium
EDP	Engineering Development Plan
EM&EF	Environmental Management and Enrichment Facilities
ESAMS	Energy Systems Action Management System
ES&H	Environmental, Safety and Health
FTE	full-time equivalent
FY	fiscal year
IFSM	Installation Facility Safety Manager
IDODS	Interdivisional Operations Directives
K-25	K-25 Site
LMER	Lockheed Martin Energy Research Corporation
LMES	Lockheed Martin Energy Systems, Inc.
LMUS	Lockheed Martin Utility Services, Inc.
M&O	management and operating
M&TE	measurement and test equipment
MO3	Major Objective 3
MOU	memoranda of understanding
NACE	National Association of Corrosion Engineers
NBIC	National Board Inspection Code
NCSA	Nuclear Criticality Safety Approval
NE-1	Office of Nuclear Energy-DOE
NE-40	Office of Facilities-DOE
NEPA	National Environmental Policy Act
NMC&A	Nuclear Material Control and Accountability
NMIS	Nuclear Materials Inventory System
OSHA	Occupational Safety and Health Act
PEIS	Programmatic Environmental Impact Statement
PCIP	Process Control and Inspection Plan
PSOA	plant safety operational analyses
PGDP	Paducah Gaseous Diffusion Plant
PHA	Preliminary Hazard Analyses
PORTS	Portsmouth Gaseous Diffusion Plant
PMP	UF_6 Cylinder Program Management Plan
QA	quality assurance

RWP	Radiological Work Permit
SAR	Safety Analysis Report
SEMP	Systems Engineering Management Plan
SHERC	K-25 Site Safety, Health, and Environmental Review Committee
SRD	System Requirements Document
SSC	structures, systems, and components
SWP	Safety Work Permit
TAD	Task Assignment Directive
TOW	time of wetness
UF_6	uranium hexafluoride
UCLIM	UF_6 Cylinder Location, Inspection, and Measurement
USEC	United States Enrichment Corporation
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
UT	ultrasonic thickness
WBS	work breakdown structure
WCS	work control structure

EXECUTIVE SUMMARY

The Department of Energy (DOE) is responsible for an inventory of uranium hexafluoride (UF_6). The inventory was produced by the gaseous diffusion uranium enrichment process while the plants were operated by DOE and its predecessors, the U. S. Atomic Energy Commission and the Energy Research and Development Administration. DOE established the UF_6 Cylinder Program to manage this UF_6 inventory.

The majority of the inventory is 560,000 metric tons of depleted UF_6 with assays of less than 0.71% ^{235}U. The balance of DOE's uranium managed by the UF_6 Cylinder Program includes small quantities of enrichment feed and "heels," most with assays between 0.71 and 5%.

The depleted UF_6 is stored as a crystalline solid under vacuum. The material is stored principally in 48-inch-diameter, steel cylinders with rated capacities of 10 or 14 tons. Most of the cylinders have a nominal wall thickness of 5/16 inch. The cylinders are managed under DOE Directives and Orders derived from the Atomic Energy Act and other relevant laws.

The cylinders are stored at storage yards three DOE sites. The K-25 Site (K-25) in Oak Ridge, Tennessee, stores 4,683 cylinders; the Paducah Gaseous Diffusion Plant (PGDP) stores 28,351 cylinders; and the Portsmouth Gaseous Diffusion Plant (PORTS) stores 13,388 cylinders. The cylinders are stacked two high in double rows, outdoors, on wooden or concrete saddles. Because the storage yards have deteriorated with time, many of the cylinders are maintained in substandard storage conditions. Cylinder designs and cylinder handling means have evolved with time, resulting in varying corrosion rates for the cylinders. In view of this, DOE recognizes the benefit of including risk management in a comprehensive and systematic approach to cylinder management.

On October 16, 1995, DOE submitted an Implementation Plan to the Defense Nuclear Facility Safety Board (DNFSB). The Implementation Plan incorporated completed and near-term actions in response to DNFSB Recommendation 95-1 on Depleted Uranium. The Implementation Plan committed to using a Systems Engineering approach, which was to be developed concurrent with responsive field actions and enhanced by an open dialogue among DNFSB staff and personnel from DOE and Lockheed Martin Energy Systems, Inc. (LMES). The Systems Engineering commitment provides the assurance that Program actions and their integration will be improved. The Implementation Plan specified several interim and final deliverables to establish an operative Systems Engineering process for the continued improvement of UF_6 management. These deliverables, with due dates and status, are:

- System Requirements Document (SRD): November 30, 1995 (submitted, accepted, revised);
- Systems Engineering Management Plan (SEMP): March 31, 1996 (submitted);
- Engineering Development Plan (EDP): June 1, 1996 (submitted);
- UF_6 Cylinder Program Management Plan (PMP): July 31, 1996 (this document);
- Draft Safety Analysis Reports: September 30, 1996 (in development; and
- Safety Analysis Reports: March 30, 1997 (in development).

This UF_6 Cylinder Program Management Plan (PMP) is one of four key Systems Engineering technical and planning documents used by LMES Environmental Management and Enrichment Facilities Technical Support Organization to manage the storage of UF_6 in cylinders. (The other key technical and planning documents are the SRD, SEMP, and EDP.)

The UF_6 Cylinder PMP is the controlling document for managing and implementing Program operations. The plan addresses work to be accomplished FY 1996 through FY 2002. The plan links the mission statement and specific actions, documents implementation of the coordinated three-site program, and documents the roles and responsibilities within DOE and LMES for technical management, integration, and resources. The plan documents current results of the process as described in the SRD, the SEMP, and the EDP. The PMP provides the work breakdown structure, establishes schedules and costs, and is used by Program Management to execute and assess the ongoing Program. To facilitate a control and monitoring aspect, the plan includes milestones and performance measures. The plan also provides the mechanism for introducing new or modified activities after successful engineering development.

The configuration developed through the Systems Engineering approach is termed the **baseline configuration**. Actions essential to developing the baseline configuration and complying with requirements identified in the SRD were documented in the SEMP. These actions were identified through the requirements analysis process performed by about thirty subject matter experts in the fields of UF_6 cylinder operations; Environmental, Safety and Health; Systems Engineering; and Program management. Development actions derived from the requirements analysis are managed through the EDP, and actions that are ready for implementation are managed through the PMP.

The PMP provides discussion of an integrated approach to safety, conduct of operations, and risk management, and quality assurance. The PMP contains a Configuration Management Plan and a Quality Assurance Plan. The Configuration Management Plan provides the framework for maintaining the financial and technical configurations and associated documentation, with emphasis on change control. The Quality Assurance Plan is responsive to 10 CFR 830.120, "Quality Assurance," which provides quality assurance requirements for nuclear facilities.

PMP emphasis is on scheduling, costing, and executing appropriate actions. In concert with initializing the Systems Engineering approach, the UF_6 Cylinder Program has accomplished significant near-term actions including removing cylinders from ground contact; cleaning and painting accessible skirted ends; constructing storage yards; restacking cylinders; improving cylinder inspection and handling procedures; and piloting cylinder surface preparation and coating. The Systems Engineering process is expected to continue to enhance the management of UF_6 cylinders in storage.

1. INTRODUCTION

The Department of Energy (DOE) established the UF_6 Cylinder Program to manage its inventory of uranium hexafluoride (UF_6). The UF_6 Cylinder Program Management Plan (PMP) is one of four key technical and planning documents used by the Lockheed Martin Energy Systems, Inc., (LMES) Environmental Management and Enrichment Facilities Technical Support Organization to manage the Program.

1.1 BACKGROUND

DOE owns an inventory of depleted UF_6. The majority of the inventory is 560,000 metric tons of depleted UF_6 with assays of less than 0.71% ^{235}U. The balance of DOE's uranium managed by the UF_6 Cylinder Program includes small amounts of enrichment feed and "heels" between 0.71 and 5% assay, with small quantities having a higher assay. The inventory was produced by the gaseous diffusion uranium enrichment process while the plants were operated by DOE and its predecessors, the U. S. Atomic Energy Commission and the Energy Research and Development Administration.

The depleted UF_6 is stored as a crystalline solid under vacuum. The material is stored principally in 48-inch-diameter, steel cylinders with rated capacities of 10 or 14 tons. Most of the cylinders have a nominal wall thickness of 5/16 inch. The cylinders are pressure vessels manufactured to the ASME Boiler and Pressure Vessel Code Section VIII, Division 1. The cylinders are stored at three DOE sites. The K-25 Site (K-25) in Oak Ridge, Tennessee, stores 4,683 depleted UF_6 cylinders; the Paducah Gaseous Diffusion Plant (PGDP) stores 28,351 cylinders; and the Portsmouth Gaseous Diffusion Plant (PORTS) stores 13,388 cylinders. The cylinders are stacked two high in double rows, outdoors, on wooden or concrete saddles. The cylinders are managed under DOE Directives and Orders derived from the Atomic Energy Act and other relevant laws.

During the development and operation of the enrichment process, containers, support equipment, and support facilities were designed, constructed, and used as a system to store, transport, and process the depleted UF_6. After a significant inventory was produced, outdoor storage facilities ("cylinder yards") evolved independently at the sites. Cylinder yards are constructed of either concrete, compacted gravel, or asphalt over gravel. The handling equipment used to stack these cylinders has also evolved, from mobile cranes to specially designed machines that grasp and lift the cylinders with hydraulic tines.

The congressional adjustment of DOE's mission to facilitate privatization of uranium enrichment has limited DOE to uranium storage and depleted uranium disposition. The system for which DOE is responsible has been realigned to containment and use of a finite inventory of UF_6. The various types of construction and the subsequent deterioration of the yards have led to substandard storage conditions for many of the cylinders. The variety of cylinder designs that have evolved over the years has also resulted in varying localized corrosion rates. These two main factors led to the need for long-term corrosion monitoring of the cylinders.

Until 1990, surveillance consisted of an annual nuclear materials inventory of the cylinders. The K-25 cylinder yards were surveyed in May 1990 to provide input for planning long-term corrosion monitoring of cylinders. Cylinder valves with corrosion and evidence of potential valve leakage were discovered. A subsequent valve survey in June 1990 at PORTS revealed two breached cylinders. Investigation of these cylinder breaches indicated that they were initiated by mechanical tears resulting from impact with adjacent cylinder lifting lugs. Subsequent inspections of depleted UF_6 storage cylinders revealed four breached cylinders at K-25 and one breached cylinder at PGDP. Two of the K-25 breaches and the PGDP breach were attributed to mechanical damage. The other two breached cylinders at K-25 were attributed to external corrosion resulting from substandard storage conditions.

The risks to personnel health and safety and the potential environmental impact posed by these cylinder breaches and valve leaks are low because of the nature of the system. The UF_6 is stored as a crystalline solid. When UF_6 is exposed to the atmosphere, hydrogen fluoride and uranium reaction by-products are formed. The uranium by products form a hard crystalline solid that acts as a self sealant. The hazard potential of the depleted UF_6 is primarily chemotoxic from hydrogen fluoride, rather than radiological. These factors contribute to the low risk incurred from these and potential additional failures. This low risk was confirmed by analysis of air and soil samples collected near the breaches at PORTS and by subsequent weighing of the cylinders. Although the risk posed by these breaches is low, the existence of breached cylinders heightens the importance of a comprehensive, long-term, three-site management program for the UF_6 storage cylinders.

After visiting the DOE sites in 1995, the Defense Nuclear Facilities Safety Board (DNFSB) issued Recommendation 95-1 and a supporting technical report.[1, 2] That report (TECH 4) addressed the improved safety of cylinders containing depleted UF_6.

DNFSB "Recommendation 95-1 on Depleted Uranium"[1] recommended the following:

- Start an early program to renew the protective coating of cylinders containing the tails from the historical production of enriched uranium.
- Explore the possibility of additional measures to protect these cylinders from the damaging effects of exposure to the elements, as well as any additional handling that may be called for.
- Institute a study to determine whether a more suitable chemical form should be selected for long-term storage of the depleted uranium.

On June 29, 1995, DOE accepted Recommendation 95-1[1] and emphasized five focus areas for DOE response:

- removing cylinders from ground contact and keeping cylinders from further ground contact;
- relocating all cylinders into adequate inspection configuration;
- repainting cylinders as needed to avoid excessive corrosion;
- updating handling and inspection procedures and site-specific Safety Analysis Reports (SARs); and
- completing an ongoing study that will include an analysis of alternative chemical forms for the material.

On October 16, 1995, DOE submitted an Implementation Plan[3] that incorporated complete and near-term actions in accordance with these five focus areas. The Implementation Plan[3] also committed to managing the UF_6 Cylinder Program using a Systems Engineering approach (see Fig. 1.1). The approach is being developed concurrent with field response actions and is enhanced through an open dialogue among DNFSB staff and DOE and LMES personnel. The Implementation Plan[3] specifies the following interim and final deliverables and defines their respective content to establish an operative Systems Engineering process for the continued improvement of depleted UF_6 management:

- System Requirements Document[4] (SRD)–identifies the system requirements;
- System Engineering Management Plan[5] (SEMP)–identifies organization, direction, and controls for system integration;
- Engineering Development Plan[6] (EDP)–identifies development actions, costs, and schedules for technical improvements;
- UF_6 Cylinder Program Management Plan (PMP)–identifies costs, schedules, and controls for operating the system and implementing required actions;
- Draft SARs –proposes the safety basis; and
- Approved SARs–define the safety basis.

1.2 SYSTEM OVERVIEW

The ***mission*** of the UF_6 Cylinder Program is to safely store the DOE-owned UF_6 inventory until its ultimate disposition. The ***system*** was established to meet the Program mission and is the means by which containment is achieved. The system comprises ***components*** (such as the UF_6, cylinders, cylinder yards, cylinder-handling equipment, personnel, and financial resources) and ***activities*** (such as operations, management processes, and administration).

The existing cylinders used to contain the UF_6 inventory are typically constructed with 5/16-inch-thick, mild steel walls and have a capacity of 10 or 14 tons. A bounding assumption identified in the SRD is that the system can and will continue to use the existing cylinders as storage containers for the depleted UF_6. Therefore, the current phase of the system is focused on maintaining the containment integrity of the existing UF_6 cylinders. The containment integrity of the cylinders must be maintained to progress the system from the current storage phase to the subsequent UF_6 disposition phase.

The system includes several ***operational functions*** to maintain containment of the UF_6. These operational functions are:

- Surveillance and Maintenance,
- Handling and Stacking,

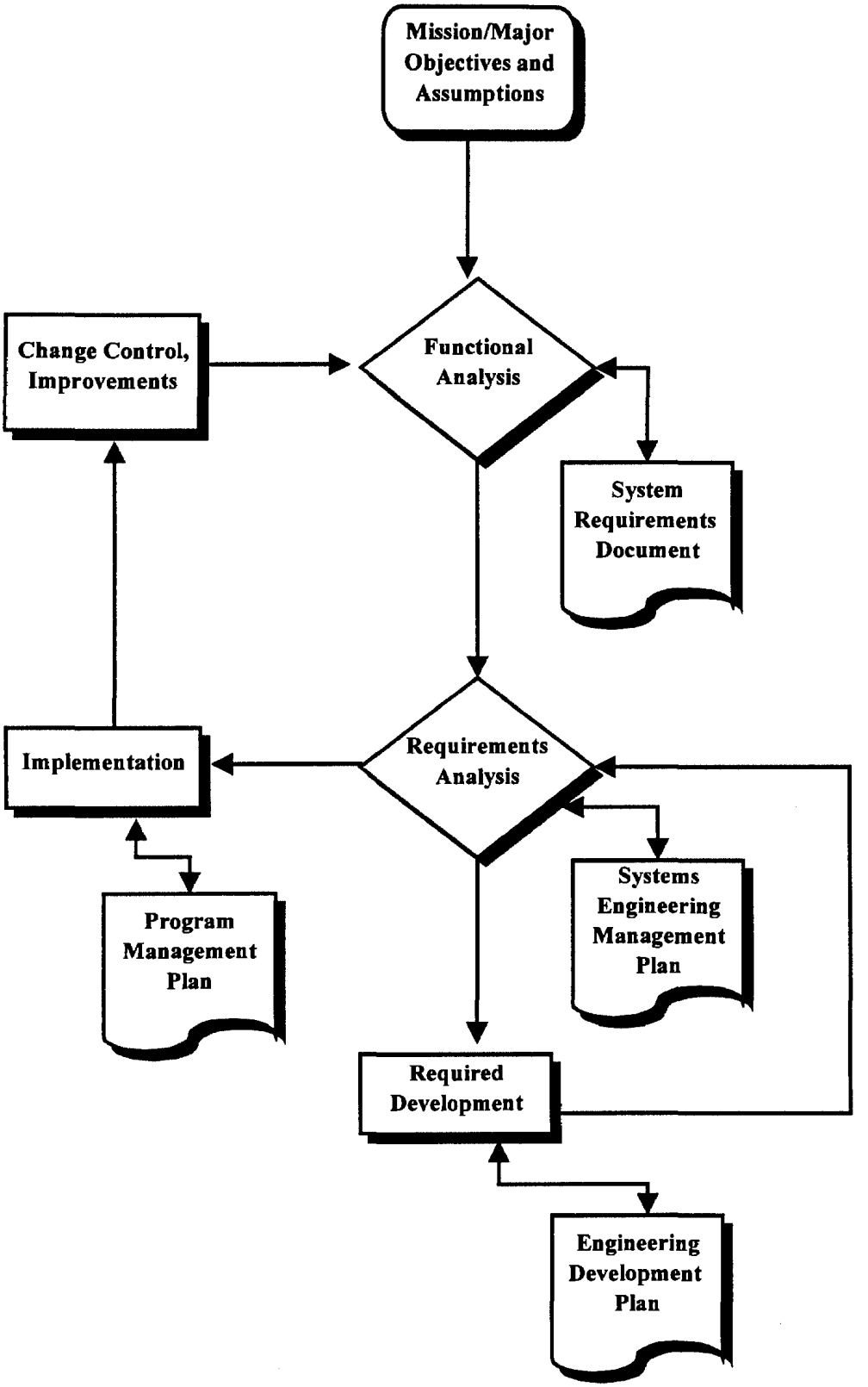

Fig. 1.1. Systems Engineering approach.

- Contents Transfer, and
- Off-site Transport.

The interface of the operational functions is illustrated in Fig. 1.2. The system encompasses facilities, hardware, support systems, and/or subsystems for each of these operational functions. In addition to the operational functions, the system requires ***development and administrative support functions***, such as engineering development, to realign and sustain the system effectiveness in meeting the Program mission.

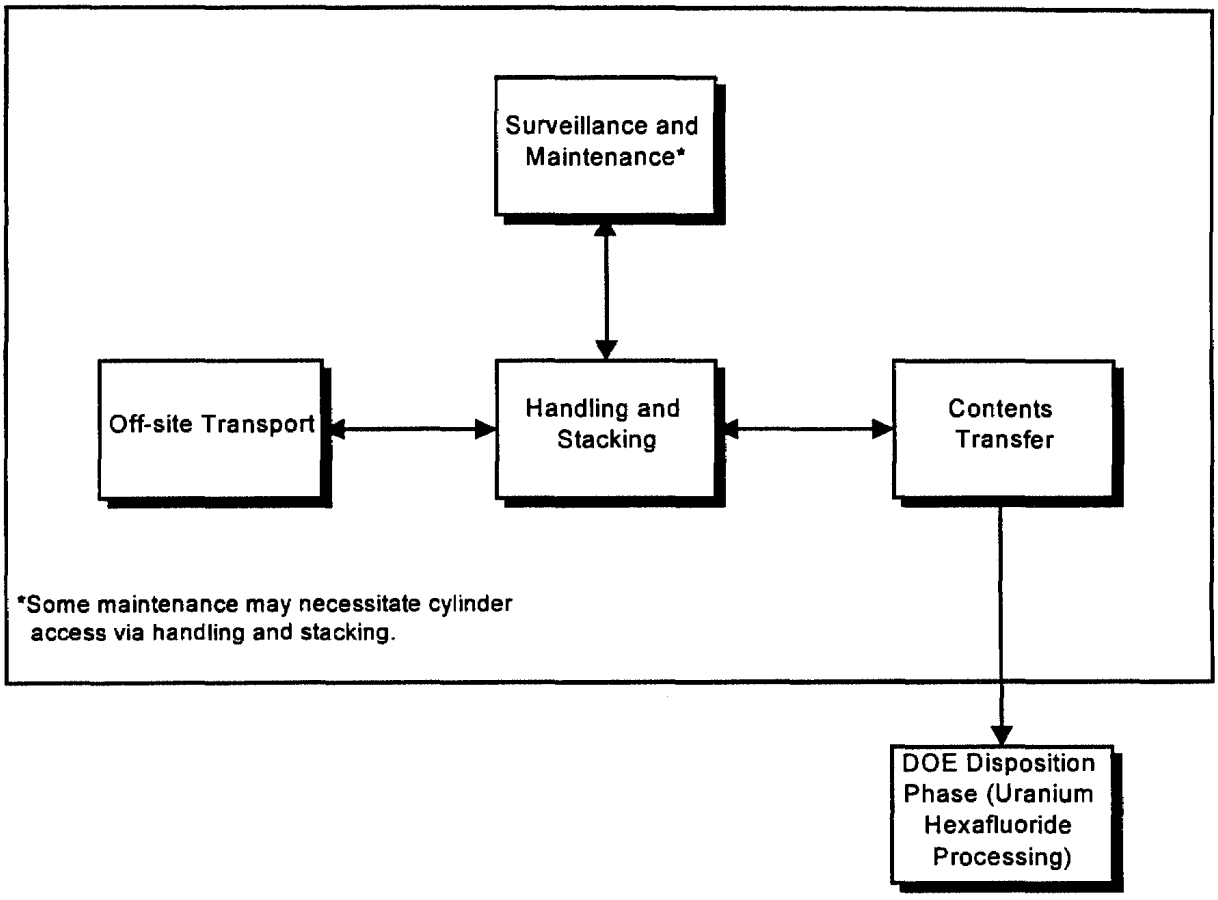

Fig. 1.2. System Operational Functions.

1.3 PURPOSE

The purpose of the PMP is to document planning and execution of the three-site UF_6 Cylinder Program and to document the roles and responsibilities within DOE and LMES for technical management, system integration, resource allocation, and project or task execution.

The PMP provides the work breakdown structure (WBS), establishes schedules and costs, and will be used to monitor and control the Program. The PMP includes milestones and measures

for performance, such as inspections and associated performance measures. The PMP also provides the mechanism for relating the results of engineering development activities to Program operations.

The UF_6 Cylinder PMP is the controlling document for managing and implementing program operations. The plan demonstrates transition from between the mission statement to specific actions comprehensively addressing the concerns identified in DNFSB Recommendation 95-1.[1] The plan documents the integration and reliance on the logic sequence of the preceding Systems Engineering documents (the SRD, the SEMP, and the EDP).[4,5,6]

1.4 SCOPE AND ORGANIZATION

The contents of the PMP are consistent with DOE's Implementation Plan[3] and DOE Order 4700.1[7] guidelines. The PMP consists of the following:

- Section 1 provides a brief introduction to the UF_6 Cylinder Program and describes the scope, applicability, and contents of the PMP.
- Section 2 describes the UF_6 Cylinder Program organization and responsibilities including the management and operating (M&O) organization and interfaces.
- Section 3 discusses the WBS.
- Section 4 provides the WBS Dictionary.
- Section 5 presents the Work Plan Schedule, Cost, and Work Force Estimates
- Section 6 lists the Performance Criteria.
- Section 7 addresses Program Planning, Control, and Reporting.
- Section 8 discusses Compliance and Risk Management.

The PMP addresses work within the scope of the Program mission for the period July 1, 1996, to September 30, 2002. Work is expected to continue beyond 2002. The duration beyond 2002 is dependent upon the analyses in progress associated with the DOE Programmatic Environmental Impact Statement (PEIS). The PEIS in conjunction with the BIOs and SARs comprise DOE's total response to DNFSB Subrecommendation 3. The DOE PEIS evaluates strategies for depleted UF_6 long-term management and use, and supports selection of an implementation strategy. Strategy alternatives include conversion/use, storage, disposal and transportation/packaging options. The PMP will be reviewed annually and updated, as necessary, to reflect changes in the Program mission, objectives, funding, and technical and compliance requirements.

1.5 PMP INTEGRATION AND INTERFACE

Activities managed by the PMP are derived from a requirements analysis to identify actions as documented in the SEMP. New activities must be integrated with other system activities, including those in operations, administration, and development. The system interfaces are initially established in planning stages of development activities. The tool for ensuring integration of a development action with the existing system is verification. Specifically, verification ensures that

the development task is focused on satisfying system and technical requirements. There are two verification steps in the EDP management process: scope verification and results verification.

External influences such as budget approval cycles and actual costs will require modification of the PMP. Factors such as regulatory, technology, and mission changes will necessitate reactivation of the Systems Engineering process with a resultant modification to the SRD, SEMP or EDP, as necessary.

Management of interfaces is depicted in the work control structure (WCS) (Fig. 1.3). The WBS requires that related tasks be identified. This is accomplished by relating the development elements to operations and administrative branches of the WBS. The specification tree and performance tree also play key roles in managing system integration and its results. Integration is by logic sequencing and defined interfaces. The tool for logic sequencing is analysis of Program and development actions to meet mission, system, and technical requirements. Actions are defined and undertaken in a logical sequence supporting the Program baseline.

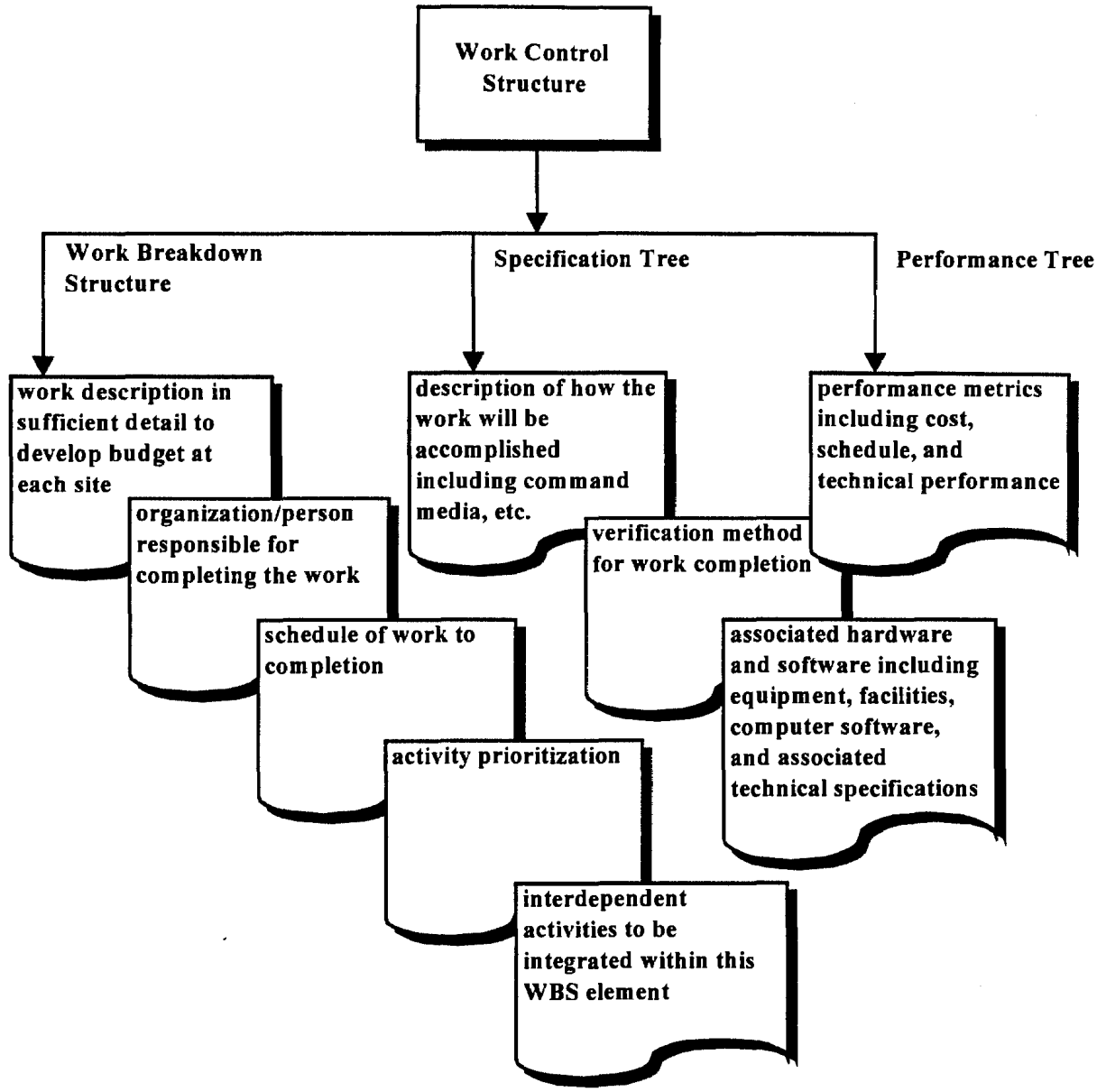

Fig. 1.3. Work control structure definition.

2. ORGANIZATION AND RESPONSIBILITIES

2.1 PROGRAM ORGANIZATION

Management of DOE's depleted, natural, and enriched uranium is the responsibility of the Office of Nuclear Energy, Science and Technology (NE-1) and the Office of Facilities (NE-40). A program manager for depleted uranium resides under NE-40, Office of Gaseous Diffusion Plants Management. In accordance with the Energy Policy Act of 1992,[8] the Director of NE-1 is responsible for executing DOE's obligations with respect to materials not transferred to or generated by USEC. The Director of Nuclear Energy reports to the Secretary of Energy and is also responsible for ensuring execution of DOE's 1995 Implementation Plan[3] commitments to DNFSB. Overall Program policy, planning, and management (with particular emphasis on maintaining integration in support of ultimate material disposition) are carried out by the Director, a principal subordinate in the Office of Facilities, or a designee (the Assistant Manager for Enrichment Facilities).

The LMES Environmental Management and Enrichment Facilities UF_6 Cylinder Program

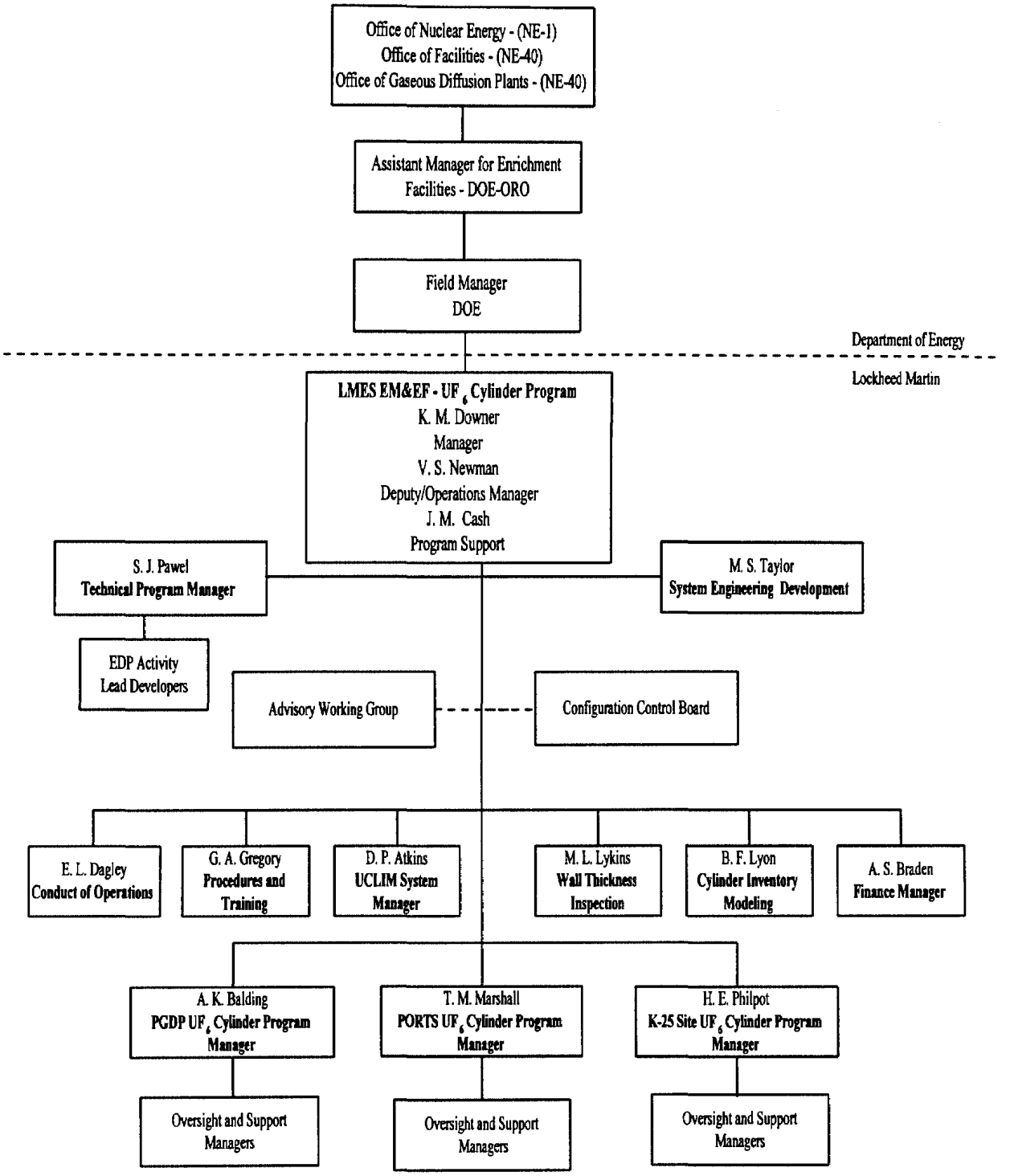

Fig. 2.1. Program organization chart.

2.2 RESPONSIBILITIES

2.2.1 Advisory Working Group

The Advisory Working Group will periodically review the Program scope, status, and direction, and will advise the UF_6 Cylinder Program Manager, LMES-OR. The group will review and evaluate Program activities in response to recommendations by the Program Manager. The group will be composed of members identified by the Program Manager and confirmed by DOE-ORO Assistant Manager for Enrichment Facilities based on specific expertise and experience in areas related to Program management. For implementation, the objectives of the group may include:

- facilitate transition to the subsequent Program phase (disposition);
- verify that actions are effectively and efficiently meeting the intent of mission and major objectives;
- evaluate certain Program change proposals;
- review and evaluate status and plans for capability to ensure consistency and improvement in meeting mission and objectives; and
- provide strategic and technical guidance.

2.2.2 Configuration Control Board

The Configuration Control Board (CCB) is appointed by the UF_6 Cylinder Program Manager for the purpose of reviewing and approving or disapproving proposed changes to the specified items of the technical configuration. The CCB consists of site representation and a representative from each of the following disciplines: Program Management (Chairman); Systems Engineering; Operations; Environmental, Safety, and Health; Quality Assurance (QA); Technical (metallurgy); and Risk Assessment. The CCB also ensures adequate application of the Systems Engineering process requirements prior to approving changes.

2.2.3 UF_6 Cylinder Program Management (Manager and Deputy/Operations Manager)

Program Role: Manage, direct, and administer the three-site UF_6 Cylinder Program. This includes Program control to be accomplished through the institutionalization and maintenance of Systems Engineering for the Program.

