U.S. DEPARTMENT OF ENERGY
CONTRACT AND PROJECT MANAGEMENT

ROOT CAUSE ANALYSIS
CORRECTIVE ACTION PLAN

CORRECTIVE MEASURE 7

IMPROVE DOE OVERSIGHT AND MANAGEMENT OF PROJECTS, CONTRACTS, AND CONTRACTORS

FINAL REPORT

OCTOBER 2010

DRAFT

Executive Summary

Opportunities remain within the U.S. Department of Energy [hereafter referred to as DOE or the Department and inclusive of the National Nuclear Security Administration (NNSA)] for further improvement in the areas of contract and project management. A root cause analysis (RCA) and corresponding corrective action plan (CAP) were completed in 2008 to identify significant contract and project management deficiencies and underlying causes for past challenges. Eight corrective measures were developed and are currently being implemented to make the necessary changes required to improve DOE contract and project management.

This report is directed at identifying opportunities to improve DOE oversight and management of projects, contracts, and contractors with an emphasis on roles, responsibilities and authorities; the Department's organizational structure; integrated program and project prioritization; contractor and federal accountability; and plans, policies, and procedures. Increased DOE management and oversight accountability in contract and project management is an overarching theme in the observations and recommendations section of this report.

The Corrective Measure 7 (CM 7) report was developed through collaboration between the CM 7 team and DOE Headquarters project and contract management professionals. The report identifies: (1) the generally accepted contract and project management practices used in public and private sector organizations; (2) the identification of practices currently used by DOE Program and Support Offices and NNSA; and (3) recommendations to further improve DOE contract and project management practices.

The CM 7 team identified widely used and generally accepted program and project management practices used by public and private sector organizations to successfully manage and oversee contracts and projects. These practices are based on the Project Management Institute's Project Management Body of Knowledge. Nine program and project management areas and associated practices were reviewed and document by the team. The purpose was to use these practices as a basis for assessing the DOE Headquarters program and project management functions. The nine areas are summarized below and discussed in more detail in Section 3.1 of this report.

- **Program/Project Integration**. The processes required to ensure that the various elements of the program and project are properly coordinated. This area includes project plan development, project plan execution, and overall change control.

- **Scope Management**. The processes required to ensure that the program and project includes all the work required, and only the work required, to complete the project successfully. This area includes project initiation, scope planning, scope definition, scope verification, and scope change control.

- **Schedule Management**. The processes required to ensure the timely completion of the project. This area includes activity definition, activity sequencing, activity duration estimating, schedule development, and schedule control.

- **Cost Management**. The processes required to ensure that the program and project is completed within the approved budget. This area includes resource planning, cost estimating, cost budgeting, and cost control.

- **Quality Management**. The processes required to ensure the program and project will satisfy the needs for which it was undertaken. This area includes quality planning, quality assurance, and quality control.

- **Personnel Management**. The processes required to make the most effective use of the people involved with the program and project. This area includes organizational planning, staff acquisition, and team development.

- **Communications**. The processes required to ensure the timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of program and project information. This area includes communications planning, information distribution, performance reporting, and general project administration.

- **Risk Management**. The processes concerned with identifying, analyzing and responding to program and project risks. This area includes risk identification, risk quantification, risk response development, and risk response control.

- **Acquisition Management**. The processes required to acquire goods and services from outside the organization. This area includes acquisition planning, solicitation planning, solicitation, source selection, contract administration, and contract close out.

Several of these effective practices are evident within DOE. Sections 3.2 through 3.6 of this report provide examples where the practices exist within DOE. In certain cases, there is also a lack of visibility of these practices and in these instances it is noted.

In addition to documenting effective practices, the team made a number of positive observations in the Office of Science (SC), the Office of Environmental Management (EM), the Office of Engineering and Construction Management (OECM), the Office of Procurement and Assistance Management (OPAM), and NNSA that represent significant improvements in the areas of contract and project management. These include:

- Continuing senior DOE management dedication and commitment to improving contract and project management, including the Department's follow through on actions from the Root Cause Analysis and Corrective Action Plan, memoranda from the Deputy Secretary of Energy, and ongoing initiatives being made in EM and NNSA.

- Improving its Project Assessment and Reporting System (PARS) to keep leadership aware of project status and to effect appropriate corrective actions in a timely manner.

- Strengthening project management procedures by revising DOE Order 413.3A, Chg 1, Program and Project Management for the Acquisition of Capital Assets, along with revisions or development of 20 associated supporting Guides, including risk management and change control.

- Improving the staffing and associated competencies of Project Management Support Offices (PMSOs) within EM, NNSA, and SC.

- Implementing a new NNSA contracting and acquisition strategy.

- Enhancing the Project Management Career Development Program, the Federal Project Director Certification Program, the Acquisition Career Development Program, and the Acquisition Professional Certification requirements to enhance the training and qualifications of contract and project management personnel.

- Achieving project management professional (PMP) and certified cost engineer (CCE) certifications for OECM personnel, and PMP certifications for EM PMSO personnel.

- Implementing enhanced Independent Project Reviews (IPRs) and Technical IPRs to better monitor project development and execution by leveraging the successful processes employed by SC.

- Expanding the breadth and depth in scope of External Independent Reviews (EIRs), including expanding existing lines of inquiry and adding additional lines of inquiry.

- Enhancing the use of project management tools and techniques, including Technology Readiness Assessments, the Project Definition Rating Index, Risk Registers and Monte Carlo risk analyses, and Earned Value Measurement, for improved management decision-making.

However, despite these positive changes, there are also several areas where further improvement could be realized. Accordingly, in each of these areas, the CM 7 team developed recommendations to address the improvement opportunity. These recommendations are summarized in Table ES–1.

Table ES–1. Summary of Recommendations

Recommendations to Improve Contract and Project Management
1. Maintain a Contract and Project Management Champion at the Highest Level of the Department.
2. Improve and Expand the Use of Deputy Secretary Reviews, Independent Project Reviews, Construction Project Reviews, Peer Reviews, and External Independent Reviews.
3. Increase the Investment in Acquisition and Project Management Career Development Programs and Other Training.
4. Align and Integrate a More Rigorous Identification and Control of Project and Contract Changes
5. Align the Appropriate Authority with the Responsibility of Federal Project Directors and Ensure Accountability for Project Results
6. Document and Communicate the Roles, Responsibilities, and Accountability of Federal Contract, Project, and Program Management Personnel at Headquarters and in the Field
7. Establish and Maintain More Robust Contract and Project Management Communication
8. Continue to Strengthen the Alignment of Project Management Support Offices with Direct Reporting to their Organization's Senior Leadership.
9. Augment Non-Mandatory Guides with Program Minimum Requirements and Permit a Graded Approach to Implementation
10. Develop and Implement a Multi-Year Program Planning, Budgeting, and Execution Process that Integrates Project Prioritization and Optimizes Project Execution.
11. Review and Align Contractor Performance Plans and Fee on a Regular Basis to Incentivize Improved Project Cost and Schedule Baseline Performance

The Department made significant headway to improving contract and project management over the past two years and brought about much needed improvements to DOE's oversight of its contractors and management of its projects, as well as aligning authority, accountability and responsibility for contract and project management. While the Department is developing and issuing an RCA and CAP closure report, this in no way ends the Department's commitment to improving and sustaining its ability to deliver capital asset projects within its scope, cost and schedule commitments. The Department of Energy is resolved to a long-term effort to change its contract and project management culture. As a result, these efforts will extend as the Department transitions from RCA/CAP activities to Contract and Project Management Reform in its pursuit of management excellence.

Contents

Chapter 1
Introduction

The U.S. Department of Energy (DOE) Office of Engineering and Construction Management (OECM) sponsored this study to address the organizational structure and related roles and responsibilities related to some of the organizational shortcomings documented by both the Department and outside organizations that continue to hinder the successful execution of DOE projects on schedule and within budget.

In April 2008 DOE published the *U.S. Department of Energy Contract and Project Management Root Cause Analysis* and then subsequently published the *U.S. Department of Energy Contract and Project Management Root Cause Analysis Corrective Action Plan* in July 2008. The root cause analysis identified the most significant challenges impeding the improvement in contract and project management. One of the most significant issues identified was the Department's organizational structure and inadequate project oversight. Accordingly, the Department established a multi-Program team to develop and implement corrective measures to address the issue.

The report addresses the DOE roles, responsibilities, authorities, and accountabilities of program and project management professionals; documented contract and project management policies, plans, procedures, processes and practices; and the organizational structures of two DOE Program Offices – the Office of Science (SC) and the Office of Environmental Management (EM), the National Nuclear Security Administration (NNSA), and two Support Offices – the Office of Engineering and Construction Management (OECM) and the Office of Procurement and Assistance Management (OPAM).

This report identifies widely accepted industry standard effective program and project management practices, DOE Program Offices, Support Offices, and NNSA practices, and the identification of opportunities for continuous performance improvement in DOE contract and project management.

1.1 BACKGROUND

The DOE capital asset line item and environmental cleanup projects are large, complex, and technically challenging. Many are unique, one-of-a-kind initiatives that involve cutting-edge technology. These projects represent the diverse nature of DOE missions, encompassing energy systems and research, nuclear weapons stewardship, environmental restoration, contaminated and complex facility deactivation and decommissioning, waste management, and basic and applied energy and scientific research activities. Few other government or private sector organizations are challenged by projects of a comparable magnitude, diversity, and complexity. The Department requires highly developed project management capabilities, processes, and procedures to complete these complex projects on

schedule, within budget, and in scope and meet mission need requirements. While the Department has developed and implemented several successful improvements, more challenges remain.

Challenges remaining in contract and project management were identified in the DOE root cause analysis completed in 2008. Three of the top 10 DOE contract and project management issues (numbers 7, 9, and 10) and associated root causes identified include:

- DOE's organizational structure is not optimized for managing projects
  - Competing priorities
  - Lack of prioritization on project management
  - Lack of alignment in authority, accountability, and responsibility
  - Attributes of optimized organizational structure are not understood
- Ineffective DOE project oversight has sometimes resulted in failure to identify project performance issues in a timely manner
  - Inadequate budget and personnel resources
  - Competing and conflicting resource priorities
  - Lack of effective portfolio management
  - Inadequate field oversight
- DOE is not effectively executing its ownership role on some large projects with respect to the oversight and management of contracts and contractors
  - Inconsistent expectations and definition of federal ownership role
  - Lack of personnel with the appropriate skills
  - Limited authority of Federal Project Directors
  - Lack of accountability

Due to the continued existence of these and other challenges identified in the 2008 root cause analysis, DOE contract and project management continues to be included on the Government Accountability Office (GAO) High-Risk List and has been since 1990. However, in 2009, the DOE Office of Science was removed from the GAO High-Risk List. The deficiencies noted in the above mentioned reports include both inadequate management and oversight of contractors and failure to hold contractors accountable. The focus of Corrective Measure 7 (CM 7) is to identify opportunities to improve the management and oversight of contracts and projects. This includes increased accountability that will lead to greater management commitment and improved project performance.

1.2 PURPOSE AND OBJECTIVES

The purpose of the CM 7 is to: clarify Federal project management roles, responsibilities, and authorities, including Field and Headquarters integration; establish effective program and project oversight practices; and align the program and project organizational structures. The result will be to provide DOE senior management with opportunities to improve organizational performance in the areas of contract and project oversight and management.

The primary objectives are to:

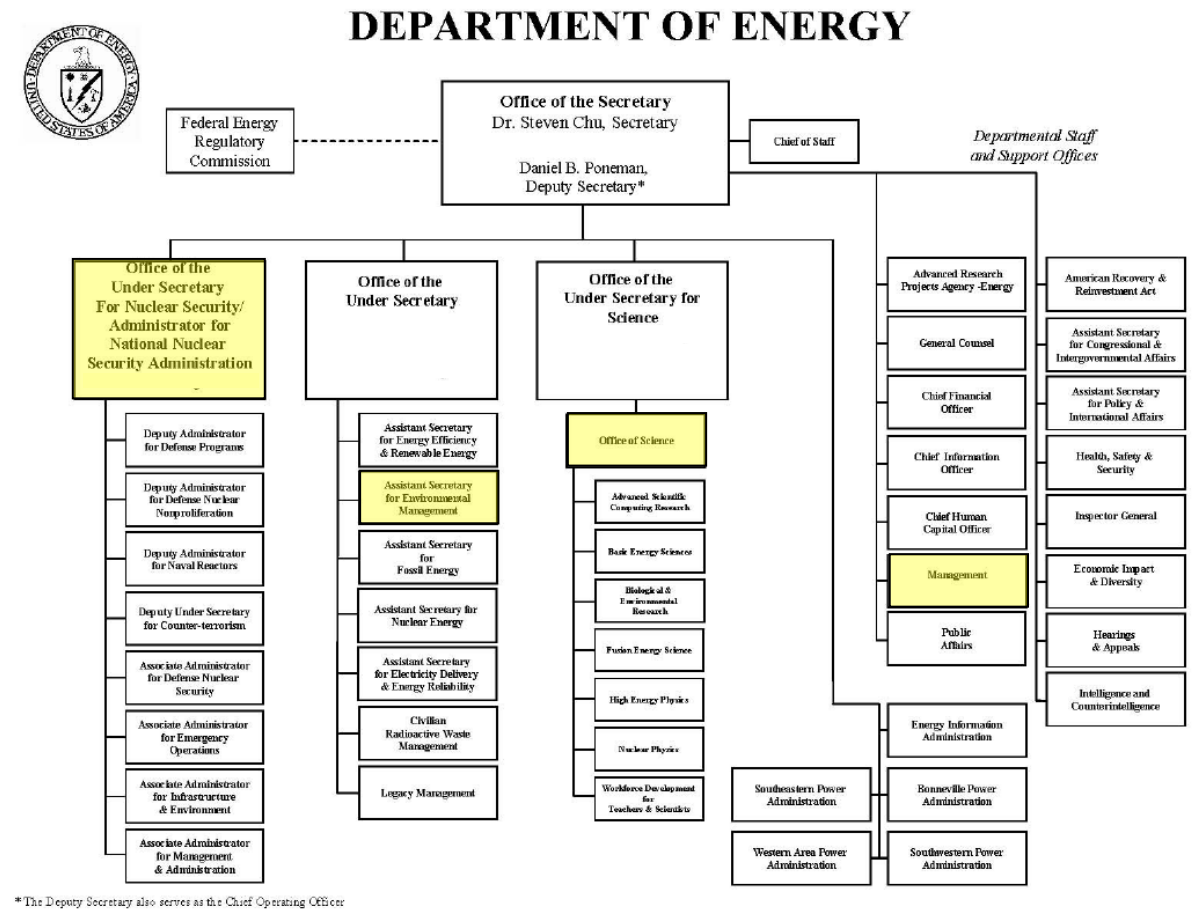
- Document effective contract and project management practices used successfully by public and private sector organizations;
- Recognize the existence of effective practices by DOE organizations; and
- Provide recommendations to further improve DOE contract and project management.

1.3 SCOPE AND LIMITS

The scope of this initiative included the review and analysis of two DOE Program Offices—EM and SC; two Support Offices within the Office of Management—OECM and OPAM, and NNSA. These offices are highlighted in Figure 1-1.

Multiple offices within DOE are responsible for various aspects of contract and project management. The DOE OECM is responsible for establishing Departmental policies and guidance for planning and managing projects. The DOE OPAM and NNSA Office of Acquisition and Supply Management establish policies and guidance for awarding and administering contracts. In addition, each of the eight Departmental Programs have representatives responsible for providing oversight to ensure that contractors are appropriately managing projects to support DOE missions. The Department's two largest Programs—EM and SC, and NNSA—have established and staffed Project Management Support Offices (PMSOs) to provide management and oversight of contractors and projects. These PMSOs coordinate project management efforts within their organizations, provide additional oversight of projects, and conduct independent reviews of individual projects.

Figure 1-1. Department of Energy Organizational Structure



This effort is limited to assessing the contract and project management and organizational structures of Headquarters entities relative to preferred practices as recognized by the Project Management Institute.

1.4 EXPECTED OUTCOMES

Based on the observations and findings from CM 7, the expected outcomes from the recommendations contained in this report are the following:

- Identify the common, success-oriented capabilities and attributes for effective program and project management.
- Improve alignment of DOE contract and project management organizations, including OECM, OPAM, and distributed PMSOs within SC, NNSA, and EM.

- Clarify and document roles, responsibilities, and authorities for contract and project management offices and personnel.
- Acknowledge the distinct DOE organizational contract and project management business models and acceptance that not all Programs need to be exactly the same to deliver successful results.

1.5 REPORT OUTLINE

The following summarizes the organization and content of this report.

- Chapter 1 provides an introduction to the efforts of CM 7 including the background for this initiative and the purpose and objectives.
- Chapter 2 includes a brief description of the CM 7 approach to conduct and implement this corrective measure.
- Chapter 3 summarizes the generally accepted effective contract and project management practices and the recognition of these practices within DOE.
- Chapter 4 includes CM 7 observations and recommendations for improvement.

Chapter 2
Approach

The approach upon which this report is based includes collecting data through document reviews and personnel interviews, analyzing the documentation, summarizing the implementation of contract and project management practices, and recommending opportunities to further improve and facilitate Headquarters functions with regard to effective project execution. Data were gathered to document contract and project management policy, procedures, processes, and practices as it pertains to Headquarters roles, responsibilities, and authorities and organizational alignment. These data were predominantly gathered from the Department's contract and project management offices. The collection of documents was supplemented with interviews of people directly responsible for, and closely familiar with, DOE contract and project management.

2.1 Identify Effective Program and Project Management Practices

There are a number of characteristics that can contribute to successful project management within the DOE environment. These practices are used routinely by both public and private sector organizations to complete projects on schedule and within budget. As such, the CM 7 team identified these effective practices as documented by the Project Management Institute (PMI) in the Project Management Body of Knowledge (PMBOK).

2.2 Collect Data Through Document Reviews and Interviews

Over the years, many external reports and studies have focused on DOE contract and project management challenges. Some of these reports and studies highlighted the root causes of these challenges. The value and importance of past findings and recommendations addressed in previous studies on DOE contract and project management remain applicable. Accordingly, relevant reports authored by the GAO, National Research Council (NRC), and others, as well as internal reviews and reports issued by DOE, were reviewed. The team also collected and reviewed documentation used by DOE Programs to support and oversee contracts and projects executed in the field by Site Office personnel.

The CM 7 team conducted interviews with DOE Headquarters personnel to identify the policies, procedures, plans and processes, and associated documents used to govern contract and project management within their respective organizations. However, the CM 7 team did not interview field personnel. Key documents used by Headquarters offices to oversee and support projects within each

organization were identified. The interview results, along with DOE self assessments, were used to identify DOE Program and Staff/Support Office program and project management practices of as summarized in Sections 3.2 through 3.6 of the report.

2.3 Analyze Data Based on Effective Practices

The effective practices documented were used to identify similar practices used by DOE Programs. The purpose of identifying effective practices within DOE was to establish where DOE has implemented contract and project management effective practices, and identify additional opportunities for contract and project management continuous improvement. The identification of effective practices and the use of these practices by DOE Programs are included in Section 3.0.

2.4 Develop Opportunities For Improvement

Based on the information collected and evaluated, the CM 7 team made observations regarding contract and project management performance within DOE. These observations included positive attributes of program improvements as well as areas where further improvements can be realized. Where opportunities for further improvement have been identified, the CM 7 team developed recommendations, that when implemented, would contribute significantly toward improving the management and oversight of contracts, contractors, and projects and result in improved project performance. These observations and recommendations are documented in Section 4.0 of this report.

Chapter 3
Identification and Application of Effective Practices

In mature public and private sector project management organizations, project management exists in a broader context governed by program management and portfolio management. Organizational strategies and priorities are linked and have relationships between portfolios and programs, and between programs and individual projects. Organizational planning impacts the projects by means of project prioritization based on risk, funding and the organization's strategic plan. Organizational planning can direct the funding and support for individual projects on the basis of risk categories, specific lines of business, or general types of projects. The following discusses the relationship between portfolio, program, and project management. This is important to put the DOE Headquarters structure and associated roles and responsibilities in context to providing support and oversight to project execution activities.

Portfolio Management. Within DOE, as in other public and private sector organizations, portfolio refers to a collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives. Portfolio management refers to the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, or other related work in order to achieve specific strategic business objectives. Portfolio management focuses on ensuring that projects and programs are reviewed to prioritize resource allocation, and that the management of the portfolio is consistent with and aligned to organizational strategies. Portfolio management is primarily a DOE Headquarters function.

Program Management. A program is defined as a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Like portfolio management, program management is predominantly performed by DOE Headquarters. A project may or may not be part of a program; however, a program will always include projects. Program management is defined as the centralized coordinated management of a program to achieve the program's strategic objectives. Within DOE, program management of projects is coordinated by specific Program Offices. Projects within a program are related through the common outcome or collective capability. If the relationship between projects is only that of a shared organization, technology, or resource, the effort should be managed as a portfolio of projects rather than as a program. Program management focuses on project interdependencies and helps determine the optimal approach for managing the projects. Actions related to project interdependencies include: resolving resource constraints and/or conflicts that affect multiple projects within the program; aligning organizational and strategic direction that affects the project and program goals and objectives; and resolving issues and change management within a shared governance structure.

Project Management Office. A project management office (PMO) or in DOE's case a project management support office (PMSO) is an organizational body assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. The responsibilities of the PMSO are to provide project management support functions, including independent project reviews. The specific form, function, and structure of a PMSO are dependent upon the needs of the organization that it supports. A primary function of a PMSO is to support project managers in a variety of ways which include, but are not limited to:

- Collecting, analyzing and disseminating lessons learned and industry best practices;
- Assisting senior management on issues related to project performance and implementation of corrective actions;
- Identifying and developing project management methodology, best practices, and standards;
- Coaching, mentoring, training, and oversight;
- Monitoring compliance with project management standards, policies, procedures, and templates through project audits;
- Developing and managing project policies, procedures, templates, and other shared documentation; and
- Coordinating communication across projects.

Project managers and the PMSO pursue different objectives and, as such, are driven by different requirements. In the Department, the project manager resides with the contractor contracted by DOE to do the work. The Department utilizes a Federal Project Director (FPD) to manage the project. For purposes of our discussion here, the FPD will be referred to as a project manager. All of these efforts, however, should be aligned with the strategic needs of the organization. Differences between the role of project managers and a PMSO may include the following:

- The project manager focuses on the specified project objectives, while the PMSO manages major program scope changes which may be seen as potential opportunities to better achieve organizational strategic business objectives.
- The project manager controls the assigned project resources to best meet project objectives while the PMSO optimizes the use of organizational resources across all projects.
- The project manager manages the constraints (scope, schedule, cost, quality) of individual projects while the PMSO manages methodologies, standards, overall risks/opportunities, and interdependencies among projects at the organizational level.

Role of the Project Manager. The project manager is the person assigned by the performing organization to achieve the project objectives. In DOE this is the Federal Project Director (FPD). The roles and responsibilities of the FPD or project manager are limited to the project and distinct from those of others within the PMSO or organization. Depending on the organizational structure, the project manager may report to a functional manager or in other cases report to a portfolio or program manager. This varies within DOE. Many of the tools and techniques for managing projects are specific to project management. However, understanding and applying the knowledge, tools, and techniques that are recognized as good practices is not sufficient for effective project management. In addition to specific skills and general management proficiencies required for the project, effective project management requires that the project manager possess the following characteristics:

- **Knowledge.** The project manager must possess a depth of knowledge and understanding of project management and the use of proven tools, techniques, templates, and methodologies for effective management.

- **Performance.** The project manager must be able to apply their project management knowledge and translate this knowledge into tangible accomplishments and measurable performance.

- **Personal.** The project manager must possess the personal characteristics to effectively manage a project including general attitude, time management, and leadership qualities. The project manager must be able to guide the project team while achieving project objectives and balancing project constraints.

Program and project management take place in an environment that is broader than that of the project itself. Understanding the broader context helps to ensure the work is carried out in alignment with the goals of the organization and managed in accordance with the established methodologies of the organization. The following section establishes effective program and project management practices.

3.1 EFFECTIVE PROGRAM AND PROJECT MANAGEMENT PRACTICES

The primary purpose of this section is to identify and describe generally accepted effective program and project management practices. Generally accepted means that the knowledge areas and practices described are applicable to most projects most of the time, and that there is widespread consensus about their value and usefulness. Generally accepted does not mean that the knowledge and practices described are or should be applied uniformly on all projects. The program and project management team is ultimately responsible for tailoring and implementing these effective practices based on the size, scope, and complexity of the project.

The CM 7 team reviewed several sources of program and project management best practices. To establish an objective source for evaluation and comparison,

the team selected effective practices based on the Project Management Institute (PMI) Project Management Body of Knowledge (PMBOK)[1].

The following is an overview of the nine program and project management knowledge areas and processes considered when assessing Headquarters support to Field project execution activities.

- **Program/Project Integration.** The processes required to ensure that the various elements of the program and project are properly coordinated. This area includes project plan development, project plan execution, and overall change control.

- **Scope Management.** The processes required to ensure that the program and project includes all the work required, and only the work required, to complete the project successfully. This area includes project initiation, scope planning, scope definition, scope verification, and scope change control.

- **Schedule Management.** The processes required to ensure the timely completion of the project. This area includes activity definition, activity sequencing, activity duration estimating, schedule development, and schedule control.

- **Cost Management.** The processes required to ensure that the program and project is completed within the approved budget. This area includes resource planning, cost estimating, cost budgeting, and cost control.

- **Quality Management.** The processes required to ensure the program and project will satisfy the needs for which it was undertaken. This area includes quality planning, quality assurance, and quality control.

- **Personnel Management.** The processes required to make the most effective use of the people involved with the program and project. This area includes organizational planning, staff acquisition, and team development.

- **Communications.** The processes required to ensure the timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of program and project information. This area includes communications planning, information distribution, performance reporting, and general project administration.

- **Risk Management.** The processes concerned with identifying, analyzing and responding to program and project risks. This area includes risk identification, risk quantification, risk response development, and risk response control.

- **Acquisition Management.** The processes required to acquire goods and services from outside the organization. This area includes acquisition

[1] A Guide to the Project Management Body of Knowledge (PMBOK Guide), Fourth Edition, 2008, Project Management Institute.

planning, solicitation planning, solicitation, source selection, contract administration, and contract close out.

A more detailed summary of each of the nine areas and processes and associated effective practices is included in the matrices in Sections 3.2 through 3.6

The following sections include a summary by DOE organization of the effective use of the processes comprising the nine PMI PMBOK program and project management areas.

3.2 OFFICE OF SCIENCE PRACTICES

The Office of Science (SC) has a well-established set of practices that govern program and project management activities. These practices are becoming more known throughout the Department, and the SC business model and associated practices has been recognized as successful. There are a number of practices such as regular independent project reviews, tailoring, staff competencies, and management commitment and leadership in project management that are being highlighted as examples to be used in other DOE Programs. As a result of the SC use of these practices and the subsequent impact on project performance, the GAO recently removed SC from its High-Risk List.

The following section summarizes the management practices implemented by the SC Program. These practices are aligned by the nine program and project management areas (as defined by the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK).

3.2.1 SC Program/Project Integration

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Program/ Project Integration Practices
1.0	**Program/Project Integration**	
1.1	The organization charter is clearly identified, defined, and understood including a narrative description of the products or services to be delivered by the organization. The charter references the strategic plan or business need, as appropriate.	▪ SC projects have a very clear and concise definition of mission need established at Critical Decision 0. ▪ SC projects have full program support and awareness. For projects with TPC of $20M or greater, all Mission Need Statements are approved by the Program Secretarial Officer. ▪ Mission need Independent Project Reviews are performed for projects greater than $750K. ▪ After the approval of CD-0 by the Acquisition Executive, an alternative analysis is performed to select an alternative and begin the associated conceptual design.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Program/ Project Integration Practices
1.2 A project management plan is established that documents the necessary actions to define, prepare, integrate, and coordinate all subsidiary plans. The project management plan defines how the project is executed, monitored and controlled, and closed.	▪ Project execution plans (PEPs) are developed and updated in accordance with established policy and used as an effective management tool.
1.3 The program office and project director are actively involved in management and oversight of performance of the planned project activities, and provides oversight of the various technical and organizational interfaces.	▪ The SC HQ Program Offices, Federal Project Directors (FPDs), and M&O contractor at the sites are actively involved in the management and oversight of projects, including weekly calls and monthly project "watch list" meetings. ▪ After CD-0, project status data are available in Project Assessment and Reporting Systems (PARS). Quarterly Project Reviews are also initiated after CD-0 approval. ▪ SC maintains an effective web site that provides project documents/procedures, review dates, and other project related resources.
1.4 Project work is prioritized and closely monitored and controlled through regular tracking, reviewing and regulating progress to meet the performance objectives defined in the project management plan.	▪ SC and the project team conduct regular project reviews that include technical, cost, schedule, and management components. ▪ The SC HQ Program Offices, Federal Project Directors (FPDs), and M&O contractor at the sites are actively involved in the management and oversight of projects including weekly calls, distribution of monthly progress reports, and monthly project "watch list" meetings, ▪ Key project data, with an emphasis on earned value reporting, are input into the PARS by SC Federal Project Directors monthly. ▪ PARS data are reviewed by all levels of SC staff monthly. ▪ Immediate action is taken by appropriate levels of SC management to address performance issues identified in PARS. ▪ External Project Advisory Committees-Within SC, projects also typically utilize Advisory Committees, which include members with experience in the planning, construction, management, use, and operations of major facilities. The Advisory Committee reviews the progress of the project and advises the Laboratory Director and Associate Laboratory Director on matters involving construction planning, project management, technical performance, and safety issues that can impact project performance, cost, and schedule goals. ▪ Quarterly Project Reviews also initiated after CD-0 approval. ▪ SC project performance has been excellent since PARS reporting began in February 2002.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Program/ Project Integration Practices
1.5	Integrated change control is established, documented, and performed from project inception through completion. This includes reviewing all change requests, approving changes and managing changes to deliverables, organizational assets, project documents and the project management plan.	▪ The DOE baseline and contract change control processes are known, understood, and followed to ensure changes are incorporated in accordance with established protocol. ▪ Guidance is available on the SC PMSO website.
1.6	The project is closed when all activities are finalized. The program office and project director review all prior information from previous phase closures to ensure that all project work is complete and that the project has met its objectives.	▪ SC personnel verify key performance parameters or completion criteria have been achieved prior to project completion or approval for the start of operations. ▪ The project transition/closeout plan is reviewed and approved. ▪ Final administrative and financial closeout activities are performed. ▪ A final closeout report is developed.

3.2.2 SC Scope Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Scope Management Practices
2.0	**Scope Management**	
2.1	Requirements are collected and clearly documented including stakeholder needs to meet project objectives. The requirements include the quantified and documented needs and expectations of the sponsor, customer and other stakeholders. These requirements are elicited, analyzed, and recorded in enough detail to be measured once project execution begins.	▪ SC program offices have Advisory Committees consisting of members from the universities, laboratories, and private industry who provide input and develop reports on science needs and priorities at the national level. ▪ The Project Execution Plan (PEP) documents key project performance parameters. Scope is managed and modified as required to meet the mission requirements and budget constraints.
2.2	A detailed description of the project and product is established and documented. The detailed project scope description builds upon the major deliverables, assumptions, and constraints that are documented during project initiation. The project scope is defined and analyzed for completeness and additional risks, assumptions and constraints are included as necessary.	▪ SC PEPs clearly document project scope and major deliverables. ▪ Design documents contain detailed specifications and requirements for the project. Design reviews are performed prior to CD-1, 2, and 3. ▪ Project WBS and the WBS dictionary also describe and document project scope.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Scope Management Practices
2.3 Project deliverables and project work is subdivided into smaller, more manageable components and organized in a work breakdown structure. The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables and each descending level represents an increasingly detailed definition of the project work. The WBS organizes and defines the total scope of the project and represents the work specified in the current approved project scope statement.	▪ SC projects follow effective project management practices including establishing a WBS and WBS dictionary to develop, integrate, and manage scope, schedule, and cost performance.
2.4 Scope is verified and represents formal acceptance of completed project deliverables. Scope verification includes reviewing deliverables with the customer and sponsor to ensure the deliverables are completed satisfactorily and obtaining formal acceptance of deliverables by the customer or sponsor.	▪ SC program and project personnel manage scope to ensure that deliverables meet project requirements and performance expectations. ▪ SC performs a final project acceptance review prior to approval of CD-4, Project Completion.
2.5 Project scope is monitored and controlled and scope changes are managed in accordance with the scope baseline. Project scope is controlled and all requested changes and recommended corrective or preventative actions are processed through an integrated change control process.	▪ Changes to SC project scope are kept to a minimum. When scope changes are necessary, the changes are reviewed and approved by SC program and project personnel to manage to and maintain scope baselines.