Program Responsibilities:

- Direct strategic planning, development, prioritization, and optimization at the LMES level.
- Execute and refine the Systems Engineering approach. Prepare revisions as necessary to the SRD[4], SEMP[5], EDP[6], and PMP.
- Facilitate development of cost and schedule baseline.
- Facilitate three-site consistency in requirements and implementation via the Systems Engineering process.

- Measure and verify Program performance within LMES and communicate performance to DOE with particular emphasis on the commitments made to DNFSB.
- Ensure adequate support for development of DOE's PEIS is provided.
- Provide Program direction for technical and programmatic development and usage [including UF_6 Cylinder Location, Inspection, and Measurement (UCLIM)].
- Monitor and communicate the safety, timeliness, and cost efficiency of the Program.
- Serve as central point of contact for DOE for planning, resource allocation, and issues management.
- Serve as central point of contact for the three-site Cylinder Program personnel.
- Provide monthly status to DOE on cost relative to budget, schedule, milestones, and accomplishments.
- Direct necessary LMES corrective actions to maintain consistency with Program mission and objectives.
- Provide input to DOE-ORO in weekly status meetings with senior management and with periodic Program highlights.
- Provide LMES response to DNFSB Recommendation 95-1[1] in accordance with the DOE Implementation Plan[3] and as necessary.
- Act as Configuration Control Board Chairperson.

Interfaces: The Cylinder Program Manager and Deputy Manager interface with site management, site cylinder personnel, site subject matter [environmental, safety and health (ES&H)] experts, Office of General Counsel, and DOE-ORO personnel or their designees. Program Management also interface with DNFSB staff and DOE-HQ personnel on specific issues with the awareness of DOE-ORO Assistant Manager for Enrichment Facilities or his designee. Program Management interfaces also include Technical Support Organization business and finance personnel.

2.2.4 Technical Program Manager

Program Role: Provide technical recommendations and guidance to UF_6 Cylinder Program Managers; participate in technical investigations and evaluations including procurements; represent technical aspects of the Program to DNFSB and DOE; and participate in Systems Engineering.

Program Responsibilities:

- Provide technical guidance on corrosion issues (includes painting and related specification and vendor evaluations, inspection requirements, results interpretation, and valve monitoring concerns).

- Initiate the engineering development process as described in the EDP and facilitate implementation of technical input (participate in development of procedures and Program plans).
- Prepare EDP Activity WCS Form and submit to Program Manager for approval.
- Perform development activity, scope, and results verification in accordance with the EDP[6]; assign lead developer.
- Facilitate documentation of technical information.
- Facilitate resolution of three-site technical issues.
- Locate and assist in acquisition of technical expertise as deemed necessary.
- Compile status of development activities periodically.

Interfaces: The Technical Program Manager has ongoing interfaces with UF_6 Cylinder Program Management; site program managers (for example engineering personnel involved in specification development); other Program technical personnel such as Inventory Modeling and Optimization Modeling; and program/site field personnel, such as Operations and Maintenance personnel, and Quality Inspectors. The Technical Program Manager works with the designated Lead Developer to define the scope of a development activity in accordance with the EDP.[6]

2.2.5 Systems Engineering Development

Program Role: Ensure appropriate development and initial application of the Systems Engineering approach.

Program Responsibilities:

- Implement systematic approach for integrating the configuration of the system.
- Assist in the identification of revisions to the SRD.[4] Involve Program and line organization staff and health, safety, environmental, and engineering organizations' subject matter experts in the process.
- Assist in the identification of revisions to the SEMP,[5] which will establish actions for meeting system requirements, technical rationale for the requirements, schedules/sequencing, and verification.
- Assist in identification of revisions to the EDP[6] and the PMP.
- Monitor the utility of the process as it matures.

Interfaces: Systems Engineering Development interfaces with the Program Manager to ensure the systematic approach is implemented and refined. Interfaces with other Program and line managers to ensure implementation of the systematic approach.

2.2.6 Conduct of Operations Manager

Program Role: Develop and facilitate implementation of a comprehensive conduct of operations process for the UF_6 Cylinder Program to include configuration management, personnel selection, procedures, training, document control, and records management.

Program Responsibilities:

- Ensure that the intent of applicable requirements identified in the Environmental Management and Enrichment Facilities (EM&EF) Standards and Requirements Identification Document related to DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities,"[9] is implemented throughout the three-site Program.
- Develop and implement a configuration management process for controlling selected system components, functions, and documents. This includes hardware, software, safety documentation, design bases, procedures, and work authorization documents.
- Develop and implement a structured performance-based assessment process to assess programs, performance, and site conditions.
- Develop Program performance indicators to report Program progress, trends, and areas needing improvement to Program participants, DOE, and DNFSB.
- Identify potential system requirements and actions resulting from regulatory and technology changes.

Interfaces: The Conduct of Operations Manager has frequent interfaces with UF_6 Cylinder Program and line managers, LMES-EM&EF Quality Programs Division, and LMER technical support staff in the development and implementation of the Conduct of Operations process.

2.2.7 Procedures and Training Manager

Program Role: Establishes and leads procedures management and personnel training processes. Provides flowdown from regulatory documents and corporate policies through implementing procedures, to individual activity work instructions that meet the requirements of DOE 5480.20A, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities."[10]

Program Responsibilities:

- Establish a process for the development and control of LMES procedures and instructions governing Program work at the three sites.
- Ensure requirements from the safety basis are fully integrated in Program procedures.

- Assist managers and workers in procedure development methods that ensure worker ownership of the procedures they must use.
- Provide training plans and procedures to implement a systematic approach to training.
- Establish baseline training requirements for LMES personnel and LMUS personnel who perform work for LMES.
- Use performance-based assessments to determine effectiveness of the procedures and training management processes and areas needing improvement.
- Identify potential system requirements and actions resulting from regulatory and technology changes.

Interfaces: The Procedures and Training Manager interfaces with Program and line managers; site training and procedures staff; LMES and LMUS operations, maintenance, quality assurance, and quality control staff; LMER technical support staff; the Energy Systems Center for Continuing Education; and EM&EF Procedures Coordinator in the development and implementation of the procedures and training processes.

2.2.8 UCLIM System Manager

Program Role: Manage the development and maintenance of the UCLIM System that tracks inventory and inspection data for the DOE-owned UF_6 cylinders. Provide reports for technical and management staff as required.

Program Responsibilities:

- Administer all database changes, menus, and access to the system.
- Manage all software development activities by LMES and subcontractor employees.
- Monitor system performance and disk space requirements.
- Maintain the UCLIM task list for each site and ensure that deliverables are identified and worked by the appropriate people.
- Provide user support and training as required.
- Manage all activities related to transmittal of data from UCLIM for use by the Nuclear Material Control and Accountability (NMC&A) systems, the cylinder inventory modeling system, and other systems that require data from UCLIM.
- Ensure that UCLIM supports daily entry validation of inspection, relocation and corrective actions via manual input methods and electronic data transfers.
- Review inspection and handling procedures to determine their impact on UCLIM.
- Identify system requirements and actions.
- Manage the implementation of the UCLIM Computerized Inspection Interface (CII).

- Ensure that required system documentation is produced and maintained.
- Participate in Program procedure development to address implications to UCLIM.

Interfaces: The UCLIM System Manager has ongoing communications with the three-site Program management, the Program site managers, the Cylinder Wall Thickness Inspection Program Manager, the Cylinder Inventory and Optimization Modeling Project Manager, and UCLIM users regarding deliverables, system modifications, reporting requirements, system interfaces, and other related issues.

2.2.9 Cylinder Wall Thickness Inspection Program Manager

Program Role: Aid in determination of the integrity of DOE-owned cylinders used to store depleted UF_6 utilizing nondestructive techniques such as ultrasonic thickness (UT) measurement technology.

Program Responsibilities:

- Oversee cylinder wall thickness measurement contract to include contract proposal preparation, review, and contractor qualification.
- Develop cylinder wall thickness measurement procedure, general procedure for P-scan method, and special procedures for evaluating non-routine cylinders.
- Develop training for wall thickness measurement to ensure three-site consistency, technical review of information, and review of records/qualifications.
- Review and analyze cylinder wall thickness data, maintain cylinder wall thickness data, prepare and issue reports, and present results.
- Resolve conflicts regarding cylinder wall thickness evaluations such as cylinder anomalies.
- Identify potential system requirements and actions resulting from standards and technology changes.

Interfaces: Ongoing interfaces with line organization personnel at the three sites (health physics, code inspectors, quality inspectors, cylinder handlers, etc.) and LMES Cylinder Program Managers. Represent cylinder wall thickness inspection program to DOE, DNFSB, and regulatory agencies.

2.2.10 Cylinder Inventory and Optimization Modeling Project Manager

Program Role: Develop and perform cylinder inventory modeling for the UF_6 Cylinder Program using cylinder wall thickness data. The inventory model will be used to determine the current condition of the storage cylinders. Develop a model to determine the optimal approach to recoating the cylinders.

Program Responsibilities:

- Lead the development and application of statistical sampling plans that provide the necessary information to meet the short- and long-term objectives of the UF_6 Cylinder Program. Ensure the plans are consistent for the three sites.
- Analyze data and improve the corrosion models to be used within the UF_6 Cylinder Program.
- Maintain the inventory model to be used by the Program.
- Maintain a central repository of collected data used for purposes of inventory modeling.
- Define the problems, constraints, and alternative approaches.
- Identify candidate approaches or solution techniques (system requirements or actions).
- Recommend a solution methodology.
- Identify how to integrate the model results and capability into the Program. This may involve field changes affecting current operations and introduction via the Program's Systems Engineering process.

Interfaces: Modeling activities will be performed in collaboration with the UF_6 Cylinder Program Technical Program Manager, the cylinder wall thickness Inspection Program Manager, and site staff collecting field data. Interface frequently with Program and site LMES technical personnel including Systems Engineering.

2.2.11 Finance Manager

Program Role: Support the UF_6 Cylinder Program Management in the formulation, presentation, and execution of the uranium programs Baseline Program Plan and the annual budget request to Congress. This includes coordination of budget planning and execution with DOE Planning and Budget, finance, and Construction Engineering organizations.

Program Responsibilities:

- Establish and maintain a time-phased budget baseline at the cost account level against which financial performance can be measured. Budgets are established for all authorized work with separate identification of cost elements (labor, material, etc.)

- Ensure that the commitment and expenditure of funds will not exceed authorized limits. Provide early warnings that funding limits are about to be exceeded.

- Evaluate the impact of changes on planned funding limits and in turn on technical, cost, and schedule baselines and ensure that such impact is appropriately reflected in changes to the baselines.

- Maintain the ability to reconcile between forecasts for funding requirements and estimates for costs to execute project work.
- Ensure that Program costs are recorded in a systematic timely and accurate manner.
- Identify significant differences between planned and actual cost on a regular and frequent basis. Find the root cause of problem areas when there is some evidence of occurrence and develop a corrective action plan before problems escalate.
- Communicate timely, accurate periodic progress reports in formats and reporting levels as stipulated and required by DOE and LMES management.
- Perform special "what if" analyses as requested.

Interface: The UF_6 Cylinder Program Finance Manager interfaces with Program management, site management, and site Business Management personnel. The Finance Manager is matrixed to the Program from the Business Management Organization. Business Management is integrating organization for the UF_6 Cylinder Program with other LMES and LMUS organizations such as Contracts (Interdivisional Operations Directives [IDODS} and LMUS Service Agreements), Central Accounting Services such as Cost Accounting Systems and the Payroll Accounting and Labor System (PALS), and Procurement. The Finance Manager is co-located with Program Management to facilitate day-to-day interaction and communication.

2.2.12 UF_6 Cylinder Site Program Managers

Program Role: The UF_6 Cylinder Site Program Managers provide direction and oversight for the respective site portion of the UF_6 Cylinder Program. This includes Program control to be accomplished through participation in the Systems Engineering process.

Program Responsibilities:

- Ensure site Program operates within approved safety basis.
- Establish UF_6 Cylinder Site Management Program objectives and priorities based upon input, direction, and approval from DOE, LMES Management, and the three-site Program management.
- Establish, execute, and manage the site Program activities and budget including baseline management and performance measurement.
- Integrate and coordinate activities between various site and Program organizations to accomplish the objectives and goals of the Program.

- Provide leadership and guidance to the Cylinder Yard Supervisor maintaining the Program work force under MOU with LMUS. Prepare and maintain MOU for support of Program goals. (PORTS and PGDP)
- Ensure use, refinement, and accuracy of the UCLIM database.
- Monitor cylinder safety, cost, and schedule efficiency for the respective site. Report to site and Program management in consistent manner and in accordance with specified monthly schedules.
- Distribute Program-related documents to appropriate site personnel for comment, review, and use.
- Maintain cognizance of three-site activities and methods for the purpose of ensuring consistent use of best available technology.
- Identify system requirements or actions.

Interface: The Site Program Managers report to a designated Operations or Facilities Manager within the respective site's EM&EF organization, and are matrixed to the three-site Cylinder Program Manager in the Oak Ridge Enrichment Facilities organization. The Site Program Managers frequently communicate with site and division management and LMES and LMUS personnel in the Program matrix. LMUS provides labor in support of Program activities.

3. WORK BREAKDOWN STRUCTURE

The work breakdown structure (WBS) is a multi-level framework that organizes and graphically displays elements representing work to be accomplished in logical relationships (see Fig 3.1). The WBS establishes an activity base for planning, controlling, and reporting on the Program. In addition, it provides the formal structure that identifies the products and the related work efforts necessary to meet Program objectives. All the work contained in the WBS must be estimated, scheduled, and budgeted. The WBS dictionary, the work plan schedule, and the WBS represent the technical baseline for the Program.

The WBS was developed by defining the work required to meet the Program mission and objectives as described in the SRD and to meet the actions defined in the SEMP. This work was then organized into logically related groups of operations, development, and administration. WBS work elements 1.1 and 1.2 are "operations;" element 1.3 is "development;" and elements 1.4 and 1.5 are "administration." Further divisions of the WBS were determined by additional segregation of work packages that were necessary to plan, budget, control, and report on the Program. A cross referencing of actions as defined by the SEMP to these WBS elements is provided in Appendix A.

Detailed descriptions of each work element and the relationships among the WBS work elements are presented in Section 4, the Program WBS Dictionary. The WBS Dictionary is a key project definition tool that specifies the scope for each element, documents assumptions about the work, and provides links to key technical design or engineering documents. The Program Work Plan Schedule presented in Section 5 includes deliverables, milestones, and processes. Required resources are developed using the Program Work Plan Schedule and are documented in Detailed Activity Directives (DADs). The DADs are the mechanism by which the funding to implement the planned work is obtained. This financial process is further described in Section 7.5.1, Financial Configuration.

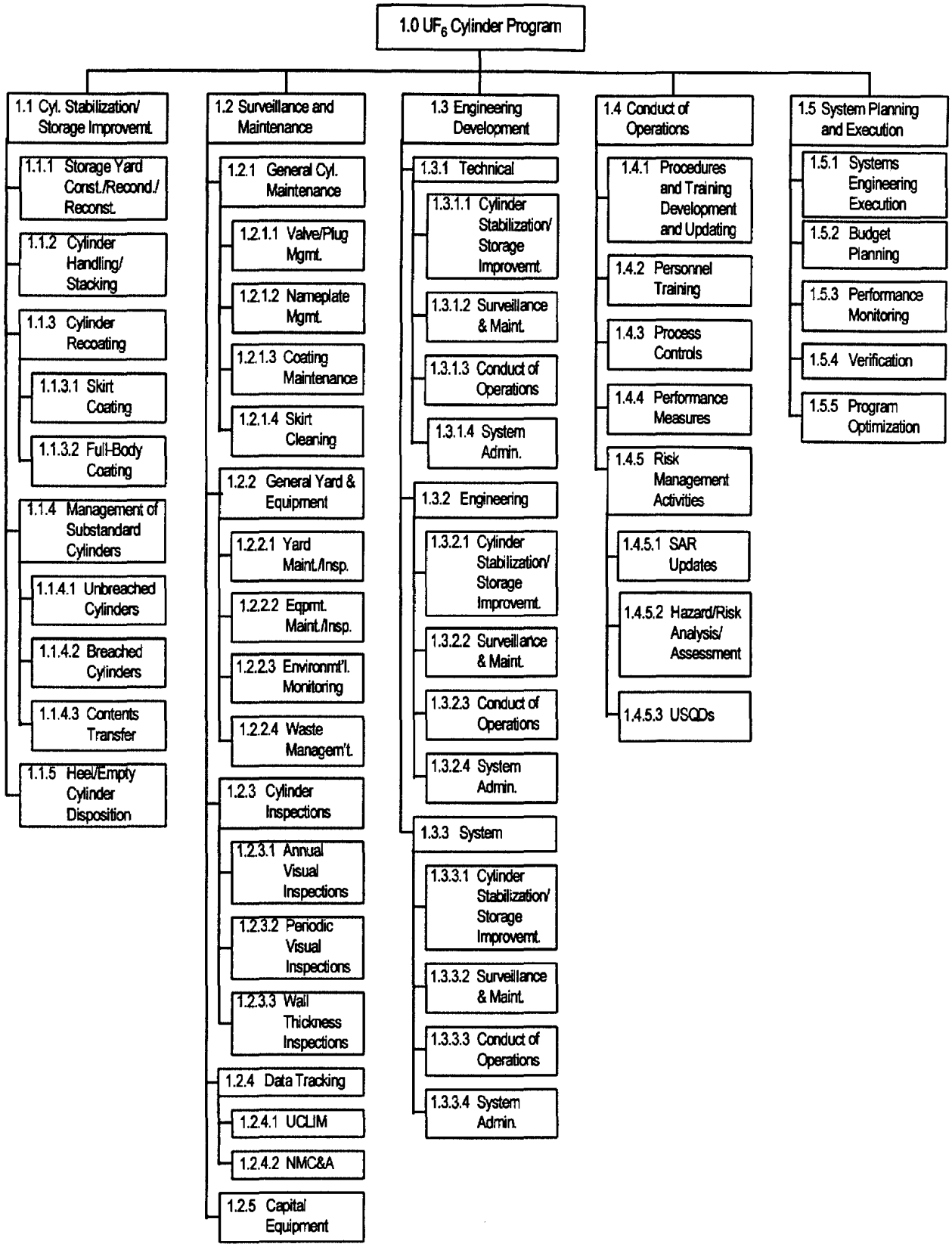

Fig. 3.1. WBS diagram.

4. WORK BREAKDOWN STRUCTURE DICTIONARY

4.1 CYLINDER STABILIZATION AND STORAGE IMPROVEMENT (WBS 1.1) (DAD J.93-U-200; DAD J.96-U-201; DAD J.98-U-200; DAD J.2.11; DAD J.2.8; DAD J.2.9; DAD J.2.3

Past general deficiencies in the management of the DOE cylinder population have led to conditions contributing to the degradation of the cylinders. A number of cylinders remained in ground contact for extended periods and in storage yards in which drainage was not adequate. This condition, in conjunction with the lack of protective coating maintenance, has resulted in corrosion of the cylinders. In addition, past stacking configurations have been such that many cylinders have not been accessible for an adequate inspection. The scope of this element is construction of new cylinder yards to facilitate placing the cylinders on well-drained concrete yards on concrete saddles; restacking of cylinders into an array allowing adequate aisle space for inspections; cylinder recoating to provide a protective barrier between the steel wall of the cylinder and the environment that contributes to corrosion of the mild steel; management of substandard cylinders; and disposition of heel/empty cylinders.

4.1.1 Storage Yard Construction and Reconstruction (WBS 1.1.1) (DAD J.93-U-200; DAD J.96-U-201; DAD J.98-U-200; DAD; DAD J.2.11)

Some UF_6 cylinder storage conditions are still substandard. Surfaces of some storage yards are gravel and are deteriorating such that cylinders will subside into ground contact if the condition is left uncorrected. Other surfaces have poor drainage, which allows water to stand under the cylinders after heavy precipitation. It has been determined that these conditions accelerate corrosion of cylinder surfaces and can cause premature failure of material containment. In addition, some cylinders are spaced too closely for adequate inspection, and respacing necessitates additional space. To correct these conditions, new concrete storage yards will be constructed and gravel yards will be reconstructed as concrete. The scope of this element is equivalent to the congressional line item construction projects.

4.1.2 Cylinder Handling and Stacking (WBS 1.1.2) (DAD J.2.8)

This element consists of the personnel, equipment, and materials to support relocation and restacking of cylinders from the old to new yards and within existing yards. As noted in Section 4.1.1, many cylinders are currently spaced too closely for adequate inspection or are in areas of poor drainage. These cylinders will be respaced within, or relocated to, the existing concrete yards and the new yards (which will be constructed as described in Section 4.1.1). Included as part of this element are the pre- and post-move visual inspections, NMC&A requirements associated with the relocations, any required radiological monitoring, and saddle placement. This activity will be performed in accordance with ERWM/EF- P2400, "DOE 48 Inch Diameter UF_6 Cylinder Handling and Inspection."[11]

4.1.3 Cylinder Recoating (WBS 1.1.3) (DAD J.2.9)

A protective coating is necessary to provide a barrier between the cylinder and the moist environment that contributes to deterioration of the cylinder. This coating will arrest corrosion of the mild steel cylinder bodies. This element consists of the personnel, equipment, and materials to recoat the cylinders. Coating of the heads of skirted cylinders has begun as an interim measure pending the initiation of full-body coating. The full-body coating activity will consist of a pilot program at the PGDP in FY 1996, with implementation at all three sites in FY 1997.

4.1.3.1 Skirt Coating (WBS 1.1.3.1) (DAD J.2.9)

Accelerated corrosion has been observed at the interface of the skirt and cylinder body. This corrosion is due to retention of moisture and corrosion products at that location. Therefore, the cleaning of the built-up rust and recoating of the heads of skirted cylinders has been an interim measure prior to full-body coating. This activity will be discontinued or limited at each site as full-body coating is implemented. Cylinder skirt/head coating is accomplished in situ.

4.1.3.2 Full-Body Coating (WBS 1.1.3.2) (DAD J.2.9)

The current cylinder coatings deteriorate and expose the mild steel cylinder to the atmosphere. Proper recoating and maintenance of that coating will extend the storage life of the cylinders. Prior to cylinder recoating, the cylinders will be moved to a coating area and the old paint, rust, and scale will be removed. The cylinders will likely be prepared and coated in temporary facilities under a contract administered by LMES. After the cylinders are recoated, they will be placed back into the storage arrays and the coating repaired if damaged during the handling. This element includes cylinder movement, movement inspections, coating materials, coating equipment, coating quality assurance, NMC&A requirements, and any radiological or industrial hygiene requirements.

4.1.4 Management of Substandard Cylinders (WBS 1.1.4) (DAD J.2.3)

In keeping with the Program's mission, substandard cylinders will be managed appropriately. This element consists of the personnel, equipment, and materials needed to evaluate, monitor, and repair breached or severely degraded cylinders and perform contents transfer when deemed necessary.

4.1.4.1 Unbreached Cylinders (WBS 1.1.4.1) DAD J.2.3)

Substandard cylinders that are not breached will be managed such that the risk of breach or loss of contents by any other means (e.g., leaking valves/plugs) is minimized. Corrective actions encompassed by this element include increased surveillance, repairing, and secondary containment.

4.1.4.2 Breached Cylinders (WBS 1.1.4.2) (DAD J.2.3)

The primary mode of exposure to hazards of UF_6 is loss of containment as a result of a cylinder breach. This element encompasses corrective actions necessary if a breached cylinder is identified, including evaluation, monitoring, cleanup of surrounding area, and repair. Corrosion modeling has indicated that the probability of finding breaches due to corrosion is low. In the event that a breach is identified, the cylinder will be "enclosed" as necessary to prevent rain and the atmosphere from spreading potential contamination while a patch is designed. After the patch is designed, it will be applied to the cylinder. Until the breached cylinder is patched, the cylinder will be inspected daily to monitor for changes in the cylinder condition. Investigations related to the breaches will be conducted as necessary and tracked as an element under WBS 1.3, Engineering Development.

4.1.4.3 Contents Transfer (WBS 1.1.4.3) (DAD J.2.3)

Cylinders that are identified as being undesirable for continued long-term storage (e.g., a patched breached cylinder) will be emptied via cold feeding in an existing process or a field portable transfer unit. A field portable transfer unit has not been designed and procured but is being addressed as an element in the Engineering Development activities. In some cases (e.g., at the K-25 Site), in-house transfer of material may not be available; therefore, if contents transfer is still desired, prior to procurement of field unit, this element will include transportation of the breaches. The scope of this element is limited to transfers necessary for the current mission to maintain safe storage. It does not include steps toward any long-term management strategy.

4.1.5 Heel/Empty Cylinder Disposition (WBS 1.1.5)

The cylinder inventory includes cylinders with heel quantities of UF_6 (as defined in ORO-651)[12], cylinders that have been rinsed and are considered contaminated but not accountable per NMC&A, and emptied breached cylinders. This element consists of activities performed to prepare these cylinders for disposition as scrap metal or other uses such as cylinder washing, heel disposition, and off-site shipment, if necessary. The current work plan does not have an identified, available, and accepted proposal to achieve this disposition. However, such tasks will be considered and prioritized through the EDP process.

4.2 SURVEILLANCE AND MAINTENANCE (WBS 1.2) (DAD J.2.7; DAD J.2.6; DAD J.2.4)

This major element encompasses the activities necessary for routine surveillance and maintenance of the cylinders for long-term safe storage. The principle operation in the cylinder yards is the passive storage of cylinders and those activities relating to achieving safe storage.

4.2.1 General Cylinder Maintenance (WBS 1.2.1) (DAD J.2.7)

To maintain safe storage, it is necessary to routinely correct deficiencies that occur with time. This element consists of personnel, materials, and equipment necessary to monitor and maintain the cylinders, including valve and plug management, nameplate management, cylinder coating maintenance, and skirt cleaning.

4.2.1.1 Valve and Plug Management (WBS 1.2.1.1) (DAD J.2.7)

The cylinder valves and plugs are an integral part of the containment system. Valves and plugs with potential leaks and defective or missing parts are identified through visual inspections and routine radiological surveys. Short-term monitoring will be conducted as necessary to provide information relating to the cause of the deficiency. After the appropriate information is collected, the valve/plug will be replaced with a new one or other corrective actions (e.g., port cap replacement). Valve replacement is expected to affect 0.03% of the total population of 48-inch-diameter cylinders.

4.2.1.2 Nameplate Management (WBS 1.2.1.2) (DAD J.2.7)

The nameplate on the cylinder is the primary means of identifying the cylinder. In many cases the welds holding the nameplate in place have deteriorated. This failure of the welds is predominantly due to galvanic corrosion between the stainless steel nameplate and the mild steel cylinder. This element consists of the fabrication and installation or replacement of nameplates that are not on the cylinder. Procedures for performing this task will consider the requirements for maintaining the ASME/NBIC certification.

4.2.1.3 Coating Maintenance (WBS 1.2.1.3) (DAD J.2.7)

Initial recoating of the cylinders and touch-up after "final" restacking are in WBS 1.1.3 as described in Section 4.1.3. To maximize the benefits resulting from this recoating operation, it will be necessary to repair areas on the cylinders that have flaking of paint, "spot corrosion", or other deficiencies that occur as the coating weathers. This element provides personnel, equipment, and materials for periodic maintenance of the cylinders' coating. It is expected that little or no activity will be necessary for the first few years after the full-body coating of cylinders.

4.2.1.4 Skirt Cleaning (WBS 1.2.1.4) (DAD J.2.7)

During the baseline inspections, it was noted that corrosion products from the head of the cylinder flake from the surface and collect in the cylinder skirt. Other debris from wind and rain also collect in the head. This heavy accumulation of debris holds excess moisture in skirt and cylinder head, accelerating corrosion of the cylinder head. This element consists of the removal of this heavy accumulation of debris. Subsequent to the initial removal, additional cleaning will be phased into a task to be performed as part of the periodic/annual inspections, to prevent future similar problems.

4.2.2 General Yard and Equipment (WBS 1.2.2) (DAD J.2.6)

Maintaining cylinder yards and equipment in an acceptable condition is imperative to safe operation of the Program. This element consists of the personnel and equipment necessary to perform yard maintenance, yard repairs, signs and boundary maintenance, minor repairs to yard access roads, equipment preventive and corrective maintenance, waste management, and environmental monitoring.

4.2.2.1 Yard Maintenance/Inspection (WBS 1.2.2.1) (DAD J.2.6)

The cylinder yards are nuclear facilities that require routine maintenance and inspection as well as postings to help ensure the health and safety of personnel. This element includes activities associated with maintaining the yards in an acceptable condition. Activities include periodic walk-throughs of yards to monitor general conditions; procurement and posting of any signs to meet posting and boundary notification requirements, and the maintenance and/or replacement of signs currently in the yards; purchasing any utilities needed; mowing grass and controlling weeds; maintenance of yard drainage; and routinely replacing road surfaces degraded by cylinder handling equipment. Most yard maintenance will be performed during spring and summer. Other activities are ongoing annually.

4.2.2.2 Equipment Maintenance/Inspection (WBS 1.2.2.2) (DAD J.2.6)

Equipment used to manage the cylinders includes the full cylinder handlers/stackers, straddle buggies, forklifts, cranes, and older trailers. Other equipment includes generators and miscellaneous equipment. This element includes the necessary routine preventive and corrective maintenance to keep equipment working safely and efficiently and the routine inspection of this equipment. The cost and scheduling of this ongoing preventive maintenance and inspections depends on the total number of pieces of equipment to be maintained.

4.2.2.3 Environmental Monitoring (WBS 1.2.2.3) (DAD J.2.6)

This element includes the environmental monitoring activities required by each site based on state and federal regulations. Samples of water, soil, and air are taken based on specific requirements and during special work activities. The samples are analyzed to identify and determine the extent of any releases. Samples are also taken and analyzed to monitor exposure of personnel and the public within certain proximities of the cylinders. This element may be included in and performed by site programs.

4.2.2.4 Waste Management (WBS 1.2.2.4) (DAD J.2.6)

Activities performed in the cylinder yard may generate certain types of nonhazardous, hazardous, or low-level waste. Waste will be generated during recoating as well as routine activities such as valve replacement and skirt cleaning. These wastes must be managed in accordance with applicable federal and state regulations, as well as requirements from DOE Orders and LMES policies. This element addresses the personnel and materials necessary to meet these requirements.

4.2.3 Cylinder Inspections (WBS 1.2.3) (DAD J.2.4)

This element consists of the personnel and materials necessary to perform annual and periodic visual inspections, as well as nondestructive measurements of cylinder wall thickness. Visual inspections are the primary means of verifying cylinder integrity. Inspections are conducted to monitor the conditions of the cylinders and yards and to document any changes that may necessitate corrective actions. Inspection criteria are established according to the purpose of the inspection. The frequency of inspection is based on the risk of the release of irretrievable reaction products from the cylinder through a breach in the cylinder wall. Routine cylinder visual inspections are conducted annually or once every 4 years in accordance with ERWM/EF-P2402, "In-Storage Inspection of UF_6 Cylinders."[13]

4.2.3.1 Annual Visual Inspections (WBS 1.2.3.1) (DAD J.2.4)

An annual inspection frequency is based on conditions of the cylinder or the storage environment of the cylinder that could lead to cylinder degradation or ultimately to cylinder breaches. Cylinder storage conditions are somewhat dynamic. For example, with time gravel yards can deteriorate and allow cylinders to come into ground contact, or drainage paths become clogged or blocked and cause cylinders to be in standing water for extended periods of time. Therefore, the inspection frequency for the cylinders is based on the most recent knowledge of the cylinder and storage conditions.

Cylinders that meet the following criteria will be inspected annually (defined in ERWM/EF-P2402[13] and subject to the revisions of this procedure):

- Cylinders in or near ground contact (e.g., body or stiffening ring ground contact).
- Cylinders located in standing water more than 48 hours after a heavy rain. (Dried sludge on the yard surface during dry weather is an indication of poor drainage.)
- Cylinders with a bulge, severe pitting (on cylinder body or in skirt/head region),or heavy scale, as defined in ERWM/EF-P2402.[13]
- Cylinders with saddles deteriorated to the extent that the cylinder could come into ground contact in the near future.

The numbers of cylinders requiring annual inspection may vary from year to year based on either improved or deteriorated conditions. About 17,475 cylinders are subject to the annual inspection requirement in FY 1996.

The scope of this element consists of the activities associated with performing the required annual inspections. Inspectors note the conditions as defined in the inspection procedure, ERWM/EF-P2402.[13] About 50 criteria are defined for observation of each cylinder.

4.2.3.2 Periodic Visual Inspections (WBS 1.2.3.2) (DAD J.2.4)

This element addresses the cylinders in long-term storage that are not subject to the annual inspection requirement. The inspection information is recorded according to an established format, to verify previously noted anomalies and document any new anomalies. Periodic visual inspections are conducted every 4 years. The 4-year interval was determined based upon the observed

deterioration of the cylinder wall thickness from atmospheric corrosion studies and upon reported information from the investigation of breached cylinders. About 34,000 cylinders are subject to this requirement in FY 1996, and about one-fourth are expected to be inspected per year. This element consists of the activities associated with performing these required periodic inspections per the inspection procedure ERWM/EF-P2402[13]. The number of cylinders in this category may increase or decrease depending on changes in cylinder condition or storage environment.

4.2.3.3 Wall Thickness Inspections (WBS 1.2.3.3) (DAD J.2.4)

Cylinder wall thickness evaluations are conducted using nondestructive techniques. Interpretation of cylinder thickness data and determination of the amount of data to be collected in the future is currently being tracked as a task under the Engineering Development WBS element.

4.2.4 Data Tracking (WBS 1.2.4) (DAD J.2.5)

This element consists of the personnel necessary to maintain the UCLIM database and maintain the routine NMC&A inventory requirements.

4.2.4.1 UCLIM (WBS 1.2.4.1) (DAD J.2.5)

UCLIM is the central repository for all visual inspection data collected from the annual, quadrennial, and relocation inspections performed on the DOE-owned cylinders located at K-25 Site, PGDP, and PORTS. The UCLIM database also maintains information from other sources such as NMC&A. This information includes material assay and weight, mechanical specifications and cylinder model, and cylinder location history. Improvements in UCLIM are underway to enable automated assignment of inspection category to individual cylinders (i.e., annual vs. quadrennial) and automated corrective action planning and tracking. This element of the WBS consists of the personnel, equipment, and materials needed to maintain and upgrade the UCLIM hardware and software system.

As inspections are performed to meet the annual, periodic, or relocation requirements, the results are entered into UCLIM. The personnel needed to perform this data entry are included as a part of this WBS element. Data entry into UCLIM is labor intensive, and the paperwork is often handled by several persons before actual entry into the computer database is initiated.

In order to reduce the time and cost required for entry of inspection data and to streamline the inspection data evaluation, programming for a hand-held computer is being developed to use in collection of inspection data. This element includes the software upgrades necessary to enable field use of these hand-held portable computers for recording visual inspection data and direct up-loading into UCLIM.

4.2.4.2 Nuclear Materials Control and Accountability (WBS 1.2.4.2) (DAD J.2.5)

The inventory of uranium is maintained officially by the NMC&A departments at each site. This inventory information requires database information concerning cylinder identification number,

net weights, tare weights, specific location of cylinder (i.e., yard, row, position), assay, and grams of uranium.