3.2.3 SC Schedule Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Schedule Management Practices
3.0 Schedule Management	
3.1 Activities are defined by identifying the specific actions to be performed to produce the project deliverables.	▪ SC projects include the specific actions to be performed to produce project deliverables. These are defined in the WBS dictionary, which is integrated with the resource-loaded schedule (RLS). ▪ The PEP also identifies major milestones. ▪ SC projects have clear design documents that include technical specifications and requirements.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Schedule Management Practices
3.2	Discrete activities are sequenced by identifying and documenting relationships among other project activities. Activities are sequenced using logical relationships and each activity and milestone except for the first and last are connected to at least one predecessor and one successor.	▪ SC project schedules clearly identify the sequencing and relationships of activities.
3.3	Activity resources are estimated by the type and quantities of material, people, equipment, or supplies required to perform discrete activities.	▪ The activity resources (labor and non-labor) to perform SC project activities are clearly estimated, documented, and included in the RLS. ▪ Basis of estimate document also include this data.
3.4	The project schedule is developed by analyzing activity sequences, durations, resource requirements, and schedule constraints. The project schedule clearly identifies the planned start and finish dates for project activities and milestones. A realistic project schedule is revised and maintained throughout the project as work progresses, the project management plan changes, and the nature of risk events evolve.	▪ SC projects have a RLS at detailed WBS levels that are logically tied with clearly identified start and finish dates. The schedule is continually updated to reflect project progress and changes to the future work.
3.5	Schedule control is maintained by monitoring project performance and updating the schedule based current status and progress. Schedule changes are managed through an integrated change control process to maintain the schedule baseline.	▪ SC program and project personnel regularly monitor and measure schedule performance using earned value management (EVM) to maintain the schedule baseline. ▪ The PEP identifies the schedule change control thresholds. ▪ Any changes implemented through a change control process are recorded in the change control log.

3.2.4 SC Cost Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Cost Management Practices
4.0	**Cost Management**	
4.1	Costs are estimated in an accurate manner including development of the approximate monetary resources needed to complete project activities. Monetary resource estimates include the identification and consideration of cost alternatives to initiate and complete the project. Costs are estimated for all resources that will be charged to the project including labor, materials, equipment, services, and facilities, as well as special categories such as inflation analysis or contingency costs.	▪ SC costs (labor, material, equipment, and subcontract) are estimated in an accurate manner using various sources including vendor quotes, catalog items, expert judgment, and historical data. ▪ Typically, costs are estimated based on a funding profile provided by HQ. Both the cost estimate and the funding profiles are baselined at CD-2. ▪ SC projects include an accurate estimate of the monetary resources required to execute the project. ▪ SC employs a design-to-cost approach and maintains cost by managing flexibility in scope.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Cost Management Practices
4.2	A realistic budget is developed and aligned by aggregating the estimated costs of individual activities or work packages for projects to establish an authorized cost baseline.	▪ For SC, budget is developed at HQ for a majority of SC projects and cost estimates are developed based on the funding profile provided. Both the cost estimate and the funding profile are baselined at CD-2. ▪ The aggregate estimated cost of all activities represents the entire project budget (total project cost, including contingency) and is defined as the cost baseline.
4.3	Costs are controlled by actively monitoring the status and performance of the project and used to update the project budget and manage changes to the cost baseline. Updates to the project budget include recording actual costs spent to date. Increases to authorized budget are approved through integrated change control. The relationship between the consumption of project funds to the physical work being accomplished is analyzed. Effective cost control is managed through the approved cost performance baseline and changes to the baseline.	▪ The cost baseline is closely monitored by SC program and project personnel using EVM. ▪ Any changes implemented through a change control process are recorded in the change control log.

3.2.5 SC Quality Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Quality Management Practices
5.0	**Quality Management**	
5.1	Quality planning is performed and includes identifying quality requirements and standards for the project and products and documenting how the project will demonstrate compliance. Quality planning is performed in parallel with other project planning processes such as scope definition, schedule and resource estimate development, and risk identification and analysis.	▪ SC project quality starts with up front planning at project inception and continues through the project lifecycle. Quality planning is embedded in the SC projects quality assurance program and is consistent with DOE Orders.
5.2	Quality assurance is performed and includes the auditing of quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used.	▪ Quality requirements are established and audited as appropriate to ensure quality assurance is maintained throughout all SC project phases.
5.3	Quality control is performed and includes monitoring and recording results of executing quality activities to assess performance and recommend necessary changes.	▪ SC program and project personnel monitor the contractor's control of quality. Independent review of quality control actions are conducted on a periodic basis.

3.2.6 SC Personnel Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Personnel Management Practices
6.0	**Personnel Management**	
6.1	A personnel management plan is developed including the identification and documentation of roles, responsibilities, and required skills, reporting relationships and staffing plan. The human resource plan includes the organization, training needs, recognition and rewards program, and the impact of staffing on the organization.	▪ The roles and responsibilities for SC project personnel are clearly understood and practiced. ▪ Within a project, an Integrated Project Team (IPT) is established. The PEP and/or the IPT Charter document the roles and responsibilities of the project team. ▪ SC and SC Federal Project Directors (FPDs) participate in the PMCDP that develops and certifies FPDs. ▪ SC proactively engages in the PMCDP process to ensure most experienced and qualified SC FPDs are certified. ▪ SC has developed and implemented an effective project management decision/approval matrix, which clearly delineates who has decision/approval authority for critical decisions, baseline management and reviews depending upon the total project costs. ▪ Personnel competencies are constantly evaluated through the personnel evaluation process. Personnel are assigned to positions based on possessing the required competencies and experience.
6.2	The organization is assembled and structured to complete the defined requirements. The organization includes the adequate number of personnel with the required competencies to effectively complete specific requirements.	▪ The SC organization, as well as the project team, is streamlined to provide effective management and oversight of programs and projects including having clearly defined roles, responsibilities, and accountabilities. ▪ For each project, there is involvement from all levels of the SC Program. The roles, responsibilities, and accountabilities are clearly documented in the PEP and/or the IPT Charter. ▪ SC FPDs are engaged in SC and DOE corporate project management initiatives. ▪ SC proactively works to ensure the experience and qualifications of FPDs and contractor project managers are appropriate. ▪ DOE/SC Reviews (“Lehman” Reviews) evaluate the capability, experience, qualification, and effectiveness of the project team.
6.3	Organizational development is ongoing and results in continuous improvement including improving competencies, team interaction, and the overall team environment improving project performance	▪ The SC Office of Project Assessment, while structured under the Deputy Director for Science Programs, has a direct line access to SC Director, as well as Site Managers and FPDs. ▪ The working relationship at all levels is collaborative and effective and results in continuous performance improvement.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Personnel Management Practices
6.4	Organizational management is effective including tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance. Team behavior is observed, conflict managed, issues resolved, and staffing adjusted as necessary.	▪ SC personnel evaluations are conducted on a regular formal and informal basis. ▪ Evaluations are candid and direct, and changes are made where and when required. ▪ SC personnel management is one of the significant strengths in terms of the quality and competencies of personnel assigned to manage projects.

3.2.7 SC Communication

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Communication Practices
7.0	**Communication**	
7.1	Stakeholders are identified including all personnel impacted by the project and relevant information regarding stakeholder interests, involvement, and impact are documented.	▪ All SC programs have an Advisory Committee consisting of members from universities, National laboratories, and private industry who provides input and develops reports on science needs and priorities at the national level. These Advisory Committees typically meets two to three times per year. ▪ The final users of the facilities, equipment, and systems meet with the project team regularly, and are involved throughout all phases of the project. ▪ SC project stakeholders are clearly established as part of the project development phase and communication is maintained throughout all projects phases.
7.2	Communications are planned including determining stakeholder information needs and defining an effective communications approach.	▪ Periodic calls and meetings are conducted among SC program and project personnel to communicate time sensitive information.
7.3	Relevant information is distributed and made available to project stakeholders as planned. The distribution of information is conducted in a timely manner and is performed throughout the entire project lifecycle.	▪ SC project information is communicated to site and HQ stakeholders in a timely and effective manner through weekly or monthly calls, distribution of monthly reports, PARS updates, QPRs, and other forms of communication throughout all the project phases
7.4	Stakeholder expectations are actively managed including ensuring their needs are met and issues are addresses as they occur. Management of stakeholder expectations includes clear and concise communication activities directed toward project stakeholders to influence their expectations, address concerns, and resolve issues.	▪ Regular communication is established and maintained between SC and OECM as well as other DOE project management support offices, as necessary. ▪ SC Advisory Committees meet approximately two to three times per year and are briefed of SC activities during the advisory committee meetings. ▪ The final users of the facilities, equipment, and systems meet with the project team regularly, and are involved in the project from initiation to completion.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Communication Practices
7.5 Performance is reported including the collection and distribution of performance information such as status reports, progress measurements, and forecasts. Performance reporting includes the periodic collection and analysis of planned versus actual project data and results in the timely communication of project progress and performance and the forecast of project results.	▪ Key project data, with an emphasis on earned value reporting, are input into the PARS by the SC FPD monthly. ▪ PARS data are reviewed by all levels of SC staff and management monthly. ▪ Monthly project reports are available for the interested parties. ▪ SC performs QPRs throughout all phases of the project. ▪ Corrective action is identified and taken by appropriate levels of SC management to address performance issues identified in PARS. ▪ SC project performance has been excellent since PARS reporting began in February 2002. ▪ Weekly project calls and monthly project "watch list" meetings are conducted for all SC projects between HQ program and field personnel.

3.2.8 SC Risk Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Risk Management Practices
8.0 Risk Management	
8.1 Risk management planning is conducted and includes the definition of specific risk management activities that are to be performed. Risk management planning includes the degree, type and visibility of risk management commensurate with both the risks and the importance of the project to the organization.	▪ Risk management is an essential element of all SC projects. SC risk management is structured, forward looking, analytical, informative, and continuous.
8.2 Risks are identified and their characteristics are accurately documented. A risk register is established, maintained, and updated throughout the project lifecycle.	▪ Comprehensive and realistic risk registers that includes due dates, responsible parties, risk mitigation approach, risk quantification, risk ranking, and other risk data are compiled for all SC projects. The risk registry is updated continuously throughout the project. ▪ SC projects are characterized by a comprehensive assessment of risks early in the project development phase and a constant management and understanding of the risks as the project evolves.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Risk Management Practices
8.3	Qualitative risk analyses are performed including risk prioritization, and assessing the probability and occurrence and impact associated with identified risks. Risk priorities are assessed using the relative probability or likelihood of occurrence and the corresponding impact on project objectives if the risks occur.	▪ Qualitative risk assessments are started early in the SC project lifecycle and include critical technical, performance, schedule, and cost risks.
8.4	Quantitative risk analyses are performed including numerically analyzing the effect of identified risks on overall project objectives.	▪ Quantitative schedule and cost risk analyses are also performed on SC projects.
8.5	Timely and effective responses to identified risks are planned, including the development of options and specific actions to reduce threats to project objectives. Planned risk responses include identification and assignment of risk response owners who are responsible each agreed to and funded risk response. Risk responses are prioritized and the appropriate resources and activities are included into the budget, schedule and project management plan as needed.	▪ Risk mitigation strategies and actions that identify the responsible individual, when the risk is likely to occur, how the risk is to be handled, risk ranking, and remaining risk are developed, documented, and implemented for identified SC project risks.
8.6	Risks are monitored and controlled including the implementation of risk response plans, tracking of identified risks, monitoring of residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.	▪ SC program and project personnel regularly review risk registers and the effectiveness of mitigation actions to ensure risks are updated and actively managed. ▪ Risk reviews are monthly or quarterly depending on the project and significance of the risk.

3.2.9 SC Acquisition Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of SC Acquisition Management Practices
9.0	**Acquisition Management**	
9.1	Procurements are planned in a timely and effective manner including documenting the project purchasing decisions, specifying the approach, and identifying potential suppliers. The procurement plan identifies the project needs which can best be, or must be, met by acquiring products, services or results outside the project organization.	▪ SC utilizes its Management and Operations (M&O) contractor to execute its projects. SC has policies on procurement approvals and approval thresholds. SC does not execute the projects directly. ▪ Procurement actions and milestones are included in the project schedule.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of SC Acquisition Management Practices
9.2 Procurements are conducted in accordance with documented acquisition processes in a timely and cost effective manner. Detailed evaluations are conducted based on a specific and comprehensive requirements document requested from suppliers.	▪ SC procurements adhere to and follow established guidelines, including DOE Orders, Policy, and associated Guides. ▪ The Federal staff develops an Acquisition Strategy, which documents the high-level acquisition approach for the project.
9.3 Procurements are administered and include monitoring contract performance, making contract changes and corrections as needed, and ensuring that contractual obligations and legal rights are protected.	▪ SC utilizes an M&O contractor to execute its projects. SC has policies on procurement thresholds and approvals. SC does not execute the projects directly. ▪ Procurement actions and milestones are included in the project schedule that allows tracking of procurement status and performance.
9.4 Procurements are closed in a timely manner upon verification that all work was completed and deliverables are acceptable. Procurement closure includes administrative activities such as finalizing open claims, updating records to reflect final results, and archiving information for future use.	▪ Procurements are closed upon completion of deliverables by the M&O contractor and acceptance and verification by SC.

3.3 NATIONAL NUCLEAR SECURITY ADMINISTRATION PRACTICES

The NNSA, as a subordinate organization within the DOE, has a well-established set of directives and associated practices that address headquarters contract and project management as it pertains to supporting field operations at its eight sites. Additionally, NNSA-specific directives, business operating policies, and associated guides and manuals exist to supplement the DOE directives. Significant among these actions is NNSA's *Line Oversight and Contractor Assurance System (LOCAS) Supplemental Directive* (NA-1 SD 226.1A), which is a manual for achieving a management system that fosters mission performance and operational excellence. Another similarly significant initiative is NNSA's *Establishment of an Independent Cost Estimate (ICE) Policy* (BOP 50.005) and the accompanying *Cost Estimating Guide* (Guide 50.005). The BOP defines roles and responsibilities for performing independent cost estimating on NNSA capital asset projects having an estimated total project cost equal to or greater than $20 million; the Guide serves to provide information on preparing cost estimates specific to all NNSA initiatives to help ensure consistent application of best practices.

NNSA recently announced its new contracting and acquisition strategy. Central to this strategy is combining into one (solicitation and) procurement the M&O contract for both the Pantex Plant and the Y-12 National Security Complex, and including an option for the potential phase-in of Tritium Operations performed at the Savannah River Site. In addition, NNSA plans to competitively award a new Integration, Management, and Execution (IME) Construction Management Con-

tract. The IME initiative is key to improving construction management—avoiding schedule creep and cost overruns that have plagued NNSA's capital asset acquisition projects. This will be accomplished to a great extent by relieving the M&O contractors at all NNSA laboratories and defense-related production sites of construction project management, thereby allowing them to focus on their principal duties associated with the nuclear security enterprise. Project planning and execution efforts will be performed by the IME contractor with the experience to execute project design and construction more effectively and efficiently than the M&O contractors.

The following sections summarize the contract and project management practices governing NNSA headquarters offices in support of field operations at its eight sites relative to effective practices derived from PMBOK.

3.3.1 NNSA Program/Project Integration

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Program/ Project Integration Practices
1.0	**Program/Project Integration**	
1.1	The organization charter is clearly identified, defined, and understood including a narrative description of the products or services to be delivered by the organization. The charter references the strategic plan or business need, as appropriate.	▪ Program charters are established with the NNSA Act, are held by NA-60, and are published on the NNSA external website, describing national management, radiological emergency, transportation, and other missions supporting nuclear weapons stewardship and other national security interests. ▪ Project charters are defined in PEPs.
1.2	A project management plan is established that documents the necessary actions to define, prepare, integrate, and coordinate all subsidiary plans. The project management plan defines how the project is executed, monitored and controlled, and closed.	▪ On an M&O contract, the PEP satisfies the requirements for a PMP; on a non-M&O contract, the PEP integrates all the contractor's PMPs. ▪ PEPs are prepared by the FPD and IPT for each project. ▪ Program office personnel provide independent review of PEPs, risk management plans (RMPs), acquisition strategies/plans, mission need statements, and other project management documents. (NA-54 statement of functions/project support services).
1.3	The program office and project director are actively involved in management and oversight of performance of the planned project activities, and provides oversight of the various technical and organizational interfaces.	▪ The Program Office and FPDs are actively involved in the daily management of project activities. ▪ Oversight reviews are performed by the headquarters program office personnel consistent with DOE directives. ▪ Independent and/or technical independent project reviews (IPRs and T-IPRs) are performed in accordance with business operating policy and associated procedures.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Program/ Project Integration Practices
1.4	Project work is prioritized and closely monitored and controlled through regular tracking, reviewing and regulating progress to meet the performance objectives defined in the project management plan.	▪ Projects report monthly into PARS. ▪ QPRs are held with the responsible AE or Program Manager. ▪ Monthly briefings are held with NA-1 to review projects assessed by NA-54: scored as "red" if unlikely to achieve the performance baseline; scored "yellow" if meeting the performance baseline is at risk; and "green" if meeting the performance baseline is likely. ▪ Monthly Project Status Snapshots reports are prepared for senior management. ▪ Project data sheets are updated annually and reviewed by program management personnel.
1.5	Integrated change control is established, documented, and performed from project inception through completion. This includes reviewing all change requests, approving changes and managing changes to deliverables, organizational assets, project documents and the project management plan.	▪ Project baselines are established at CD-2, and performance against the baseline is monitored monthly. ▪ Changes to the baseline are defined in DOE O 413.3A and are managed through a formal baseline and contract change control processes established for each project, which is typically documented in the PEPs. ▪ IPRs and/or T-IPRs are performed by headquarters program office personnel. (DOE O 413.3A, BOP 50.003).
1.6	The project is closed when all activities are finalized. The program office and project director review all prior information from previous phase closures to ensure that all project work is complete and that the project has met its objectives.	▪ Following approval of CD-4, a final project closeout report is prepared once all project costs are incurred and invoiced, and all contracts are closed (DOE O 413.3A).

3.3.2 NNSA Scope Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Scope Management Practices
2.0	**Scope Management**	
2.1	Requirements are collected and clearly documented including stakeholder needs to meet project objectives. The requirements include the quantified and documented needs and expectations of the sponsor, customer and other stakeholders. These requirements are elicited, analyzed, and recorded in enough detail to be measured once project execution begins.	▪ A formal process is established within the CD process (DOE O 413.3A) for documenting project mission needs and reviewing such in relation to program requirements. ▪ Mission Needs Statements and Program Requirements Documents (PRDs) are prepared at CD-0.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of NNSA Scope Management Practices
2.2 A detailed description of the project and product is established and documented. The detailed project scope description builds upon the major deliverables, assumptions, and constraints that are documented during project initiation. The project scope is defined and analyzed for completeness and additional risks, assumptions and constraints are included as necessary.	▪ Project mission need, PRDs, updated PEPs, updated acquisition strategies, and updated RMPs are documented and reviewed. ▪ A comprehensive and integrated work breakdown structure (WBS) is established for all projects. ▪ Design is commenced and associated activities are clearly documented. ▪ PRDs established at headquarters are used to drive project requirements.
2.3 Project deliverables and project work is subdivided into smaller, more manageable components and organized in a work breakdown structure. The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables and each descending level represents an increasingly detailed definition of the project work. The WBS organizes and defines the total scope of the project and represents the work specified in the current approved project scope statement.	▪ Projects are developed and defined within the WBS and WBS Data Dictionary established for each project ▪ Project costs and (resource loaded) schedule are developed using the defined WBS.
2.4 Scope is verified and represents formal acceptance of completed project deliverables. Scope verification includes reviewing deliverables with the customer and sponsor to ensure the deliverables are completed satisfactorily and obtaining formal acceptance of deliverables by the customer or sponsor.	▪ Project scope is reviewed and verified in accordance with applicable DOE Orders. ▪ IPRs or EIRs are performed to validate scope consistent with the PEP.
2.5 Project scope is monitored and controlled and scope changes are managed in accordance with the scope baseline. Project scope is controlled and all requested changes and recommended corrective or preventative actions are processed through an integrated change control process.	▪ The process for scope change control is contained in the PEP. ▪ Project scope changes are monitored and managed through documented NNSA and DOE and processes and associated procedures in accordance with DOE directives. ▪ Changes in project scope subject to approval by the Deputy Secretary are validated by EIRs performed by OECM. ▪ Project scope is controlled and maintained through a documented configuration management plan and process.

3.3.3 NNSA Schedule Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Schedule Management Practices
3.0	**Schedule Management**	
3.1	Activities are defined by identifying the specific actions to be performed to produce the project deliverables.	▪ A detailed WBS, data dictionary, and associated RLS with milestones, are prepared.
3.2	Discrete activities are sequenced by identifying and documenting relationships among other project activities. Activities are sequenced using logical relationships and each activity and milestone except for the first and last are connected to at least one predecessor and one successor.	▪ Activities are sequenced in the detailed project schedule using predecessor/successor logic ties. ▪ A critical path schedule and a project master schedule are developed and maintained in accordance with DOE O 413.3A, Attachment 1. ▪ Project schedules are subject to review during IPRs or EIRs. ▪ A detailed WBS and associated RLS with milestones are prepared.
3.3	Activity resources are estimated by the type and quantities of material, people, equipment, or supplies required to perform discrete activities.	▪ A detailed project cost estimate and associated basis are prepared.
3.4	The project schedule is developed by analyzing activity sequences, durations, resource requirements, and schedule constraints. The project schedule clearly identifies the planned start and finish dates for project activities and milestones. A realistic project schedule is revised and maintained throughout the project as work progresses, the project management plan changes, and the nature of risk events evolve.	▪ A detailed WBS and associated RLS with milestones are prepared.
3.5	Schedule control is maintained by monitoring project performance and updating the schedule based current status and progress. Schedule changes are managed through an integrated change control process to maintain the schedule baseline.	▪ Self assessments, IPRs by the program office, and other types of external independent reviews by other DOE (i.e., non-NNSA) organizations (e.g., OECM, CFO) are performed to monitor and validate project schedule and cost realism against the schedule. ▪ IPTs are responsible for weekly and monthly monitoring of schedule. ▪ Once a project achieves CD-2, earned value performance against the schedule baseline is reported monthly in PARS.

3.3.4 NNSA Cost Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Cost Management Practices
4.0	**Cost Management**	
4.1	Costs are estimated in an accurate manner including development of the approximate monetary resources needed to complete project activities. Monetary resource estimates include the identification and consideration of cost alternatives to initiate and complete the project. Costs are estimated for all resources that will be charged to the project including labor, materials, equipment, services, and facilities, as well as special categories such as inflation analysis or contingency costs.	▪ NNSA business operating policy and associated procedures and guides are formally established for preparing independent cost estimates. ▪ Line Oversight and Contractor Assurance System (LOCAS) drives mission performance and operational excellence. LOCAS requires the implementation of effective contractor self-assurance systems, coupled with focused Federal oversight. LOCAS fosters efficient use of personnel and budgets.
4.2	A realistic budget is developed and aligned by aggregating the estimated costs of individual activities or work packages for projects to establish an authorized cost baseline.	▪ Business operating policy and associated procedures are used to ensure that NNSA achieves and articulates results by establishing clear, concise, meaningful, and measurable performance baselines, and by conducting credible reviews to compare results against these baselines. ▪ Processes exist, are documented, and are followed to ensure the quality of budget submissions and that they are within the framework of the NNSA Planning, Programming, Budgeting, and Evaluation (PPBE) process.
4.3	Costs are controlled by actively monitoring the status and performance of the project and used to update the project budget and manage changes to the cost baseline. Updates to the project budget include recording actual costs spent to date. Increases to authorized budget are approved through integrated change control. The relationship between the consumption of project funds to the physical work being accomplished is analyzed. Effective cost control is managed through the approved cost performance baseline and changes to the baseline.	▪ FPDs receive a contractor monthly report, allowing active monitoring of the project status. Acquisition executives participate in quarterly status meetings. ▪ Baseline cost performance is monitored through implementation of DOE directives for capital asset acquisition and management. ▪ For projects greater than $20 million that have achieved CD-2, monthly earned value data are reported in PARS. ▪ NNSA-specific business operating policy provides implementation guidance to the Energy Systems Acquisition Advisory Board (ESAAB) and program office acquisition advisory board processes required by DOE O 413.3A to advise the AE on the critical decisions and baseline change control proposals.

3.3.5 NNSA Quality Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Quality Management Practices
5.0	**Quality Management**	
5.1	Quality planning is performed and includes identifying quality requirements and standards for the project and products and documenting how the project will demonstrate compliance. Quality planning is performed in parallel with other project planning processes such as scope definition, schedule and resource estimate development, and risk identification and analysis.	▪ Quality planning in the acquisition process includes preparing a performance work statement with measurable performance standards and a quality assurance assessment plan. ▪ Integrated project teams established by the federal project director (collectively a line organization) ensure that quality is addressed.
5.2	Quality assurance is performed and includes the auditing of quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used.	▪ An acceptable quality assurance program and plan is put in place per DOE directives and in accordance with applicable requirements (e.g., 10 CFR 830 Subpart A and DOE O 414.1C).
5.3	Quality control is performed and includes monitoring and recording results of executing quality activities to assess performance and recommend necessary changes.	▪ The NNSA has a cost estimating business operating policy that provides for the implementation of independent cost estimating on projects being executed by the NNSA. One aspect of this policy is check estimates as one way that a program or field office can infuse quality assurance/quality control practices into a cost estimate. These estimates are developed and performed by a third party who did not participate in the original cost estimate. ▪ Each project has a requirement to establish a Quality Assurance Plan (QAP) prior to CD-1. The QAP discusses the differences between quality assurance (QA) and quality control (QC) and establishes the QC requirements for the project.

3.3.6 NNSA Personnel Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Personnel Management Practices
6.0	**Personnel Management**	
6.1	A personnel management plan is developed including the identification and documentation of roles, responsibilities, and required skills, reporting relationships and staffing plan. The human resource plan includes the organization, training needs, recognition and rewards program, and the impact of staffing on the organization.	▪ Project team responsibilities are summarized in the IPT charter and are carried out through the respective roles of IPT members. ▪ Primary and secondary project oversight areas of responsibility for program office personnel are delineated in headquarters office documents accessible on the internal NNSA website (NA-54 Roles and Responsibilities Matrix; Personnel List and Responsibilities). ▪ Business operating procedure provides detailed requirements to supplement DOE M 360.1-1B, Federal Employee Training Manual.
6.2	The organization is assembled and structured to complete the defined requirements. The organization includes the adequate number of personnel with the required competencies to effectively complete specific requirements.	▪ Site offices have day-to-day responsibility for weapons production and site management ▪ Headquarters has responsibility program planning, and management for R&D and nonproliferation activities ▪ NNSA Site Offices have primary responsibility for day-to-day program and contract administration ▪ The NNSA Service Center provides the procurement and contract support to the eight NNSA Site Offices ▪ Business operating policy established to guide program management activities, including providing increased organizational discipline, clearly defined responsibilities and authorities, and consistency across headquarters and site offices to increase management efficiency and effectiveness, eliminate redundancies, and provide clear direction from program offices to contractors.
6.3	Organizational development is ongoing and results in continuous improvement including improving competencies, team interaction, and the overall team environment improving project performance.	▪ A uniform process for Federal employee training that supplements DOE M 360.1-1B, Federal Employee Training Manual).
6.4	Organizational management is effective including tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance. Team behavior is observed, conflict managed, issues resolved, and staffing adjusted as necessary.	▪ A staffing model is being applied to assess staffing at the five principal NNSA construction projects.

3.3.7 NNSA Communication

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Communication Practices
7.0	**Communication**	
7.1	Stakeholders are identified, including all personnel impacted by the project and relevant information regarding stakeholder interests, involvement, and impact are documented.	▪ Documentation required by the CD process is used to identify and include stakeholder's interests, including the PEP and IPT charter. The FPD is responsible for assembling the IPT and ensuring stakeholder representation.
7.2	Communications are planned including determining stakeholder information needs and defining an effective communications approach.	▪ The PEP includes a communications plan, including identifying project stakeholders, and communication methods and frequency, for the project.
7.3	Relevant information is distributed and made available to project stakeholders as planned. The distribution of information is conducted in a timely manner and is performed throughout the entire project lifecycle.	▪ Monthly project snapshot for management. ▪ Monthly NA-1 "red" - "yellow" briefing ▪ Monthly PARS reporting ▪ Quarterly Project Reviews ▪ Independent project review and external independent reports distributed. ▪ Several NNSA sites, such as Los Alamos National Laboratory, have project management web pages and are used to communicate project-related information. ▪ Routine communication is maintained with the Defense Nuclear Facility Safety Board (DNFSB), Congress and other project stakeholders.
7.4	Stakeholder expectations are actively managed including ensuring their needs are met and issues are addresses as they occur. Management of stakeholder expectations includes clear and concise communication activities directed toward project stakeholders to influence their expectations, address concerns, and resolve issues.	▪ Project planning documents prepared in accordance with DOE directives, including PEPs, PRDs, and mission needs analyses are used collectively to manage stakeholder expectations.
7.5	Performance is reported including the collection and distribution of performance information such as status reports, progress measurements, and forecasts. Performance reporting includes the periodic collection and analysis of planned versus actual project data and results in the timely communication of project progress and performance and the forecast of project results.	▪ Monthly project snapshot for management. ▪ QPRs. ▪ Periodic meetings with the NNSA Administrator on projects that are judged to be at risk of meeting their performance baseline (i.e., rated yellow) and expected to not meet their performance baseline (i.e., rated red). ▪ Voluntary project definition rating index (PDRI) is prepared by line personnel (i.e., IPT staff) and reviewed during a T-IPR or IPR. ▪ Project data are input into PARS monthly and reviewed by the appropriate NNSA management and available project stakeholders.