Cylinders weighing more than 100 pounds are classified as non-man-portable. The bulk weight and container size for uranium in non-man-portable containers act as a defense barrier and reduce the requirements for complete periodic physical inventories; however, an annual statistical physical inventory is performed for all cylinders containing depleted, enriched, and normal uranium. During the inventory process, an evaluation will be performed to determine if there is an appearance of attempts having been made to remove accessible cylinders or to tamper with the accessible cylinders to get to the material. The sample sizes of cylinders inventoried each year are calculated to have 80% confidence that there are no more than p% discrepant items in a population of N items when no discrepant items are found in the randomly selected sample.

Additionally, these activities include a complete physical inventory of any cylinders relocated during the year and the reconciliation of the entire relocated inventory as well as a complete inventory of the rows to which cylinders were added or removed. Other rows that did not relocate are counted for numerical accuracy. This physical inventory information is collected during field activities and provided to the NMC&A department as cylinders are relocated so that the DOE Nuclear Material Inventory System (NMIS) is kept current. Audits by DOE and internal organizations are conducted periodically to determine if this requirement is being met. This element includes all the resources and personnel to perform these tasks as well as providing the interface with UCLIM.

4.2.5 Capital Equipment (WBS 1.2.5) (DAD J.CE)

This element consists of the procurement of capital equipment needed for accomplishing the Program mission. This will include specialized cylinder handling equipment and associated fixtures. Equipment to be procured includes full cylinder stackers, straddle buggies, fork lifts, rotators, and trailers.

4.3 ENGINEERING DEVELOPMENT (WBS 1.3) (DAD J.2.10)

This WBS major element encompasses development activities of the Program, including:

- development needed to clarify the technical basis (where needed) before changes to the configuration are implemented (e.g., safety, risk-related);
- development to optimize the configuration in the interest of reducing cost, risk, or time; and
- development in support of resolving a deficiency identified internally or externally through audits, assessments, or reviews.

The Development WBS major element contains elements that indicate the type of development activity: Technical (WBS 1.3.1), Engineering (WBS 1.3.2), and System (WBS 1.3.3). Each of these elements contains sub-elements that reproduce the top WBS level or major WBS elements (Fig 3.1). For example, the Technical Development WBS elements contains sub-elements

of Cylinder Stabilization and Storage Improvement, Surveillance and Maintenance, Conduct of Operations, and System Administration. These sub-elements are used to associate development activities to the most applicable part of the system or Program.

The following three Sections 4.3.1, 4.3.2, and 4.3.3, represent the activities in the EDP. These activities are described in detail in the EDP and the work control structure forms and thus detailed descriptions are not included in this document. The EDP is a sup-plan of the PMP. Activities resulting from the EDP are integrated and scheduled with PMP activities to meet the Program needs and priorities.

4.3.1 Technical Development (WBS 1.3.1) (DAD J.2.10)

Technical development creates and documents the basis or foundation for Program activities or components. Specification boundaries for activities or components are identified and documented. Examples of activities in this element are inventory modeling and development of a storage guide. This element contains these sub-elements (the details of these sub-elements are described in the EDP):

- 1.3.1.1 Cylinder Stabilization/Storage Improvement,
- 1.3.1.2 Surveillance and Maintenance,
- 1.3.1.3 Conduct of Operations, and
- 1.3.1.4 System Administration.

4.3.2 Engineering Development (WBS 1.3.2) (DAD J.2.10)

Engineering development uses existing requirements, specifications, or the results of Technical Development to create operational or design specifications for a component or activity. Examples of activities in this element are the development of the SARs, development of the systems engineering process, and evaluation of engineering controls to reduce handling damage. This element contains these sub-elements (the details of these sub-elements are described in the EDP):

- 1.3.2.1 Cylinder Stabilization/Storage Improvement,
- 1.3.2.2 Surveillance and Maintenance,
- 1.3.2.3 Conduct of Operations, and
- 1.3.2.4 System Administration.

4.3.3 System Development (WBS 1.3.3) (DAD J.2.10)

System development integrates technical and engineering results into existing Program configuration and activities. It also includes modification, optimization, and integration of the existing Program configuration and activities. Examples of activities in this element are evaluation of various inspection requirements. This element contains these sub-elements (the details of these sub-elements are described in the EDP):

- 1.3.3.1 Cylinder Stabilization/Storage Improvement,

- 1.3.3.2 Surveillance and Maintenance,
- 1.3.3.3 Conduct of Operations, and
- 1.3.3.4 System Administration.

4.4 CONDUCT OF OPERATIONS (WBS 1.4) (DAD J.2.2)

The Conduct of Operations element covers the improvement of work process activities and controls for the Program system. Items covered are the identification of the safety basis for the system, [i.e., updated plant safety operational analyses (PSOAs) and SARs]; guidance and instruction for operating within that safety basis; necessary training for line and Program staff; identification of the financial and technical configurations for the system; new change control methods required for program configuration maintenance; and records management/document control. The term "safety basis" as used in this PMP and throughout Program operations is defined as follows: "The combination of information relating to the control of hazards at a facility (including design, engineering analysis, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely." (Definition taken from DOE Order 5480.23, Nuclear Safety Analysis Reports.)[14]

4.4.1 Procedures/Training Development and Updates (WBS 1.4.1) (DAD J.2.2)

The need for three-site procedures has been identified based on job task analysis. These procedures cover handling, inspection, cylinder identification, and actions to take in the event of potential breaches or breaches. Procedures are written and field validated through a team effort involving operations and Program staff. Review, issuance, maintaining, and archiving are handled by the EM&EF Procedures Coordinator. Training modules are prepared based on the approved procedures and are made available to the Site Program Managers. Compliance with DOE Order 5480.20A[10] is maintained.

4.4.2 Personnel Training (WBS 1.4.2) (DAD J.2.2)

This element entails the actual training of line and Program personnel in program-specific requirements, (e.g.,handling and inspection of cylinders).

4.4.3 Process Controls (WBS 1.4.3) (DAD J.2.2)

This element includes work plans, permits, procedures, configuration management, records management, and document control needed to maintain the system within the safety basis.

4.4.4 Performance Measures (WBS 1.4.4) (DAD J.2.2)

Performance measures are defined by management for each WBS Level 2 work element. Progress is reviewed each month. Goals are adjusted during the mid-year review, if necessary, with approval by DOE.

4.4.5 Risk Management Activities (WBS 1.4.5) (DAD J.2.2)

Engineering provides ongoing support to the sites to assist with annual SAR updates, preparation and processing of Unreviewed Safety Question Determinations (USQDs) and hazard/risk analysis to resolve any Unreviewed Safety Questions (USQs). Also, an annual report summarizing the fiscal year USQD and USQ activities is prepared and submitted to DOE.

4.4.5.1 SAR Updates (WBS 1.4.5.1) (DAD J.2.2)

As defined in DOE Order 5480.23,[14] this element covers the annual requirement to revise the SAR to ensure that the information in the SAR is current and remains applicable. Revisions shall be submitted at least annually and shall reflect all changes implemented up to six months prior to the filing of the updated SAR. The DOE approval of any Unreviewed Safety Question pursuant to DOE Order 5480.21,"Unreviewed Safety Questions,"[15] amendments to the Technical Safety Requirements, and the material submitted in support of these approvals shall be considered an addendum to the SAR until the information is incorporated in the SAR as part of the next annual update.

4.4.5.2 Hazard/Risk Analysis (WBS 1.4.5.2) (DAD J.2.2)

This element covers the detailed analysis required to evaluate risk/hazards associated with proposals or as-found conditions that constitute USQs.

4.4.5.3 USQDs (WBS 1.4.5.3) (DAD J.2.2)

This element implements the USQD process (Energy Systems Procedure FS-102, "Unreviewed Safety Question Determinations.")[16] which determines if proposed changes, tests, experiments, and as-found conditions result in a facility being outside its authorized basis.

4.5 SYSTEM PLANNING AND EXECUTION (WBS 1.5) (DAD J.2.1)

LMES UF_6 Cylinder Program management will provide System Planning and Execution through:

- strategic planning, development, prioritization, and optimization at the EM&EF and LMES level;
- strategic planning, development, prioritization, and optimization at the Program level via execution of the systems engineering process;
- development of activity cost and schedule baseline;
- monitoring of the execution, safety, timeliness, and cost efficiency of Program activities;
- facilitation of three-site consistency;
- point-of-contact services for DOE-ORO and HQ reporting and issue resolution;
- maintaining an open dialogue with the customer via weekly meetings with the DOE-ORO Assistant Manager;

- Monthly status of budget, schedule, and milestones to DOE;
- Feedback to Program personnel and site managers regarding DOE concerns and directives;
- coordination of Program response to DNFSB Recommendation 95-1;[1] and
- point-of-contact services with DNFSB on management of depleted UF_6 cylinders.

4.5.1 Program Management/Integration (WBS 1.5.1) (DAD J.2.1)

Although the UF_6 cylinders are located at three sites in three states, they are considered a single population that should be addressed as a whole for the purpose of consistency and economy. This is also necessary to provide optimal interface with the disposition phase and comprehensive input to DOE's PEIS, that supports decisions regarding the material's ultimate disposition. Consistency at the three sites necessitates that cylinder facilities, equipment, and storage practices be identical or equivalent to reduce cost associated with demonstrating compliance with applicable standards. Regulatory decisions or interpretations at one location (for example, regarding the material status or frequency of inspection) could have serious implications to the cylinders at another facility. Also, funding sources (the DOE controlling program) have historically varied from site to site. This WBS element consists of the personnel, resources, and materials necessary to effect cohesive Program management through the initial and ongoing application of the Systems Engineering process, including the use of the Advisory Working Group and preparation and updates of this PMP.

4.5.2 Budget Planning (WBS 1.5.2) (DAD J.2.1)

The preparation of FY and multi-year activity and cost plans necessitates detailed coordination with field execution management to ensure work descriptions are consistent and unit costs are comparable. This WBS element consists of the personnel resources and materials necessary to effect preparation of a consolidated budget for the UF_6 Cylinder Program.

4.5.3 Performance Monitoring (WBS 1.5.3) (DAD J.2.1)

Performance measures identified by WBS 1.4.4 are compiled monthly for the purpose of assessing activity progress and effective utilization of associated approved funds. It is expected that as many as 20 key measures will be designed and monitored on an ongoing basis. These measures will include cost expended versus budget for discrete activities and total activity categories, as well as capital and expense items. Activity performance relative to schedule and associated budget will be monitored. This element consists of the personnel, resources and materials necessary to prepare and report these performance measures to DOE.

4.5.4 Verification (WBS 1.5.4) (DAD J.2.1)

Verification is the term used to describe the confirmation that system requirements (including those that drive engineering development) are being or have been met. This requires verifying that the activities as well as their respective execution satisfy currently designated system requirements. This element consists of the personnel, resources, and materials necessary to perform field and office assessment of conformance to requirements. Activities performed to reconcile the system's

requirements to the result of the Work Smart Standards evaluation process previously identified as the Necessary and Sufficient process are included in this element.

4.5.5 Program Optimization (WBS 1.5.5) (DAD J.2.1)

Optimization (minimizing cost and risk simultaneously) is an integral part of effective system administration. Optimization efforts in the near term focus on the cylinder handling, recoating, and restacking supported by inventory modeling using cylinder wall thickness data. This element consists of personnel resources, equipment, and materials necessary to initiate system changes for the purpose of optimization.

5. PROGRAM WORK PLAN SCHEDULE, COSTS, AND WORK FORCE ESTIMATES

The purpose of this section is to provide the Program baseline schedule, including key milestones, costs, and associated workforce estimates. The schedule described is consistent with the Program WBS (presented in Section 3), the Detailed Activity Directives (DADs) (presented in Section 5.3), and reflects the FY 1996 authorized budget and out year planning budgets (not yet approved).

5.1 REQUIREMENTS

Requirements/criteria for Program schedules include:

- Schedules should reflect accomplishment of activities in a manner consistent with Program mission and objectives.
- Schedules should specify the work identified in the Program WBS.
- Schedules should reflect activity and funding prioritization.
- Schedules should be used to plan the work, specify milestones and deliverables, specify ownership, and measure progress.
- More detailed schedules will be established as needed to plan and control the work adequately.
- Key milestones may be modified with DOE approval. Modifications may be necessitated by availability of funds.
- Task metrics and milestone information shall be maintained by the Program Management.
- *Metrics for Performance to schedule* relative to *performance to budget* for major actions will be developed and monitored.

5.2 PROGRAM WORK PLAN SCHEDULES

The Program work plan schedule is presented in Appendix B. Schedules are shown for each Level 3 work element and are consistent with the WBS Dictionary in Section 4. Key milestones for activities within these work elements are shown where they are defined and approved by DOE at this time. In some areas, the activity is continuous or is dependent upon results of other activities and, therefore, precludes definition of specific milestones.

Activities in many WBS work elements have been underway for some time. For the purpose of the PMP, a start date for all such elements is shown as October 1, 1995, the beginning of the 1996 fiscal year. Similarly, although many activities are ongoing and are expected to extend beyond FY 2002, a finish date of September 30, 2002, is shown for these activities, consistent with the assumed time frame of this PMP.

5.3 COST ESTIMATES

Table 5.1 provides the Program cost estimates by FY 1996 DADS and Table 5.2 provides the FY 1997–2002 cost estimates by the FY 1997 restructured DADS. The structure and dollars proposed are provided for information, but are pending DOE approval via the budget authorization process. Costs are projected in year-spent dollars. The total estimated Program costs are based on the approved FY 1996 Baseline Program Plan for Uranium Programs, FY 1997 budget estimates, and the Uranium Programs Multi-Year Plan (for FY 1997 through FY 2002 estimates).

5.4 WORK FORCE PROJECTIONS

Program management will ensure that sufficient personnel resources are available to effectively achieve the Program objectives. Table 5.3 shows projected work force requirements at each site. The projected average full-time equivalent (FTE) persons are shown by fiscal year from FY 1996 through FY 2000. Construction and other subcontractor personnel are not included.

Table 5.3. UF_6 cylinder work force projections [a] (average FTEs)

Work Entity	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
3-Site Mgmt.	4	4	3	3	3	3	3
PORTS	37	42	42	40	40	40	40
PGDP	54	54	60	66	66	66	66
K-25 Site	32	27	26	20	21	18	10
TOTALS	127	127	131	129	130	127	119

[a]Projections do not include construction and other subcontractor personnel.

Table 5.1. UF_6 Cylinder Program estimated costs (FY 1996 dollars in 1,000s)

DAD Title	Site	FY 1996 Cost Estimate[a]
Maintain Core DU Program	PORTS	3,460
	PGDP	3,301
	K-25	2,179
OEPA ACD Implementation (Implementation of Tri-annual inspections per original ACD. Current Findings and Orders only require quadrennial inspections.)	PORTS	0[b]
	PGDP	100[c]
	K-25	0[d]
Repair of Gravel Portion of K-1006E Yard	K-25	784
DU Three Site Technical Support	Oak Ridge	1,470
Restack Cylinders	PORTS	2,265
	PGDP	2,472
	K-25	390
NEPA, Geotech., PMP, SRD & Engineering Support for Line Items (93-U-200 @ PGDP)	PGDP	437
Paint Skirted Cylinder Ends	PORTS	340
	PGDP	36
	K-25	297
Cylinder Program CE (Cylinder Handler/Turning Fixture, etc.)	PORTS	510
	PGDP	500
	K-25	474
Field Coating Maintenance Program (full body painting)	PORTS	100
	PGDP	2,409
	K-25	143
Breached Cylinder Disposition	PORTS	300
	PGDP	47
	K-25	672
EIS Support	Oak Ridge	170
Heel Cylinder Disposition & Other	PORTS	40
	PGDP	32
	K-25	269

[a]As of May 23, 1996, prioritization submitted to DOE-HQ.

[b]Due to inspections being performed as part of moves, no dollars were associated with implementation at PORTS>

[c]For 3-site consistency, implementation of tri-annual inspections at PGDP.

[d]Due to the small number of cylinders requiring quadrennial inspections, no reportable cost was accrued in changing this inspection frequency to tri-annual.

Table 5.2. UF_6 Cylinder Program preliminary estimated costs[a]
(FY 1997–2002 dollars in 1,000s)

DAD Number	DAD Title	Cross Ref. to WBS #(s)	Site	Cost ($x1,000)					
				FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
J.2.93-U-200	Line Item 93-U-200	1.1.1	PGDP	849	—	—	—	—	—
J.2.1	System Planning and Execution	1.5	PORTS	437	450	465	480	496	511
			PGDP	821	862	896	932	969	1008
			K-25	340	349	358	367	377	386
			3-Site	921	957	746	777	808	840
J.2.2	Conduct of Operations (includes SAR comment resolution)	1.4	PORTS	679	700	723	746	770	795
			PGDP	246	258	268	279	290	302
			K-25	256	262	269	277	285	293
			3-Site	280	125	98	101	105	110
J.2.3	Management of Substandard Cylinders	1.1.4	PORTS	80	83	85	88	91	94
			PGDP	122	180	187	195	202	211
			K-25	714	578	265	272	280	288
J.2.4	Cylinder Inspections	1.2.3	PORTS	721	744	768	792	818	843
			PGDP	996	1046	1088	1131	1177	1224
			K-25	240	170	146	150	155	159
J.2.5	Data Tracking	1.2.4	PORTS	204	210	217	224	231	238
			PGDP	388	344	358	372	387	402
			K-25	201	140	144	147	151	156

[a]This table reflects the draft restructuring of the DADS. The dollars and exact tasks in each DAD will be worked through the normal budget process.

Table 5.2. UF_6 Cylinder Program preliminary estimated Costs (cont.)[a]

(FY 1997–2002 dollars in 1,000s)

DAD Number	DAD Title	Cross Ref. to WBS #(s)	Site	Cost ($x1,000)					
				FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
J.2.6	General Yard and Equipment	1.2.2	PORTS	164	169	175	180	186	192
			PGDP	644	676	703	731	760	791
			K-25	234	189	194	200	205	211
J.2.7	General Cylinder Maintenance	1.2.1	PORTS	211	218	225	232	239	247
			PGDP	211	255	265	276	287	298
			K-25	115	88	91	93	96	99
J.2.93-U-201	Line Item 96-U-201, Phase IX Cylinder Yards at Paducah	1.1.1	PGDP	5831	5499	7348	4208	—	—
J.2.8	Cylinder Handling and Stacking	1.1.2	PORTS	2366	2803	50	52	53	55
			PGDP	1689	1760	1830	1904	1980	2059
			K-25	149	77	77	15	16	16
J.2.9	Cylinder Recoating	1.1.3	PORTS	2174	2244	2315	2389	2466	2545
			PGDP	4042	5331	5544	5766	5997	6237
			K-25	1640	1477	1517	1560	1601	821
J.CE	DU Capital Equipment	1.2.5	PORTS	—	200	200	200	200	200
			PGDP	200	200	200	200	200	200
			K-25	217	35	36	37	38	39
J.2.10	Engineering Development	1.3	PORTS	588	607	626	646	667	688
			PGDP	456	479	498	518	538	560
			K-25	1715	650	300	310	320	330
			3-Site	139	18	19	19	20	21

[a]This table reflects the draft restructuring of the DADs. The dollars and exact tasks in each DAD will be worked through the normal budget process.

Table 5.2. UF_6 Cylinder Program preliminary estimated Costs (cont.)[a]

(FY 1997–2002 dollars in 1,000s)

DAD Number	DAD Title	Cross Ref. to WBS #(s)	Site	Cost ($x1,000)					
				FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
J.2.11	Line Item 98-U-201 K-25/PGDP Phase X (location dependent on outcome of EIS)	1.1.1	K-25/PGDP	50	400	3000	2200	—	—
J.2.12	PEIS Support	1.5.1	3-Site	170	85	—	—	—	—
			TOTAL	31500	30918	32294	29066	23461	23469

[a]This table reflects the draft restructuring of the DADs. The dollars and exact tasks in each DAD will be worked through the normal budget process.

6. PERFORMANCE CRITERIA

The purpose of this section is to specify performance criteria for the Program. Performance criteria are shown for the WBS Level 2 work elements in terms of WBS Level 3 work elements. These criteria are summary statements of criteria derived during development of the SEMP. The highest level Program performance criterion is "all DOE-owned depleted UF_6 will be safely stored in cylinders until its ultimate disposition." Specific performance criteria for each WBS Level 2 work activity are given below.

6.1 CYLINDER STABILIZATION/STORAGE IMPROVEMENT (WBS 1.1)

a. Storage yards will be designed, constructed and completed as planned, including procurement of new concrete cylinder support saddles. Cylinders are accessible, have adequate storage space, and conditions in the new storage configuration are such that cylinders are not in standing water 48 hrs. after a heavy rain.

b. Handling and storage operations are conducted in a manner that ensures consistency with the safety basis.

c. Cylinder skirt ends and bodies are recoated to provide a protective coating adequate to arrest corrosion.

d. Substandard cylinders are evaluated and managed on a case-by-case basis and repaired or replaced as necessary to meet Program standards.

e. Clean, empty cylinders are removed from the depleted UF_6 inventory.

6.2 SURVEILLANCE AND MAINTENANCE (WBS 1.2)

a. General cylinder maintenance ensures that skirt corrosion products in cylinders are cleaned periodically to reduce the amount of corrosion and associated extended time of wetness (TOW) in the skirt area. Valves and plugs are repaired or replaced as necessary to meet design, material, and Program requirements for long-term storage.

b. General yard maintenance ensures that unwanted vegetation is controlled; the utilities are maintained; housekeeping is performed in a timely manner; and postings, signs, and boundaries are clearly marked and maintained.

c. Risk-based cylinder visual inspections are performed such that cylinders are inspected daily (if breached and unrepaired) or annually based on criteria in Section 4.2.3.1. Other cylinders are inspected at least once every 4 years as described in 4.2.3.2.

d. Equipment is maintained such that it meets the requirements of the safety basis.

e. Inspection data are consistently entered into the UCLIM database.

f. Program guidelines and inventory numbers are consistent with the NMC&A Organization.

g. Capital equipment sufficient to perform surveillance and maintenance without interruption are procured and placed in service.

h. Soil, water, and air monitoring is conducted regularly and yields reliable results.

i. No notices of violation are received regarding Program activities.

6.3 ENGINEERING DEVELOPMENT (WBS 1.3)

a. Technical and engineering activities effectively support the Program's requirements to mitigate deterioration of and damage to cylinders.

b. System activities effectively coordinate, prioritize, and implement Program operations.

6.4 CONDUCT OF OPERATIONS (WBS 1.4)

a. Procedures and training are developed, evaluated, and updated such that handling damage is minimized and all operations are performed within the safety basis.

b. Personnel are selected, trained, and developed through a structured process, which ensures that cylinder handling damage is minimized and that all operations are performed within the safety basis. Personnel evaluation and requalification are performed periodically to validate the process.

c. A structured process is used to control the appropriate system configuration (physical components, functions, and documents) and to develop, authorize, and implement work controls, activities, procedures, work plans, and permits.

d. Performance measures communicate expectations for work performance and effectively measure progress toward Program goals.

e. The safety basis is adequately defined by the SAR upgrade and periodically evaluated and updated according to lessons learned, configuration changes, and the results of ongoing studies.

f. Program hazards, risks, and controls are identified and appropriately documented through Preliminary Hazard Screenings (PHAs) and USQDs.

g. Work permits such as Safety Work Permits (SWPs), and Radiological Work Permits (RWPs), are used to notify workers of hazards or document worker understanding of job risks, hazards, and controls.

h. Environmental, health and safety permit requirements are reflected in operating procedures.

6.5 SYSTEM PLANNING AND EXECUTION (WBS 1.5)

a. Integration of all Program activities is effective as measured by achievement of Program objectives with allocated resources.

b. The system configuration is optimized in accordance with life-cycle projections as measured by achievement of Program objectives.

c. Financial resources are obtained and effectively used to sustain and improve the system.

d. Work is monitored to reinforce expectations for work performance and facility conditions.

As stated in the SEMP, performance measures change as the system matures and as problems are identified. Performance measures that are currently used to meet mission, drive cost, and improve performance are discussed in Section 7.6 and examples are included in Appendix F. Additional measures are being developed and will be incorporated in PMP updates.

7. PROGRAM PLANNING, CONTROL, AND REPORTING

UF_6 Cylinder Program work is formally planned, authorized, executed, controlled, tracked, monitored, and reported. The multi-year budget planning and change authorization process (Appendix C), the WBS (discussed in Section 3.0), and Configuration Management (CM) ensure that only work authorized by DOE and Program management is performed. The Systems Engineering process provides a mechanism for introducing new requirements, engineering development, analyses, design, fabrication, construction, tests, actions and management systems.

7.1 WORK SPECIFICATION AND AUTHORIZATION

The WBS establishes an activity base for program planning, control, and reporting. It provides the formal structure that identifies the products and related work efforts needed to meet Program mission and objectives. Work activities will be planned to the degree necessary to provide for understanding of aspects so that job progress can be measured against specified performance criteria. Work is specified in discrete work segments or packages. Documentation will include, as appropriate:

- work objectives
- description of work
- work duration
- key milestones and/or thresholds
- technical requirements
- resources and estimated costs by month
- responsible line organization and personnel

Work package documentation should also include direction to the organization accomplishing the work regarding what is expected. These expectations would include work status reporting (including technical, cost, and schedule reporting); training and regulatory compliance; and participation in reviews. Services are acquired at PGDP and PORTS through the use of MOUs with LMUS. The K-25 Site has direct access to services through the use of Maintenance Job Requests. MOUs are supplemented through the use of work orders that contain detailed expectations.

As specified by a given contract, contractors provide a written description of the work to be accomplished subject to specifications. Contractors are required to take the necessary actions to plan and execute work in accordance with applicable company policy and procedures. Responsible management shall confirm that work is accomplished as specified. Only work that has been authorized through the Baseline Program Plan and associated change control process will be performed.

7.2 PROGRAM BASELINE

The WBS shown in Section 3.0 will be used to plan, schedule, and control work for the program. The WBS is used to identify the cost breakdown structure and the organization responsible for the execution of the work. Therefore, the Program WBS provides the framework for defining the Program baseline funded activities as summarized in the Program Work Plan.

There are three components of the Program baseline:

1. The **technical baseline** is defined as the current ongoing technical work deemed necessary to meet the Program mission and objectives. The results of ongoing inspections, corrosion studies, and other technical activities and the degree of applicability of regulatory requirements may significantly impact this baseline through the EDP process.

2. The **financial baseline** is developed annually according to the required system performance reflected in the work plan. The financial change control process is identified in the Uranium Programs Baseline Plan for Enrichment Facilities. A description of this process is contained in Appendix C.

3. A detailed description of CM of the Program baselines is contained in Section 7.5.

7.3 COST ACCOUNTING

The cost accounting process focuses on the timely retrieval and collection of activity cost data for the purpose of measuring performance, identifying problems, prompting problem analysis and changes (where required), and generating management reports. Sites will provide monthly input to Enrichment Facilities Support (EFS) regarding cost and variances in accordance with a schedule provided at the beginning of each fiscal year for reporting on the Baseline Program Plan. The Finance Officer transmitting the information to EFS will include a text line verifying that the information has been reviewed and accepted by the respective cylinder site program manager and the LMES Site Manager. Appendix D provides a sample of monthly cost accounting documentation.

7.4 CONDUCT OF OPERATIONS

Conduct of Operations principles are applied throughout the Program. Program Major Objective 3, (MO3) "Improve Conduct of Operations," documented and discussed in the SEMP[5] and associated system requirements drive this effort. Conduct of Operations program requirements and activities are based on the LMES command media listed in Table 7.1. The term command media is defined by Lockheed Martin Energy Systems as any document intended to control work activities which includes program descriptions, company-wide procedures, activity specific procedures, work permits, regulatory permits, interpretation letters, forms, flow charts, checklists, functional area

Table 7.1. Three-Site UF_6 Cylinder Program Conduct of Operations Command Media[a,b]

Number	Title	Issue Date
	Policies	
OP-100	Conduct of Operations and Maintenance	March 1995
ES-OP-200	Roles and Responsibilities Documentation and Communications	January 1992
ES-CM-100	Configuration Management	December 1992
ES-IO-100	Records Management	September 1991
ES-QA-1.0	Quality	May 1991
ES-OP-300	Occurrence Reporting	January 1992
	Program Description	
Y/QD-15	Quality Program Description	June 1995
Y/QD-35	Price Anderson Amendments Act Quality Assurance Program Commitments and Implementation Plan	January 1995
	Standards and Procedures	
OP-101	Conduct of Operations	July 1995
ESP-OP-151	Equipment Tagging for Administrative Control	September 1991
ESS-OP-201	Roles and Responsibilities Documentation and Communications	September 1991
ESS-OP-401	SI-metrication	January 1996
OP-551	Operational Readiness Review and Assessment Process	June 1993
ESS-CM-101	Configuration Management	November 1994
IO-101	Records Management	December 1992
IO-201	Document Control	June 1993
ESS-QA-3.0	Design Control	May 1992
ESS-QA-15.0	Control of Nonconforming Items (and Services)	July 1996
ESS-QA-16.0	Corrective Action	March 1992
QA-312	Issues Management Program	April 1996
QA-16.2	Root Cause Analysis	November 1994
QA-16.3	Lessons Learned and Alerts Program	October 1994
ESS-QA-16.4	Energy Systems Action Management System (ESAMS)	August 1992
QA-18.1	Independent Assessments	March 1995
QA-18.2	Management Assessment	April 1994
	Instructions	
OP-121INS	Site/Facility Assess Requirements	January 1996

[a]The Work Smart standards identification process may reduce this list of requirements.

[b]The latest revisions of these command media are available on the Lockheed Martin internal web at universal resource locator address "**http://www-internal.ornl.gov/**".

plans, vendor manuals, job aids, handbooks, labels and postings, signs, personnel training modules, and timely orders, etc. The latest revisions of the Program command media will be followed by Program personnel. Procedures will be available to personnel as verified copies or through the Lockheed Martin internal server at universal resource locator address http://www-internal.ornl.gov/.

The key requirements and derived actions of MO3, "Improve Conduct of Operations," are embedded in the following Program initiatives:

- define and communicate Program roles and responsibilities;
- develop and issue three-site handling and inspection procedures;
- train personnel in the three-site procedures so that three-site consistency can be achieved in ongoing, emergency and off-normal operations;
- develop and strictly adhere to Program configuration management/change control, including physical, functional, and financial;
- develop and implement sound document control and records management practices;
- monitor, evaluate, and report program performance;
- assess discrete pieces of work and overall program performance through assessments, audits, surveillances, walk-downs, and routine review of performance indicators.

DOE Order 5480.19:[9] has been evaluated for applicability to the Program. The following list indicates applicable chapters:

Chapter 1	Operations Organization and Administration
Chapter 2	Shift Routines and Operating Practices
Chapter 4	Communications
Chapter 5	Control of On Shift Training
Chapter 6	Investigation of Abnormal Events
Chapter 7	Notifications
Chapter 8	Control of Equipment and System Status
Chapter 9	Lockout and Tagout
Chapter 10	Independent Verification
Chapter 11	Logkeeping
Chapter 12	Shift Turnover
Chapter 14	Required Reading
Chapter 15	Timely Orders to Operators
Chapter 16	Operating Procedures
Chapter 17	Operator Aid Postings
Chapter 18	Equipment and Piping Labeling

Two chapters of DOE Order 5480.19[9] are not applicable to the Program at this time. Because the Program does not have control rooms associated with cylinder yard operations, Chapter 3, "Control Station Activities," does not apply. Chapter 13, "Operational Aspects of Facility Chemistry and Unique Procedures" does not apply because the Program does not control any facility chemistry or continuous processes. Each of the three sites has prepared a conduct of operations

applicability matrix that provides specific implementing procedures for chapters of DOE Order 5480.19.[9]

Any significant deviation from program safety documentation, permits, and command media shall be reported and investigated per LMES policies and procedures on occurrence reporting (ES-OP-300[17] and OP-301[18]). Appropriate follow-up activities will be taken. These activities include evaluations; corrective and preventive actions; the preparation of red, yellow, or green alerts per the LMES Lessons Learned system; or monitoring management commitments through the Energy Systems Action Management System (ESAMS)[(QA-312,[19] QA-16.3,[20] and ESS-QA-16.4[21])].

7.5 CONFIGURATION MANAGEMENT PLAN

The Program uses CM to ensure that consistency is maintained among the technical and financial configuration, the requirements, and the related documentation throughout the system's life cycle, with special emphasis on control of changes. These relationships are shown in Fig. 7.1. This section serves as the Configuration Management Plan for the Program.

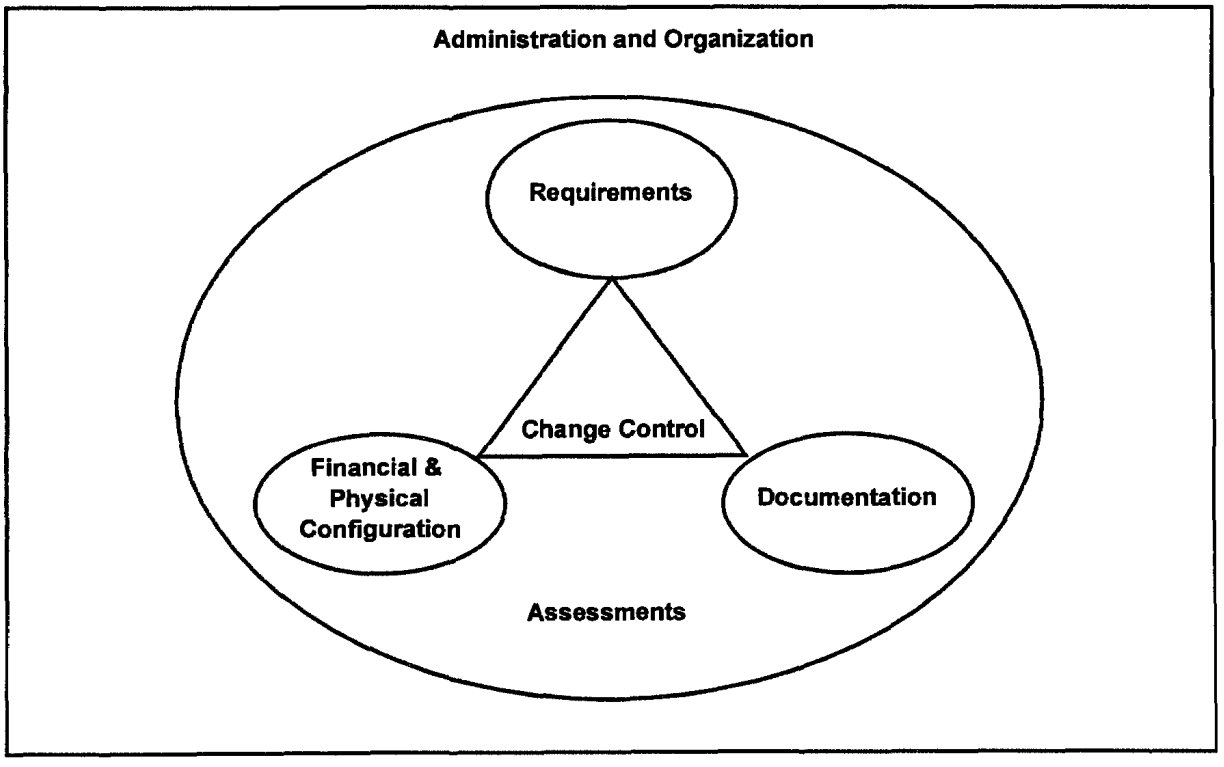

Fig. 7.1. Configuration Management Process.