3.3.8 NNSA Risk Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Risk Management Practices
8.0	**Risk Management**	
8.1	Risk management planning is conducted and includes the definition of specific risk management activities that are to be performed. Risk management planning includes the degree, type and visibility of risk management commensurate with both the risks and the importance of the project to the organization.	▪ Risk management planning is an integral part of the Critical Decision process, documented in DOE O 413.3A and included in PEPs. ▪ NNSA routinely uses the DOE risk management guide, DOE G 413.3-7, to guide its risk management practices.
8.2	Risks are identified and their characteristics are accurately documented. A risk register is established, maintained, and updated throughout the project lifecycle.	▪ Risk registers are reviewed to ensure that all appropriate cost, technical, and programmatic risks/threats and opportunities are identified. ▪ Risk registers are monitored throughout the project life cycle.
8.3	Qualitative risk analyses are performed including risk prioritization, and assessing the probability and occurrence and impact associated with identified risks. Risk priorities are assessed using the relative probability or likelihood of occurrence and the corresponding impact on project objectives if the risks occur.	▪ Risk analysis techniques are reviewed for appropriateness in accordance with the CD process (e.g., IPRs).
8.4	Quantitative risk analyses are performed including numerically analyzing the effect of identified risks on overall project objectives.	▪ Quantitative analyses are used to analyze the probability and consequence of NNSA project risks. ▪ NNSA routinely uses quantitative risk analysis techniques such as Monte Carlo to model project risks.
8.5	Timely and effective responses to identified risks are planned, including the development of options and specific actions to reduce threats to project objectives. Planned risk responses include identification and assignment of risk response owners who are responsible each agreed to and funded risk response. Risk responses are prioritized and the appropriate resources and activities are included into the budget, schedule and project management plan as needed.	▪ Risk/threat occurrence, including frequency and timing during the project life cycle, and the implementation of mitigations activities are examined during IPRs. ▪ Project risk prioritization, as established ion the risk register, are reviewed in accordance with the CD process (e.g., IPRs). ▪ RMPs are updated throughout the project life cycle. ▪ Risks are addressed during QPRs
8.6	Risks are monitored and controlled including the implementation of risk response plans, tracking of identified risks, monitoring of residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.	▪ IPRs and T-IPRs address the RMP, including the risk register, technical and programmatic risks, threats and opportunities, and risk analysis methods applied. ▪ Project risk is reviewed in accordance with the CD process. ▪ RMPs are updated throughout the project life cycle. ▪ Risks are addressed during QPRs

3.3.9 NNSA Acquisition Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of NNSA Acquisition Management Practices
9.0	**Acquisition Management**	
9.1	Procurements are planned in a timely and effective manner including documenting the project purchasing decisions, specifying the approach, and identifying potential suppliers. The procurement plan identifies the project needs which can best be, or must be, met by acquiring products, services or results outside the project organization.	▪ Procurements are addressed in project acquisition strategy documents. ▪ Long lead procurements are indentified and assessed during the independent review process.
9.2	Procurements are conducted in accordance with documented acquisition processes in a timely and cost effective manner. Detailed evaluations are conducted based on a specific and comprehensive requirements document requested from suppliers.	▪ NNSA contracting officers have well-established processes and documented procedures to manage procurements. ▪ Procurement evaluations include documented requirements.
9.3	Procurements are administered and include monitoring contract performance, making contract changes and corrections as needed, and ensuring that contractual obligations and legal rights are protected.	▪ Procurements are addressed in project acquisition strategy documents. ▪ The Service Center supports field offices with contracts and procurements, including contract changes and legal reviews.
9.4	Procurements are closed in a timely manner upon verification that all work was completed and deliverables are acceptable. Procurement closure includes administrative activities such as finalizing open claims, updating records to reflect final results, and archiving information for future use.	▪ A formal process is established within the CD process wherein a final project closeout report is prepared once all project costs are incurred and invoiced, and all contracts are closed.

3.4 OFFICE OF ENVIRONMENTAL MANAGEMENT PRACTICES

The Office of Environmental Management (EM) has a documented and well-considered set of standards and practices to guide project and contract management. In 2006 the National Academy of Public Administration (NAPA) began a study of the Office of Environmental Management (EM) which included project and contract management as areas of focus. Corrective actions based on the NAPA recommendations advanced EM management discipline. Seeking to further advance the specific focus on project and contract management, EM partnered with the U.S. Army Corps of Engineers in February 2007. This initiative sought to build upon the NAPA actions and transform EM into a "Best-

in-Class" project and contract management organization. EM also responded to the April 2008 DOE Root Cause Analysis with specific corrective actions.

In 2009, under the direction of a new Assistant Secretary, the EM leadership team developed a Corrective Action Plan (CAP)[2] to continue to improve project management performance. The CAP consolidated all completed and ongoing actions from NAPA, Best-in-Class, DOE Root Cause Analysis, and specific Government Accountability Office (GAO) findings into a single comprehensive action plan to guide and measure continuous project and contract management improvement. Key continuing improvements within the CAP include:

- Integrating safety earlier into design,
- Starting construction after 90 percent design,
- Dividing large programmatic work into smaller discrete projects,
- Conducting readiness assessments to ensure technology maturity,
- Performing monthly senior management reviews for projects at risk,
- Evaluating contractor project management and technical capabilities,
- Performing comprehensive construction project status reviews,
- Establishing an EM corporate Cost Estimating Team, and,
- Deploying a new project management information system for analysis of project performance (WTP, SWPF, SBW, and U-233).

The matrix below outlines nine program and project management areas (as defined by the PMI's PMBOK) in the first column, and in the second column provides examples and observations of the EM Program in relation to the PMBOK areas.

[2] US Department of Energy Office of Environmental Management, Acquisition and Project Management Corrective Action Plan (CAP), August, 2009.

3.4.1 EM Program/Project Integration

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Program/ Project Integration Practices
1.0	**Program/Project Integration**	
1.1	The organization charter is clearly identified, defined, and understood including a narrative description of the products or services to be delivered by the organization. The charter references the strategic plan or business need, as appropriate.	▪ The EM mission and vision are clearly documented. ▪ EM has applied applicable project management principles to their projects, including clearly delineating capital asset projects from operations activities. ▪ Each project has scope, schedule, and cost that is independently reviewed and validated as well as a clearly established life cycle cost estimate at the program (PBS) level. As such EM's management approach is anchored on managing and controlling the lifecycle cost of the entire EM program, including all "to go" work. ▪ EM has clearly identified work scopes, cost estimates and schedules for its mission at each site.
1.2	A project management plan is established that documents the necessary actions to define, prepare, integrate, and coordinate all subsidiary plans. The project management plan defines how the project is executed, monitored and controlled, and closed.	▪ EM projects have Project Execution Plans (PEPs) that identify the required supporting documentation. ▪ DOE and EM polices clearly define how projects are to be executed, monitored, controlled, and closed.
1.3	The program office and project director are actively involved in management and oversight of performance of the planned project activities, and provides oversight of the various technical and organizational interfaces.	▪ A Federal Project Director (FPD) is assigned to all EM projects. ▪ FPDs are responsible for the day-to-day project management and contract oversight ▪ EM HQ Program offices, FPDs, IPTs, Field/site offices, actively manage and oversee project and contract performance. Weekly, monthly and quarterly reviews are held to ensure emerging issues are addressed in a timely and cost effective manner ▪ At the Program level, EM actively monitors projects and provides support and oversight, including monthly and quarterly detailed project reviews. ▪ Corporate Quality Assurance Program and Quality Implementation Plan ensure continuing assessment of programs and effectiveness of oversight.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Program/ Project Integration Practices
1.4 Project work is prioritized and closely monitored and controlled through regular tracking, reviewing and regulating progress to meet the performance objectives defined in the project management plan.	▪ EM HQ Program offices, FPDs, IPTs, Field/site offices, are actively involved in the management and oversight of projects though monthly progress reports, bi-weekly calls with EM senior management, and face to face meetings with the contractor corporate senior officials on troubled projects ▪ The Construction Project Review (CPR) process has been institutionalized utilizing independent experts in the planning, design, construction, commissioning, and management and operations of highly complex facilities. The CPR is conducted for all construction projects every six months to identify any upcoming major issues and to proactively manage the associated risks. In addition, the CPR has been expanded to include other large projects and contract management functions. ▪ Project performance data that includes earned value variance explanation and summary status are reported to IPABS/PARS or PARS II monthly and reviewed by all levels and significant performance issues are immediately addressed. ▪ Quarterly project reviews are conducted for the projects that are "green" focusing on any upcoming risks.
1.5 Integrated change control is established, documented, and performed from project inception through completion. This includes reviewing all change requests, approving changes and managing changes to deliverables, organizational assets, project documents and the project management plan.	▪ EM has developed a standardized process for Integrated Contract and Project change control. ▪ EM has conducted several training seminars on the Contract Change and Modification Process at EM HQ and multiple field sites. ▪ The EM baseline and contract change control processes are followed to ensure changes are incorporated in accordance with established procedures. ▪ Project Execution Plans are developed and updated to reflect any changes and the EMAAB process is used to review and approve BCPs and HQ's planning/budget offices are engaged to ensure that the baseline changes are evaluated against the total life cycle costs at the site and the overall EM LCC. ▪ Guidance and SOPPs are available on EM Portal. i.e., EM's internal electronic library.
1.6 The project is closed when all activities are finalized. The program office and project director review all prior information from previous phase closures to ensure that all project work is complete and that the project has met its objectives.	▪ Projects in EM are closed and finalized following documented policies and procedures. ▪ EM project personnel verify key performance parameters or other relevant completion criteria have been achieved and for nuclear facility a rigorous operational readiness review by DOE per DOE Order 425.1D prior to approval for start-up. ▪ Project scope is reviewed by EM program and project personnel, by the receiving /accepting organization e.g. site landlord or Legacy Management, and by regulators to ensure project objectives have been met.

3.4.2 EM Scope Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Scope Management Practices
2.0 Scope Management	
2.1 Requirements are collected and clearly documented including stakeholder needs to meet project objectives. The requirements include the quantified and documented needs and expectations of the sponsor, customer and other stakeholders. These requirements are elicited, analyzed, and recorded in enough detail to be measured once project execution begins.	▪ Through the EM advisory Board, and Site Specific Advisory Boards, EM ensures that the full-range of stakeholder requirements are collected. ▪ In some instances, requirements are not consistently identified, documented and analyzed across all EM projects. ▪ The Project Execution Plan (PEP) and Performance Management Plan (PMP) documents contain key project performance parameters. Scope is managed and modified as required to meet the mission requirements and budget constraints.
2.2 A detailed description of the project and product is established and documented. The detailed project scope description builds upon the major deliverables, assumptions, and constraints that are documented during project initiation. The project scope is defined and analyzed for completeness and additional risks, assumptions and constraints are included as necessary.	▪ Each project has an approved Project Execution Plan (PEP) and a Risk Management Plan (RMP). These documents describe the project scope, Key Performance Parameters, cost implementation schedule, key risks, roles and responsibilities of the Integrated Project Team, change approval authorities and management approach. ▪ The EMAAB process is used monthly or quarterly to review project progress and resolve issues.
2.3 Project deliverables and project work is subdivided into smaller, more manageable components and organized in a work breakdown structure. The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables and each descending level represents an increasingly detailed definition of the project work. The WBS organizes and defines the total scope of the project and represents the work specified in the current approved project scope statement.	▪ EM has decomposed to break large projects into smaller, more discrete projects so they can be better defined and managed. ▪ An EM corporate work breakdown structure (WBS) has been established for the entire EM complex. Each project has a specific WBS. ▪ EM piloted “smaller projects” and separation of capital projects from operations activities as a part of its ARRA work, and has now implemented this into the base program. ▪ EM has restructured the project portfolio into smaller, more discrete projects for better definition, oversight, easier management and reduced risk. The restructured projects have reduced durations (no more than 4 years to complete) and more complete design maturity.
2.4 Scope is verified and represents formal acceptance of completed project deliverables. Scope verification includes reviewing deliverables with the customer and sponsor to ensure the deliverables are completed satisfactorily and obtaining formal acceptance of deliverables by the customer or sponsor.	▪ Project scope is reviewed by EM program and project personnel, by the receiving/accepting organization e.g. site landlord or Legacy Management, and by regulators to ensure project requirements are met. ▪ Project completion is documented via a formal closure process outlined in EM’s internal policies and procedures. Project cost, scope and key performance parameters are verified. ▪ EM performs a final project review prior to approval of CD-4, Project Completion.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Scope Management Practices
2.5	Project scope is monitored and controlled and scope changes are managed in accordance with the scope baseline. Project scope is controlled and all requested changes and recommended corrective or preventative actions are processed through an integrated change control process.	▪ EM projects are separated into smaller discrete work scopes. These scopes are monitored and controlled. EM has issued contingency and management reserve policies to more effectively manage risk. ▪ EM has developed a standardized process for Integrated Contract and Project change control. EM has conducted several training seminars on the Contract Change and Modification Process at EM HQ and multiple field sites. ▪ The EMAAB process is in place to review scope changes and process baseline revisions as necessary. Federal and site change controls boards are also in place. Project cost and scope thresholds are established for the Acquisition Executive, Program Secretarial Office, Federal Project Director and contractor.

3.4.3 EM Schedule Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Schedule Management Practices
3.0	**Schedule Management**	
3.1	Activities are defined by identifying the specific actions to be performed to produce the project deliverables.	▪ Project activities and deliverables are documented in the Acquisition Executive (AE) approval memorandum, project execution plans (PEPs) and other related project documentation. These documents include the work scope descriptions and document Key Performance Parameter requirements, in addition to cost and schedule targets. ▪ EM has established key milestones, including regulatory milestones and reviews milestone completion on a quarterly basis. EM has key performance metrics with established annual targets and assesses project completion on a quarterly basis.
3.2	Discrete activities are sequenced by identifying and documenting relationships among other project activities. Activities are sequenced using logical relationships and each activity and milestone except for the first and last are connected to at least one predecessor and one successor.	▪ Project activities are assembled in project execution plans (PEPs) and activity relationships are identified and documented in resource loaded schedules (typically managed in Primavera software). ▪ Critical Decision (CD) documents contain major high-level milestone targets. ▪ Most projects are required to use certified Earned Value Management system, which require activity sequencing. All of EM projects use EVM as appropriate. About 90% of EM projects have been EVMS certified.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Schedule Management Practices
3.3 Activity resources are estimated by the type and quantities of material, people, equipment, or supplies required to perform discrete activities.	▪ Most EM projects are required to use certified Earned Value Management systems, which require the use of resource loaded schedules (RLS) and Work Breakdown Structures (WBS) with associated WBS dictionaries. These tools require estimation of resources. ▪ At the program level, staffing studies have been conducted with results being used to staff the EM program as appropriate based upon programmatic needs.
3.4 The project schedule is developed by analyzing activity sequences, durations, resource requirements, and schedule constraints. The project schedule clearly identifies the planned start and finish dates for project activities and milestones. A realistic project schedule is revised and maintained throughout the project as work progresses, the project management plan changes, and the nature of risk events evolve.	▪ Project schedules in EM are developed and monitored on a regular basis. ▪ About 90% of EM projects have been EVMS certified. Updated project schedules are a requirement for maintaining EVMS certification. ▪ At the HQ level, “Deep Dive” reviews, Monthly Project Reviews and Quarterly Project Reviews are used to review work progress and to eventually direct projects, as necessary, to revise project schedules as high-level milestones are missed or project risks are realized.
3.5 Schedule control is maintained by monitoring project performance and updating the schedule based current status and progress. Schedule changes are managed through an integrated change control process to maintain the schedule baseline.	▪ Project schedules in EM are monitored and maintained. ▪ Certified EVM systems are used across the EM complex in the majority of projects. Certification standards are maintained via scheduled Surveillances of the EMVS. Policies, procedures and a Federal and contractor change control boards are in place to manage changes on project schedules. ▪ All changes to schedule are under configuration control. Changes are approved and recorded through an established change control process. All changes are documented in IPABS.

3.4.4 EM Cost Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Cost Management Practices
4.0	**Cost Management**	
4.1	Costs are estimated in an accurate manner including development of the approximate monetary resources needed to complete project activities. Monetary resource estimates include the identification and consideration of cost alternatives to initiate and complete the project. Costs are estimated for all resources that will be charged to the project including labor, materials, equipment, services, and facilities, as well as special categories such as inflation analysis or contingency costs.	▪ In April 2010, EM issued guidance to standardize contingency and management reserve policy for EM projects. ▪ EM employs FAR Part 15 contracts that require the contractor to propose the full cost of executing a project at the time of award. ▪ EM established the Cost Estimating & Analysis Center to establish standards, policy, and procedures to ensure that cost estimates are accurate, traceable, and reliable; provide Independent Cost Estimating (ICE) and Independent Cost Analysis (ICA) capability to support acquisition and project management program requirements, and the budget formulation processes; and to lead the development and management of cost and schedule databases, methodologies, and tools needed by EM to improve and standardize its cost estimating and analysis capabilities. ▪ Projects are establishing cost and schedule baselines at 80% confidence level, or higher, through qualitative and quantitative risk management processes stipulated in DOE Guide 413.3-7 Risk Management. ▪ Cost estimates will be improved due to smaller, more manageable projects resulting from restructuring the EM project portfolio. ▪ EM will conform to updated policy, requirements, and guidance in the revision to Order 413.3A Program and Project Management for Acquisition of Capital Assets that will reflect best practices noted by GAO in their best practices for Cost Estimating and Assessment Guide. ▪ In FY 2010, EM restructured its previous portfolio of Project Baseline Summaries (PBS) and disaggregated projects into smaller, more definitive capital asset projects and non-capital operations activities. This new structure will more succinctly align capital asset acquisitions with federal and Departmental asset management requirements, and provide for more focused management and oversight.
4.2	A realistic budget is developed and aligned by aggregating the estimated costs of individual activities or work packages for projects to establish an authorized cost baseline.	▪ EM balances project requirements and funding profiles. ▪ Capital Asset Project funding requests align with funding requirements outlined in Project Data Sheets with few exceptions, both for design and construction activities.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Cost Management Practices
4.3	Costs are controlled by actively monitoring the status and performance of the project and used to update the project budget and manage changes to the cost baseline. Updates to the project budget include recording actual costs spent to date. Increases to authorized budget are approved through integrated change control. The relationship between the consumption of project funds to the physical work being accomplished is analyzed. Effective cost control is managed through the approved cost performance baseline and changes to the baseline.	▪ Monitoring, controlling, and managing on-going costs across the EM Program have produced mixed results. ▪ EM has restructured the project portfolio into smaller, more discrete projects for better definition, oversight, easier management and reduced risk. The restructured projects have reduced durations (no more than 4 years to complete) and more complete design maturity. Each project has approved baselines. ▪ Key project cost and EVM data, with an emphasis on earned value reporting are reported to IPABS/PARS or PARS II monthly and reviewed by all levels and significant performance issues are immediately addressed. ▪ Recent CPR activities at WTP have resulted in identification of need to change the funding profile of the project to increase confidence level in achieving project cost and schedule baselines.

3.4.5 EM Quality Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Quality Management Practices
5.0	**Quality Management**	
5.1	Quality planning is performed and includes identifying quality requirements and standards for the project and products and documenting how the project will demonstrate compliance. Quality planning is performed in parallel with other project planning processes such as scope definition, schedule and resource estimate development, and risk identification and analysis.	▪ Quality planning is conducted in accordance with established EM corporate Quality Assurance Program (QAP) which has been appropriately flowed down to the field/site offices and individual contracts and projects. The EM QAP and EM projects QA programs are consistent with DOE Orders and Standards ▪ Quality plans are documented and integrated with the Project Execution Plans (PEPs).
5.2	Quality assurance is performed and includes the auditing of quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used.	▪ Quality control measures are well developed and applied in all EM projects throughout their project phases. ▪ Quality assurance audits and surveillances performed as appropriate in accordance QA audit plans for each project. ▪ QA is also routinely reviewed (every six months) as part of the EM Construction Project Reviews for all construction projects to ensure NQA-1 or other appropriate standard is implemented adequately.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Quality Management Practices
5.3	Quality control is performed and includes monitoring and recording results of executing quality activities to assess performance and recommend necessary changes.	▪ Quality control is performed on all EM projects and all audit findings and recommendations are documented as part of corrective action tracking system. ▪ For nuclear design and construction projects NQA-1 vendor inspection, audits and surveillance are routinely performed to ensure requisite quality performance levels are achieved for critical safety and process systems and equipments.

3.4.6 EM Personnel Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Personnel Management Practices
6.0	**Personnel Management**	
6.1	A personnel management plan is developed including the identification and documentation of roles, responsibilities, and required skills, reporting relationships and staffing plan. The human resource plan includes the organization, training needs, recognition and rewards program, and the impact of staffing on the organization.	▪ EM has developed a strategic approach to workforce planning and annually conducts a workforce analysis to determine both short- and long-term needs of the organization. Federal project directors or their equivalents are established for construction projects, capital asset projects and operating activities. ▪ EM has established a Technical Qualifications Program to track the technical capabilities of the staff and to ensure that the technical capabilities are adequate for the projects managed at each site.
6.2	The organization is assembled and structured to complete the defined requirements. The organization includes the adequate number of personnel with the required competencies to effectively complete specific requirements.	▪ Staffing issues are routinely assessed and new processes will allow quicker back fill of vacancies. ▪ Project and cost control personnel have been supplemented using EM's Project Management Partnership through COE and national laboratories providing expertise for high technical issues. ▪ EM utilized multiple independent analyses of resource needs to complete a staffing analysis and remediation plan focused at capital asset projects. ▪ EM continues to successfully hire, train and certify contract and project professionals. ▪ EM has expanded its Project Management Partnership with the U.S. Army Corps of Engineers with two new support contracts. Also, EM developed an agreement for support by a Technical Expert Group drawn from the national laboratories.
6.3	Organizational development is ongoing and results in continuous improvement including improving competencies, team interaction, and the overall team environment improving project performance.	▪ Turnover of key EM projects personnel has been stabilized. ▪ A "lessons learned" process has been established for project teams from on-going and completed projects to help other teams at key project junctures.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Personnel Management Practices
6.4	Organizational management is effective including tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance. Team behavior is observed, conflict managed, issues resolved, and staffing adjusted as necessary.	▪ As appropriate, organizational management is tailored for each project. ▪ Examples of active, effective personnel management are increasing and becoming prevalent. ▪ Management and organizational issues are routinely evaluated as part of the EM CPR process and monthly/quarterly project reviews to proactively address any staffing shortages or immediate skill gap issues. ▪ EM targeted, by FY 2011, 90 percent or more of the FPDs will be certified at the appropriate level for the project or activity. ▪ A certification process has been established for EM's contracting staff. By FY 2011, over 80 percent of the contracting staff will be certified at the appropriate level.

3.4.7 EM Communication

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Communication Practices
7.0	**Communication**	
7.1	Stakeholders are identified including all personnel impacted by the project and relevant information regarding stakeholder interests, involvement, and impact are documented.	▪ Project Execution Plans (PEP) in EM requires that all the projects identify stakeholders and develop communications plans. ▪ All major projects in EM have a person, either a Public Affairs person or a communications specialist, dedicated to communications. ▪ EM has Citizen Advisory Boards at many sites, meets with the National Governor's Association, Source Term Working Group (STWG) and other outside groups on a regular basis including regulators, Nuclear Regulatory Commission (NRC) and Defense Nuclear Facilities Safety Board (DNFSB).
7.2	Communications are planned including determining stakeholder information needs and defining an effective communications approach.	▪ At the project level, communications plans are embedded in Project Execution Plan and stakeholder needs are defined and documented.
7.3	Relevant information is distributed and made available to project stakeholders as planned. The distribution of information is conducted in a timely manner and is performed throughout the entire project lifecycle.	▪ At the Program level, information is sometimes communicated outsides for the formal planned communication lines. ▪ At the project level, information is communicated to stakeholders in a timely manner, and throughout the life of projects.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Communication Practices
7.4 Stakeholder expectations are actively managed including ensuring their needs are met and issues are addresses as they occur. Management of stakeholder expectations includes clear and concise communication activities directed toward project stakeholders to influence their expectations, address concerns, and resolve issues.	▪ At the project level, stakeholders' issues and concerns are addressed through newsletters, site advisory meetings, and Town Hall sessions with regulatory agencies to ensure that stakeholder needs have been identified and addressed. ▪ Key internal and external stakeholders are routinely invited to EM's monthly and quarterly project review sessions ▪ EM-1 interfaces with community leaders and local officials regarding stakeholder concerns. ▪ Quarterly Project Reviews (QPRs), Deep Dive Reviews and Monthly Project Reviews are used to bring project issues to the attention of HQ, so senior management can provide direction/guidance.
7.5 Performance is reported including the collection and distribution of performance information such as status reports, progress measurements, and forecasts. Performance reporting includes the periodic collection and analysis of planned versus actual project data and results in the timely communication of project progress and performance and the forecast of project results.	▪ At the Program level, performance information is consistently collected and reported in a timely manner. ▪ At the project level, clean-up information and project progress is communicated to key stakeholders on a regular basis. ▪ For all projects government policy and requirements in terms transparency, daily/weekly reporting, and forecasts are rigorously followed. ▪ Most projects are required to report Earned Value Management metrics, which compare planned to actual project performance data. ▪ EM ARRA program has utilized internet web pages, monthly newsletters, and special newsflashes to keep stakeholders immediately informed of progress.

3.4.8 EM Risk Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Risk Management Practices
8.0 Risk Management	
8.1 Risk management planning is conducted and includes the definition of specific risk management activities that are to be performed. Risk management planning includes the degree, type and visibility of risk management commensurate with both the risks and the importance of the project to the organization.	▪ Risk management has been an area of emphasis and improvement in project planning. ▪ Risk Management Plans are actively developed, managed and updated by EM Federal staff. DOE or "owner risks" are clearly differentiated from contractor managed risks. At most sites Federal and contractor staff collaborate on risk planning as part of the IPT.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of EM Risk Management Practices
8.2 Risks are identified and their characteristics are accurately documented. A risk register is established, maintained, and updated throughout the project lifecycle.	▪ Risks are identified and documented. Risk registers are maintained and updated as part of project planning and management. ▪ Some larger sites (ex. ORP, Savannah River and Oak Ridge) have dedicated staff to update risk status. ▪ Most Capital Asset Projects are updating risk registers on a monthly basis, but not less than twice a year.
8.3 Qualitative risk analyses are performed including risk prioritization, and assessing the probability and occurrence and impact associated with identified risks. Risk priorities are assessed using the relative probability or likelihood of occurrence and the corresponding impact on project objectives if the risks occur.	▪ DOE Guide 413.3-7 was issued in late 2008 and provides consistent guidance for performing quantitative and qualitative risk analyses using statistical modeling techniques such as Monte Carlo, Quasi-Monte Carlo, sensitivity simulations, and other stochastic methodologies, depending upon the project data. ▪ Projects have detailed analyses on qualitative risks or quantitative analysis depending on the nature of the project. ▪ Site implementation of the DOE Risk Guide has markedly improved.
8.4 Quantitative risk analyses are performed including numerically analyzing the effect of identified risks on overall project objectives.	▪ DOE Guide 413.3-7 was issued in late 2008 and provides consistent guidance for performing quantitative and qualitative risk analyses using statistical modeling techniques such as Monte Carlo, Quasi-Monte Carlo, sensitivity simulations, and other stochastic methodologies, depending upon the project data. ▪ Projects have generally applied the level of detail in analysis appropriate to the project.
8.5 Timely and effective responses to identified risks are planned, including the development of options and specific actions to reduce threats to project objectives. Planned risk responses include identification and assignment of risk response owners who are responsible each agreed to and funded risk response. Risk responses are prioritized and the appropriate resources and activities are included into the budget, schedule and project management plan as needed.	▪ Risks are documented on risk-opportunity forms in detail and are listed in terms of probability of occurrence and cost and schedule impact if they come to fruition. ▪ Budgets for capital asset projects are set at 80% confidence level. With the restructuring of the EM portfolio, funding profiles for capital asset projects are better aligned to ensure proper budget to address identified risks.
8.6 Risks are monitored and controlled including the implementation of risk response plans, tracking of identified risks, monitoring of residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.	▪ Federal Risk Management planning and implementation has matured and improved considerably as a result of fully dedicated Federal risk management professionals working at the site level to develop, implement, and manage Federal Risk Management Plans.

3.4.9 EM Acquisition Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of EM Acquisition Management Practices
9.0	**Acquisition Management**	
9.1	Procurements are planned in a timely and effective manner including documenting the project purchasing decisions, specifying the approach, and identifying potential suppliers. The procurement plan identifies the project needs which can best be, or must be, met by acquiring products, services or results outside the project organization.	▪ EM has continued to expand the use of FAR Part 15 contracts for its capital asset projects (and other non-capital work), leading DOE in the use of FAR Part 15 contracts. ▪ EM is conducting Procurement Strategy Panel meetings that enable EM Senior Managers, OPAM, GC, the Office of Small and Disadvantaged Business Utilization, and the Office of Engineering and Construction Management to meet and discuss all aspects of an upcoming procurement with the Integrated Project Team early in the planning process to address issues that could potentially cause delays later in the process. ▪ EM federal staff develops the Acquisition Strategy required under DOE O 413.3A and EM acquisitions adhere to the established Federal Acquisition Regulations and DOE policies.
9.2	Procurements are conducted in accordance with documented acquisition processes in a timely and cost effective manner. Detailed evaluations are conducted based on a specific and comprehensive requirements document requested from suppliers.	▪ EM has implemented a centralized strategy to standardize the acquisition process through the establishment of the Environmental Management Acquisition Center (EMAC). This business model enabled acquisitions and contract transitions to be executed efficiently. ▪ EM utilizes standardized acquisition templates that provide a consistent approach for timely and cost effective procurements. ▪ EM utilizes a peer review process to ensure evaluations are conducted in a thorough and comprehensive manner.
9.3	Procurements are administered and include monitoring contract performance, making contract changes and corrections as needed, and ensuring that contractual obligations and legal rights are protected.	▪ In an effort to make the procurement process transparent, EM is making the information on contractor fee payments and Earned Value Management available on the EM webpage: (http://www.em.doe.gov/Pages/Acquisitions.aspx). The website also provides pre-award information, current solicitations and a consolidated contractor list. ▪ EM has implemented an integrated change control process for contract and project changes.
9.4	Procurements are closed in a timely manner upon verification that all work was completed and deliverables are acceptable. Procurement closure includes administrative activities such as finalizing open claims, updating records to reflect final results, and archiving information for future use.	▪ EM closes the procurements only after acceptance and verification of all deliverables and, when applicable, AE approval of project completion (CD-4).

3.5 OFFICE OF ENGINEERING AND CONSTRUCTION MANAGEMENT

The Office of Engineering and Construction Management (OECM) is responsible for establishing project management and real property management policy, guidance, and oversight—fostering value-added change by providing corporate processes for, and oversight of, DOE's acquisition of capital assets.

For the past 10 years OECM has worked diligently with major DOE programs (e.g., SC, EM, and NNSA) to improve the process for acquiring capital assets (facilities and infrastructure and major items of equipment) and executing environmental management (e.g., groundwater and soil remediation and D&D) projects. OECM has developed, coordinated, and published DOE O 413.3A, Program and Project Management for the Acquisition of Capital Assets, and an accompanying manual, which has been replaced by 20 guides) to assist DOE programs adopt and adhere to sound project management principles and practices. The overall objective is to complete projects on time and within budget, leading to DOE's removal from the GAO High-Risk List.

In addition to the publication of the order and guides, and coordinating an in-depth Root Cause Analysis of DOE project management issues, OECM and the Programs have advanced the departmental project management capabilities through the extensive use of project reviews (e.g., EIRs, IPRs, Independent Cost Reviews, Technology Readiness Reviews), the PMCDP, PARS, Earned Value Management Systems, and lessons learned.

Other OECM responsibilities include assessing project performance, developing and monitoring corporate performance measures for real property asset management, conducting EIRs, reviewing and certifying contractor's EVMS, managing the Department's PARS, maintaining the Facilities Information Management System (FIMS), managing the career development program, and supporting the Department's ESAAB.

Organizationally, OECM is currently under the Office of Management (MA), which is DOE's central management organization providing leadership in various mission critical areas, including project and acquisition management. OECM has a staff of about 40 engineers, program analysts, and realty specialists.

The following tables identify OECM effective practices compared to the nine program and project management areas documented in the PMI PMBOK.