7.5.1 Financial Configuration

The financial configuration combines the system's operational milestones and associated financial requirements. The financial configuration provides the business management baseline expectations. The details of identification, monitoring, and change control of the financial baseline are provided in Section 4, Section 5, and Section 7.3. The financial baseline change control process is outlined in Appendix C.

The financial configuration is revised annually, as needed, to reflect performance requirements expressed in the WBS. The financial configuration is established through a process that ensures financial resources received are used in the most cost-effective manner. All the activity that is required to be performed for a certain year is broken down into work packages entitled DADs. Table 5.2 outlines the DAD structure to be used for 1997 and describes the work scope to be performed in each DAD. These DADs have been prioritized and will be kept current throughout the year as new or revised requirements become known.

DOE authorizes the work that is on the prioritized listing down to the level of funding that is available. Each of the funded DADs is assigned to a Task Assignment Directive (TAD), and a monthly spend plan is established. Also negotiated at that time are the specific deliverables that will be used to measure actual performance. There are three levels for deliverables: Major Milestones, Milestones, and Markers. Financial baseline information is collected into an annual Baseline Program Plan, which provides DOE authorization and direction necessary to allow work to be performed.

7.5.2 Technical Configuration

For purposes of the Program, the term "technical configuration" is used to refer to (1) safety class, structures, systems, and components (SSCs), (2) safety significant components SSCs, (3) other important system components, and (4) system documentation. Several existing control methods (e.g., document and procedure control) in use at the three sites will be used by the Program. Configuration Management falls within WBS 1.4.3, Process Controls, and is one of the major elements of the QA program. Program CM implements the requirements and guidelines provided in Energy Systems LMES ES-CM-100, "Configuration Management,"[22] and ESS-CM-101, "Configuration Management."[23]

7.5.2.1 Design Reconstitution

The existing design and configuration of safety class and safety significant change control items is considered adequate based on the many years of successful operation. Thus, the design of these items shall not be reconstituted except to the extent necessary to support review and approval of subsequent changes. However, reasonable efforts will be taken to retrieve/recover readily available design drawings and design information, field verify their accuracy, and place these drawings and information under document control. Also, for any new designs, the associated as-built design drawing and design documents will be captured and placed under document control. This information will be invaluable for the review and approval of subsequent changes. Discrepancies

found during the field verification efforts will be evaluated for their impact on the safety basis, properly dispositioned, and the disposition documented. Significant discrepancies that have potential to adversely impact the safety basis will be brought to the attention of the Program's Configuration Control Board (CCB).

7.5.3 Configuration Management Elements

The following sections briefly describe the elements of the CM for the UF_6 Cylinder Program. This CM is an adaptation of that provided in DOE-STD-1073-93-Pt.1, "Guide for Operational Configuration Management Program."[24]

7.5.3.1 Administration and Organization

This element organizes and administers CM for the Program to ensure that the other elements are implemented in a consistent, cost-effective, and timely manner. This element defines and communicates the responsibilities, authorities, and interfaces among organizations to managers and personnel responsible for implementing CM; identifies and documents the items to be included in the scope of CM; ensures conformance with system requirements; and provides CM training for personnel to improve communication and understanding of important CM concepts, terminology, and requirements. Also, it ensures adequate staffing and resources are provided; necessary databases (e.g., UCLIM) are developed and maintained; and CM weaknesses are identified, monitored, and resolved in a timely manner.

7.5.3.2 Requirements

This element identifies the essential characteristics of technical change control items that must be satisfied to meet the Program mission and objectives and system requirements as defined in the SRD. This element interfaces with the change control element to provide a basis for deciding whether a change to a change control item is acceptable. Likewise, it interfaces with the documentation element to ensure the requirements are documented and available. With time, new requirements may be identified or developed, as needed.

7.5.3.3 Documentation

The documentation element ensures that the documents affected by a change to a change control item are identified, updated to reflect the change in a timely manner, approved for release by authorized personnel, and distributed in a controlled manner. Document control ensures that the documentation is consistent with the physical elements and conveys the functional configuration consistent with the applicable requirements. This control process identifies those documents to be included under CM and monitors document status, especially during revision; identifies documents with unique numbers for traceability; uses controlled copy management to ensure the most current approved documentation are available to personnel assessing, managing, and developing the system; and uses a change/addendum control system.

7.5.3.4 Configuration

The technical baseline system configuration is identified through the Systems Engineering process and is reflected in the BIOs. The BIOs provide the current safety basis for the system. Upon approval, the SARs will supersede the BIOs as the safety basis. The safety basis bounds safe operation for all ongoing and planned performance activities. The technical baseline is controlled through identification of and control of changes to change control items. Change control items are the family of components, activities, and documentation that describes the system and are necessary to ensure safe operation of the system. Change control items for the Program are the system components (such as cylinders) and system documentation (such as drawings and procedures) that, if not maintained in compliance with applicable requirements, could lead to a loss of life or health and/or noncompliance with the law, regulations, or orders. Change control items will comprise only items essential to the safe and successful performance of the system. Unique identification numbers are used on hardware and documents for permanent identification.

7.5.3.5 Change Control

The Change Control element comprises control processes to ensure consistency among the technical baseline system configuration, the requirements, and the associated documentation. The change control process ensures that changes to change control items are properly identified, reviewed, approved, implemented, validated, and documented. To accomplish this, the change control element is integrated with the requirements element and the documentation element. The mechanisms for change which require control within the Program are identified and the controls prevent unauthorized changes. Some change control items (e.g., procedures) are controlled by established change control processes and procedures. Proposed changes to change control items will have a technical review performed to ensure that each proposed change is consistent with the requirements. Change control for the Program is discussed in detail in Section 7.5.4 below.

7.5.3.6 Assessments

Assessments systematically evaluate the effective implementation of other CM elements. Assessments also ensure continued consistency between the requirements, the system configuration, and the documentation. The Program uses a variety of assessments (e.g., technical reviews, inspections, performance-based evaluations, and audits of documents) to ensure adherence to the baseline configuration and to ensure adherence to Program mission and objectives.

When completed, an initial assessment will identify the change control items for the Program. Assessments will be conducted periodically to ensure continued effectiveness and consistency with the objectives of CM. The assessment function will include both independent and self assessments as well as development and implementation of corrective and preventive actions.

7.5.4 Change Control of Change Control Items

Based on the results of the Plant Safety Operational Analyses (PSOAs), conducted in support of SARs for PGDP and PORTS, and the SAR for the K-25 Site Cylinder Yards, there are currently

no safety class change control items associated with the Program. The final SARs may identify safety class or safety significant change control items.

In addition to the safety class and safety significant change control items, the documents that describe the system, its safety basis, and the important activities are identified as change control items. Appendix E lists typical change control items expected to be controlled. An updated approved list will be maintained by the UF_6 Cylinder Program Manager.

The ultimate goal of change control is to ensure that **all** changes to identified change control items are reviewed and approved by the proper level of authority. The proper level of authority can be at the site level or the Program level and in some instances DOE level. Changes to change control items will not be implemented until reviewed and approved by the proper level of authority.

7.5.4.1 Configuration Control Board

The CCB is appointed by the UF_6 Cylinder Program Manager for the purpose of reviewing and approving changes to selected change control items. The CCB consists of a representative from each of the following disciplines: Program Management (Chairman), Systems Engineering, Operations, Environmental Safety and Health, Quality Assurance, Technical (metallurgy), and Risk Assessment. Selection of CCB members is based on knowledge and experience in one or more specific disciplines. A separate charter will contain details of the membership and protocol.

Applicability

For the UF_6 Cylinder Program, change control applies to:

- Physical changes to Safety Class and Safety Significant Hardware.
- Changes to approved operation, maintenance, or testing activities.
- Changes to approved System Documentation, including three-site procedures.

Change control does not apply to routine activities (e.g. operation, maintenance, or testing) that continue to be performed in compliance with approved procedures. This includes existing approved work control processes and administrative controls such as cylinder surveillance, inspection, cleaning, and coating. Also, change control does not apply to "like for like" replacement of physical hardware items. Some items are controlled by existing change control processes of site organizations.

Initiation

Changes to CCB controlled change control items can be initiated by anyone associated with the Program. The request for a change will include sufficient supporting information such as redlined documents, sketches, drawings, etc. to support the review and approval of the change. The information provided for the "Change Description" and "Reason for Change" in the request shall be adequate to allow full understanding by subsequent technical reviewers and the CCB as appropriate. The change request and supporting technical information will be assembled into a change package

for distribution of copies for technical review. Review and approval of a change is initiated by submitting a change package to the CCB. The change package includes, as a minimum, the following:

- statement of the problem and description of proposed change;
- alternatives considered;
- analysis showing that the change will solve the problem;
- analysis to ensure that the solution will not introduce new or integration problems;
- verification of interface compatibility including test, operations, safety, and reliability;
- estimate of cost and schedule impact;
- proposed specification performance, or integration revision;
- implementation plan for accommodating the change;
- impact if not implemented; and
- field verification..

Technical review

All changes to change control items will receive a technical review to ensure that the change:

- solves the concern without creating new concerns;
- is technically correct and consistent with applicable requirements;
- does not compromise human health and safety or the environment;
- does not cause a nuclear criticality problem;
- does not represent an unreviewed safety question;
- is constructable, operable, and maintainable; and
- is compatible with other pending changes.

In addition, the technical reviews will verify that the change is consistent with applicable site safety requirements, and DOE Orders. During the technical reviews any other change control items such as nuclear criticality safety approvals, system safety analyses, or operating/maintenance procedures impacted by the change shall be identified.

Changes will be reviewed against the applicable design requirements to verify consistency with the limits, safety margins, and other parameters for which the program is authorized. If the change deviates from a design requirement, then it must be either modified to satisfy the requirement, justified to be implemented as proposed with appropriate change made to the requirement, or canceled.

Changes to safety class or safety significant items and most of the system documentation will have an USQD performed in accordance with Energy Systems Procedure FS-102, "Unreviewed Safety Question Determinations."[16] If a change is a USQ, then DOE review and approval are required prior to implementation.

The results of the technical reviews will be documented and attached to the change package. As a minimum, this documentation includes the following:

- requirements review,
- USQD documentation (if required),
- any other pertinent technical review checklists or documentation, and
- other change control items impacted.

CCB review

When CCB review and approval of a change to a change control item is required, the CCB review will verify the following:

- The benefits of the change warrant the cost and schedule impacts.
- Adequate resources are available for implementation.
- Technical and safety reviews have been performed adequately.
- All necessary external reviews and approvals have been obtained.
- The change package is complete and ready for implementation.
- All affected documents are identified.
- Training requirements are identified.

After individual review by the CCB members, the CCB will formally meet to approve or disapprove the change or recommend alternative actions. Based on the recommendations of the CCB members and his or her own review, the CCB Chairperson will either reject the change or grant approval for implementation. After approval, the implementation plan will be issued and implementation status monitored through the assessment process and performance measures.

Implementation

The approved change package will be distributed to the department or organization responsible for implementation of the change. The Cylinder Site Program Manager ensures that the implementation of the change is controlled through acceptable work control processes such as those described in DOE Order 4700.1, "Project Management System."[7] During implementation of a hardware change, the Cylinder Site Program Manager with input from Engineering, will review any field change requests or nonconformances and determine if CCB review and approval of the field change or nonconformances is required. If it is determined that CCB review and approval are not required, then the field change request or nonconformance will be dispositioned as necessary.

All field changes will be reported to the site Cylinder Program Manager. Prior to closeout of the change package, a final review of all field changes and nonconforming items will be performed to verify for consistency with the original design assumptions, calculations, technical reviews, and other design considerations. The design documents, will be updated to reflect field changes and nonconformance dispositions as required.

Validation

Validation of proper implementation of a change will consist of a visual inspection and/or a functional test, if appropriate. The visual inspection of the implemented change will verify the

consistency of the as-built configuration with the design documents and technical reviews. During the final visual inspection, revised procedures and documents should be validated against the as-built conditions.

A functional test will verify that the implemented change performs as intended and operates within the design requirements before. If the functional test fails to meet the acceptance criteria, then relevant documentation must be sent to the site Cylinder Program Manager for review and resolution.

Changes to documents are validated by visual comparison to the physical configuration. Changes to procedures are validated by table top simulation or physical walkdown. Validation information will be documented and included in the final change package.

Closeout and turnover

The final change package should include the following:

- completed original change request;
- all review documentation and/or checklists;
- conceptual and detailed design packages, as appropriate;
- implementation guidance, functional test procedure, and test results;
- any other supporting information (e.g., memos, correspondence, specifications, data sheets, analyses, etc.);
- field change documentation; and
- as-built drawings (if available).

Key documents affected, by a change, such as drawings and procedures necessary to support daily operation, must be revised prior to use.

7.5.4.2 Change Control for Items Controlled at the Site Level

Program change control items may be controlled at the site level, through methods that include engineering analysis and review; document control; the USQD process; procedures development and control process; and review and approval by site safety and health committees such as the Plant Operations Review Committees (PORC) at PORTS and PGDP and the Site Health, Safety, and Environmental Review Committee (SHERC) at the K-25 Site. The site Cylinder Program Managers should apply a graded approach in determining the degree of formality of site-level change control. Appendix E lists typical change control items, selected to be controlled by either the CCB or the site organizations.

7.6 PERFORMANCE ANALYSIS AND REPORTING

Program performance will be analyzed and reported monthly to DOE, LMES EM&EF management, and Program personnel. The process will focus on the identification and analysis of

significant deviations from the baseline and the development and implementation of effective corrective actions. Performance indicators will be used to facilitate performance measurement against stated objectives and goals. Current measures in use are included as Appendix F. In addition, the Cylinder Site Program Managers will provide the Program Manager with a weekly update on activities at the site, and this update will be used to generate a brief report.

Program and work progress in relation to the respective site baselines must be examined. This examination will take place during scheduled project team meetings. The Program Manager will review all three site baselines in preparation for a monthly Project Review Meeting with DOE. The Program Manager will assess deviations or variances from planned activities to determine the impacts associated with these deviations or variances. The Program Manager and Program Cylinder Site Manager will then determine corrective actions. The focus is to identify the factors contributing to the deviations from the plan so that appropriate corrective actions to minimize risk can be determined.

The information collected into the Uranium Programs Baseline Program Plan is used to establish the baseline for measuring and reporting actual performance. The actual monthly performance and amount spent are reported. Problems and cost variances are explained, and solutions are recommended. As the year progresses, overruns or underruns because of work pace or revised work scope may be projected. As these projections are validated, changes to the financial configuration may be necessary. These changes are requested, explained, and justified in the Baseline Change Control Process.

The corrective action step is an important element of the performance analysis process. It results in a plan of action to maximize probability of success for work being conducted and, ultimately, the success of the overall Program. The corrective action plan will include the names of the personnel responsible for taking the corrective action and include an associated schedule.

8. COMPLIANCE AND RISK MANAGEMENT

This section specifies Program-level environmental, safety, health, and quality assurance compliance requirements and practices.

8.1 ENVIRONMENT, SAFETY, AND HEALTH

The Program basic premise is to protect the environment, safety, and health of site and Program personnel and to protect the public. The identification of the safety basis, operating within that envelope, and use of the configuration management process provide administrative and engineered controls for maintaining risks according to ALARA principles. Hazard screening analyses, adherence to the SAR and USQD process, adherence to Program procedures, and implementation of site environmental and safety policies and procedures ensure required regulatory compliance and safety.

New and changing operations are reviewed through the National Environmental Policy Act (NEPA) process (ESP-EP-163, National Environmental Policy Act Review)[25] to determine any potential adverse impacts on the environment (e.g., review of new coating activities to determine any potential adverse impacts on the environment). Likewise, the USQD and readiness review processes (FS-102[16] and OP-551,[26] respectively) are used to review proposed operational changes for adverse impacts to worker and public health and safety, and changes that would violate approved operational safety limits.

Verbatim compliance or approved deviations is required per approved, active NCSAs; safety, radiation, hot work, and excavation/penetration permits; Clean Air Act, Clean Water Act, Resource Conservation Recovery Act permits; and applicable site and facility health and safety requirements; and other safety requirements. Site-specific and cylinder yard access requirements will be followed at all times.

Program managers at each of the three sites are responsible for ES&H compliance during the performance of all cylinder activities. Health and safety and environmental oversight for the Program are provided by the EM&EF Health and Safety and Environmental Management organization managers, respectively.

8.2 QUALITY ASSURANCE

The cylinder yards and associated operations are considered Category 2 Nuclear Facilities by DOE and fall under the QA requirements of 10 CFR 830.120.[27] LMES's implementation of 10 CFR 830.120[27] and the Price-Anderson Amendments Act of 1988,[28] is described in Y/QD-35, Rev. 1.[29] All Program personnel are responsible for the quality of their work and implementation of 10 CFR 830.120.[27] This is achieved through work planning, execution, control, and assessment according to the PMP and EDP. Responsible managers and/or supervisors will ensure that their

assigned personnel are familiar with the quality issues and requirements applicable to the work to be accomplished, that appropriate procedures/instructions are available, and that personnel are trained for conducting those activities affecting quality.

MO3, "Improve Conduct of Operations,"as discussed in the SEMP and WBS Element 1.4, "Conduct of Operations," describe the goals and associated work packages for achieving improved operations and compliance with 10 CFR 830.120[27] and 10 CFR 830.310.[30] The graded approach to formality of conduct of operations and safety management has been applied throughout the planning for Program activities. It is based on programs in effect, the authorization documents (BIOs and SARs for each of the three sites), and the recognized low hazards associated with the Program. Assurance of worker and public health and safety and environmental protection are built into the Program through the basic program design; systems engineering approach; procedures; training; and work control processes, such as the USQD process and various work permits.

Program progress is continuously assessed via field surveillance, cylinder inspections, management walk-downs, and more formal programmatic assessments. Each Program requirement as defined in the SRD, the SEMP, and the EDP must be verified for completion and adequacy. Management emphasis is directed at preventing problems that could adversely affect the Program. Therefore, issues and/or risks affecting quality (as identified through formal or informal assessments or document reviews) shall be brought to the attention of the Program manager or a designated representative as soon as possible. The complement of Program requirements specification, implementation, verification, and adjustment of requirements and tasks provides a framework for continuous improvement.

The Program QA plan is described in the following sections. The ten criteria for a QA program (as specified in 10 CFR 830.120)[27] are addressed.

8.2.1 Management

The Program is led by the organization shown in Fig. 2.1. Overall Program management is carried out through the processes described in the PMP and EDP. Program personnel are responsible for following the applicable requirements set in these documents, as well as additional ES&H and QA requirements imposed by their sites.

8.2.1.1 Quality Assurance Program

The Program Systems Engineering approach has resulted in system requirements and processes that implement 10 CFR 830.120[27] requirements. Conduct of operations, safety management, QA, and CM are overlapping in goals, scope, and methods of achievement. The integrated Safety Management System model, shown in Fig. 8.1, was adapted from information provided in DNFSB TECH-6, "Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities."[31] The model illustrates the relationships among program

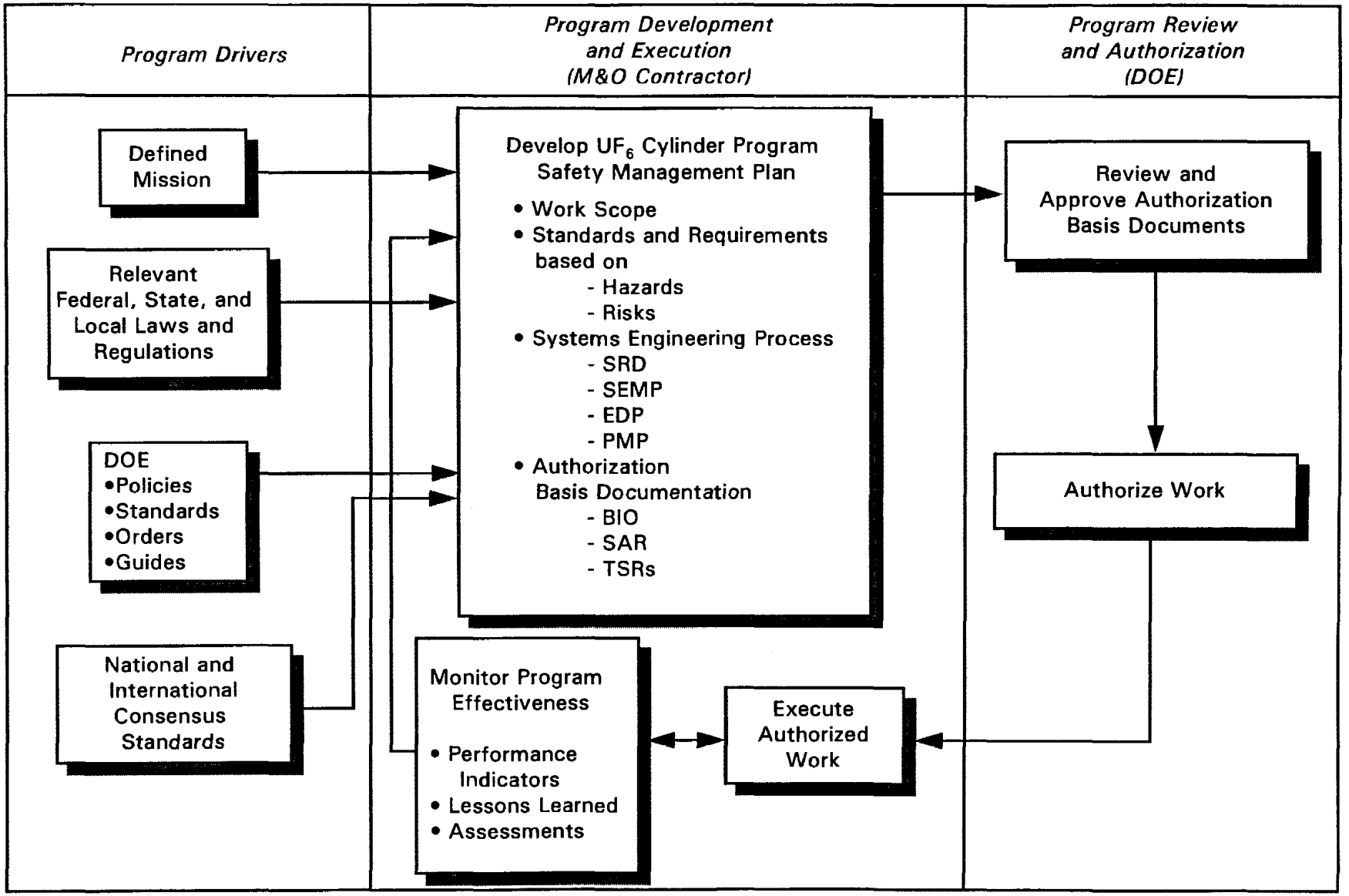

Fig. 8.1. Integrated Safety Management System for UF_6 Cylinder Program.

planning, execution, assessment, and improvement activities. The LMES 830.120 Implementation Plan includes one milestone ERWM-004 for the Program: "Build or refurbish UF_6 cylinder yard storage facilities to provide adequate protection against damage and deterioration." The milestone pertains to PGDP and the implementation date is March 31, 1997.

8.2.1.2 Personnel Training and Qualification

Highly qualified and competent personnel are selected for positions within the Program. Training and qualification requirements have been determined for all positions, according to DOE Order 5480.20A,[10] and are provided in the SRD.[4] Personnel performing hands-on work will understand the intent of cylinder yard operations and the safety aspects and will be able to demonstrate, through performance, the proper use of procedures. Performing personnel are to be generally knowledgeable of the Program's safety basis. Training modules are developed in conjunction with the site's Program operations and training personnel as well as experts from the LMES Center for Continuing Education. Training modules are developed for each new three-site Cylinder Program procedure and training is conducted prior to use of the new procedures.

Training and development plans are prepared for each individual. These plans include required compliance, job-specific, and job enrichment courses, and initial and re-training deadlines. Training status is monitored with the LMES Training Management System database. Supervisors are responsible for monitoring the training status of their personnel. Work performance will be monitored through ongoing field observation by cylinder yard supervisors, through LMES audits, and by the annual performance-based evaluation. Three-site consistency and adherence to procedures will be among aspects monitored.

8.2.1.3 Quality Improvement

Continuous quality improvement is built into the Program activities through the ongoing assessment activities (described in Section 8.2.3), reporting and investigation of problems, implementation of corrective and preventive actions, use of the Lessons Learned system, and the verification processes. Verifications are made of the scope of development activities, and adequate completion of all program actions. In addition, new and revised procedures are prepared through a performance measurement team effort. A group of expert procedure writers, subject matter experts, and operations personnel representing the Program office and the three-sites Programs prepare each procedure. This approach ensures that the procedures are usable in the field and that three-site consistent approaches, as well as site-specific requirements, are clearly defined.

One major quality improvement effort being undertaken by the program is the Work Smart Standards process. The EM&EF Business Unit has selected the Program to serve as one of the first three programs for Work Smart Standards implementation. The objective is to identify standards to be implemented, based on hazards associated with a particular program or facility, thereby minimizing the number of requirements imposed. The Program team has adopted an activity-based hazard analysis approach as the method for evaluating Program work. Activities will be grouped, based on similar tasks, into three functional areas: handling and inspection, maintenance and repair, and support activities. Authorization to implement the Work Smart Standards is expected by early

FY 1997. The product of this initiative will be reconciled with the SRD[4] and issued as a revision to the SRD.

8.2.1.4 Documents and Records

The Program will make and preserve records containing adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the Program. Records will be sufficient to support technical and regulatory decisions. See Appendix G for a preliminary list of program records and record copy storage locations. Program records are maintained decentralized.

8.2.2 Performance

8.2.2.1 Work Processes

Work processes (such as cylinder surveillance and maintenance, inspection, and nameplate replacement) are to be conducted in accordance with approved, three-site procedures. Development activities will follow the process outlined in the EDP.[6] At no time will unauthorized work be performed. Adherence to procedures and work plans will include the preparation and approval of required safety, radiation, and hot work permits.

Items (including the configuration and change control items listed in Appendix E) shall be identified with unique identification numbers. Equipment use and work area entry are permitted only to authorized personnel. Lifting, moving, inspection, cleaning, and coating equipment shall be maintained per the sites' preventive maintenance systems. Such equipment shall be inspected by operations personnel prior to use. Operational problems will be reported to the responsible supervisor immediately, and repair/maintenance requests will be initiated.

8.2.2.2 Design

Design work follows requirements of DOE Order 6430.1A, "General Design Criteria,"[32] and ESS-QA-3.0, "Design Control."[33] Management of the project follows DOE Order 4700.1, "Project Management System."[7] Design drawings will be controlled in accordance with Engineering Procedure EP-C-18, "Design Document Change Control."[34]

The engineering project manager (or designee) will prepare a project review plan for the project, in accordance with Engineering Procedure EP-C-17, "Design Verification."[35] The engineering project manager will identify all key reviewers applicable to the design submittal. At a minimum, the project manager, the principal engineer, the project engineer, the Site Cylinder Program Manager, a safety and health representative, and the responsible quality assurance specialist shall be identified as key reviewers.

During construction, deviations from certified-for construction design drawings will be approved and documented. The approval list for each deviation shall be the same as used for the original design. To avoid delays, telephone approval from the project manager is acceptable.

However, telephone approval should be documented, and approval signatures from all required individuals should be obtained.

Requirements and specifications conveyed to prime contractors and subcontractors will identify the required quality assurance records. Test plans, procedures, and specifications will be reviewed, approved, and included in the design control systems for the Program.

8.2.2.3 Procurement

Only approved cylinder, saddle, and handling equipment may be purchased by site Program personnel. Cylinders and lifting equipment must be approved by the three-site Program Manager or her designee and must be purchased with authorized funds. Procured cylinders and lifting equipment must be per designs that have been approved by the Program CCB. Requirements for procurement activities are stated in ESS-QA-7.0, "Control of Purchased Items and Services."[36] The technical and quality requirements for procured items will be included in engineering drawings and specifications.

8.2.2.4 Inspection and Acceptance

Inspection and acceptance will follow Energy Systems requirements in ESS-QA-10.0, "Inspection;"[37] ESS-QA-11.0, "Test Control;"[38] and ESS-QA-14.0, "Inspection, Testing, and Operating Status,"[39] PRO-8, "Inspection of Material,"[40] and ESS-QA-12, "Control of Measuring and Test Equipment."[41] Specific inspection requirements are covered in the following three-site Cylinder Program procedures: ERWM/EF-P2400, "DOE 48 Inch Diameter UF_6 Cylinder Handling and Inspection,"[11] and ERWM/EF-P2402, "In-Storage Inspection of UF_6 Cylinders."[13]

For the PGDP pilot, the recoating effort has a Process Control and Inspection Plan (PCIP) that defines methods used to conduct cylinder inspections, characteristics to be inspected, and acceptance criteria. Stringent inspector qualifications are required. Inspections must be conducted by qualified personnel trained to industry standards. The designated inspector will not be replaced without approval of the PGDP Cylinder Program Manager. Inspections will be conducted and inspection records maintained in accordance with the PCIP. Special procured services, such as the PGDP cylinder recoating, will follow similar procurement, execution, and inspection protocols. Similar controls will be required for the production recoating efforts at all three sites.

Measuring and test equipment will be maintained per the requirements in the three-site procedures and maintenance and calibration programs.

8.2.3 Assessment

8.2.3.1 Management Assessment

Management assessment provides feedback to the three-site Program Manager and the site Program Managers on the status of Program implementation and effectiveness. These assessments are performed according to QA-18.2, "Management Assessment,"[42] and include selected

performance criteria defined in Section 6 of this PMP. Management assessment includes ongoing field observation by cylinder yard supervisors, periodic cylinder yard walk-downs by Program Managers, reviews and verification of EDP activity proposals by the Technical Program Manager, monthly and mid-year milestone and financial reviews, and the annual reviews conducted by the Advisory Working Group. Identified deficiencies are corrected immediately or are investigated, and subsequent corrective actions are monitored by the three-site Program Manager in ESAMS. Documentation of deficiencies and corrective actions taken is maintained by the site quality organizations. Assessment results, nonconformances, and other conditions adverse to quality will be evaluated against the reporting criteria specified in OP-301, "Occurrence Reporting System."[18]

Performance indicator charts are updated and reviewed monthly among Program participants and with DOE program management. Follow-up actions needed to correct performance problems are initiated as required.

8.2.3.2 Independent Assessment

Independent assessments are performed by the sites' health, safety, environmental, and quality organizations according to QA-18.1, "Independent Assessments."[43] These assessments are led by auditors certified in accordance with ESP-QA-2.4, "Qualification of Technical Audit Personnel."[44] Responses to results of these assessments are handled per QA-312, "Issues Management Program."[19] At the request of the Program Manager, independent performance-based evaluations are conducted annually. These teams are composed of staff from the LMES Evaluations Group and other trained field evaluators. Results of these evaluations provide the basis for further system and process improvements in areas such as work control, maintenance, surveillance, inspection, and radiation protection.

8.3 RISK MANAGEMENT

The Program applies a rigorous concept of risk management to all Program elements, from the Program mission ("to safely store the DOE-owned UF_6 inventory until its ultimate disposition") to the system definition ("the means by which containment is achieved"). The safety basis is the boundary of safe operation for all ongoing and planned program activities. Program activities tied to major objectives [(1) achieve and maintain acceptable risks and (2) achieve and maintain cylinder integrity] identify the safety basis and Program routines for operating within the safe operating window. The CM process (described in Section 7 and SEMP Major Objective 3 activities) is established to ensure that only authorized work, within the safety basis, is conducted. Major Objectives 3 and 4 address monitoring and improving system cylinder integrity and system processes.

As an integral part of bounding the system risk, a BIO for the UF_6 cylinder storage yards has been issued for each site. The BIO is used to document risk assessment analysis and control and provides the current safety basis. A standard hazard assessment method consistent with the guidance of DOE-STD-3011-94[45] was used to identify hazards associated with storage of UF_6 in steel cylinders. The hazards were prioritized using a Process Hazards Analysis, which examined the

operations in the cylinder yards to identify the mechanisms for exposing facility workers, plant workers, and the environment to the hazards. It further characterized risk by analyzing the cause, effects, and magnitudes of accident scenarios leading to hazard exposure. The types of accident scenarios identified include operational events, external events, and natural phenomena. The events were categorized according to the estimated frequency of occurrence (anticipated, unlikely, extremely unlikely or beyond extremely unlikely) and consequence (negligible, low, or high). The events were then assigned to an overall risk category. To more rigorously define the safety basis and risk boundary, a SAR for cylinder yard operations at each of the three sites is being prepared and will be issued by March 30, 1997.

The ALARA concept will serve as a guide to all risk management and reduction efforts within the Program. The current configuration of the system contains inherent risks that could be reduced or eliminated. Risk reduction measures–such as reducing the corrosion rate on cylinders through recoating cylinders, eliminating gravel yards, and facilitating drainage from cylinder skirts–are part of a risk reduction strategy. As new hazards are identified or estimates of risk associated with known hazards change, the program scope and schedule will also change to accommodate the best available risk information. Other risk reduction and avoidance tools include: periodic job hazards analysis; analysis of occurrences and appropriate follow-up actions; and active participation in the DOE, LMES, and LMUS Lessons Learned systems.

The system is monitored to identify changes in risk. These changes are analyzed to determine their impact on the system and the resulting risks associated with meeting the Program mission and major objectives. The following methods are used to identify risks within the Program and are explained in more detail in the SEMP:[5]

- corrosion risk assessment modeling,
- technical performance monitoring,
- operational performance assessments, and
- facility safety walk-throughs.

One important management system used by the Program for reviewing new or changing operations is the USQD process and the readiness review process. The program for USQD and readiness review implementation shall follow LMES FS-102[16] and OP-551.[26]

Engineered controls are also used within the Program in a "defense in depth" sense to control or eliminate risk. Engineered controls are physical barriers to mitigate or prevent the occurrence of an incident. For the Program, they include the coating of cylinders, designed drainage capacity of storage facilities, and speed controls on cylinder handling equipment. Additional engineering controls are to be evaluated as the baseline configuration of the system is developed. These engineered controls are included in drawings, specifications, procedures, and operator aids provided by Program and line managers.

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APPENDIX A

Correspondence of SEMP "Needed Actions" to PMP WBS Activities

The results of the system requirements analysis are provided in the following tables. The product of the requirements analysis is a list of comprehensive actions necessary to meet the system and technical requirements. These tables trace the requirements and associated standards from the major objectives to required actions. The numbering system corresponding to this tracing provides unique numbers for each major objective, requirement category, system requirement, technical requirement, and action. The numbering system is defined as follows:

major objective	requirement category	system requirement	action	subactions	
X.	X.	X.	X.	X.	X.

Technical requirements subordinate to the system requirements are identified by the system requirement number followed by a unique alphanumeric identifier. Actions key to complying with the technical requirements are identified by technical requirements in [ ] following the action statement.

The table also provides the following information:

- *Standards*–The standards identified are used to establish the degree and extent to which requirements and actions will be accomplished. In some circumstances, standards provide the methodology for how a requirement will be met.
- *Requirements Allocation*–After the requirement statements in ( ) are the operational functions for which the requirement is allocated.
- *Evaluation Criteria*–These criteria are used in evaluating more detailed actions to be developed by the program management. The criteria ensure that the actions to be further detailed meet the intent of the requirement. Many criteria were developed from the issues identified in the DNFSB "Tech 4" report, to ensure the program is responsive to DNFSB's concerns.
- *Action Allocation*–Each action has been allocated to either the EDP or the PMP for completion. This designation is shown in the last column of the tables.