3.5.1 OECM Program/Project Integration

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Program/Project Integration Practices
1.0	**Program/Project Integration**	
1.1	The organization charter is clearly identified, defined, and understood including a narrative description of the products or services to be delivered by the organization. The charter references the strategic plan or business need, as appropriate.	▪ OECM has mission and vision statements, accompanied by a list of functional responsibilities for its four primary teams. ▪ For DOE Program capital asset acquisition and environmental restoration project teams, OECM typically assures, via EIRs, that the IPT is properly chartered and led by an appropriately certified FPD. ▪ DOE G 413.3-17 supports the Order by providing suggested content, definitions, and examples of mission need documents. ▪ DOE G 413.3-18 supports the Order by providing the use of IPTs to achieve improved project outcomes and efficiency.
1.2	A project management plan is established that documents the necessary actions to define, prepare, integrate, and coordinate all subsidiary plans. The project management plan defines how the project is executed, monitored and controlled, and closed.	▪ OECM is not responsible for capital asset acquisition projects of its own but rather supports the responsible program offices. OECM support task scopes are either spelled out in writing or verbally agreed to. OECM has several contracts with support services contractors to assist its staff with mission accomplishment. ▪ OECM has written and/or sponsored a series of guides that supplement DOE O 413.3A and expand upon improving program, contract, and project management capabilities at headquarters and in the field. ▪ DOE G 413.3-15 specifically deals with guidance to FPDs on PEP preparation, which is the governing document that establishes the means to execute, monitor, and control projects.
1.3	The program office and project director are actively involved in management and oversight of performance of the planned project activities, and provides oversight of the various technical and organizational interfaces.	▪ The OECM director and deputy director, as well as the Project Assessment and Project Management Systems team leaders (division chiefs) are fully engaged in performance management oversight. ▪ The OECM director and deputy director, as well as the Project Assessment and Project Management Systems team leaders (division chiefs) hold weekly, bi-weekly, and monthly meetings to oversee project/task activities and to issue clarifying guidance and direction to their staff and support contractors. ▪ OECM participates, or observes, Program-led project peer reviews and construction project reviews. ▪ OECM participates on Program-led QPRs.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of OECM Program/Project Integration Practices
1.4 Project work is prioritized and closely monitored and controlled through regular tracking, reviewing, and regulating progress to meet the performance objectives defined in the project management plan.	▪ Policy and process enhancement work is prioritized through the RCA/CAP corrective measures. ▪ Prioritization of project/task work is also driven by the critical decision process. ▪ Through PARS, EVMS, Deep Dives, QPRs, and the DOE Project Watch List, OECM monitors and reports Program project status monthly to senior DOE management officials.
1.5 Integrated change control is established, documented, and performed from project inception through completion. This includes reviewing all change requests, approving changes and managing changes to deliverables, organizational assets, project documents and the project management plan.	▪ Changes to tasks being performed internally by this HQ staff office are typically without the need for formal change control. Changes to tasks being performed by OECM support contractors are handled as formal modifications to task SOWs. ▪ For Program projects, OECM participates in the change control process and ESAAB as specified in the Order and Guide 413.3-20. ▪ OECM tasks its support contractors to review BCPs via EIRs to validate the revised PB. ▪ The SAE must approve BCPs under certain conditions and subsequent changes must be documented in the PEP.
1.6 The project is closed when all activities are finalized. The program office and project director review all prior information from previous phase closures to ensure that all project work is complete and that the project has met its objectives.	▪ Policies and procedures for proper close out of capital asset acquisition and environmental restoration projects are addressed in the DOE Order, manuals, and DOE G 413.3-16. ▪ FPDs are required to perform final administrative and financial closeout and prepare a final closeout report once all project costs are incurred and invoiced and all contracts are closed.

3.5.2 OECM Scope Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of OECM Scope Management Practices
2.1 Requirements are collected and clearly documented including stakeholder needs to meet project objectives. The requirements include the quantified and documented needs and expectations of the sponsor, customer and other stakeholders. These requirements are elicited, analyzed, and recorded in enough detail to be measured once project execution begins.	▪ Through the Order, the associated Guides, IPRs, PDRI use, Technology Readiness Assessments, and OECM-sponsored EIRs, OECM promotes a process whereby user needs and requirements are fully identified and translated into a satisfactory capital asset design and construction project. ▪ DOE G 413.3-1 provides FPDs with the methodologies and tools needed to translate program mission need requirements into designs that will result in successful satisfaction of key performance parameters. ▪ DOE G 413.3-12, Project Definition Rating Index, and DOE G 413.3-4, Technology Readiness Assessment, also aid the FPD for assuring adequate front-end planning and project definition.
2.2 A detailed description of the project and product is established and documented. The detailed project scope description builds upon the major deliverables, assumptions, and constraints that are documented during project initiation. The project scope is defined and analyzed for completeness and additional risks, assumptions and constraints are included as necessary.	▪ The Order and DOE G 413.3-15 require that detailed descriptions of the project be codified in the PEP, the core document for management of a project. The PEP will provide a brief background of the project identifying important issues, external drivers, project's purpose and major objectives, what will be accomplished and the time frame required. ▪ Per the Order, relevant Guides, and DepSec Memoranda, this activity is then addressed during the IPRs, PDRI use, Technology Readiness Assessments, EVMS certifications, PARS utilization, ESAABs, and EIRs. ▪ Via CD-2 (and sometimes CD-3) EIRs, OECM staff is kept apprised of the project scope, design, risk, assumptions, and constraints.
2.3 Project deliverables and project work is subdivided into smaller, more manageable components and organized in a work breakdown structure. The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables and each descending level represents an increasingly detailed definition of the project work. The WBS organizes and defines the total scope of the project and represents the work specified in the current approved project scope statement.	▪ The Order requires contractor's project management systems contain cost and schedule performance, milestone status, and financial status by CD-2. This reporting must be conducted on a monthly basis using DOE-approved WBS elements and data elements for all projects. ▪ During CD-2/3, EIRs and EVMS certification, OECM staff verifies that a suitable WBS has been developed for the project under design, i.e., the WBS organizes and fully defines the total project scope. ▪ DOE G 413.3-9, Project Reviews, DOE G 413.3-5, Performance Baseline Guide, and DOE G 413.3-8, Environmental Management Cleanup Projects, provide relevant guidance to the FPD and the IPT.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of OECM Scope Management Practices
2.4 Scope is verified and represents formal acceptance of completed project deliverables. Scope verification includes reviewing deliverables with the customer and sponsor to ensure the deliverables are completed satisfactorily and obtaining formal acceptance of deliverables by the customer or sponsor.	▪ The Order requires that a performance baseline be established by CD-2 to include key performance parameters, total project cost, schedule, and scope. This represents the commitment to which a project must be executed. ▪ OECM staff, in the conduct of EIRs and participation on IPRs, verifies that the scope and associated design/construction are resulting in satisfactory deliverables, and scope and performance parameters. ▪ DOE Guides 413.3-1 (Managing Design and Construction Using Systems Engineering), 3-15 (PEP), and 3-6 (High Performance Sustainable Building) ensure the scope is clearly defined, system functions and requirements are managed, risks are identified, communicated and managed, and a basis for informed decision-making is established.
2.5 Project scope is monitored and controlled and scope changes are managed in accordance with the scope baseline. Project scope is controlled and all requested changes and recommended corrective or preventative actions are processed through an integrated change control process.	▪ The Order requires that a change control process be defined in the PEP. This ensures that project changes are identified, evaluated, coordinated, controlled, reviewed, approved/ disapproved, and documented in a manner that best serves the project. ▪ Through EVMS certifications, PARS utilization, BCPs, ESAABs, and follow-on EIRs, OECM is able to monitor project scopes and assure that any baseline changes are approved at the appropriate level. ▪ DOE G 413.3-5, Performance Baseline Guide, identifies key PB elements, development process and context, and how to handle changes.

3.5.3 OECM Schedule Management

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of OECM Schedule Management Practices
3.0 Schedule Management	
3.1 Activities are defined by identifying the specific actions to be performed to produce the project deliverables.	▪ The Order requires that a performance baseline be established by CD-2 to include key performance parameters, total project cost, schedule, and scope. This represents the commitment to which a project must be executed. ▪ OECM, via its Order, Guides, and documented Lessons Learned, encourages the complete identification and linking of all activities on the resource-loaded schedule (RLS) such that a complete and useable capital asset is deliverable on time. ▪ DOE G 413.3-1, Managing Design and Construction Using Systems Engineering, and DOE G 413.3-5, Performance Baseline Guide, helps the FPD, IPT and support contractor with schedule development.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Schedule Management Practices
3.2	Discrete activities are sequenced by identifying and documenting relationships among other project activities. Activities are sequenced using logical relationships and each activity and milestone except for the first and last are connected to at least one predecessor and one successor.	▪ During IPRs and EIRs, qualified teams analyze the WBS and RLS, using Pertmaster, Primavera, or equivalent, for completeness and logic. ▪ DOE G 413.3-9, Project Reviews, addresses the various reviews conducted during the project life cycle.
3.3	Activity resources are estimated by the type and quantities of material, people, equipment, or supplies required to perform discrete activities.	▪ During IPRs and EIRs, cost estimating SMEs spot check through sampling techniques to ascertain that quantities, unit prices, rates, and productivity factors are reasonable and representative of the time and place the construction will take place.
3.4	The project schedule is developed by analyzing activity sequences, durations, resource requirements, and schedule constraints. The project schedule clearly identifies the planned start and finish dates for project activities and milestones. A realistic project schedule is revised and maintained throughout the project as work progresses, the project management plan changes, and the nature of risk events evolve.	▪ During IPRs and EIRs, qualified teams analyze the WBS and RLS, using Pertmaster, Primavera, or equivalent, for completeness and logic. ▪ The Order requires that any schedule changes that affect the approved baseline or contract are processed through Change Control Boards, as appropriate. ▪ DOE G 413.3-15, PEP, provides guidance to the FPD and IPT for establishing appropriate change control levels.
3.5	Schedule control is maintained by monitoring project performance and updating the schedule based current status and progress. Schedule changes are managed through an integrated change control process to maintain the schedule baseline.	▪ Through PARS, EVMS, and periodic reviews, OECM Project Assessment Team and Project Management Systems Team members work with the Programs to monitor the schedule baseline and participate in the process to effect required changes to the performance baseline in a timely manner.

3.5.4 OECM Cost Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Cost Management Practices
4.0	**Cost Management**	
4.1	Costs are estimated in an accurate manner including development of the approximate monetary resources needed to complete project activities. Monetary resource estimates include the identification and consideration of cost alternatives to initiate and complete the project. Costs are estimated for all resources that will be charged to the project including labor, materials, equipment, services, and facilities, as well as special categories such as inflation analysis or contingency costs.	▪ The Order requires that an independent cost estimate be developed or an independent cost review be performed as part of performance baseline validation. ▪ During IPRs and EIRs, cost estimating SMEs spot check through sampling techniques to ascertain that quantities and productivity factors are reasonable and that value engineering principles and practices are encouraged and used throughout the project execution. SMEs also review the risk analysis and resulting contingency identified for reasonableness. ▪ DOE G 413.3-9, Project Review Guide, addresses the various reviews conducted during the project life cycle.
4.2	A realistic budget is developed and aligned by aggregating the estimated costs of individual activities or work packages for projects to establish an authorized cost baseline.	▪ During IPRs, EIRs, and other project assessment reviews, SMEs evaluate the funding required per the RLS and compare it to the indicated funding profile to assure agreement and consistency. ▪ OECM validates project baselines based on program commitment to fund the project in accordance with the identified cost profile.
4.3	Costs are controlled by actively monitoring the status and performance of the project and used to update the project budget and manage changes to the cost baseline. Updates to the project budget include recording actual costs spent to date. Increases to authorized budget are approved through integrated change control. The relationship between the consumption of project funds to the physical work being accomplished is analyzed. Effective cost control is managed through the approved cost performance baseline and changes to the baseline.	▪ Through PARS, EVMS, and periodic reviews, OECM Project Assessment Team and Project Management Systems Team members work with the Programs to monitor the cost performance baseline and participate in the process to effect required changes to the baseline in a timely manner. ▪ Contingency use is closely monitored to assure that risk and the implementation of associated mitigation strategies are consistent with the RMP as described in DOE G 413.3-7, Risk Management Guide.

3.5.5 OECM Quality Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Quality Management Practices
5.0	**Quality Management**	
5.1	Quality planning is performed and includes identifying quality requirements and standards for the project and products and documenting how the project will demonstrate compliance. Quality planning is performed in parallel with other project planning processes such as scope definition, schedule and resource estimate development, and risk identification and analysis.	▪ The Order requires that a Quality Assurance Program be developed at project inception and continue through its life cycle. ▪ OECM has published DOE G 413.3-2, Quality Assurance Guide for Project Management, to assist Programs with their quality planning and implementation.
5.2	Quality assurance is performed and includes the auditing of quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used.	▪ During IPRs, EIRs, and other project assessment reviews, SMEs evaluate the QA performance of the FPD and IPT during project execution. ▪ DOE G 413.3-2, QA Guide for Project Management, provides acceptable approaches for implementing QA requirements and criteria of the Order.
5.3	Quality control is performed and includes monitoring and recording results of executing quality activities to assess performance and recommend necessary changes.	▪ During project reviews, as provided for in DOE G 413.3-9, and other project assessment reviews, SMEs evaluate the QC performance of the FPD and IPT during project execution.

3.5.6 OECM Personnel Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Personnel Management Practices
6.0	**Personnel Management**	
6.1	A personnel management plan is developed including the identification and documentation of roles, responsibilities, and required skills, reporting relationships and staffing plan. The human resource plan includes the organization, training needs, recognition and rewards program, and the impact of staffing on the organization.	▪ The OECM staffing plan identifies the knowledge, skills, and abilities in position descriptions for members of its Project Assessment and Project Management Systems team members. ▪ Professional development and performance evaluation plans establish performance goals, training, and incentives for reaching those goals. ▪ During IPRs, EIRs, and other project assessment reviews (DOE G 413.3-9), SMEs evaluate the PEP (DOE G 413.3-15), and the FPD and IPT (DOE G 413.3-18) qualifications and staffing adequacy (DOE G 413.3-19) to provide the FPD an understanding of a project's staffing needs.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Personnel Management Practices
6.2	The organization is assembled and structured to complete the defined requirements. The organization includes the adequate number of personnel with the required competencies to effectively complete specific requirements.	▪ During IPRs, EIRs, and other project assessment reviews (DOE G 413.3-9); SMEs evaluate the PEP and the FPD and IPT qualifications and staffing adequacy for consistency and currency as per DOE G 413.3-19. ▪ OECM has several contracts with support services contractors to assist its staff with the accomplishment of its mission.
6.3	Organizational development is ongoing and results in continuous improvement including improving competencies, team interaction, and the overall team environment improving project performance	▪ OECM senior management supported PMP and CCE certifications for staff members as part of staff development initiatives. ▪ OECM director and deputy director hold regular meetings with division chiefs and participate in MA-1 staff meetings, including ESC meetings and governance boards.
6.4	Organizational management is effective including tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance. Team behavior is observed, conflict managed, issues resolved, and staffing adjusted as necessary.	▪ OECM director, deputy director, and division chiefs meet regularly with staff members providing feedback on performance relevant to their performance plan goals, training, and task implementation. Issues are addressed, misunderstandings resolved, and staffing assignments made as necessary.

3.5.7 OECM Communication

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Communication Practices
7.0	**Communication**	
7.1	Stakeholders are identified including all personnel impacted by the project and relevant information regarding stakeholder interests, involvement, and impact are documented.	▪ OECM assigns to each project, an analyst who continuously monitors and assesses monthly performance information in PARS. ▪ During IPRs, EIRs, and other project assessment reviews, SMEs evaluate the project team's Communication Plan for completeness and effectiveness for keeping all stakeholders informed of the project's goals, objectives, and schedule.
7.2	Communications are planned including determining stakeholder information needs and defining an effective communications approach.	▪ During reviews, OECM and its support contractor(s) evaluate communications plans developed by the FPD, IPT, and the Program for their projects.

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Communication Practices
7.3	Relevant information is distributed and made available to project stakeholders as planned. The distribution of information is conducted in a timely manner and is performed throughout the entire project lifecycle.	▪ OECM director and deputy hold monthly all-hands meetings with the OECM staff and weekly meetings with division chiefs. Division chiefs hold weekly meetings with their staffs to determine task status, pass on information from the top, receive input from the staff, and lay out plans for the coming days and weeks. ▪ OECM communicates with external stakeholders (e.g., GAO, OMB, and IG) during audits to demonstrate contract and project performance and achievement of planned cost, schedule and performance goals.
7.4	Stakeholder expectations are actively managed including ensuring their needs are met and issues are addresses as they occur. Management of stakeholder expectations includes clear and concise communication activities directed toward project stakeholders to influence their expectations, address concerns, and resolve issues.	▪ Through memos, white papers, point papers, email, and verbal feedback, the OECM director, deputy director, and division chiefs respond to the needs and expectations of DOE senior management. This is facilitated through ESC meetings, ESAAB meetings, governance boards, and meetings and discussions with under/assistant secretaries and other senior staff members.
7.5	Performance is reported including the collection and distribution of performance information such as status reports, progress measurements, and forecasts. Performance reporting includes the periodic collection and analysis of planned versus actual project data and results in the timely communication of project progress and performance and the forecast of project results.	▪ Project status information, largely gleaned from EVMS, PARS, EIRs, IPRs, and other communication sources, is passed to senior management in accordance with the Order and established policies and procedures.