Correspondence of SEMP "Needed Actions" to PMP Activities

Action Number	SEMP "Needed Action" Description	WBS Number
1.1.1.2	Define baseline configuration.	1.4.3
1.1.1.2.2.1	Integrate the purpose of cylinder inspection functions including code inspections, periodic visual inspections, handling, transport, maintenance, and contents transfer functional acceptance inspections.	1.4.1
1.1.1.2.2.2	Integrate the functional flow of cylinder inspections, degradation studies, degradation factor monitoring, and cylinder maintenance.	1.3.3
1.1.1.2.3	Document the technical basis for design of components, activities, and subsystems that comprise the technical configuration. Incorporate into the technical basis the anticipated operational states i.e., test/demonstration, start-up, steady-state, off-normal, emergency, and standby. 5.1.1.2-5	1.3.1
1.1.1.2.3.1	Resurrect/re-document the technical basis for components, activities, and subsystems. [1.1.1.b]	1.3.1.4
1.1.1.2.3.2	Revise specifications (drawings, etc.) to reflect current configuration of components. 5.3.y(2)[1.1.1.b]	1.3.3.4
1.1.1.2.3.3	Document pertinent history of component use. 5.1.3.2-2[1.1.1.b]	1.3.1.4
1.1.1.2.3.4	Improve the database that provides cylinder location, condition, content, maintenance, and history necessary to manage actions and constraints related to maintaining cylinder integrity.	1.2.4.1
1.1.1.2.4	Determine required baseline maintenance. 5.1.1.2-5	1.3.3.3
1.1.1.2.4.1	Develop a baseline configuration management system. 5.1.1.2-3(2)[1.1.1.b, 1.1.1.c]	1.3.3.3
1.1.1.2.4.2	Determine the intent and periodicity of configuration audits. [1.1.1.c]	1.3.3.3
1.1.1.2.5	Determine method to verify baseline meets requirement.	1.3.3.3
1.1.1. 3	Implement baseline configuration.	1.1 and 1.2
1.1.1.3.1	Implement configuration management system for system baseline. 5.1.1.2-2, 5.1.1.2-3, 5.1.1.2-5, 5.3.y[1.1.1.c]	1.4.3
1.1.1.3.2	Implement configuration audits.	1.4.3
1.1.1.4	Verify compliance with this requirement.	1.5.4

Action Number	SEMP "Needed Action" Description	WBS Number
1.1.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
1.1.2.2.4	Determine required baseline maintenance including methods for keeping the hazards analysis current. 5.1.1.2-3(3)[1.1.2.b]	1.3.3.3
1.1.2.2.4.1	Determine the periodicity of hazards re-assessment of program operations/conditions. 5.1.1.2-2, 5.1.1.2-3[1.1.2.b]	1.4.5
1.1.2.2.4.2	Identify controls for triggering hazards assessment for new/modified operations. [1.1.2.b] 5.1.1.2-2(2), 5.1.1.2-3(3), 5.1.1.2-4	1.4.5
1.1.2.2.5	Determine method to verify baseline meets requirement.	1.3.3.3
1.1.2.3	Implement baseline configuration.	1.1 and 1.2
1.1.2.3.1	Obtain authorization of the safety basis (SAR). [1.1.2.a]	1.4.5
1.1.2.3.2	Periodically re-assess hazards. 5.1.1.2-2, 5.1.1.2-3 [1.1.2.b]	1.4.5
1.1.2.3.2.1	Assess hazards for new/modified operations. 5.1.1.2-2(2), 5.1.1.2-3(3), 5.1.1.2-4 [1.1.2.b]	1.4.5
1.1.2.3.2.2	Obtain approval of changes in the safety basis. 5.1.1.2-2	1.4.5
1.1.2.4	Verify compliance with this requirement.	1.5.4
1.1.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
1.1.3.2.3.1	Document the risk management matrix.	1.4.5
1.1.3.2.4	Determine required baseline maintenance. 5.1.1.2-3(3)	1.3.3.3
1.1.3.2.4.1	Identify intent and periodicity of risk re-assessments. 5.1.1.2-3, 5.1.2.2-2[1.1.3.c, 1.1.3.d]	1.4.5
1.1.3.2.4.2	Identify controls for triggering risk assessments for new/modified operations. 5.1.1.2-2(2), 5.1.1.2-3(3), 5.1.1.2-4 [1.1.3.c, 1.1.3.d, 1.1.3.e]	1.4.5
1.1.3.2.5	Determine method to verify baseline meets requirement.	1.3.3.3
1.1.3.3	Implement baseline configuration. (see 1.1.1 configuration management)	1.1 and 1.2
1.1.3.3.1	Obtain authorization of safety basis (Safety Analysis Report). [1.1.3.b]	1.4.5

Action Number	SEMP "Needed Action" Description	WBS Number
1.1.3.3.2	Periodically re-assess risk within the program. 5.1.1.2-3, 5.1.1.2-2 [1.1.3.c, 1.1.3.d]	1.4.5
1.1.3.3.3	Assess risks of new/modified operations. 5.1.1.2-2(2), 5.1.1.2-3(3), 5.1.1.2-4 [1.1.3.c, 1.1.3.d, 1.1.3.e]	1.4.5
1.1.3.4	Verify compliance with requirement.	1.5.4
1.1.3.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
1.2.1.2.1	Develop all program risk controls in accordance with the system configuration (see requirement 1.1.1). Integrate the development of risk controls with site requirements. 5.1.1.2-1(2), 5.1.1.2-5(3), 5.1.3.2-1, 5.1.3.2-3, 5.1.3.2-4, 5.3.1.2-1, 5.3.1.2-4(2), 4.3-1	1.4.3
1.2.1.2.1.1	Verify the industrial hazard controls to be administered by the industrial hygiene program. [1.2.1.a]	1.5.4
1.2.1.2.1.2	Verify the inventory controls including movement and processing authorization to be administered by the NMC&A program. [1.2.1.b]	1.2.4.2
1.2.1.2.1.3	Verify criticality controls including mitigative alarms and inventory segregation to be administered by the Nuclear Criticality Safety program. [1.2.1.c]	1.4.3/1.5.4
1.2.1.2.1.4	Verify the safeguards and security controls including periodic patrols, physical boundaries, and facility lighting to be administered by the Safeguards and Security program.	1.4.3/1.5.4
1.2.1.2.1.5	Verify operational controls to prevent cylinder placement in ground contact beyond a specified duration. Specify duration. [1.2.1.e]	1.4.3/1.5.4
1.2.1.2.1.6	Verify in the authorization of cylinder repair/replacement through contracted services the validation of a safety envelope for specified operations. [1.2.1.f]	1.4.5/1.5.4
1.2.1.2.1.7	Verify integration of program hazards with site emergency preparedness.	1.4.5/1.5.4
1.2.1.2.2	Develop implementation means for all program risk controls. 5.1.1.2-3, 5.1.1.2-5(2)	1.3.3.3
1.2.1.2.2.1	Develop a training for personnel on program risks and subsequent controls.	1.4.1
1.2.1.2.3	Determine required maintenance of risk controls. 5.1.1.2-5, 5.1.3.2-4	1.3.3.3
1.2.1.2.4	Determine method to verify baseline meets requirement.	1.3.3.3

Action Number	SEMP "Needed Action" Description	WBS Number
1.2.1.2.4.1	Determine the effectiveness of controls for reducing, eliminating, and mitigating risks.	1.3.3.3
1.2.1.3	Implement baseline configuration.	1.1 and 1.2
1.2.1.3.1	Identify current risks that are above acceptable program risks. 5.1.2.2-4, 5.1.3.2-1	1.4.5
1.2.1.3.2	Develop risk reduction actions. 3.1	1.3.3.3/1.4.5
1.2.1.3.3	Prioritize and implement risk reduction actions utilizing a risk reduction matrix for guidance. 5.1.2.2-4 [1.2.1.g]	1.4.5
1.2.1.3.4	Implement controls. [1.2.1.a, 1.2.1.b, 1.2.1.c, 1.2.1.d, 1.2.1.e, 1.2.1.f]	1.4.3
1.2.1.3.5	Train personnel. 5.1.3.2-4	1.4.2
1.2.1.3.6	Implement risk control maintenance. 5.1.1.2-5, 5.1.3.2-4	1.4.3
1.2.1.4	Verify compliance with this requirement.	1.5.4
1.2.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
1.2.2.2.1	Identify risk monitoring and evaluation tools to be used in the program. These tools will include technical and operational performance monitoring, company, corporate and industry lessons learned sharing, and investigations of occurrences. 5.1.1.2-3, 5.1.1.2-5(4), 5.1.2.2-3, 5.3.x(2)[1.2.2.b]	1.3.3.3
1.2.2.2.1.1	Establish a facility safety walk-through program with the intent of identifying risk initiators. [1.2.2.a]	1.4.5
1.2.2.3	Implement baseline configuration.	1.1 and 1.2
1.2.2.3.1	Train personnel.	1.4.2
1.2.2.3.2	Implement the risk monitoring subsystem. 5.1.2.2-2	1.5.4
1.2.2.4	Verify compliance with this requirement.	1.5.4
1.2.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.1.1.2.6	Determine method to verify baseline meets requirement. 5.2.1.2-9 [2.1.1.c]	1.3.3.3
2.1.1.2.7	Determine the coating inspection and maintenance intent, method and frequency.	1.3.1.2/1.3.3.1

Action Number	SEMP "Needed Action" Description	WBS Number
2.1.1.3	Implement baseline configuration.	1.1 and 1.2
2.1.1.3.1	Initiate immediate temporary actions to mitigate the deterioration from worst case corrosion rates (paint skirts). [2.1.1.a]	1.1.3.1
2.1.1.3.2	Coat all cylinders per work plan and schedule. 5.2.1.2-2[2.1.1a, 2.1.1.b]	1.1.3.2
2.1.1.3.3	Adjust physical array of cylinders as necessary to maintain coating.	1.1.2
2.1.1.3.4	Implement coating inspection and maintenance. 5.2.1.2-3	1.2.1.3/1.2.3.1
2.1.1.4	Verify compliance with this requirement.	1.5.4
2.1.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.1.2.2.1	Define acceptable cylinder time of wetness in a manner such that it is technically meaningful and can be verified. 5.2.1.2-6	1.3.1.1
2.1.2.2.2.2	Integrate the structural feature performance for the surveillance and maintenance function with performance objectives for the other system functions.	1.3.3.2
2.1.2.2.4	Develop a structural feature inspection and maintenance plan to maintain compliance with this requirement, and integrate the plan with the program. 5.2.1.2-6	1.3.3.2
2.1.2.2.5	Determine cylinder inspection/acceptance requirements for transitioning cylinders from one function to another if one cylinder acceptance criteria is not adopted for all functions.	1.3.3.2
2.1.2.2.6	Determine method to verify baseline meets requirement.	1.3.3.3
2.1.2.3	Implement baseline configuration.	1.1 and 1.2
2.1.2.3.1	Implement immediate actions to reduce cylinder time of wetness (clear debris from skirts). [2.1.2.a]	1.2.1.4
2.1.2.3.2	Modify structural features to meet acceptable cylinder time of wetness. [2.1.2.a]	1.2.1
2.1.2.3.3	Perform inspection and maintenance of cylinder structural features. 5.2.1.2-6, 5.2.1.2-9, 5.2.3.2-1[2.1.2.a]	1.2.1/1.2.3
2.1.2.3.4	Implement baseline maintenance.	1.1 and 1.2
2.1.2.4	Verify compliance with this requirement.	1.5.4

Action Number	SEMP "Needed Action" Description	WBS Number
2.1.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.1.3.2.1	Define performance objectives of cylinder support structures with respect to system functions including the interface with cylinder coatings, periodic inspections, and water drainage. 5.2.1.2-1(2) [2.1.3.a, 2.1.3.b]	1.3.2.3
2.1.3.2.3	Identify and evaluate modifications to cylinder support structures to meet cylinder time of wetness performance objectives. 5.2.1.2-7, 5.2.1.2-9	1.3.2.1
2.1.3.2.3.I	Assess current designs to determine their capacity to drain water.	1.3.2.1
2.1.3.2.4	Determine inspection and maintenance methods to maintain compliance with this requirement. 5.2.3.2-6	1.3.2.2
2.1.3.2.5	Determine method to verify baseline meets requirement.	1.3.3.3
2.1.3.3	Implement baseline configuration.	1.1 and 1.2
2.1.3.3.1	Implement immediate actions to meet performance objectives. [2.1.3.a, 2.1.3.b]	1.5.5
2.1.3.3.2	Procure or modify support structures to meet acceptable cylinder time of wetness. 5.2.3.2-6	1.1.1
2.1.3.3.3	Perform inspection and maintenance of cylinder support structures to ensure meeting this requirement. 5.2.1.2-1, 5.2.1.2-7, 5.2.1.2-9, 5.2.3.2-1, 5.2.3.2-6	1.2.2.1/1.2.3.1/ 1.2.3.2
2.1.3.4	Verify compliance with requirement.	1.5.4
2.1.3.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.1.4.2.3.2	Assess current facility design and construction methods to performance objectives.	1.4.3
2.1.4.2.4	Identify and evaluate modifications to the cylinder storage array to meet system performance objectives. 5.1.1.2-7, 5.2.3.2-1	1.3.2.1
2.1.4.2.5	Determine inspection and maintenance of storage facilities to maintain compliance with this requirement.	1.3.2.2
2.1.4.2.6	Determine method to verify baseline meets requirement.	1.3.3.3
2.1.4.3	Implement baseline configuration.	1.1 and 1.2

Action Number	SEMP "Needed Action" Description	WBS Number
2.1.4.3.1	Implement immediate actions to reduce cylinder time of wetness (remove from ground contact, improve drainage of existing yards). 5.2.1.2-1(2)	1.1.1/1.1.2
2.1.4.3.2	Determine demand for modifications and new facilities. 5.2.1.2-5	1.3.2.1
2.1.4.3.3	Build new or modify storage facilities to meet cylinder performance objectives. Utilize new/modified facilities. [2.1.4.b] 5.2.1.2-1, 5.2.1.2-4	1.1.1
2.1.4.3.4	Adjust cylinder storage array. 5.1.1.2-7, 5.2.3.2-1[2.1.4.c]	1.1.2
2.1.4.3.5	Perform inspection and maintenance of the storage facilities to ensure that this requirement is met. 5.2.1.2-7, 5.2.1.2-4, 5.2.1.2-5, 5.2.1.2-8, 5.2.1.2-1(2)	1.2.2/1.2.3
2.1.4.4	Verify compliance with this requirement.	1.5.4
2.1.4.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.1.5.3	Implement the baseline configuration.	1.1 and 1.2
2.1.5. 3.1	Replace or repair of all missing or damaged cylinder valve or plug protective measures. (This is restricted to only those measures that were installed or recommended by the cylinder manufacturer.) [2.1.5.c]	1.1.4.1/1.2.1.1
2.1.5. 3.2	Implement the valve and plug management program. [2.1.5.a]	1.2.1.1
2.1.5. 3.3	Periodically inspect the cylinders to detect failed valves and plugs. 5.2.2.2-2, 5.2.2.2-3[2.1.5.b]	1.2.3.2
2.1.5. 3.4	Repair/replace failed valves and plugs so that the performance criteria are met. 5.2.2.2-2, 5.2.2.2-3 [2.1.5.b]	1.2.1.1
2.1.5. 4	Verify compliance with this requirement.	1.5.4
2.1.5. 5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.2.1.2.3	Identify performance objectives for cylinders, support structures, and storage facilities relative to handling, processing, and transporting methods and equipment. 5.2.3.2-2, 5.2.3.2-3, 5.2.3.2-4 [2.2.1.f]	1.4.4
2.2.1 2.5.1	Define methods for handling, processing and transporting cylinders and corroded cylinders to meet system performance objectives. [2.2.1.a, 2.2.1.g]	1.3.2.1

Action Number	SEMP "Needed Action" Description	WBS Number
2.2.1 2.5.2	Establish movement and processing authorization requirements. [2.2.1.h]	1.4.1/1.4.3
2.2.1 2.5.3	Determine handling route specifications. [2.2.1.c]	1.3.2.1
2.2.1.2.5.4	Develop operational procedures for handling, processing, and transporting cylinders. Integrate hoisting and rigging handbook guidelines into cylinder movement procedures. [2.2.1.a]	1.4.1
2.2.1.2.5.5	Integrate degraded cylinder conditions into operational procedures. Utilize hoisting and rigging handbook guidelines where applicable. [2.2.1.g]	1.4.1
2.2.1 2.6	Identify necessary inspection and maintenance of equipment and operations to ensure compliance with this requirement and ensure non-conforming and non-compliant cylinders are managed safely. [2.2.1.b] 5.2.3.2-2	1.4.1
2.2.1 2.7	Determine method to verify baseline meets requirement.	1.3.3.3
2.2.1 3	Implement baseline configuration.	1.1 and 1.2
2.2.1 3.1	Modify existing equipment to add additional engineered controls. [2.2.1.d]	1.2.2.2
2.2.1 3.2	Implement a safe move program. [2.2.1.c, 2.2.1.g]	1.1.2
2.2.1 3.2.1	Implement administrative controls. [2.2.1.c]	1.4.3
2.2.1 3.3	Perform the necessary inspection and maintenance on equipment and operations including the verification actions to compensate for non-conforming and potentially non-compliant cylinders. 5.2.3.2-4(2)[2.2.1.b]	1.2.2.2/1.1.4
2.2.1 3.4	Implement baseline maintenance. 5.2.3.2-4	1.1 and 1.2
2.2.1 4	Verify compliance with this requirement.	1.5.4
2.2.1 5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.2.2.2.1	Identify all handling, processing, and transporting equipment and the tasks to be performed. 5.2.3.2-7	1.4.1
2.2.2.2.2	Perform a job task analysis for each operation. 5.2.3.2-7	1.4.1
2.2.2.2.2.1	Define the training objectives and their relationship to operational procedures.	1.4.1

Action Number	SEMP "Needed Action" Description	WBS Number
2.2.2.2.3	Identify potential consequences associated with each operation. 5.2.3.2-7	1.4.5
2.2.2.2.3.1	Define the necessary operator proficiency in terms of identified standards.	1.4.1
2.2.2.2.4	Establish training program for cylinder handling, processing, and transporting equipment operators and support crews. 5.2.3.2-7	1.4.1
2.2.2.2.5	Determine operator and support crew evaluation and retraining methods and frequencies.	1.4.1
2.2.2.2.6	Determine method to verify baseline meets requirement.	1.3.3.3
2.2.2.3	Implement baseline configuration.	1.1 and 1.2
2.2.2.3.1	Train the operators to the skill level as determined by the task to be performed. 5.2.3.2-2, 5.2.3.2-7	1.4.2
2.2.2.3.1.1	Evaluate student performance against objectives and recognized performance standards.	1.4.4
2.2.2.3.2	Perform evaluation and requalification according to the training program. 5.2.3.2-7 [2.2.2.a]	1.4.2
2.2.2.4	Verify compliance with this requirement.	1.5.4
2.2.2.5	Adjust baseline as necessary to meet the program requirement	1.5.5
2.3.1.2.2	Identify required spare parts inventory and procurement capacity and duration.	1.2.1
2.3.1.2.3	Document design specifications for replacement parts that include materials, tolerances, and manufacturing procedures that are acceptable in meeting the expected service life, reliability, and performance objectives. Incorporate industry standards into design specifications.	1.3.2.1
2.3.1.2.4	Establish a procurement quality control program to ensure specifications are met. 5.2.4.2-1	1.4.3
2.3.1.2.5	Identify qualified vendors. 5.2.4.2-1	1.2.1
2.3.1.2.6	Determine method to verify baseline meets requirement.	1.3.3.3
2.3.1.3	Implement baseline configuration.	1.1 and 1.2
2.3.1.3.1	Obtain a spare parts inventory in accordance with projected demand.	1.2.1

Action Number	SEMP "Needed Action" Description	WBS Number
2.3.1.4	Verify compliance with this requirement.	1.5.4
2.3.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.3.2.2.4	Determine required retraining frequency. [2.3.2.a]	1.4.1
2.3.2.2.5	Determine method to verify baseline meets requirement.	1.3.3.3
2.3.2.3	Implement baseline configuration.	1.1 and 1.2
2.3.2.3.1	Periodically update cylinder conditions and associated hazards.	1.4.5
2.3.2.3.2	Notify performing personnel of degraded cylinder hazards through training, procedures, contracts, and other command media. 5.2.4.2-2 [2.3.2.a]	1.4.1/1.4.2
2.3.2.4	Verify compliance with requirement.	1.5.4
2.3.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
2.3.3.2.1	Document program cylinder standards. 5.2.4.2-4	1.3.1.3
2.3.3.2.2	Develop immediate response methods for expected non-compliant cylinders. 5.2.4.2-4	1.4.1
2.3.3.2.3	Develop repair/replacement and disposition methods and procedures that are commensurate with cylinder program risks, standards, and where applicable industry standards. 5.4.1.2-4, 5.2.4.2-4 [2.3.3.b]	1.4.1
2.3.3.2.4	Identify non-compliant cylinders. 5.2.4.2-4	1.2.3
2.3.3.2.5	Prioritize and schedule cylinders in need of repair/replacement according to risk. 5.2.4.2-4	1.4.5/1.5.5
2.3.3.2.6	Develop repair/replacement capabilities and capacities with projected demand. 5.2.4.2-4 [2.3.3.a]	1.1.4
2.3.3.2.7	Determine method to verify baseline meets requirement.	1.3.3.3
2.3.3.3	Implement baseline configuration.	1.1 and 1.2
2.3.3.3.1	Perform immediate actions on cylinders when found to be non-compliant.	1.1.4.1/2

Action Number	SEMP "Needed Action" Description	WBS Number
2.3.3.3.2	Repair or replace cylinders based on risk-determined, prioritized schedule. 5.4.1.2-1(3)	1.1.4.1/2
2.3.3.3.3	Implement baseline maintenance.	1.1 and 1.2
2.3.3.4	Verify compliance with this requirement.	1.5.4
2.3.3.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
3.1.1.1	Analyze the options for what level(s) of program management should control the system configuration.	1.3.3.3
3.1.1.2	Define baseline configuration. Note: The physical and functional baselines defined under requirement 1.1.1.	1.4.3
3.1.1.2.1	Develop a configuration change process that includes a review by qualified individuals of changes against the design basis and performance requirement documents. 5.3.1.2-1(2) The change process is to include defined levels of authority and corresponding change categories. [3.1.1.a]	1.4.3/1.3.3.4
3.1.1.2.2	Develop a document control and records management process. 5.3.y(3) [3.1.1.a]	1.4.3/1.3.3.4
3.1.1.2.3	Develop the intent and periodicity of configuration assessment process and documentation audits.	1.4.3/1.3.3.4
3.1.1.3	Implement baseline configuration.	1.1 and 1.2
3.1.1.3.1	Implement the configuration change process. 5.3.1.2-4 [3.1.1.a]	1.4.3
3.1.1.3.2	Review temporary modifications to facilities and equipment for potential unreviewed safety questions.	1.4.5
3.1.1.3.3	Review procedures and training to ensure that changes in operational activities do not create an unreviewed safety question.	1.4.1/1.4.5
3.1.1.3.4	Implement the document control and records management system.	1.4.3
3.1.1.3.5	Conduct audits and independent assessments of configuration control, document control, and records management process.	1.4.4/1.5.3
3.1.1.4	Verify compliance with this requirement.	1.5.4
3.1.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
3.1.2.1	Analyze the options for what level(s) of management should control and authorize work controls.	1.3.3.3

Action Number	SEMP "Needed Action" Description	WBS Number
3.1.2.2.1	Identify the work controls to be used by the system and their intent including the specification of resources, responsibilities, work methods, work performance, and verification. 5.3.1.2-1, 5.3.x	1.3.3.3
3.1.2.2.2	Develop a process(es) for authorizing and implementing work controls including responsible personnel and positions. 5.3.x(2)This process includes the work control structure.	1.3.3.3
3.1.2.2.2.1	Develop a work control process description and implementing procedures including the integration of safety documentation, emergency response, lessons learned, and site specific requirements. [3.1.2.a, 3.1.2.c] 5.3.1.2-3, 5.3.x	1.3.3.3/1.4.1
3.1.2.2.2.2	Develop a database to track work controls currently authorized.	1.3.3.3
3.1.2.2.2.3	Incorporate verification and validation steps in the authorization of work controls to ensure the control will accomplish the intent of the task(s).	1.4.1/1.4.3
3.1.2.2.3	Develop the intent and periodicity of reviews and audits of the work controls and work control authorization and implementation process(es). 5.3.1.2-1, 5.3.1.2-2Intent is to include 3-site consistency and uniform risk management with the system. [3.1.2.b]	1.4.3/1.5.3
3.1.2.3	Implement baseline configuration.	1.1 and 1.2
3.1.2.3.1	Train personnel on process controls.	1.4.2
3.1.2.3.2	Implement work control process(es). [3.1.2.a]	1.4.3
3.1.2.3.3	Manage system documents and records per the document control and records management process.	1.4.3
3.1.2.3.4	Review and audit work controls and authorization and implementation process(es). [3.1.2.b]	1.4.3/1.5.3
3.1.2.4	Verify compliance with this requirement. 5.3.1.2-1	1.5.4
3.1.2.4.1	Conduct independent performance based assessments. [3.1.2.d]	1.5.3
3.1.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
3.2.1.1	Analyze the options for determining the integration of procedures with training and determine criteria for an integrated development based on tasks.	1.3.3.3
3.2.1.2	Define baseline configuration.	1.4.3

Action Number	SEMP "Needed Action" Description	WBS Number
3.2.1.2.1	Develop a personnel selection and training management plan and implementing procedures based on the complexity of tasks, severity of consequences, and human factors. Training plan is to include qualification specifications of trainers and training of safety documentation. [3.2.1.a, 3.2.1.b]5.3.2.2-1(2), 5.3.2.2-4	1.4.1
3.2.1.2.2	Determine the performance-based training, qualification, and certification specifications for performing personnel. 5.4.2.2-2, 5.3.2.2-4[3.2.1.d]	1.4.1
3.2.1.2.2.1	Specify the degree of training (certification, qualification, etc.) for performing personnel (inspectors) who determine cylinder condition. The quality of which cylinder conditions are determined impacts the functional and inter-functional risks within the system.	1.4.1
3.2.1.2.2.2	Specify the degree of training (certification, qualification, etc.) for performing personnel (operators) who perform work (handle, transport, transfer contents, maintenance) on cylinders. The quality for which this work is performed can directly impact the immediate and long-term functional risks within the system.	1.4.1
3.2.1.2.3	Develop training documents (modules, etc.) to train performing personnel based on learning objectives. 5.3.2.2-1(3), 5.3.2.2-4, 5.2.4.2-4 Modules are to include safety precautions, hazards, emergency response, lessons learned, and site specific requirements. [3.2.1.e]	1.4.1
3.2.1.2.4	Develop systems to maintain baseline of trained personnel. Systems are to include training records retention and ready access to current training by authorizing and implementing personnel. 5.3.2.2-1(2) [3.2.1.c]	1.4.2 and 1.4.3
3.2.1.2.5	Develop the intent and periodicity of audits, assessments, and reviews of the training program.	1.5.3
3.2.1.2.6	Develop a training revision process to accommodate changes in tasks, and improvements to training. The process is to include line and training personnel to determine the extent and frequency of retraining.	1.4.1
3.2.1.2.6.1	Revise job hazard analyses as necessary.	1.4.5
3.2.1.3	Implement baseline configuration.	1.1 and 1.2
3.2.1.3.1	Select personnel per criteria in the management plan.	1.4.2
3.2.1.3.2	Perform required training, qualification, and certification. 5.4.2.2-9(2), 5.2.1.2-1 [3.2.1.a]	1.4.2
3.2.1.3.2.1	Train cylinder inspectors.	1.4.2

Action Number	SEMP "Needed Action" Description	WBS Number
3.2.1.3.3	Develop and maintain a database to include the following: job and task analysis results, learning objectives, linking of test items, task-to-training data, instructor qualifications, training material identification data, training delivery data, employee training history, and training intervals. 5.3.2.2-4 [3.2.1.c	1.3.3.3/1.4.2
3.2.1.3.4	Perform retraining as required by line management and training personnel. 5.3.2.2-4 [3.2.1.b]	1.4.2
3.2.1.3.5	Conduct periodic reviews of selection and training process effectiveness. 5.3.2.2-1, 5.3.2.2-4 [3.2.1.f]	1.4.3
3.2.1.4	Verify compliance with requirement.	1.5.4
3.2.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
3.3.1.2	Define baseline configuration.	1.4.3
3.3.1 2.1	Select and develop performance objectives for the system functions; consider customer expectations and long-range plans.	1.4.4
3.3.1 2.2	Develop an assessment process based on guidelines in Order to evaluate system performance against the objectives, to include observation of work in the field, review of other audits/assessments, operating experience, document reviews, interviews of key personnel, facility condition inspections. [3.3.1.a]	1.5.3
3.3.1 2.3	Develop line management process to evaluate assessment results and improve system performance. The process is to include the method for keeping program personnel and customers informed of the status of the system performance to performance objectives and program mission.	1.4.4 and 1.5.3
3.3.1 3	Implement baseline configuration.	1.1 and 1.2
3.3.1 3.1	Implement the structured process to monitor system functions per the performance objectives. This requires active participation in system functions at all levels. 5.3.x [3.3.1.b]	1.5.3
3.3.1 3.2	Evaluate assessment results to provide the basis for system improvements, to include the following: evaluate results, define issues, develop mitigating actions, prioritize actions and cost/benefit analysis of highest priority actions, develop and implement action plan. 5.3.x	1.5.3 and 1.5.5
3.3.1 3.3	Train line-management to use the assessment process for monitoring and improving work activities, including observation skills, performance objectives selection and use, evaluation process skills, and action plan development process.	1.4.2

Action Number	SEMP "Needed Action" Description	WBS Number
3.3.1 3.4	Develop and use performance indicators for the system functions to demonstrate that performance objectives and mission are met to identify trends, and to identify areas requiring improvement. [3.3.1.b]	1.4.4 and 1.5.3
3.3.1 4	Verify compliance with requirement.	1.5.4
3.3.1 4.1	Conduct independent assessments of the evaluation process.	1.5.3
3.3.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
4.1.1.2.1	Identify potential pathways of exposure to the environment due to failure of containment integrity.	1.4.5
4.1.1.3	Implement baseline configuration.	1.1 and 1.2
4.1.1.3.1	Monitor cylinders and the environment for releases to the environment and the effects of such releases. [4.1.1.b]	1.2.3/1.2.2.3
4.1.1.3.2	Implement actions to maintain compliance with this requirement.	1.2.2.3/1.2.3
4.1.1.4	Verify compliance with this requirement.	1.5.4
4.1.1.5	Adjust baseline as necessary to meet the program requirement	1.5.5
4.1.2.2.1	Identify all cylinder monitoring performance objectives.	1.4.4
4.1.2.2.4.2	Specify the extent to which cylinder anomalies identified during inspections will be documented. The extent of documentation includes the precision for which anomalies will be measured and their location defined (i.e., a dent on the right side of the cylinder versus a 1/2" deep, 3" circumferential dent located 5" from the valve side of the valve-end stiffener at the 3 o'clock position).	1.4.1
4.1.2.2.4.3	Develop the visual inspection/quantitative evaluation integration (the use of visual inspections to select cylinders and general surface areas for obtaining quantitative data to verify compliance with functional criteria).	1.3.1.2
4.1.2.2.4.5	Integrate inspection/evaluation methods and resultant data with risk controls such as inventory accountability, cylinder maintenance, and contamination control.	1.5.5
4.1.2.2.4.6	Integrate the periodic inspection performance objectives with cylinder accessibility. [4.1.2.f]	1.1.2
4.1.2.2.5	Determine method to verify that the baseline configuration meets the requirement.	1.3.3.3

Action Number	SEMP "Needed Action" Description	WBS Number
4.1.2.3	Implement baseline configuration.	1.1 and 1.2
4.1.2.3.1	Identify existing cylinder conditions. 5.4.2.2-4, 5.4.2.2-8	1.2.3
4.1.2.3.1.1	Determine the baseline condition of each cylinder with respect to functional criteria to the extent visual inspections are applicable.	1.2.3
4.1.2.3.1.2	Statistically determine the baseline condition of cylinder populations by obtaining quantitative data.	1.3.1.2
4.1.2.3.2	Identify non-compliant and non-conforming cylinders. 5.4.1.2-1	1.2.3
4.1.2.3.3	Implement constraints for non-conforming cylinders.	1.1.4.1/2
4.1.2.3.4	Periodically monitor cylinder conditions. [4.1.2.e]	1.2.3.1/2/3
4.1.2.3.5	Examine justification of inspection frequency and evaluate the need to adjust. 5.4.2.2-4	1.3.1.2
4.1.2.3.6	Conduct independent assessments of the evaluation of cylinder condition.	1.4.3/1.5.3
4.1.2.4	Verify compliance with this requirement.	1.5.4
4.1.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
4.1.3.3	Implement baseline configuration.	1.1 and 1.2
4.1.3.3.1	Monitor the cylinder degradation factors. 5.4.2.2-1, 5.4.2.2-2 [4.1.3.b]	1.2.2/1.2.3
4.1.3.3.2	Record the cylinder degradation factor information in the developed database.	1.2.2/1.2.3/ 1.2.4.1
4.1.3.3.3	Implement baseline maintenance.	1.1 and 1.2
4.1.3.3.3.1	Perform self-assessments and other quality control measures to ensure that the degradation factors are being monitored according to the developed plan. 5.2.1.2-1	1.4.3
4.1.3.4	Verify compliance with requirement.	1.5.4
4.1.3.5	Adjust baseline as necessary to meet the program requirement.	1.5.5

Action Number	SEMP "Needed Action" Description	WBS Number
4.2.1.2.3	Develop procedures for grouping cylinders and storage environments in the defined categories. 5.4.2.2-9	1.4.1/1.3.2.2
4.2.1.2.4	Develop a method for tracking cylinders and storage environments according to their categories.	1.3.2.2
4.2.1.2.5	Determine a method to verify the baseline configuration.	1.3.3.3
4.2.1.3	Implement baseline configuration.	1.1 and 1.2
4.2.1.3.1	Categorize the cylinders and storage environments. 5.4.2.2-9	1.3.1.2/1.2.3
4.2.1.3.2	Record the categorization information to allow tracking.	1.2.3/1.2.4.1
4.2.1.4	Verify compliance with requirement.	1.5.4
4.2.1.5	Adjust baseline as necessary to meet the program requirement.5.4.2.2-9	1.5.5
4.2.2.2.1	Review the data collected as a result of monitoring containment integrity. 5.2.1.2-9	1.3.1.2
4.2.2.3	Implement baseline configuration.	1.1 and 1.2
4.2.2.3.1	Forecast cylinder conditions using the parameters identified. 5.4.3.2-2, 5.4.3.2-3 [4.2.2.b]	1.3.1.2
4.2.2.3.1.1	Project the number of non-compliant cylinders.	1.3.1.2
4.2.2.3.2	Record forecasting information in the developed database. [4.2.2.b]	1.5.5
4.2.2.4	Verify compliance with requirement.	1.5.4
4.2.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
5.1.1.2	Define baseline configuration.	1.4.3
5.1.1.2.1	Develop a standard, systematic method for estimating level of effort within the system to support standard cost estimates.	1.3.3.4
5.1.1.2.2	Identify the critical path of system activities (tasks).	1.5.5
5.1.1.2.3	Define budgeting cycle activities and schedules.	1.5.2
5.1.1.2.4	Develop a funds allocation and accounting system reflective of the WBS.	1.5.2

Action Number	SEMP "Needed Action" Description	WBS Number
5.1.1.2.4.1	Obtain accurate accounting of costs (funds committed to date) as needed at the single site and 3-site level to effectively control financial resources.	1.5.2
5.1.1.2.5	Define and develop financial management methods (review periods, reallocation processes, financial configuration control, etc.).	1.5.2
5.1.1.3	Implement baseline configuration.	1.1 and 1.2
5.1.1.3.1	Define task (WBS) elements with accounts.	1.5.2
5.1.1.3.2	Define budget requirements with identified activities (tasks). 5.2.1.2-9	1.5.2
5.1.1.3.3	Obtain budget authorization.	1.5.2
5.1.1.3.4	Gather accurate costs.	1.5.2
5.1.1.3.5	Control costs to the progress of activities (tasks).	1.5.2/1.4.3
5.1.1.4	Verify compliance with this requirement.	1.5.4
5.1.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
5.1.2.1	Analyze optional methods for obtaining intellectual resources (contract, subcontract, direct employment).	1.5.2
5.1.2.2	Define the baseline configuration.	1.4.3
5.1.2.2.1	Define how disciplines necessary to accomplish system activities and objectives are identified, secured, and allocated.	1.5.2
5.1.2.2.2	Establish a program organization reflective of the system functions, subsystems, and activities.	1.5.1
5.1.2.2.3	Define roles, responsibilities and qualifications reflective of the organizational structure.	1.5.1
5.1.2.2.4	Define the personnel performance monitoring system.	1.5.3
5.1.2.3	Implement baseline configuration.	1.1 and 1.2
5.1.2.3.1	Obtain and allocate intellectual resources necessary to operate the system and accomplish activities.	1.5.2

Action Number	SEMP "Needed Action" Description	WBS Number
5.1.2.3.2	Monitor personnel performance.	1.4.4/1.5.3
5.1.2.4	Verify compliance with this requirement.	1.5.4
5.1.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
5.2.1.2	Define baseline configuration.	1.4.3
5.2.1.2.1	Develop the requirement structure and traceability method(s).	1.4.3
5.2.1.2.2	Develop a method for controlling and maintaining requirements. 3.2-1	1.4.3
5.2.1.2.3	Develop a method for ensuring system tasks are based on requirements.	1.4.1
5.2.1.3	Implement baseline configuration.	1.1 and 1.2
5.2.1.3.1	Identify requirements. 3.2-1, 5.1.1.2-7	1.3.3.3
5.2.1.3.2	Trace requirements to the mission and implementing documentation.	1.3.3.3
5.2.1.3.2.1	Reconcile requirements against the results of the necessary and sufficient closure process.	1.3.3.3
5.2.1.3.3	Utilize requirements in identifying and developing system activities (tasks).	1.1.1/1.4.3
5.2.1.4	Verify compliance with requirement.	1.5.4
5.2.1.5	Adjust baseline as necessary to meet the program requirement.	1.5.5
5.2.2.2	Define baseline configuration.	1.4.3
5.2.2.2.1	Define the projected life-cycle including phase durations and operating parameters that impact current phase objectives and criteria. [5.2.2.a, 5.2.2.b]	1.3.3.4
5.2.2.2.2	Develop the system configuration and change control based on life-cycle and phase duration projections. 3.2-2, 3.2-3 [5.2.2.a]	1.3.3.3

Action Number	SEMP "Needed Action" Description	WBS Number
5.2.2.2.3	Identify the factors for triggering an assessment of the configuration, i.e., revisions to the life-cycle and duration projections, substandard performance, identification of new technologies. 5.2.1.2-9 (2), 5.2.1.2-10, New technologies include methods for reducing cylinder corrosion. [5.2.2.c]	1.3.3.3
5.2.2.2.4	Develop methods/sub-systems for identifying when a configuration assessment is necessary.	1.3.3.3
5.2.2.3	Implement baseline configuration.	1.1 and 1.2
5.2.2.3.1	Assess the configuration for efficiency, reliability, and maintainability. 4.3-2, 5.2.1.2-4, 5.2.1.2-9 [5.2.2.a]	1.5.3
5.2.2.3.1.1	Determine the three-site aspects of the system configuration. Specifically, determine whether the K-25 cylinder inventory should be relocated to PGDP and PORTS or the long-term maintainability functions should be implemented at K-25.	1.5.5
5.2.2.3.2	Implement methods for identifying when a configuration assessment is necessary.	1.4.3
5.2.2.3.4	Control the interfaces within the system.	1.4.3/1.5.5
5.2.2.4	Verify compliance with this requirement.	1.5.4
5.2.2.5	Adjust baseline as necessary to meet the program requirement.	1.5.5

Appendix B

UF_6 Cylinder Program Schedule.

UF6 Cylinder Program Schedule

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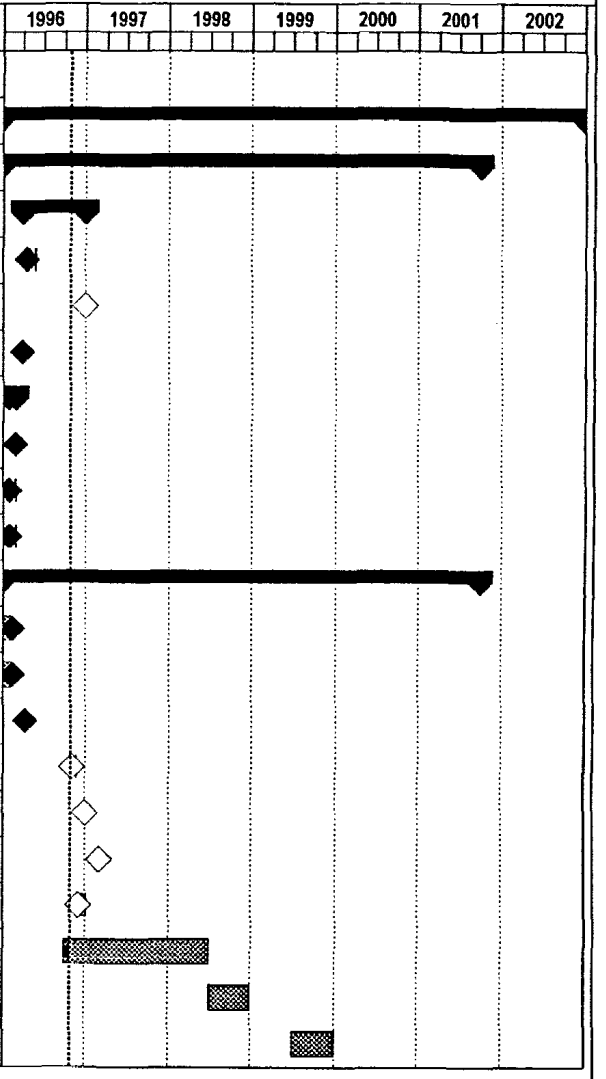
ID	Task Name	Start	Finish
2	**UF6 Cylinder Program**	10/1/95	9/30/02
3	**1.1 Cylinder Stabilization/Storage Improvement**	**10/1/95**	**9/30/02**
4	**1.1.1 Storage Yard Construction/Reconditioning/Reconstruction**	**10/1/95**	**6/30/01**
5	**93-U-200 PGDP Phase VIII: C-745-G**	**12/31/95**	**9/30/96**
6	(O) Award FPSC for construction of G-yard (PGDP)	1/18/96	1/18/96
7	(P) Complete reconstruction of G Yard (PGDP)	9/30/96	9/30/96
8	Complete delivery of cylinder handling equipment	12/31/95	12/31/95
9	**89-N-501 PGDP Phase VII: C-745-S & PORTS: X-745-E**	**10/31/95**	**11/30/95**
10	(P) Complete self-readiness assmts. nec. to stack cylinders in new sec. of S Yard (PGDP)	11/30/95	11/30/95
11	(P) Complete construction of X-745-E Yard (PORTS)	10/31/95	10/31/95
12	(O) Complete procurement and delivery of chocks needed to complete E Yard (PORTS)	10/31/95	10/31/95
13	**96-U-201 PGDP Phase IX: T, K, L, M, N, P Yards**	**10/1/95**	**6/30/01**
14	(M) Complete Design Criteria, A/E SOW, and Project Mgmt. Plan for Phase IX (PGDP)	10/2/95	11/15/95
15	(M) Support submittal of NEPA EA to DOE for approval of Storage Yard Phase IX (PGDP)	10/1/95	11/16/95
16	(M) Initiate design of C-745-T Yard	1/8/96	1/8/96
17	(M) Complete design of C-745-T Yard	7/31/96	7/31/96
18	(O) Complete design of C-745-K, L, and M storage yards	9/30/96	9/30/96
19	Complete design of C-745-N and P Storage Yards	11/30/96	11/30/96
20	(O) Award FPSC for C-745-T Yard (PGDP)	8/31/96	8/31/96
21	Construction of C-745-T	7/2/96	3/31/98
22	Reconstruction of C-745-K	4/2/98	9/30/98
23	Recontruction of C-745-L	4/1/99	9/30/99



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UF6 Cylinder Program Schedule

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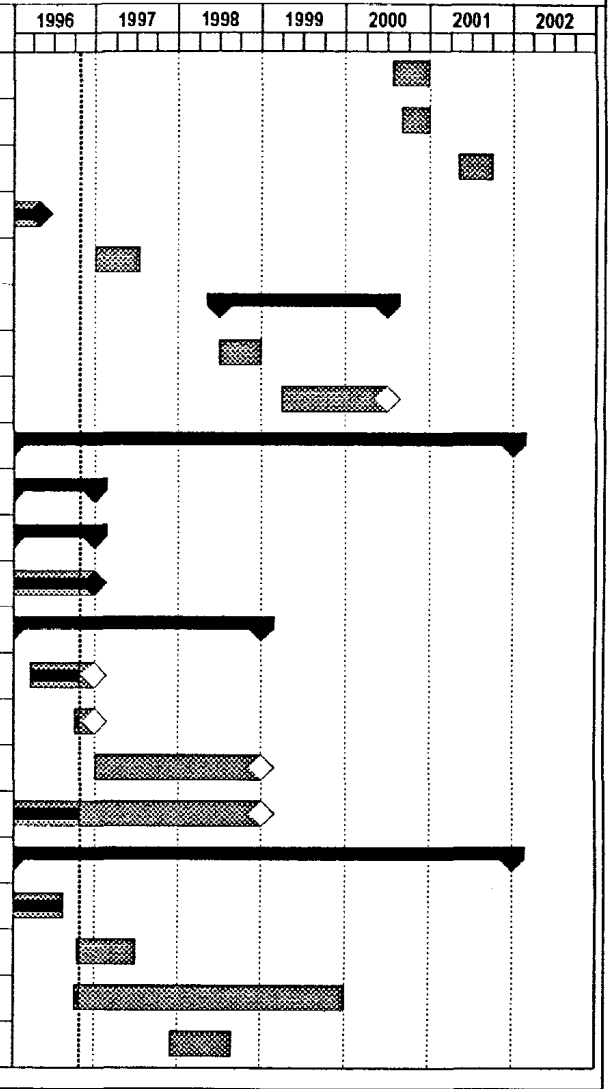
ID	Task Name	Start	Finish
24	Reconstruction of C-745-M	4/24/00	9/30/00
25	Reconstruction of C-745-N	6/1/00	9/30/00
26	Reconstruction of C-745-P	2/2/01	6/30/01
27	GPP-K-25: K-1066-E Reconstruction	10/1/95	1/31/96
28	GPP-K-25: K-1066-K Paint Area Yard	10/2/96	4/15/97
29	**98-U-200 K25/PGDP Phase X**	**4/1/98**	**3/31/00**
30	Title I and II Design	4/1/98	9/30/98
31	Construction	1/1/99	3/31/00
32	**1.1.2 Cylinder Handling/Stacking**	**10/1/95**	**9/30/01**
33	**Move cylinders from ground contact**	**10/1/95**	**9/30/96**
34	**(P) Move cylinders from ground contact (PGDP)**	**10/1/95**	**9/30/96**
35	Relocate/restack 5555 G Yard cylinders (completed 11/95)	10/1/95	9/30/96
36	**Restacking of PORTS Cylinders**	**10/1/95**	**9/30/98**
37	Restack cylinders from X-745-C to X-745-E (~3400)	12/18/95	9/25/96
38	Restack/respace 1600 cylinders in X-745-C	7/1/96	9/30/96
39	Restack/respace remaining cylinders in X-745-C	10/2/96	9/30/98
40	Perform full inspection of cylinders as part of relocations	10/1/95	9/30/98
41	**Restacking of PGDP Cylinders**	**10/1/95**	**9/30/01**
42	(7733) Cylinder relocations to C-745-G to S, F, D, Q, R	10/1/95	5/10/96
43	(6774) Cylinder restacking from C-745-F, Q, R to G	7/12/96	3/31/97
44	(5115) Cylinder restacking from C-745-A, B, C to T	7/1/96	9/30/99
45	(4023) Cylinder relocations to C-745-T	9/2/97	5/31/98



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UF6 Cylinder Program Schedule

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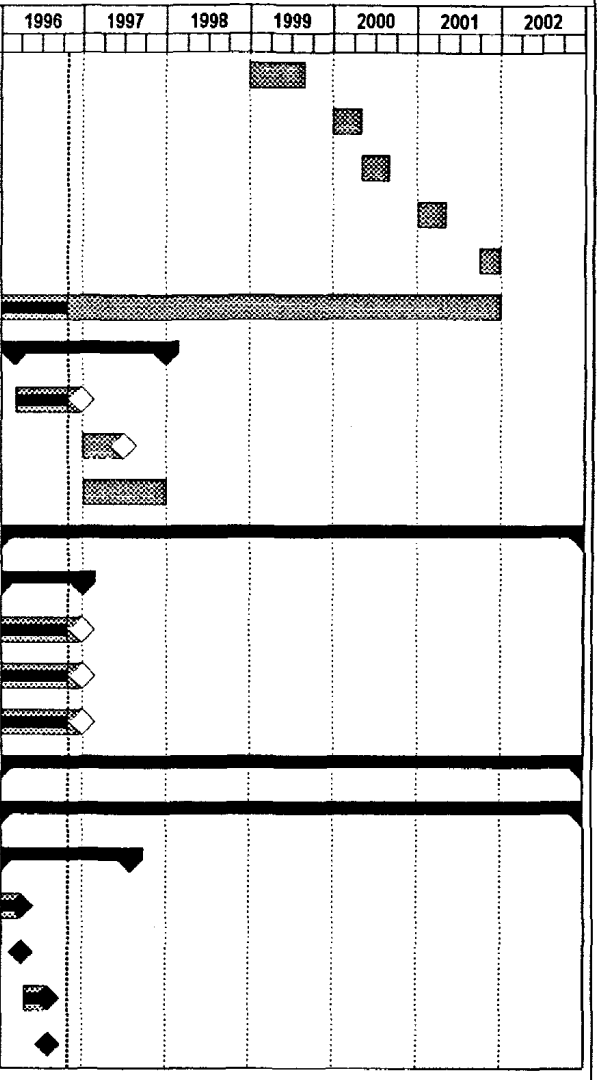
ID	Task Name	Start	Finish
46	(4524) Cylinder relocations to C-745-K and T	10/1/98	5/31/99
47	(1664) Cylinder relocations to C-745-L	10/1/99	1/31/00
48	(1629) Cylinder relocations to C-745-L	2/1/00	5/31/00
49	(1735) Cylinder relocations to C-745-N and T	10/2/00	1/31/01
50	(1561) Cylinder restacking from C-745-T to P	7/2/01	9/30/01
51	Perform full inspections of cylinders as part of relocations	10/1/95	9/30/01
52	**Relocation of K-25 Cylinders**	**12/6/95**	**9/30/97**
53	Complete relocations of K-25 cylinders from J to L yard (FY '96 Goal = 1700)	12/6/95	9/24/96
54	Relocate 500 cyinders from K-1066-K to K-1066-E	10/2/96	3/31/97
55	Perform full inspection of cylinders as part of relocation	10/2/96	9/30/97
56	**1.1.3 Cylinder Recoating**	**10/1/95**	**9/30/02**
57	**1.1.3.1 Skirt Coating**	**10/1/95**	**9/30/96**
58	(P) K-25 (FY 1996 Goal = 300)	10/1/95	9/30/96
59	(P) PGDP (FY 1996 Goal = 500)	10/1/95	9/30/96
60	† (P) PORTS (FY 1996 Goal = 3400)	10/1/95	9/30/96
61	**1.1.3.2 Full Body Coating**	**10/1/95**	**9/30/02**
62	**Planning and procurement for field maintenance recoating operation**	**10/1/95**	**9/30/02**
63	**PGDP Cylinder Field Coating Pilot**	**10/1/95**	**4/28/97**
64	Develop coating technical specification	10/1/95	1/2/96
65	(O) Issue a request for proposal for field cylinder painting (PGDP)	1/2/96	1/2/96
66	Bid, award, and subcontractor preparations	1/18/96	4/30/96
67	(P) Complete self-readiness assessment for PGDP pilot operation (PGDP)	4/30/96	4/30/96



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UF6 Cylinder Program Schedule

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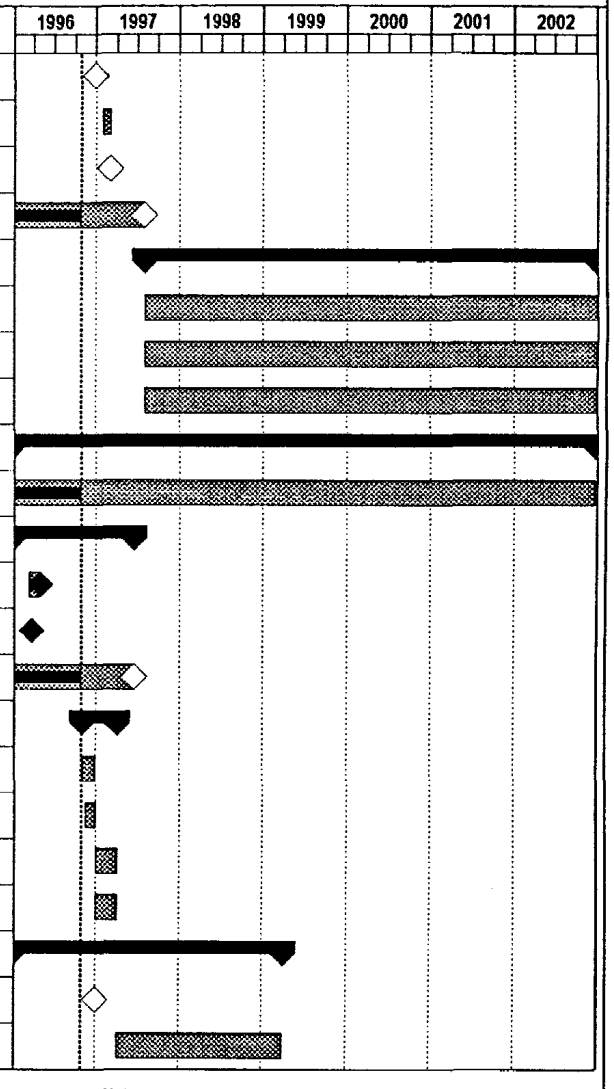
ID	Task Name	Start	Finish
68	† (P) PEC major milestone (500 cylinders painted)	9/30/96	9/30/96
69	Lessons learned	11/1/96	11/29/96
70	Issue strategy for coating schedule and reflect in PMP schedule	11/30/96	11/30/96
71	† Planning for routine coating at all sites	10/1/95	4/28/97
72	**Production field maintenance recoating**	**5/1/97**	**9/30/02**
73	Recoat PGDP cylinders	5/1/97	9/30/02
74	Recoat K-25 cylinders	5/1/97	9/30/02
75	Recoat PORTS cylinders	5/1/97	9/30/02
76	**1.1.4 Management of Substandard Cylinders**	**10/1/95**	**9/24/02**
77	**1.1.4.1 Unbreached Cylinders**	**10/1/95**	**9/24/02**
78	**1.1.4.2 Breached Cylinders**	**10/1/95**	**3/15/97**
79	Value engineering study for K-25 breached cylinders	12/12/95	1/31/96
80	(M) Apply new design patch to Cylinder 101244	12/22/95	12/22/95
81	Monitor K-25 breached cylinders	10/1/95	3/15/97
82	**Weld patches on K-25 breaches**	**8/1/96**	**12/31/96**
83	Weld patch on Cylinder 116797	8/1/96	9/30/96
84	Weld patch on Cylinder 101244	8/15/96	9/30/96
85	Weld patch on Cylinder 7953	10/1/96	12/31/96
86	Weld patch on Cylinder 114951	10/1/96	12/31/96
87	**1.1.4.3 Contents Transfer**	**10/1/95**	**12/31/98**
88	Empty contents of PORTS repaired breached Cylinder 115688	9/30/96	9/30/96
89	Plan for and empty contents of K-25 breaches	1/2/97	12/31/98



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UF6 Cylinder Program Schedule

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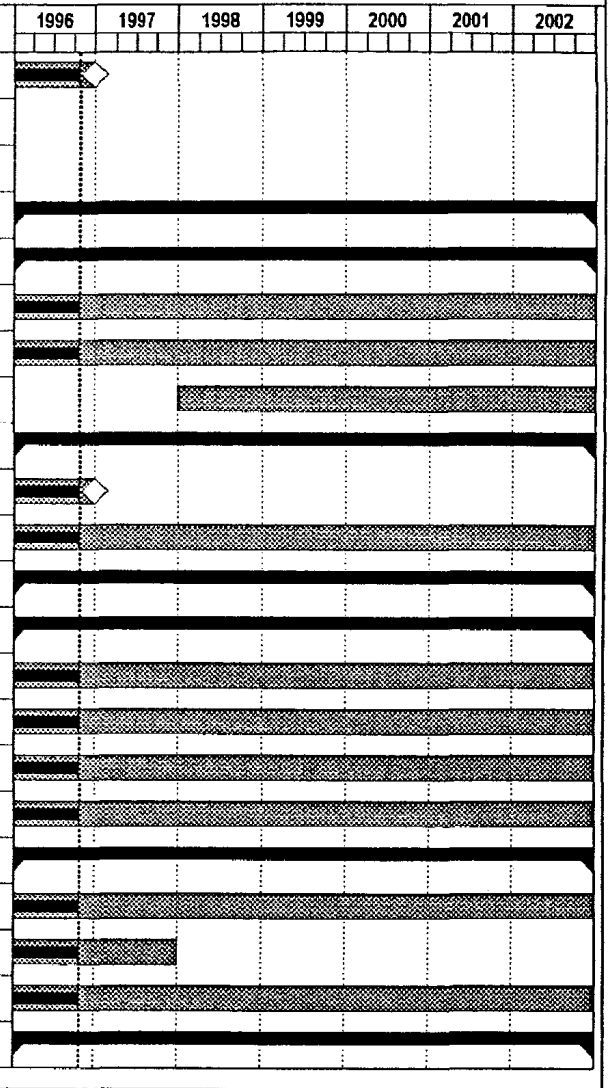
ID	Task Name	Start	Finish
90	Re-investigate use of shipping container for breaches	10/1/95	9/30/96
91	**1.1.5 Heel/Empty Cylinder Disposition (no activity pending ident. of program to implement)**	**10/1/95**	**9/30/02**
92			
93	**1.2 Surveillance and Maintenance**	**10/1/95**	**9/30/02**
94	**1.2.1 General Cylinder Maintenance**	**10/1/95**	**9/30/02**
95	**1.2.1.1 Valve/Plug Management**	**10/1/95**	**9/30/02**
96	**1.2.1.2 Nameplate Management**	**10/1/95**	**9/30/02**
97	**1.2.1.3 Coating Maintenance (as needed based on periodic visual inspections)**	**10/1/97**	**9/30/02**
98	**1.2.1.4 Skirt Cleaning (K-25 and PGDP completed all accessible skirts)**	**10/1/95**	**9/30/02**
99	PORTS (FY 1996 Goal = 2200)	10/1/95	9/30/96
100	Continue routine cleaning as needed	10/1/95	9/30/02
101	**1.2.2 General Yard and Equipment Maintenance**	**10/1/95**	**9/30/02**
102	**1.2.2.1 Yard Maintenance/Inspection**	**10/1/95**	**9/30/02**
103	Routine S&M for yards (weed control, yard repairs)	10/1/95	9/30/02
104	Maintain lighting, boundary controls, cylinder road conditions	10/1/95	9/30/02
105	Periodic walk-throughs of yards	10/1/95	9/30/02
106	**1.2.2.2 Equipment Maintenance/Inspection**	**10/1/95**	**9/27/02**
107	**1.2.2.3 Environmental Monitoring**	**10/1/95**	**9/30/02**
108	Complete radiological survey of cylinder yards on an annual basis	10/1/95	9/30/02
109	Repost K-25 storage yards from contam. to radioactive matls. storage areas	10/1/95	9/29/97
110	**1.2.2.4 Waste Management**	**10/1/95**	**9/27/02**
111	**1.2.3 Cylinder Inspections**	**10/1/95**	**9/30/02**



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UF6 Cylinder Program Schedule

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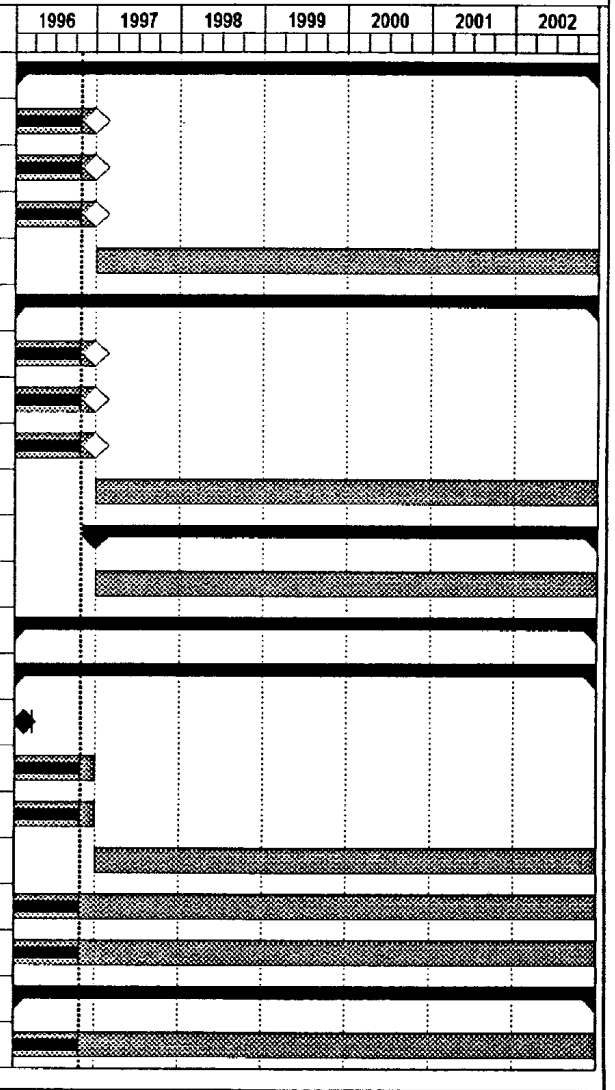
ID	Task Name	Start	Finish
112	**1.2.3.1 Annual Visual Inspections**	**10/1/95**	**9/30/02**
113	(P) Complete annual insp. of 11,275 PGDP cyls. w/accel. corr./other probs. (per ETO-114)	10/1/95	9/30/96
114	(P) Complete annual insp. of 2200 PORTS cyls. w/accel. corr./other probs. (per ETO-114)	10/1/95	9/30/96
115	(P) Complete annual insp. of 4000 K-25 cyls. w/accel. corr./other probs. (per ETO-114)	10/1/95	9/30/96
116	Continue annual inspections	10/2/96	9/30/02
117	**1.2.3.2 Periodic Visual Inspections**	**10/1/95**	**9/30/02**
118	(P) Complete inspection of 6700 cylinders (periodic inspection) at PGDP	10/1/95	9/30/96
119	(P) Complete inspection of 5070 cylinders (periodic inspection) at PORTS	10/1/95	9/30/96
120	(P) Complete inspection of 570 cylinders (periodic inspection) at K-25	10/1/95	9/30/96
121	Continue periodic inspections	10/1/96	9/30/02
122	**1.2.3.3 Wall Thickness Inspections**	**10/1/96**	**9/30/02**
123	Collect wall thickness data on sample of cylinders moved during restacking	10/1/96	9/30/02
124	**1.2.4 Data Tracking**	**10/1/95**	**9/30/02**
125	**1.2.4.1 UCLIM**	**10/1/95**	**9/30/02**
126	(P) Update inspection data in UCLIM; provide appopriate reports (K-25, PGDP & PORTS)	11/15/95	11/15/95
127	Process all inspections performed prior to FY 1996	10/1/95	9/30/96
128	Process all cylinder locations that occured prior to 7/1/96	10/1/95	9/30/96
129	Continue to process periodic and relocation inspection data	10/1/96	9/30/02
130	Generate reports and data to assist in making mgmt. decisions and scheduling insp., corr. act	10/1/95	9/30/02
131	Review new business practices and procedures to determine impact on UCLIM	10/1/95	9/30/02
132	**UCLIM Documentation**	**10/1/95**	**9/30/02**
133	Maintain System Requirements, Business Rules, Data Dictionary, ER Diagrams, etc.	10/1/95	9/30/02



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UF6 Cylinder Program Schedule

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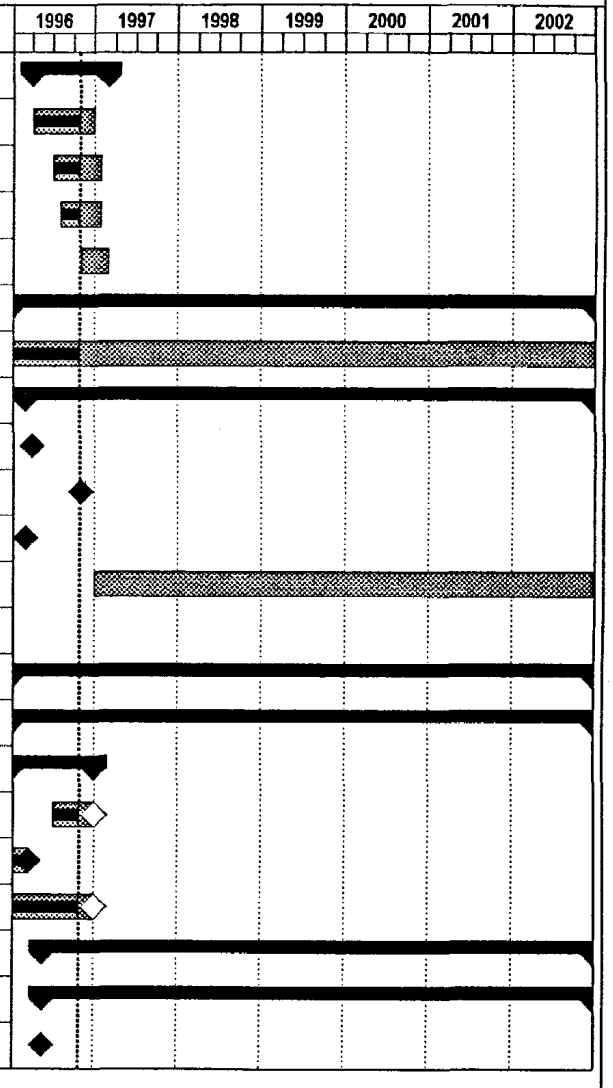
ID	Task Name	Start	Finish
134	**UCLIM Computerized Inspection Interface (CII)**	**1/1/96**	**11/30/96**
135	System Requirements, Business Rules, Data Dictionary, ER Diagrams, etc.	1/1/96	9/30/96
136	Programming and Implementation	4/1/96	10/30/96
137	User training, acceptance, and testing	5/1/96	10/30/96
138	Install hardware and software at each site	8/1/96	11/30/96
139	**1.2.4.2 NMC&A**	**10/1/95**	**9/30/02**
140	Perform routine NMC&A inventories	10/1/95	9/30/02
141	**1.2.5 Capital Equipment**	**11/30/95**	**9/27/02**
142	(O) Complete delivery of cylinder handling equipment (PGDP)	12/29/95	12/29/95
143	(O) Obtain cylinder handler (K-25 & PORTS)	7/31/96	7/31/96
144	(M) Obtain concrete saddles for K-25	11/30/95	11/30/95
145	Procure equipment necessary to support program activities	10/1/96	9/27/02
146			
147	**1.3 Engineering Development**	**10/1/95**	**9/30/02**
148	**1.3.1 Technical**	**10/1/95**	**9/30/02**
149	**1.3.1.1 Cylinder Stabilization/Storage Improvement**	**10/1/95**	**9/30/96**
150	1.3.1.1.1 Stress analysis on all cylinder types	4/1/96	9/30/96
151	Independent review of stress analysis for UF6 cylinder storage vessel criteria	10/1/95	12/15/95
152	Evaluate storage array requirements for maintenance and inspection needs	10/1/95	9/30/96
153	**1.3.1.2 Surveillance and Maintenance**	**2/15/96**	**9/30/02**
154	**1.3.1.2.1 Cylinder Inventory Modelling**	**2/15/96**	**9/30/02**
155	Issue updated inventory model with PGDP data	2/15/96	2/15/96



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Summary

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UF6 Cylinder Program Schedule

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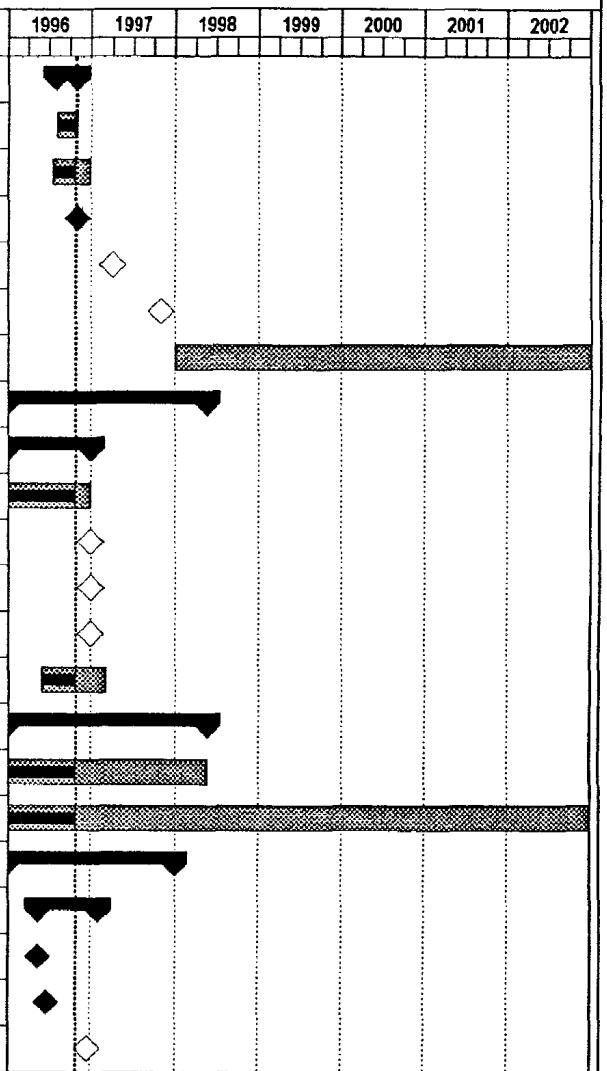
ID	Task Name	Start	Finish
156	**(M) Update the cylinder inventory model with inspection and NMC&A data**	**5/1/96**	**7/31/96**
157	Define statistical rqmts. for no. of points/cyl. and no. of cyls./population	5/1/96	7/31/96
158	† Determine percentage of cylinders meeting industry standards	4/17/96	9/26/96
159	Update inventory model with data reported through 5/31/96	7/31/96	7/31/96
160	Update inventory model with data reported through 10/31/96	12/31/96	12/31/96
161	Update inventory model with data reported through 5/31/97	7/31/97	7/31/97
162	Update inventory model with new thickness data	10/1/97	9/30/02
163	**1.3.1.2.2 Cylinder Condition Characterization (C3)**	**10/1/95**	**2/20/98**
164	**1.3.1.2.3 ASME code interpretations related to cylinder design criteria**	**10/1/95**	**9/30/96**
165	Perform code interpretations for application to storage	10/1/95	9/30/96
166	Issue final report for 10- and 14-ton cylinders	9/30/96	9/30/96
167	Issue report for 2 1/2- ton cylinders	9/30/96	9/30/96
168	Issue report for convertor vessels (CV) and 12.8- and 19-ton cylinders	9/30/96	9/30/96
169	1.3.1.2.4 Ultrasonic Thickness Measurement Contract	2/27/96	11/30/96
170	**Coupon, Time of Wetness, and Corrosion Probe Evaluations**	**10/1/95**	**2/20/98**
171	Monitor coupons, time-of-wetness and corrosion probes and collect data	10/1/95	2/20/98
172	1.3.1.4 Conduct of Operations	10/1/95	9/30/02
173	**1.3.1.5 System Administration**	**10/1/95**	**9/30/97**
174	**1.3.1.5.1 Prepare and issue guidance document for storage of UF6 cylinders**	**2/12/96**	**10/31/96**
175	Develop operational structure and plan	2/12/96	2/12/96
176	Evaluate for external standard	3/22/96	3/22/96
177	Issue for LMES review	9/16/96	9/16/96



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UF6 Cylinder Program Schedule

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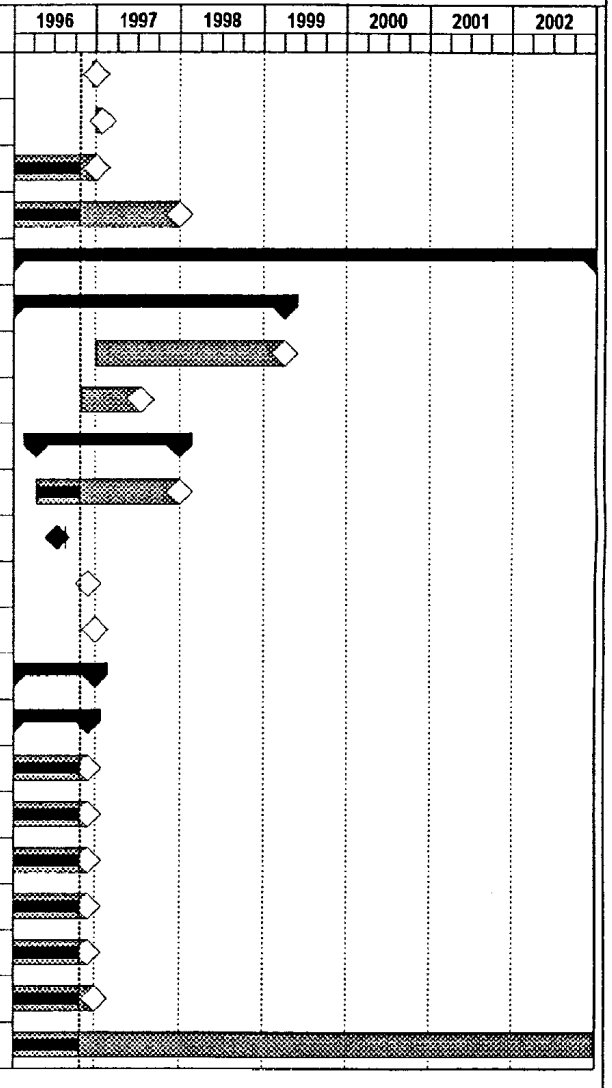
ID	Task Name	Start	Finish
178	Prepare final draft	9/16/96	10/1/96
179	Issue guidance document	10/1/96	10/31/96
180	(P) Support the Ohio EPA Findings and Orders	10/1/95	10/3/96
181	(P) Support EIS activities as requested by program office	10/1/95	9/30/97
182	**1.3.2 Engineering**	**10/1/95**	**9/30/02**
183	**1.3.2.1 Cylinder Stabilization/Storage Improvement**	**10/1/95**	**1/1/99**
184	1.3.2.1.1 Field performance evaluation for pilot coating system	10/2/96	1/1/99
185	1.3.2.1.2 Laboratory performance evaluation for pilot coating system	8/2/96	4/13/97
186	**Coating Evaluations**	**1/15/96**	**9/30/97**
187	Evaluate new coating being applied to cylinder heads and skirts	1/15/96	9/30/97
188	Evaluate "Italian" cylinders coated in 1980	4/15/96	4/15/96
189	Issue draft report on three-site coating data	8/30/96	8/30/96
190	Issue final report on three-site coating data obtained through 7/96	9/30/96	9/30/96
191	**1.3.2.1.3 Provide evaluation of engineering controls to aid cylinder protection**	**10/1/95**	**9/30/96**
192	**Determine technical and operational feasibility of engineering controls**	**10/1/95**	**8/30/96**
193	Design/test fixtures to drill drain holes in skirts	10/1/95	8/30/96
194	Design/evaluate saddle to prevent line contact in double stacking	10/1/95	8/30/96
195	Design/evaluate device to prevent lifting lug impacts	10/1/95	8/30/96
196	Evaluate 30" cylinder end protectors	10/1/95	8/30/96
197	1.3.2.1.4 Evaluate saddle for stacking bottom row on stiffening rings	10/1/95	8/30/96
198	1.3.2.1.5 Optimization analysis for recoating and movement	10/1/95	9/30/96
199	**1.3.2.2 Surveillance and Maintenance**	**10/1/95**	**9/30/02**



P = Major Milestone, O = Milestone,
M = Marker, † = IP Deliverable.

Task

Major Milestone/Milestone/Marker ◇

Progress

Summary

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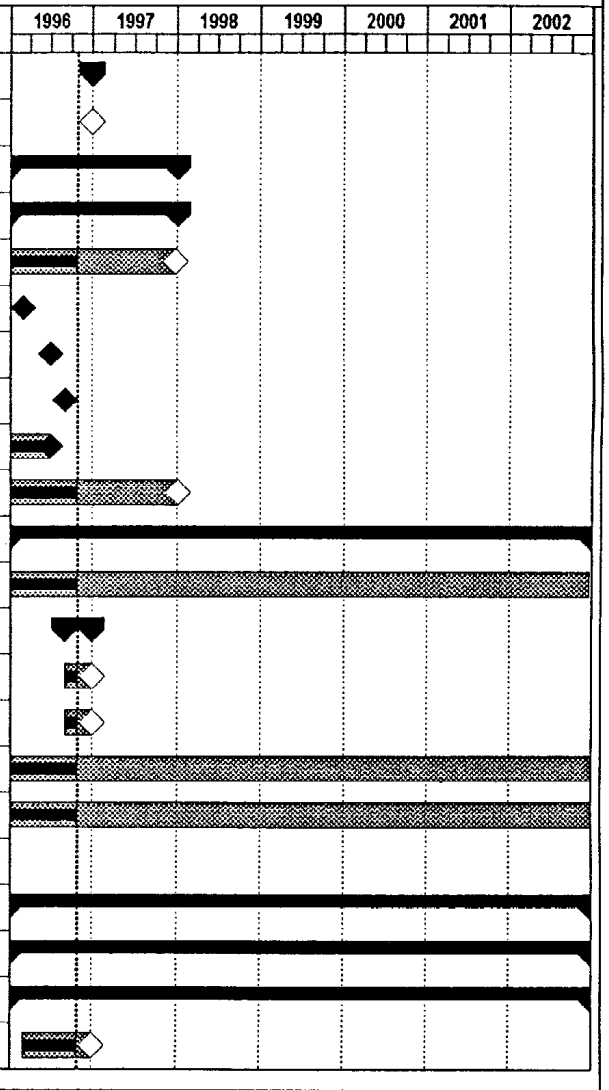
UF6 Cylinder Program Schedule

DRAFT

ID	Task Name	Start	Finish
200	**1.3.2.4 Conduct of Operations**	**9/30/96**	**9/30/96**
201	1.3.2.4.1 †(O) Draft an analysis showing technical safety basis for storage of DUF6 (SAR)	9/30/96	9/30/96
202	**1.3.2.5 System Administration**	**10/1/95**	**10/6/97**
203	**Systems Engineering Program Direction and Integration**	**10/1/95**	**10/6/97**
204	† Develop and implement the Systems Engineering Process	10/1/95	9/25/97
205	† (O) Develop the system requirements for the DUF6 Program (SRD)	11/30/95	11/30/95
206	(O) Develop the actions necessary to meet the systems requirements (SEMP)	3/31/96	3/31/96
207	†(O) Identify required dev. tasks w/subsequent completion schedules (EDP)	6/3/96	6/3/96
208	Establish mechanism to maintain Systems Engineering method	10/1/95	3/31/96
209	Develop and utilize method for optimization of program activities	10/1/95	10/6/97
210	**1.3.3 System**	**10/1/95**	**9/30/02**
211	1.3.3.1 Cylinder Stabilization/Storage Improvement	10/1/95	9/19/02
212	**1.3.3.2 Surveillance and Maintenance**	**6/1/96**	**9/30/96**
213	1.3.3.2.1 Develop specific requirements for valve and plug management	6/1/96	9/30/96
214	1.3.3.2.2 Cylinder Inspection Requirement Review	6/1/96	9/30/96
215	1.3.3.4 Conduct of Operations	10/1/95	9/30/02
216	1.3.3.5 System Administration	10/1/95	9/30/02
217			
218	**1.4 Conduct of Operations**	**10/1/95**	**9/30/02**
219	**1.4.1 Procedures and Training Development and Updating**	**10/1/95**	**9/30/02**
220	**Handling and Inspection Procedures**	**10/1/95**	**9/30/02**
221	(O) Review/update three-site handling procedure/training to reflect approved BIOs and SRD	12/1/95	9/30/96



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Task

Major Milestone/Milestone/Marker ◇

Progress

Summary

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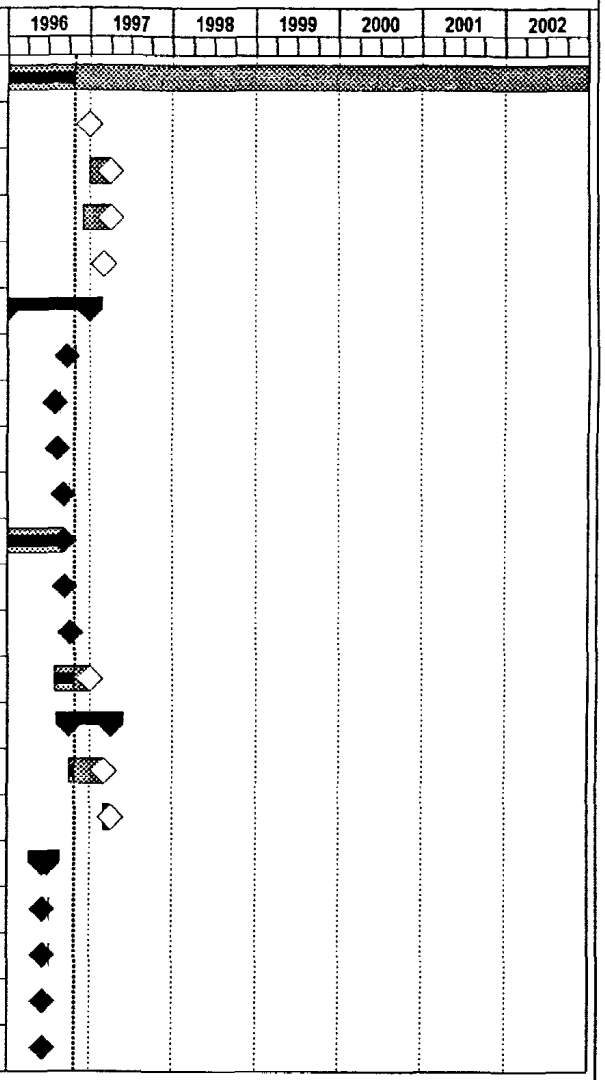
UF6 Cylinder Program Schedule

DRAFT

ID	Task Name	Start	Finish
222	Train to revised procedure as required	10/1/95	9/30/02
223	**Issue handling and inspection procedure for 30" cylinders**	**9/30/96**	**9/30/96**
224	**Issue handling and inspection procedure for cylinders other than 48" and 30"**	**9/30/96**	**12/31/96**
225	**Issue handling and inspection procedure for cylinders containing fissionable material**	**8/29/96**	**12/31/96**
226	**Convert UT inspection procedure PTMA-2003 to three-site procedure**	**11/30/96**	**11/30/96**
227	**Issue In-Storage Visual Inspection Procedure (P2402)**	**10/1/95**	**9/30/96**
228	Clarify the definition of required inspection data	6/21/96	6/21/96
229	Design new inspection forms	4/29/96	4/29/96
230	Incorporate use of UCLIM pen-based computers into procedure	5/15/96	5/15/96
231	Conduct three-site procedure PMT meeting to clarify procedure	6/5/96	6/7/96
232	Issue draft revision of P2402 (including interim improvements from Sys. Eng.)	10/1/95	6/11/96
233	Field verify revised procedure	6/14/96	6/14/96
234	Issue final revision based on field verification and final review	7/8/96	7/8/96
235	(O) Review and update visual inspection procedure to reflect approved BIOs and SRD	4/29/96	9/30/96
236	**Valve/Plug Field Change Procedure**	**7/1/96**	**12/31/96**
237	Convert valve/plug field change procedure to three-site procedure	7/1/96	11/30/96
238	Develop training module for field valve change-out procedure	11/30/96	12/31/96
239	**Procedure Control Procedure EM&EF/C-P1100**	**3/6/96**	**3/31/96**
240	Study electronic distribution and control capability	3/6/96	3/6/96
241	Develop standard reviewers list	3/6/96	3/6/96
242	Develop comment, comment resolution, and feedback process	3/7/96	3/7/96
243	Determine approval signatures	3/7/96	3/7/96



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Task

Major Milestone/Milestone/Marker ◇

Progress

Summary

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APPENDIX C

Uranium Programs Baseline Program Plan
Change Control Process

Purpose

To establish guidelines and format for approving and communicating changes to the Baseline Program Plan so that all affected parties have the same understanding of the Baseline Program Plan at all times. The objective is to maintain the Baseline Program Plan so that it is consistent with the current Uranium Program mission and objectives, and to ensure that Program personnel are working together to accomplish these objectives.

Levels of Authority/Responsibility for Approving Baseline Change Proposals:

Level 1 - DOE-Headquarters
- All Changes to Major Milestones
- Level 2 Budget and Reporting Funding changes (i.e., CD1007) - Oak Ridge Operations level only
- Level 3 Budget Authority Funding changes greater than 10% - Oak Ridge level only

Level 2 - DOE-Oak Ridge
- All Changes to Milestones
- All Level Three Budget Authority Funding changes (other than above)
- All Tasks Description changes

Level 3 - LMES
- All Changes to Markers
- All Budget Outlay Budget and Reporting Funding changes within Budget Authority Available

Explanation of Baseline Change Proposal Form:

Cover Sheet: Initiator completes the following fields:
- Date Initiated
- LMUS Service Agreement (MOU) Revision Required
- Type of Change Requested (Modification, Addition, Deletion)
- Baseline Change Proposal Type (also complete & submit just the appropriate Form(s) as indicated on the Cover Sheet)
- Designation (Priority = A change proposal that corrects a potentially hazardous condition that may result in serious injury/death to personnel or damage to equipment)
- Point-of-Contact
- Description of Change

- Change Justification/Impact of Non-Approval

Completed Form(s) is(are) submitted to the Site Business Manager
- Review form for accuracy and funding impact (Budget Authority & Budget Outlay)
- Initiate change process for LMUS Service Agreement (MOU) if applicable

Form submitted to Enrichment Facilities Support Business Manager
- Log and assign Baseline Change Proposal Number.
- Acquire review/approval of UF_6 Cylinder Management
- Determine Approval Level required
- Distribute form to appropriate Approving Official after review by lower level Approving Authority
  - Level 1 Program DOE-Headquarters: Director, Facility & Technology Management Division
  - Level 2 Field Office Oak Ridge: Assistant Manager for Enrichment Facilities, Oak Ridge
  - Level 3 Division Manager, Enrichment Facilities Support Division

Upon approval or disapproval, Approving Official returns Baseline Change Proposal request form to Enrichment Facilities Support Business Manager who distributes to the Approving Officials of the other two levels for information purposes.

APPENDIX D

Monthly Cost Accounting Report Sample

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

PART I: IDENTIFICATION		
TAD NUMBER: J.1		B&R CODE: CD1015010
PROJECT TITLE: Mgmt Strategy Development		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: S. L. Rice	PHONE: (423) 576-0899
CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
P - Support EIS activities as requested by the Program Office	09/30/96	G

PART III: FINANCIAL ($ in thousands) Rebaseline

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Monthly Budget	10	16	13	12	14	17	13	17	13	12	17	16
Revised Baseline	10	16	13	12	14	17	13	17	13	12	17	16
Monthly Actuals	0	0	2	11	24							
Variance	-10	-16	-11	-1	10							
Cumulative Budget	10	26	39	51	65	82	95	112	125	137	154	170
Cumulative Budget Revised	10	26	39	51	65	82	95	112	125	137	154	170
Cumulative Actuals	0	0	2	13	37							
Variance	-10	-26	-37	-38	-28							
Estimated Revisions	10	16	13	12	14	17	13	17	13	12	17	16

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
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CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) The manner in which the Program Office is directing performance of this work continues to differ from what was originally budgeted.

PART V: COMMENTS

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

PART I: IDENTIFICATION		
TAD NUMBER: J.1		B&R CODE: CD1015010
PROJECT TITLE: Mgmt Strategy Development		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) The manner in which the Program Office is directing performance of this work continues to differ from what was originally budgeted.

PART V: COMMENTS

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FEBRUARY

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CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*
P - Support EIS activities as requested by the Program Office	09/30/96	G

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	10	16	13	12	14	17	13	17	13	12	17	16
Revised Baseline	0	0	2	11	24	52	61	20	0	0	0	0
Monthly Actuals	0	0	2	11	24							
Variance	0	0	0	0	0							
Cumulative Budget	10	26	39	51	65	82	95	112	125	137	154	170
Cumulative Budget Revised	0	0	2	13	37	89	150	170	170	170	170	170
Cumulative Actuals	0	0	2	13	37							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	2	11	24	52	61	20	0	0	0	0

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

PART I: IDENTIFICATION		
TAD NUMBER: J.2		B&R CODE: CD1015020
PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: J. C. Hodges	PHONE: (502) 441-6800
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART III: FINANCIAL ($ in thousands) — Rebaseline

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	611	539	510	472	447	455	539	618	604	606	1,178	1,160
Revised Baseline	445	354	515	621	486	465	951	743	707	822	951	1,078
Monthly Actuals	445	354	515	621	486							
Variance	0	0	0	0	0							
Cumulative Budget	611	1,150	1,660	2,132	2,579	3,034	3,573	4,191	4,795	5,401	6,579	7,739
Cumulative Budget Revised	445	799	1,314	1,935	2,421	2,886	3,837	4,580	5,287	6,109	7,060	8,138
Cumulative Actuals	445	799	1,314	1,935	2,421							
Variance	0	0	0	0	0							
Estimated Revisions	445	354	515	621	486	465	951	743	707	822	951	1,078

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
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CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%)

PART V: COMMENTS

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

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CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
O - Review and update the Handling Procedure/training to reflect completion of the Bios and SRD	09/30/96	G
O - Review and Update the Visual Inspection procedure to reflect completion of the BIOs and SRD	09/30/96	G
M - Update the Cylinder Inventory Model with inspection and NMC&A data	07/31/96	02/28/96
P - Complete the three-site detailed implementation plan for DNFSB finding 95-1	10/16/95	10/16/95
O - Submit additional milestones/markers once the 3 site detailed Implementation Plan is completed	11/30/95	11/30/95
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the first 6 months of FY 1996 #	03/31/96	03/31/96
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the second 6 months of FY 1996 #	09/30/96	G
P - Update the inspection data in the UCLIM data base and provide the appropriate reports	11/15/95	11/15/95
P - Complete self-readiness assessments necessary to stack cylinders onto the new section of concrete C-745S yard (supports PAAA requirements)	11/30/95	10/20/95
P - Complete self-readiness assessments necessary to initiate a pilot field maintenance operation at Paducah (supports PAAA requirements)	06/30/96	05/03/96
P - Remove from ground contact all cylinders full of depleted uranium	09/30/96	05/28/96
P - Complete the prototype field painting of 500 cylinders at PGDP #	09/30/96	G
O - Issue a request for proposal for field cylinder painting	01/02/96	01/18/96
P - Complete the required inspection of 6,700 cylinders as part of the triennial inspection program at Paducah	09/30/96	G
P - Complete the annual inspection of 11,275 cylinders exhibiting accelerated corrosion and other problems (as defined in ETO-114)	09/30/96	G
P - Clean and paint approximately 500 cylinder skirt ends	09/30/96	06/07/96

FY 1996 URANIUM PROGRAMS
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FEBRUARY

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PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: E. W. Gillespie	PHONE: (614) 897-5010
CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. M. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
O - Obtain Cylinder Handler	07/31/96	11/10/95
O - Review and update the Handling Procedure/training to reflect completion of the Bios and SRD	09/30/96	G
O - Review and Update the Visual Inspection procedure to reflect completion of the Bios and SRD	09/30/96	G
M - Update the Cylinder Inventory Model with inspection and NMC&A data	07/31/96	G
P - Complete the three-site detailed implementation plan for DNFSB finding 95-1	10/16/95	10/16/95
O - Submit additional milestones/markers once the 3 site detailed Implementation Plan is completed	11/30/95	11/30/95
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the first 6 months of FY 1996 #	03/31/96	03/31/96
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the second 6 months of FY 1996 #	09/30/96	G
P - Update the inspection data in the UCLIM data base and provide the appropriate reports	11/15/95	11/15/95
P - Support the Ohio EPA Directors' findings and orders	09/30/96	G
P - Complete the required inspection of 5,070 cylinders as part of the triennial inspection program at Portsmouth	09/30/96	G
P - Complete the annual inspections of 2,200 cylinders exhibiting accelerated corrosion and other problems (as defined in ETO-114)	09/30/96	01/31/96
P - Clean and paint approximately 3,400 cylinder skirt ends	09/30/96	G

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CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. M. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	587	587	587	587	587	587	587	587	587	587	587	586
Revised Baseline	233	213	208	262	250	453	775	811	683	896	779	942
Monthly Actuals	233	213	208	262	250							
Variance	0	0	0	0	0							
Cumulative Budget	587	1,174	1,761	2,348	2,935	3,522	4,109	4,696	5,283	5,870	6,457	7,043
Cumulative Budget Revised	233	446	654	916	1,166	1,619	2,394	3,205	3,888	4,784	5,563	6,505
Cumulative Actuals	233	446	654	916	1,166							
Variance	0	0	0	0	0							
Estimated Revisions	233	213	208	262	250	453	775	811	683	896	779	942

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

FY 1996 URANIUM PROGRAMS
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Functional Area Monthly Status Report
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PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) Cylinder movement was delayed, but the level of activity is expected to increase in March. Costs associated with code review, code interpretation, and ultrasonic testing are not reflected in the year-to-date actuals, but they will begin to appear in March. A revised cost estimate was provided (reference 3/1/96 memo to J. W. Parks, "FY 1996 Baseline Uncosted Analysis"). The revised baseline of $6.5 million is expected to be used fully.

PART V: COMMENTS

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

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CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*
O - Update the 3 site Project Management Plan to reflect completion of the BIO's and SRD - IP	07/31/96	G
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the first 6 months of FY 1996 #	03/31/96	03/31/96
O - Develop the systems requirements for the depleted UF6 cylinder program - IP	11/30/95	11/27/95
O - Develop the actions necessary to meet the systems requirements - IP	03/31/96	03/29/96
P - ueet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the second 6 months of FY 1996 #	09/30/96	G
O - Identify the required development tasks with subsequent completion schedules - IP	06/01/96	05/31/96
O - Define the plan for managing cylinders - IP	07/31/96	G
O - Draft an analysis showing technical safety basis for the storage of depleted UF6 - IP	09/30/96	G

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	61	80	71	89	104	130	99	130	99	68	85	454
Revised Baseline	104	180	177	206	254	256	236	-144	89	108	94	145
Monthly Actuals	104	180	177	206	254							
Variance	0	0	0	0	0							
Cumulative Budget	61	141	212	301	405	535	634	764	863	931	1,016	1,470
Cumulative Budget Revised	104	284	461	667	921	1,177	1,413	1,269	1,358	1,466	1,560	1,705
Cumulative Actuals	104	284	461	667	921							
Variance	0	0	0	0	0							
Estimated Revisions	104	180	177	206	254	256	236	-144	89	108	94	145

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TAD NUMBER: J.2		B&R CODE: CD1015020
PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: S. L. Rice	PHONE: (423) 576-0899
CONTRACTOR: MMES - OAK RIDGE	LEAD: V. S. Newman	PHONE: (423) 576-1720
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) The original baseline projections were based on a constant level of effort to support development of the DNFSB Implementation Plan deliverable. However, upfront negotiations and development necessitated a greater level of effort than originally anticipated. The higher level of support is expected to taper off as documents are completed. In addition, some costs were inappropriately charged and are being reallocated.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.3		B&R CODE: EW2010401
PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: S. L. Rice	PHONE: (423) 576-0899
CONTRACTOR: MMES - OAK RIDGE	LEAD: H. E. Philpot	PHONE: (423) 576-4525
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
O - Complete egress monitoring in B-yard to finalize re-posting of the yard	03/31/96	03/29/96
O - Characterize and re-post L-Yard	02/29/96	10/20/95
O - Develop a plan for re-posting E and K Yards (based on B-Yard lessons learned)	04/30/96	11/15/95
O - Obtain Cylinder Handler	07/31/96	04/10/96
M - Obtain Concrete Saddles	11/30/95	11/16/95
M - Apply new design patch to cylinder #101244	12/31/95	12/22/95
O - Review and update the Handling Procedure/training to reflect completion of the Bios and SRD	09/30/96	G
O - Review and Update the Visual Inspection procedure to reflect completion of the Bios and SRD	09/30/96	G
M - Update the Cylinder Inventory Model with inspection and NMC&A data	07/31/96	G
P - Complete the three-site detailed implementation plan for DNFSB finding 95-1	10/16/95	10/16/95
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the first 6 months of FY 1996 #	03/31/96	03/31/96
O - Submit additional milestones/markers once the 3 site detailed Implementation Plan is completed	11/30/95	11/30/95
P - Meet all of the commitments in DNFSB Implementation Plan 95-1 that occur in the second 6 months of FY 1996 #	09/30/96	G
P - Update the inspection data in the UCLIM data base and provide the appropriate reports	11/15/95	11/15/95
P - Complete the required inspection of 570 cylinders as part of the triennial inspection program at K-25	09/30/96	G
P - Complete the annual inspections of 4,000 cylinders exhibiting accelerated corrosion and other problems (as defined in ETO-114)	09/30/96	G
P - Clean and paint approximately 300 cylinder skirt ends	09/30/96	G

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PART I: IDENTIFICATION		
TAD NUMBER: J.3		B&R CODE: EW2010401
PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: S. L. Rice	PHONE: (423) 576-0899
CONTRACTOR: MMES - OAK RIDGE	LEAD: H. E. Philpot	PHONE: (423) 576-4525
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	300	301	300	700	300	300	300	300	300	700	300	599
Revised Baseline	106	264	295	312	320	647	730	566	429	520	453	566
Monthly Actuals	106	264	295	312	320							
Variance	0	0	0	0	0							
Cumulative Budget	300	601	901	1,601	1,901	2,201	2,501	2,801	3,101	3,801	4,101	4,700
Cumulative Budget Revised	106	370	665	977	1,297	1,944	2,674	3,240	3,669	4,189	4,642	5,208
Cumulative Actuals	106	370	665	977	1,297							
Variance	0	0	0	0	0							
Estimated Revisions	106	264	295	312	320	647	730	566	429	520	453	566

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.3		B&R CODE: EW2010401
PROJECT TITLE: Ongoing DU Maintenance & Mgmt		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: S. L. Rice	PHONE: (423) 576-0899
CONTRACTOR: MMES - OAK RIDGE	LEAD: H. E. Philpot	PHONE: (423) 576-4525
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) The underrun is the result of the following: (1) There is a lag in subcontractor billings. (2) Cylinder movement from J yard to L Yard is behind schedule because of inclement weather. (3) Valve management closeout for E yard is behind schedule. (4) The refurbishment Coating Evaluation Report is behind schedule.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - OAK RIDGE	LEAD: H. E. Philpot	PHONE: (423) 576-6314
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*

PART III: FINANCIAL ($ in thousands) — Rebaseline

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	0	0	0	0	0	0	0	0	0
Revised Baseline	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Budget Revised	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	0	0	0	0	0	0	0	0	0	0

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - OAK RIDGE	LEAD: H. E. Philpot	PHONE: (423) 576-6314
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%)

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	0	0	0	0	100	0	0	0	750
Revised Baseline	0	0	0	0	0	0	0	0	0	0	0	500
Monthly Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	0	0	0	0	100	100	100	100	850
Cumulative Budget Revised	0	0	0	0	0	0	0	0	0	0	0	500
Cumulative Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	0	0	0	0	0	0	0	0	0	500

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%)

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	0	0	510	0	0	0	0	0	0
Revised Baseline	0	0	0	0	0	0	0	0	0	0	0	510
Monthly Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	0	0	510	510	510	510	510	510	510
Cumulative Budget Revised	0	0	0	0	0	0	0	0	0	0	0	510
Cumulative Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	0	0	0	0	0	0	0	0	0	510

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.CE		B&R CODE: 35CD10150
PROJECT TITLE: DU Cylinder Capital Equipment		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: A. V. Mehta	PHONE: (423) 576-4841
CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%)

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.89-N-501		B&R CODE: 39CD10150
PROJECT TITLE: 89-N-501, S Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*

PART III: FINANCIAL ($ in thousands)					Rebaseline							
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	0	0	0	0	0	0	0	0	0
Revised Baseline	-8	33	21	2	-2	13	0	13	26	0	0	0
Monthly Actuals	-8	33	21	2	-2							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Budget Revised	-8	25	46	48	46	59	59	72	98	98	98	98
Cumulative Actuals	-8	25	46	48	46							
Variance	0	0	0	0	0							
Estimated Revisions	-8	33	21	2	-2	13	0	13	26	0	0	0

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.89-N-501		B&R CODE: 39CD10150
PROJECT TITLE: 89-N-501, S Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) Final retention payment will be made to the subcontractor in March. Project closeout will occur shortly afterwards.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.89-N-501		B&R CODE: 39CD10150
PROJECT TITLE: 89-N-501, E Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. M. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*
P - Complete construction of X-745-E cylinder storage yard	10/31/95	09/30/95
O - Complete procurement & delivery of chocks needed to complete the X-745-E Storage Yard project (89N501)	10/31/95	10/31/95

PART III: FINANCIAL ($ in thousands)					Rebaseline							
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	162	67	247	0	0	0	0	0	0	0	0	0
Revised Baseline	64	46	47	3	-3	6	2	15	0	0	0	0
Monthly Actuals	64	46	47	3	-3							
Variance	0	0	0	0	0							
Cumulative Budget	162	229	476	476	476	476	476	476	476	476	476	476
Cumulative Budget Revised	64	110	157	160	157	163	165	180	180	180	180	180
Cumulative Actuals	64	110	157	160	157							
Variance	0	0	0	0	0							
Estimated Revisions	64	46	47	3	-3	6	2	15	0	0	0	0

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.89-N-501		B&R CODE: 39CD10150
PROJECT TITLE: 89-N-501, E Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423)-576-1828
CONTRACTOR: MMES - PORTSMOUTH	LEAD: T. M. Marshall	PHONE: (614) 897-3873
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) Construction of the X-745 E is complete. Minimal engineering closeout is still required.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.93-U-200		B&R CODE: 39CD10150
PROJECT TITLE: 93-U-200, G Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
O - Complete delivery of Cylinder Handling Equipment	12/31/95	11/22/95
P - Complete reconstruction of G-yard #	09/30/96	G
O - Award FPSC for construction of G Yard Phase I	10/02/95	01/17/96
O - Award FPSC for construction of G Yard Phase II	11/15/95	01/17/96

PART III: FINANCIAL ($ in thousands)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
						Rebaseline						
Original Baseline	744	878	515	747	730	790	955	711	472	364	274	168
Revised Baseline	-66	1,273	37	86	141	105	604	984	1,086	1,043	603	1,948
Monthly Actuals	-66	1,273	37	86	141							
Variance	0	0	0	0	0							
Cumulative Budget	744	1,622	2,137	2,884	3,614	4,404	5,359	6,070	6,542	6,906	7,180	7,348
Cumulative Budget Revised	-66	1,207	1,244	1,330	1,471	1,576	2,180	3,164	4,250	5,293	5,896	7,844
Cumulative Actuals	-66	1,207	1,244	1,330	1,471							
Variance	0	0	0	0	0							
Estimated Revisions	-66	1,273	37	86	141	105	604	984	1,086	1,043	603	1,948

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.93-U-200		B&R CODE: 39CD10150
PROJECT TITLE: 93-U-200, G Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%) An aggressive recovery schedule has been implemented. FOCI and the Notice To Start construction have been received. The project is expected to be completed on schedule and within budget.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.96-U-201		B&R CODE: 39CD10150
PROJECT TITLE: 96-U-201, T Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/95

PART II: SCHEDULE**

MARKERS/MILESTONES	DUE DATE	STATUS*
O - Award FPSC for C-745-T Yard (Cylinder Storage Yard Phase IX, 96-U-201)	08/31/96	G
M - Complete Design Criteria, A/E Stmt of Work, & Project Mgmt Plan for Storage Yard Phase IX (96-U-201)	11/15/95	11/15/95
M - Support the submittal of NEPA EA to DOE for approval of Storage Yard Phase IX (96-U-201)	11/16/95	10/02/95
M - Initiate design of C-745-T Yard (Cylinder Storage Yard Phase IX, 96-U-201)	01/08/96	01/18/96
M - Complete design of C-745-T Yard (Cylinder Storage Yard Phase IX, 96-U-201)	07/31/96	G
O - Complete design of C-745-K, L, and M Storage Yards	09/30/96	G
O - Complete design of C-745-N and P Storage Yrds	11/30/96	G

PART III: FINANCIAL ($ in thousands) — Rebaseline

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	29	139	39	139	139	98	11	11	51
Revised Baseline	0	0	0	0	17	28	26	118	149	158	154	150
Monthly Actuals	0	0	0	0	17							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	29	168	207	346	485	583	594	605	656
Cumulative Budget Revised	0	0	0	0	17	45	71	189	338	496	650	800
Cumulative Actuals	0	0	0	0	17							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	0	0	17	28	26	118	149	158	154	150

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

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PART I: IDENTIFICATION		
TAD NUMBER: J.96-U-201		B&R CODE: 39CD10150
PROJECT TITLE: 96-U-201, T Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR: MMES - PADUCAH	LEAD: A. K. Balding	PHONE: (502) 441-5125
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/95

PART IV: INFORMATION

Problems (If any)

Design was delayed six weeks because of contracting issues between the A/E and DOE.

Design was delayed six weeks because of contracting issues between the A/E and DOE.

It took DOE longer than anticipated to get the new A-E contract in place.

It took DOE longer than anticipated to get the new A-E contract in place.

Proposed Solution

DOE, LMES, and the A/E are working to accelerate the schedule in order to complete design by the 5/30/96 scheduled date of completion.

DOE, LMES, and the A/E are working to accelerate the schedule in order to complete design by the 5/30/96 scheduled date of completion.

T yard design will be completed by 7/30/96. This will not impact the construction schedule.

The designs will be completed by 11/30/96. Construction schedules will not be impacted.

Cumulative Variance Explanation (If variance is greater than 20%)

Design was delayed by 6 weeks because of contracting issues between the A/E and DOE. DOE, LMES, and the A/E are working to accelerate the schedule, and schedule recovery is expected.

PART V: COMMENTS

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PART I: IDENTIFICATION		
TAD NUMBER: J.96-U-201		B&R CODE: 39CD10150
PROJECT TITLE: 96-U-201, T Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR:	LEAD:	PHONE:
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART II: SCHEDULE**		
MARKERS/MILESTONES	DUE DATE	STATUS*

PART III: FINANCIAL ($ in thousands)						Rebaseline						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Original Baseline	0	0	0	0	0	0	0	0	0	0	0	0
Revised Baseline	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Cumulative Budget	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Budget Revised	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Actuals	0	0	0	0	0							
Variance	0	0	0	0	0							
Estimated Revisions	0	0	0	0	0	0	0	0	0	0	0	0

*Legend: G ... On Schedule - No Problems; Y ... Potential Problem; R ... Problem - Deliverable at Risk
**Legend: P ... Major Milestone; O ... Milestone; M ... Marker; # ... Award Fee Milestone

FY 1996 URANIUM PROGRAMS
Oak Ridge Operations Office
Functional Area Monthly Status Report
FEBRUARY

PART I: IDENTIFICATION		
TAD NUMBER: J.96-U-201		B&R CODE: 39CD10150
PROJECT TITLE: 96-U-201, T Yard		
FEDERAL ORGANIZATION: AMEF-ORO	LEAD: Stumbo/Mehta	PHONE: (423) 576-1828
CONTRACTOR:	LEAD:	PHONE:
PERFORMANCE PERIOD - START DATE: 10/01/95		END DATE: 09/30/96

PART IV: INFORMATION
Problems (If any)
Proposed Solution
Cumulative Variance Explanation (If variance is greater than 20%)

PART V: COMMENTS

APPENDIX E

UF_6 Cylinder Program Typical Change Control Items

UF_6 Cylinder Program Typical Change Control Items

Item Number & Issue Date	Item Title	Responsibility/Change Control Method
Three-Site Program		
Documents		
EFS-95-005, 10/95	FY 1996 Baseline Program Plan for Uranium Program Activities Oak Ridge Operations	Enrichment Facilities Support Division according to Baseline Change Control Process
K/TSO-001, Rev. 2 04/26/96	UF_6 Cylinder Program System Requirements Document	Three-Site UF_6 Cylinder Program Configuration Control Board approval
K/TSO-017, 03/96	UF_6 Cylinder Program Systems Engineering Management Plan	Three-Site UF_6 Cylinder Program Configuration Control Board approval
K/TSO-28, 04/96	UF_6 Cylinder Program Engineering Development Plan	Three-Site UF_6 Cylinder Program Configuration Control Board approval
K/TSO-30, 06/96	UF_6 Cylinder Program Management Plan	Three-Site UF_6 Cylinder Program Configuration Control Board approval
	UCLIM User's Guide	UCLIM Data Base Administration according to LMES Software Work Package Methods, to be issued 09/96 (replaces Software Development Methodology)
Procedures		
ERWM/EF-P2400, Rev. 0, 07/31/95	DOE 48-Inch-Diameter UF_6 Cylinder Handling and Inspection	Configuration Control Board according to EM & EF Procedures Control Process: EM&EF/C-P1100, Initiation, Review, Revision, Approval, and Issuance of EM&EF Programs Intersite Procedural Command Media

UF_6 Cylinder Program Typical Change Control Items

Item Number & Issue Date	Item Title	Responsibility/Change Control Method
Three-Site Program		
ERWM/EF-P2401, Rev. 0, 09/20/95	Fabrication and Installation of Replacement Identification Tags on UF_6 Cylinders	Configuration Control Board according to EM & EF Procedures Control Process: EM&EF/C-P1100, Initiation, Review, Revision, Approval, and Issuance of EM&EF Programs Intersite Procedural Command Media
ERWM/EF-P2402, Rev. 0, 02/06/96	In-Storage Inspection of UF_6 Cylinders	Configuration Control Board according to EM& EF Procedures Control Process: EM&EF/C-P1100, Initiation, Review, Revision, Approval, and Issuance of EM&EF Programs Intersite Procedural Command Media
ERWM/EF-P2403, (IAD), Rev. 0, 02/21/96	Repair of Heavily Corroded and Potentially Breached UF_6 Cylinders	Configuration Control Board according to EM & EF Procedures Control Process: EM&EF/C-P1100, Initiation, Review, Revision, Approval, and Issuance of EM&EF Programs Intersite Procedural Command Media
Software	UCLIM	UCLIM Database Administrator according to LMES Software Work Package Methods, to be issued 09/96 (replaces Software Development Methodology)
Hardware	UCLIM System	UCLIM Database Administrator approval

UF_6 Cylinder Program Typical Change Control Items

Item Number & Issue Date	Item Title	Responsibility/Change Control Method
Paducah		
Documents		
K/GDP/SAR-99/R1 04/96	Basis of Interim Operation for the UF_6 Cylinder Storage Yards, Paducah Gaseous Diffusion Plant	UF_6 Cylinder Site Program Manager reviews new work per LMES USQD process: FS-102, Unreviewed Safety Question Determinations
NCSA No. GEN-03 Requisition No. 1527	Handling, Use, and Storage of Cylinders Containing 50 Pounds or More UF_6	UF_6 Cylinder Site Program Manager reviews new work per ESS-CS-101, Nuclear Criticality Safety Program Elements and ESS-CS-102, Nuclear Criticality Safety Approval
Procedures	*Three-site procedures are used*	
Software	NUMAS, Paducah Nuclear Material Accountability System	NUMAS Program Modification Request form
Hardware		
[1]	DOE UF_6 cylinders	Three-Site UF_6 Cylinder Program Configuration Control Board approval
C-900121	Latourneau-Westinghouse Lectrolift	Three-Site UF_6 Cylinder Program Configuration Control Board approval

[1]Definitive list of UF_6 cylinders and content assays is contained in the Paducah Nuclear Material Accountability System (NUMAS) database.

UF_6 Cylinder Program Typical Change Control Items

Item Number & Issue Date	Item Title	Responsibility/Change Control Method
Paducah		
C-900130	Allied Wagner Cylinder Hauler	Three-Site UF_6 Cylinder Program Configuration Control Board approval
C-900131	Allied Wagner Cylinder Hauler	Three-Site UF_6 Cylinder Program Configuration Control Board approval
C-900132	Ransom Rotating Fixture	Three-Site UF_6 Cylinder Program Configuration Control Board approval

Item Number & Issue Date	Item Title	Change Control Method
Portsmouth		
Documents		
K/GDP/SAR-104R1, 04/96	Basis of Interim Operation for the UF_6 Cylinder Storage Yards, Portsmouth Gaseous Diffusion Plant	Site UF_6 Cylinder Program Manager reviews new work according to LMES USQD process: FS-102, Unreviewed Safety Question Determination
NCSA-PLANT004.001, 12/13/94	Nuclear Criticality Safety Approval, Storing and Handling of Large Cylinders of Uranium Material	Site UF_6 Cylinder Program Manager per LMES/ PO-FO- P1514, Nuclear Criticality Safety Evaluation and Approval
FCA-475C2, 12/13/94	Criticality Hazards Facility Change Agreement, Use of Vacuum Cleaners and Power Sweepers	Site UF_6 Cylinder Program Manager per LMES/ PO-FO-P1514, Nuclear Criticality Safety Evaluation and Approval
Procedures	*Three-site procedures are used*	

UF_6 Cylinder Program Typical Change Control Items

Item Number & Issue Date	Item Title	Change Control Method
Portsmouth		
Software	DYMCAS, Portsmouth Dynamic Nuclear Material Control and Accountancy System	DYMCAS Transaction Report via remote entry station and Nuclear Materials Accounting audit NM-AD-201, Rev. 1, DYMCAS overview
Hardware		
[2]	US DOE UF_6 cylinders	Three-Site UF_6 Cylinder Program Configuration Control Board approval
P-910263	Allied-Wagner Cylinder Stacker	Three-Site UF_6 Cylinder Program Configuration Control Board approval

Item Number & Issue Date	Item Title	Change Control Method
K-25 Site		
Documents		
K/OPS-035, Rev. 1, 04/96	Basis of Interim Operation for the UF_6 Cylinder Storage Yards at the K-25 Site	New work reviewed per LMES USQD Process: FS-102, Unreviewed Safety Question Determination
Procedures	*Three-site procedures are used*	

[2]Definitive list of UF_6 cylinders and content assays is maintained in the Portsmouth Dynamic Nuclear Material Control and Accountancy System (DYMCAS) database.

APPENDIX F
Performance Measures

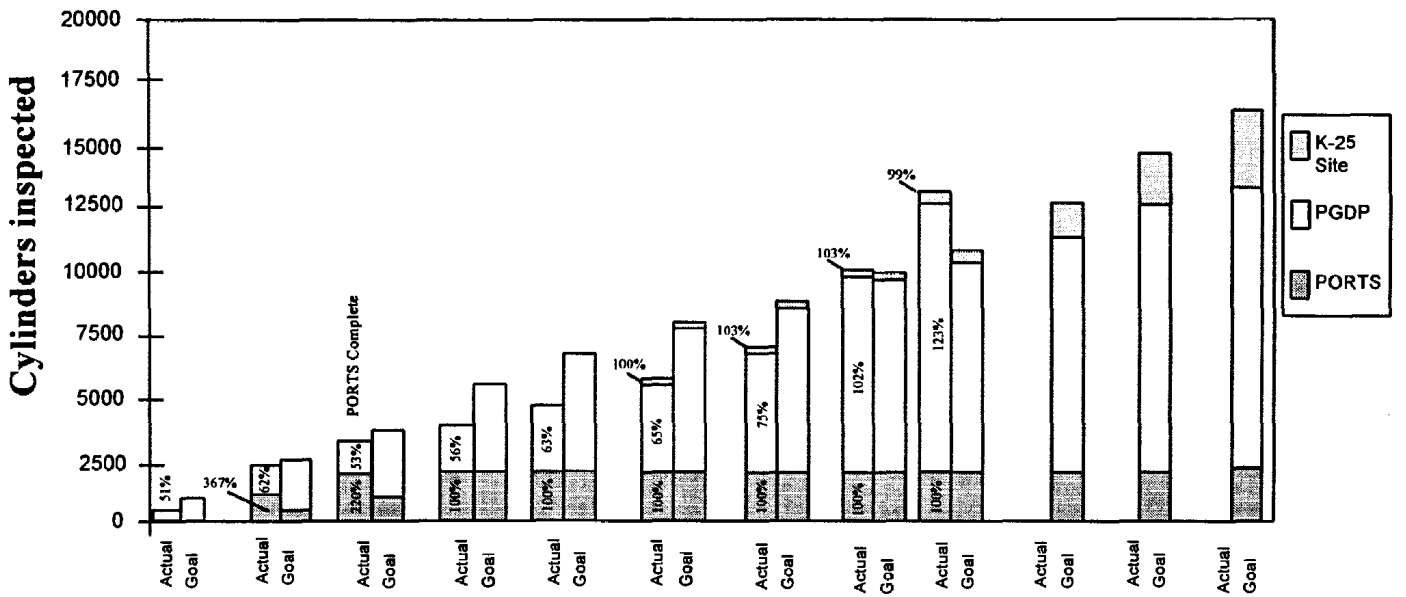
Objective:

Complete 100% of scheduled annual UF_6 Cylinder Inspections by End of FY96 (9-30-96)

Status:

As of Jul. 1, inspections are ahead of schedule and 78% complete for FY96

FY 1996
Annual UF_6 Cylinder Inspections



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	179	258	258	348			
	G	0	0	0	0	0	179	250	250	350	1,350	2,350	3,320
PGDP	A	447	1,229	1,523	2,087	3,039	3,698	4,961	7,847	10,565			
	G	880	1,980	2,860	3,740	4,840	5,720	6,600	7,700	8,580	9,460	10,560	11,275
PORTS	A	0	687	2,200	2,200	2,200	2,200	2,200	2,200	2,200			
	G	0	187	1,000	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200

A = Actual number of inspections
G = Goal for month (cumulative)

Time (months)

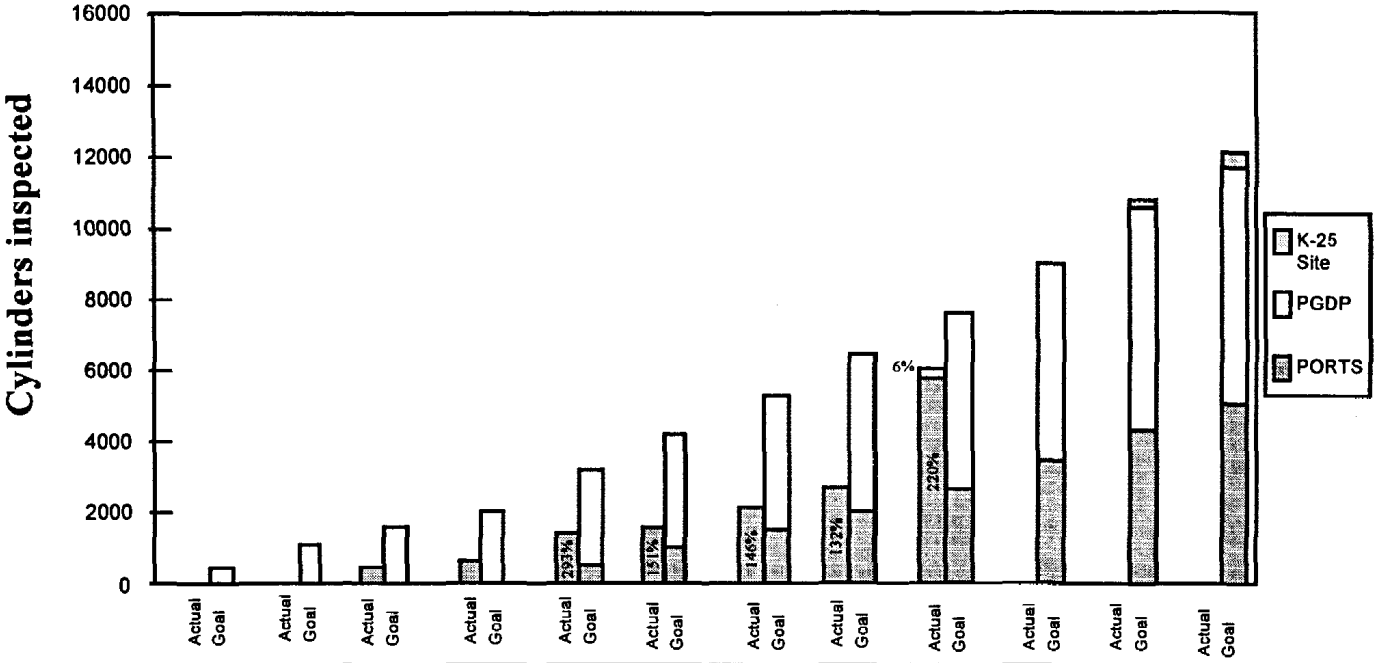
Objective:

Complete 100% of scheduled periodic UF_6 Cylinder Inspections by End of FY96 (9-30-96)

Status:

As of Jul. 1, PORTS is ahead of schedule, and the overall goal is 50% complete

FY 1996
Periodic UF_6 Cylinder Inspections



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	0	0	0	0			
	G	0	0	0	0	0	0	0	0	0	0	200	400
PGDP	A	0	0	0	0	0	0	0	0	295			
	G	480	1,080	1,560	2,040	2,640	3,180	3,740	4,440	5,000	5,560	6,260	6,700
PORTS	A	0	0	519	593	1,445	1,496	2,159	2,603	5,801			
	G	0	0	0	0	494	988	1,482	1,976	2,639	3,387	4,322	5,070

A = Actual number of inspections
G = Goal for month (cumulative)

Time (months)

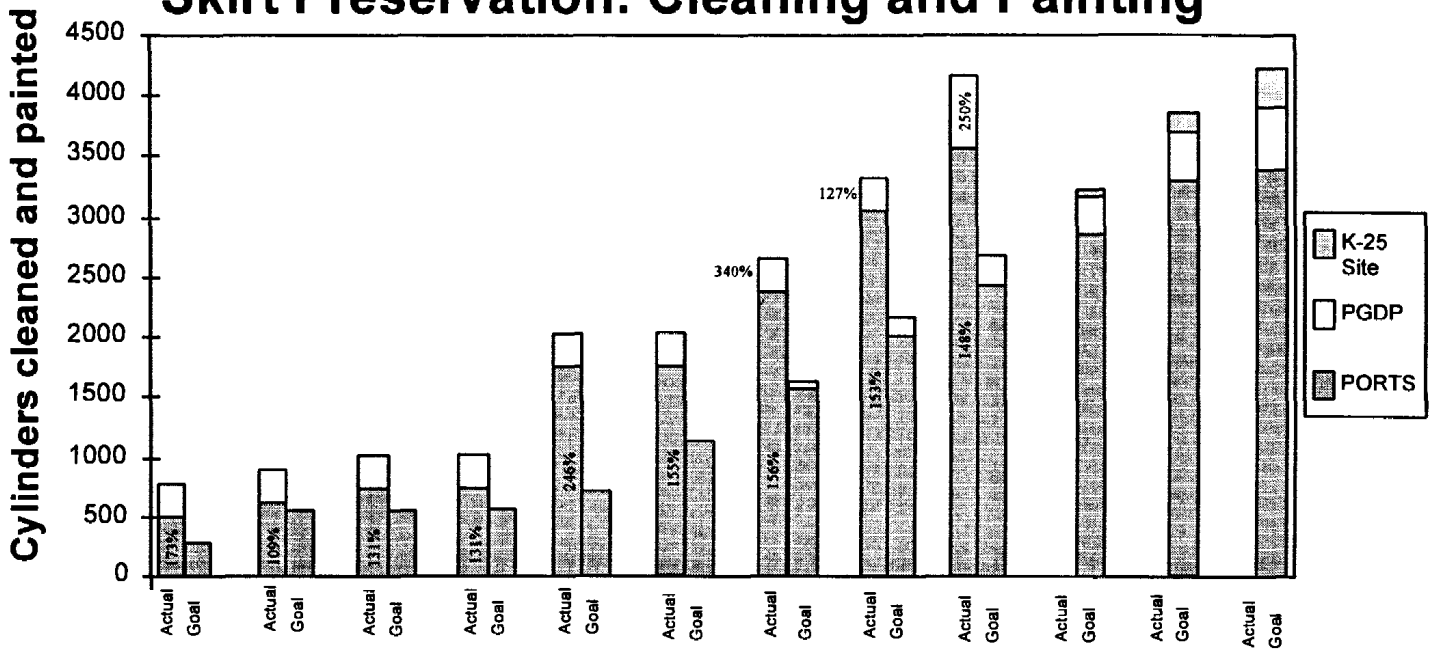
Objective:

Clean and paint 100% of scheduled UF_6 Cylinder Skirts by End of FY96 (9-30-96)

Status:

As of Jul. 1, operations at PGDP and PORTS are ahead of schedule, and this work is 99% complete.

FY 1996
Skirt Preservation: Cleaning and Painting



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	0	0	0	0			
	G	0	0	0	0	0	0	0	0	0	50	150	300
PGDP	A	204	204	204	204	204	204	204	204	599			
	G	0	0	0	0	0	0	60	160	240	320	420	500
PORTS	A	490	617	744	744	1,745	1,745	2,435	3,037	3,555			
	G	283	566	566	566	708	1,123	1,566	1,980	2,404	2,828	3,252	3,400

A = Actual number of skirts cleaned/painted
G = Goal for month (cumulative)

Time (months)

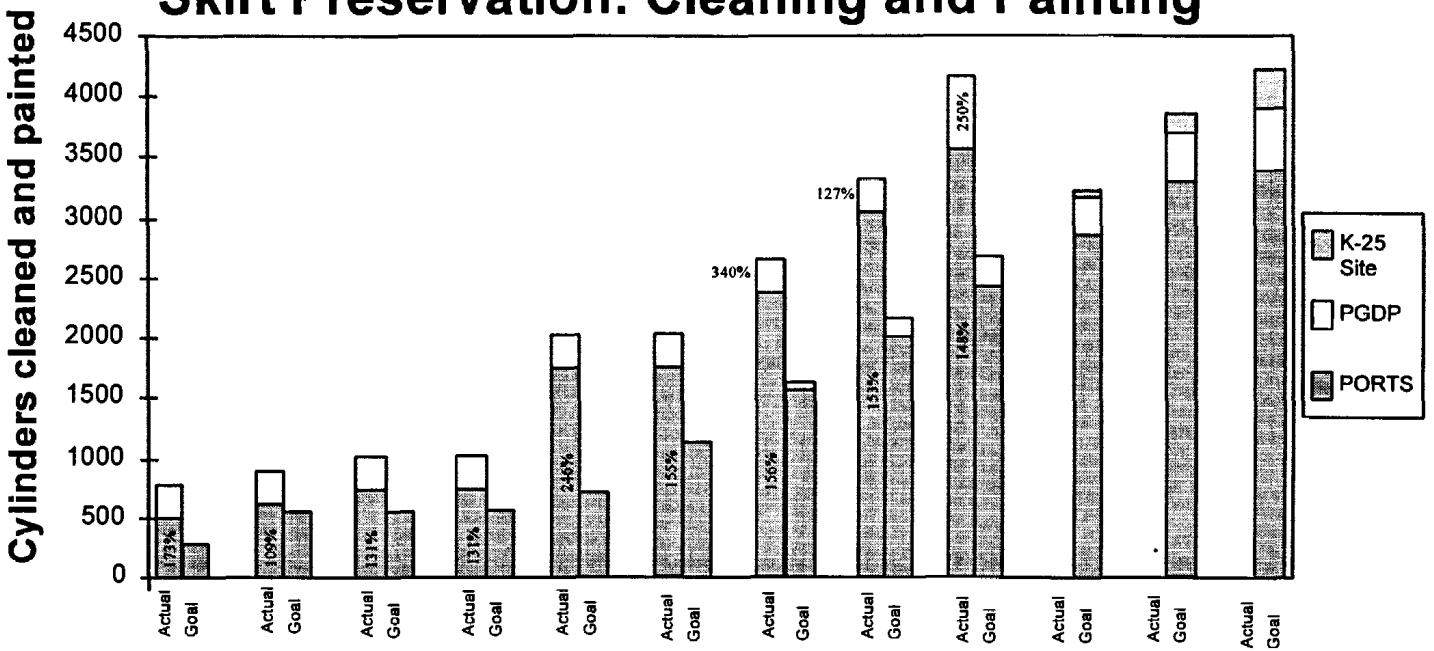
Objective:

Clean and paint 100% of scheduled UF_6 Cylinder Skirts by End of FY96 (9-30-96)

Status:

As of Jul. 1, operations at PGDP and PORTS are ahead of schedule, and this work is 99% complete.

FY 1996
Skirt Preservation: Cleaning and Painting



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	0	0	0	0			
	G	0	0	0	0	0	0	0	0	0	50	150	300
PGDP	A	204	204	204	204	204	204	204	204	599			
	G	0	0	0	0	0	0	60	160	240	320	420	500
PORTS	A	490	617	744	744	1,745	1,745	2,435	3,037	3,555			
	G	283	566	566	566	708	1,123	1,566	1,980	2,404	2,828	3,252	3,400

A = Actual number of skirts cleaned/painted
G = Goal for month (cumulative)

Time (months)

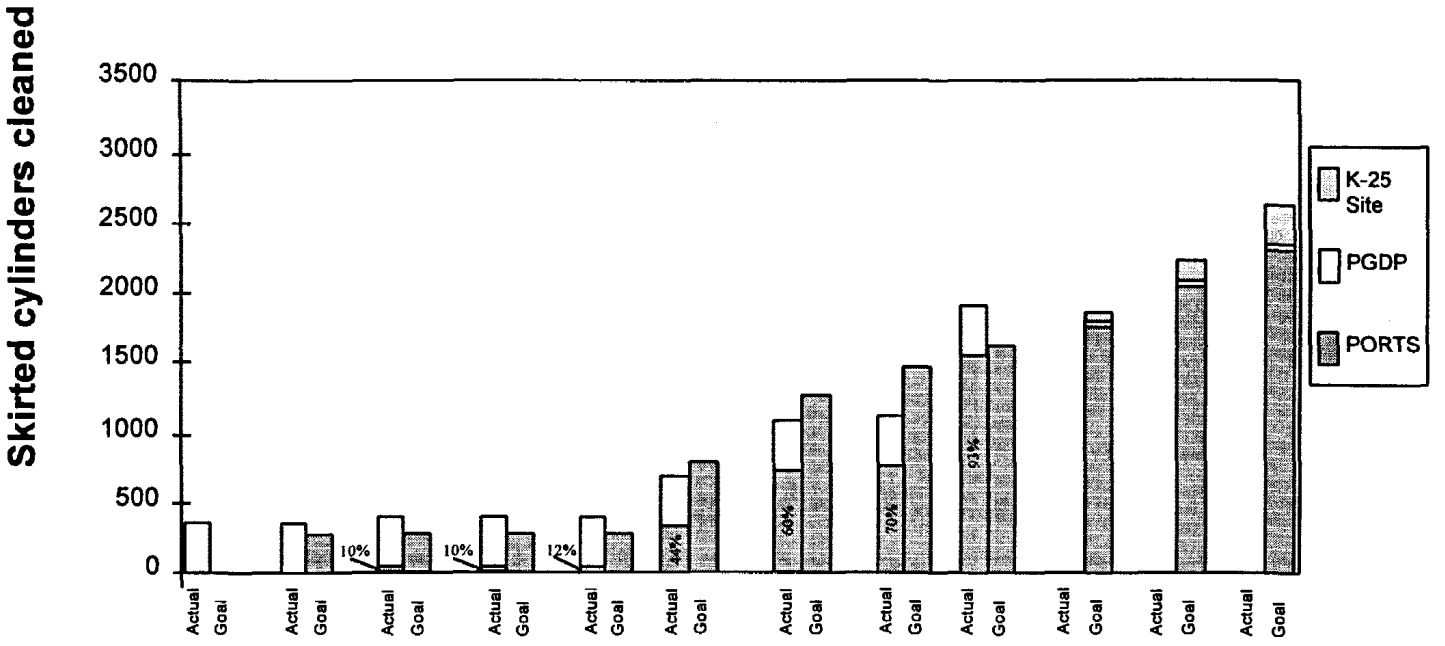
Objective:

Clean
100% of the
skirted cylinders
scheduled
by End of FY96
(9-30-96)

Status:

As of Jul. 1,
PGDP is ahead
of schedule, and
the overall goal
is 75% complete.

FY 1996
Skirted Cylinder Cleaning



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	0	0	0	0			
	G	0	0	0	0	0	0	0	0	0	50	150	300
PGDP	A	362	362	362	362	362	362	362	362	362			
	G	0	0	0	0	0	0	0	0	0	25	25	25
PORTS	A	0	0	25	25	60	300	770	1,028	1,530			
	G	0	240	240	240	240	680	1,281	1,464	1,642	1,830	2,013	2,200

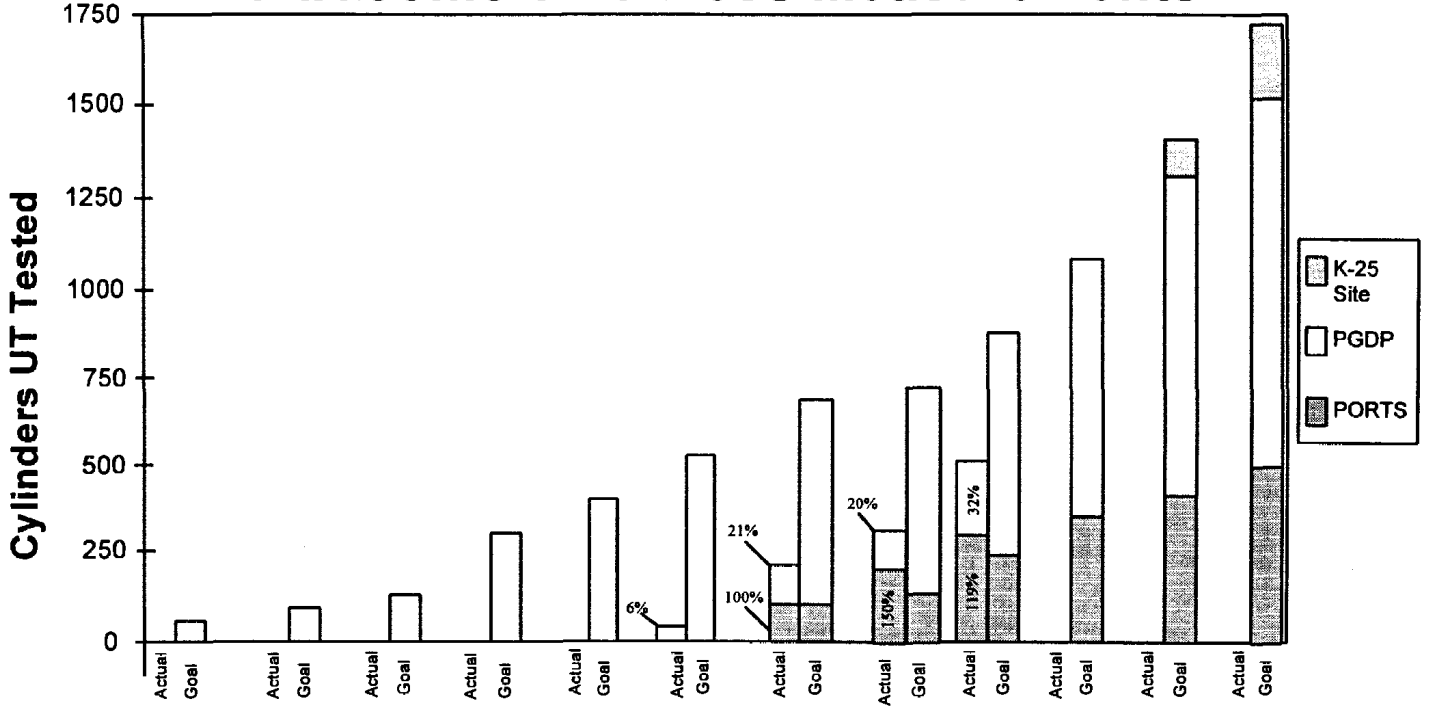
A = Actual number of skirts cleaned
G = Goal for month (cumulative)

Time (months)

Objective:

Ultrasonically measure the wall thickness of 1 in 10 cylinders moved by End of FY96 (9-30-96)

FY 1996
Ultrasonic Thickness Measurements



Site \ Month		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
K-25 Site	A	0	0	0	0	0	0	0	0	0			
	G	0	0	0	0	0	0	0	0	0	0	110	220
PGDP	A	0	0	0	0	0	29	121	121	205			
	G	72	159	234	307	416	508	560	610	650	759	924	1,056
PORTS	A	0	0	0	0	0	0	100	226	297			
	G	0	0	0	0	0	0	100	150	250	350	400	500

A = Actual number of skirts cleaned
G = Goal for month (cumulative)

Time (months)

Status:

As of Jul. 1, PORTS is ahead of schedule, and the overall goal is 28% complete.

APPENDIX G

Preliminary List of Three-Site UF_6 Cylinder Program Records

Record Type	File Point
Three-Site Program	
Systems Engineering documents	K-25 Site Records Center, K-1034
UCLIM User's Guide	K-25 Site Records Center, K-1034
Three-Site UF_6 Cylinder Program Procedures	K-25 Site Environmental Restoration Document Management Center, K-1002
Engineering Development Plan Activity Work Control Structure Form	UF_6 Document Management Center, 55 Jefferson, Room 211C, Oak Ridge
Paducah	
Basis for Interim Operation, Safety Analysis Report	Kevil Facility, Installation Facility Safety Manager's (IFSM)Office
Nuclear Criticality Safety Approvals	PGDP, Nuclear Criticality Safety Manager's Office, C-102-T6
Unreviewed Safety Question Determination	Kevil Facility, IFSM's files
Nuclear Material Control and Accountability Data	PGDP C-302 (NMC&A)/C-710 Library Plant Records
Cylinder inspection and location forms	PGDP C-400/Kevil Facility/PGDP LMES Document Management Center
Equipment checklists	PGDP Site Facilities Management, C-720, C-744
Off-site transport documents	PGDP C-720, Traffic Department
Training Records	Training and Procedures, C-743-T15
Portsmouth	
Basis for Interim Operations, Safety Analysis Report	Records Management Document Center, X-3012

*This list of Program records is not intended to be comprehensive. Additions to the list will be driven by Program implementation.

Preliminary List of
Three-Site UF_6 Cylinder Program Records (cont)

Record Type	File Point
Nuclear Criticality Safety Approvals	Records Management Document Center, X-3012
Unreviewed Safety Question Determinations	EF Operations Files, X-3012
Nuclear Material Control and Accountability Data	Nuclear Material Control and Accountability Department, X-100
Cylinder inspection and location forms	Cylinder Program Manager's Office, X-3012
Equipment checklists, off-site transport documents	Cylinder Yard Supervisor's Files, X-3012
Training Records	UE Plant Training Division Files, Maintenance Storage and Training Building, X-7721
K-25 Site	
Basis for Interim Operation, Safety Analysis Report	Health and Safety Division Document Management Center, K-1001
Nuclear Criticality Safety Approvals	Health and Safety Division, Document Management Center, K-1001
Unreviewed Safety Question Determinations	Health and Safety Division, Document Management Center, K-1001
Nuclear Material Control and Accountability Data	K-25 Site NMC&A Department, K-303-8
Cylinder inspection and location forms	Cylinder Program Manager's files, K-25 Site, K-33
Equipment checklists	Cylinder Program Manager's files, K-25 site, K-33
Off-site transport documents	K-25 Site Transportation Department
Training Records	Training Records Repository, K-1020

"This list of Program records is not intended to be comprehensive. Additions to the list will be driven by Program implementation.