3.5.8 OECM Risk Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Risk Management Practices
8.0	**Risk Management**	
8.1	Risk management planning is conducted and includes the definition of specific risk management activities that are to be performed. Risk management planning includes the degree, type and visibility of risk management commensurate with both the risks and the importance of the project to the organization.	▪ The Order requires that risk assessments should start early in the project life cycle and identify critical technical, performance, schedule, and cost risks. ▪ During IPRs, EIRs, and other project assessment reviews, OECM SMEs work with the Programs to evaluate the thoroughness of the risk identification process and the timely development of a complete RMP. ▪ In addition to the Order, DOE G 413.3-7 and risk management courses included in the PMCDP address risk management.

Program/Project Management Areas and Processes and Associated Effective Management Practices	Examples of OECM Risk Management Practices
8.2 Risks are identified and their characteristics are accurately documented. A risk register is established, maintained, and updated throughout the project lifecycle.	▪ This is a FPD, IPT, and Program responsibility. ▪ DOE G 413.3-7, Risk Management, describes an effective risk management process that enables the FPD and IPT to develop a RMP. ▪ OECM evaluates this activity during various reviews with the Programs per DOE G 413.3-9. ▪ OECM includes project risk knowledge in its monthly project assessment process.
8.3 Qualitative risk analyses are performed including risk prioritization, and assessing the probability and occurrence and impact associated with identified risks. Risk priorities are assessed using the relative probability or likelihood of occurrence and the corresponding impact on project objectives if the risks occur.	▪ This is an FPD, IPT, and Program responsibility. ▪ DOE G 413.3-7 and the PMCDP Risk Management training courses provide guidance and hands–on experience for the FPD. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. ▪ OECM includes project risk knowledge in its monthly project assessment process.
8.4 Quantitative risk analyses are performed including numerically analyzing the effect of identified risks on overall project objectives.	▪ This is an FPD, IPT, and Program responsibility. ▪ DOE G 413.3-7 and the PMCDP Risk Management training courses provide guidance and hands–on experience for the FPD. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. ▪ OECM includes project risk knowledge in its monthly project assessment process.
8.5 Timely and effective responses to identified risks are planned, including the development of options and specific actions to reduce threats to project objectives. Planned risk responses include identification and assignment of risk response owners who are responsible each agreed to and funded risk response. Risk responses are prioritized and the appropriate resources and activities are included into the budget, schedule and project management plan as needed.	▪ This is an FPD, IPT, and Program responsibility. ▪ DOE G 413.3-7 and the PMCDP Risk Management training courses provide guidance and hands–on experience for the FPD. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. ▪ OECM includes project risk knowledge in its monthly project assessment process.
8.6 Risks are monitored and controlled including the implementation of risk response plans, tracking of identified risks, monitoring of residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.	▪ This is an FPD, IPT, and Program responsibility. ▪ DOE G 413.3-7 and the PMCDP Risk Management training courses provide guidance and hands–on experience for the FPD. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. ▪ OECM includes project risk knowledge in its monthly project assessment process.

3.5.9 OECM Acquisition Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OECM Acquisition Management Practices
9.0	**Acquisition Management**	
9.1	Procurements are planned in a timely and effective manner including documenting the project purchasing decisions, specifying the approach, and identifying potential suppliers. The procurement plan identifies the project needs which can best be, or must be, met by acquiring products, services or results outside the project organization.	▪ In accordance with DOE O 413.3A, OECM reviews the acquisition strategy for major system projects and provides an approval recommendation to the PSO. ▪ The acquisition strategy and the acquisition plan are the responsibility of OPAM, the AE, Program officials, and FPD. ▪ DOE G 413.3-13, Acquisition Strategy Guide, serves as a guide to those responsible for development of the acquisition strategy. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. The Order and the relevant Guide address acquisition strategy and management in adequate detail.
9.2	Procurements are conducted in accordance with documented acquisition processes in a timely and cost effective manner. Detailed evaluations are conducted based on a specific and comprehensive requirements document requested from suppliers.	▪ The AE approves the acquisition strategy and plan at CD-1. ▪ Implementing the acquisition according to the approved plan is the responsibility of OPAM, the AE, Program officials, and the FPD. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9. The Order and the relevant Guide address acquisition strategy and management in adequate detail.
9.3	Procurements are administered and include monitoring contract performance, making contract changes and corrections as needed, and ensuring that contractual obligations and legal rights are protected.	▪ This effort is the responsibility of the FPD, site Contracting Officer, contract administrator, and the IPT. ▪ OPAM, the Program, and OECM have oversight monitoring and change control responsibilities, and authorities as addressed in the Order, DEAR, and the FAR. ▪ OECM evaluates this activity during reviews with the Programs per DOE G 413.3-9.
9.4	Procurements are closed in a timely manner upon verification that all work was completed and deliverables are acceptable. Procurement closure includes administrative activities such as finalizing open claims, updating records to reflect final results, and archiving information for future use.	▪ Project close out is a responsibility of the FPD, Contracting Officer, IPT, Program Officials, and OPAM. ▪ DOE G 413.3-16, Project Transition/Closeout (CD-4), provides guidance to the responsible parties for assuring that the project has met key performance parameters and financial closure requirements.

3.6 OFFICE OF PROCUREMENT ASSISTANCE AND MANAGEMENT

The DOE Secretary has delegated Acquisition and Procurement authority for EM and SC to OPAM. OPAM in turn delegates Acquisition and Procurement authori-

ty to EM and SC. Title 32 gives the NNSA Administrator procurement authority and designates him/her as the senior procurement executive for NNSA. Although NNSA follows DOE guidance regarding acquisition and procurement, it does not have to seek OPAM authorization.

Organizationally, OPAM has dotted-line authority for acquisition activities in EM and SC. There are no direct reporting relations from field activities into OPAM as all Contract Specialists (1102 job series) in EM and SC report into their respective field organizations. OPAM has recently reinstituted acquisition reviews in order to independently evaluate the acquisition practices on EM and SC projects.

The table below summarizes the ninth PMI PMBOK program/project management area, acquisition management, and OPAM's use of effective practices.

3.6.1 OPAM Acquisition Management

Program/Project Management Areas and Processes and Associated Effective Management Practices		Examples of OPAM Acquisition Management Practices
9.0	**Acquisition Management**	
9.1	Procurements are planned in a timely and effective manner including documenting the project purchasing decisions, specifying the approach, and identifying potential suppliers. The procurement plan identifies the project needs which can best be, or must be, met by acquiring products, services or results outside the project organization.	▪ OPAM plans and schedules procurements in concert with EM and SC; however, the coordination is often challenged impacting the timely execution of procurements. ▪ Procurement strategies and plans are developed in accordance with documented DOE procedures.
9.2	Procurements are conducted in accordance with documented acquisition processes in a timely and cost effective manner. Detailed evaluations are conducted based on a specific and comprehensive requirements document requested from suppliers.	▪ Procurements are often delayed due to the extensive coordination required within Program Offices and between OPAM and the Program Offices. ▪ Procurement evaluations are conducted in accordance with DOE established guidelines.
9.3	Procurements are administered and include monitoring contract performance, making contract changes and corrections as needed, and ensuring that contractual obligations and legal rights are protected.	▪ Procurement administration includes monitoring contract performance; however, the alignment and integration between baseline and contract changes lack rigor. ▪ A more structured, formal integrated contract change administration process is required to ensure contract and baseline alignment.
9.4	Procurements are closed in a timely manner upon verification that all work was completed and deliverables are acceptable. Procurement closure includes administrative activities such as finalizing open claims, updating records to reflect final results, and archiving information for future use.	▪ Procurements are monitored to confirm the completion of work scope. ▪ Completion criteria are established and verified; however, the lack of clear and concise criteria often makes the completion and acceptance of deliverables challenging. ▪ Procurements are closed upon completion although more timely completion of claims and update of records can be improved upon.

In addition to summarizing OPAM practices in the PMI PMBOK acquisition management area, the CM 7 team also reviewed the OPAM organization using the GAO Framework for Assessing the Acquisition Function[3]. This framework, and assessment of OPAM, is summarized in the table below.

Cornerstones	Elements	Critical Success Factors (CSFs)	Examples of OPAM Practices Relative to Critical Success Factors
Organizational Alignment and Leadership	Align Acquisition with Agency's Mission and Needs	▪ Assuring appropriate placement of the Acquisition Function ▪ Organizing the acquisition function to operate strategically ▪ Clearly defining and integrating roles and responsibilities	▪ Placement of OPAM does not indicate the organization is viewed as a strategic asset. ▪ Programs do not view OPAM as a business partner.
	Commitment from Leadership	▪ Clear, strong and ethical executive leadership ▪ Effective communications and continuous improvement	▪ OPAM provides strong and ethical leadership by providing acquisition oversight and an integrated approach to acquisition management. ▪ OPAM works with the Programs, seeks their input, and revises practices when appropriate.
Policies and Processes	Planning Strategically	▪ Partnering with internal organizations ▪ Assessing internal requirements and the impact of external events	▪ OPAM has delegated acquisition authority to EM and SC, and it works with NNSA regarding standard DOE acquisition policies and procedures.
	Effectively Managing the Acquisition Process	▪ Empowering cross-functional teams ▪ Managing and engaging suppliers ▪ Monitoring and providing oversight to achieve desired outcomes ▪ Enabling financial accountability	▪ Managing and engaging suppliers is performed at the project level; however, OPAM provides oversight activities by conducting acquisition reviews. ▪ Financial accountability is not consistently applied across the Programs.
	Promoting Successful Outcomes of Major Projects	▪ Using sound capital investment strategies ▪ Employing knowledge-based acquisition approaches	▪ Capital investment strategies are developed and implemented at the Program level with OPAM providing oversight responsibilities.

[3] Framework for Assessing the Acquisition Function at Federal Agencies, U.S. Government Accountability Office (GAO), GAO-05-218G, September 2005

Cornerstones	Elements	Critical Success Factors (CSFs)	Examples of OPAM Practices Relative to Critical Success Factors
Human Capital	Valuing and Investing in the Acquisition Workforce	▪ Commitment to human capital management ▪ Role of the human capital function	▪ OPAM develops and implements human capital strategies for headquarters acquisition personnel only. ▪ OPAM does not play a role in the hiring, developing, or evaluating acquisition personnel in the Programs. ▪ Accountability resides in the Programs.
	Strategic Human Capital Planning	▪ Integration and alignment ▪ Data-driven human capital decisions	▪ Integration and alignment of human capital planning is fragmented among OPAM and the Programs.
	Acquiring, Developing and Retaining Talent	▪ Targeted investments in people ▪ Human capital approaches tailored to meet organizational needs	▪ Acquisition training programs are inconsistent among OPAM and the Programs. ▪ Acquisition training is not tailored to meet the needs of the individual Programs or OPAM.
	Creating Results-Oriented Organization Cultures	▪ Empowerment and inclusiveness ▪ Unit and individual performance linked to organizational goals	▪ Major policies are sent for comment and discussion to procurement analysts and contracting officers designated by Procurement Directors in the field. These people are part of a long-established Procurement Policy Advisory Group (PPAG). Department of Energy Acquisition Regulation changes are reviewed by the field acquisition personnel and placed on the Federal Register for public comment. ▪ Procurement Director teleconference calls are regularly scheduled throughout the year to discuss challenges, direction, and best practices. ▪ Regularly scheduled PPAG teleconference calls at the staff level are scheduled by the OPAM policy group. ▪ Procurement Management Reviews and PERT Reviews are augmented with field personnel to bring the field perspective, experience, and best practices. Feedback is solicited to identify improvements in the conduct, structure, and execution of reviews. ▪ There is an established deviation process used by various field offices. ▪ Program acquisition performance goals are aligned with OPAM and DOE goals.

Cornerstones	Elements	Critical Success Factors (CSFs)	Examples of OPAM Practices Relative to Critical Success Factors
Knowledge and Information Management	Identifying Data and Technology that Supports Acquisition Management Decisions	▪ Tracking acquisition data ▪ Translating financial data into meaningful formats ▪ Analyzing goods and services spending	▪ DOE provides structure, policies, and procedures regarding acquisition information systems. ▪ DOE stakeholders generally agree that the information systems provide credible, reliable, and timely information.
	Safeguarding the Integrity of Operations and Data	▪ Ensuring effective general and application controls ▪ Data stewardship	▪ DOE has internal controls over acquisition systems. ▪ DOE provides policies and procedures regarding data accuracy and reliability.

Chapter 4
General Observations and Recommendations

The following section includes observations noted by the CM 7 team through discussions with DOE personnel, reviews of program documentation, and first-hand experience. Based on the current status of contract and project management within DOE, the team also offers several recommendations to address some of the identified weaknesses. These recommendations are documented in Section 4.2.

4.1 GENERAL OBSERVATIONS

The Department has taken significant steps to improve contract and project management. A number of key actions have been implemented or are currently being implemented to improve contract and project management including the following:

- The highest levels of DOE management remain dedicated to improving contract and project management, including the Department's follow through on actions from the RCA and CAP, memoranda from the Deputy Secretary, and ongoing initiatives being made in EM and NNSA. (Personnel Management)
- Improving PARS to keep leadership aware of current project status and to effect appropriate corrective actions in a timely manner. (Communications)
- Strengthening project management procedures by revising DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets, along with revisions or development of 20 associated supporting guides, supplemental directives, and operating policies. (Program/Project Integration)
- Implementing full funding for projects less than $50 million total project cost. (Cost Management)
- Improving the staffing and associated competencies of PMSOs within EM, NNSA, and SC. (Personnel Management)
- Implementing a new NNSA contracting strategy to manage the capital asset acquisition and construction management services. (Acquisition Management)
- Enhancing the PMCDP, the FPD Certification Program, the ACDP, and the Acquisition Professional Certification requirements to enhance the

training and qualifications of contract and project management personnel. (Personnel Management)

- Implementing enhanced IPRs and Technical IPRs to better monitor project development and execution by including contracting personnel on review teams and leveraging the successful processes employed by SC. (Communications)

- Expanding the scope of EIRs through increasing the depth of the current lines of inquiry and adding new lines of inquiry. (Communications)

- Enhancing the use of project management tools and techniques, including Technology Readiness Assessments, the PDRI, Risk Registers and risk analysis using Monte Carlo techniques, and Earned Value Measurement, for improved management decision-making. (Communications)

However, there are also several areas that warrant further improvement in contract and project management and these are summarized below.

Organizational Alignment, Integration, Leadership, and Communication

- Improved project management is largely attributable to the efforts of influential persons within DOE in critical management roles who have instituted policies, practices, and requirements that are proven and enduring. This is clearly evident in SC. However, in other Programs, some of these people have since departed DOE without instituting such structure. New leadership along with strong and visible champions needs to institute and follow enduring and proven contract and project management best practices. MA-1, with OECM and OPAM reporting directly, and as head of the ESC and DRB, is the DOE contract and project management champion. This is more sustaining since the position is a career SES position as opposed to a political appointee which is subject to changes in Administration policies. (Personnel Management)

- Communication, coordination, and integration between budget, contract management, and project management require further improvement. Program and project managers are often informed of issues and emerging problems too late and long after they have surfaced. Too often these functions are not effectively working together. There is limited evidence of effective, proactive, regular (formal and informal) communication and coordination mechanisms at Headquarters. Improving communication and coordination will reduce competing priorities, enhance program effectiveness, and improve project performance. (Communications)

- There is a lack of effective contract and project management integration between line and staff organizations at Headquarters, between the Field and Headquarters, and between contract and project management personnel. This is particularly evident in integrated project and contract change control. Departmental organizations and personnel responsible

for specific contract and project management change control functions are not effectively communicating and working together to integrate their activities. The Departmental structure often blurs the lines of accountability and permits challenges to go uncorrected. This results in inadequate contract and project management plans, performance, oversight, and results. (Program/Project Integration)

Roles, Responsibilities, Authority, and Decision-Making

- Alignment between contract and project management authority, accountability, and responsibility is weak. The authorities, roles, and responsibilities for project management and oversight, while identified in 413.3 and the IPT Guide, are not adequately defined. Furthermore, it is unclear whether program and project managers truly understand what the full spectrum of their responsibilities and whether manager's competencies are commensurate with their responsibilities. This sometimes produces competing and conflicting project direction, ineffective use of resources, a lack of accountability, and limited authority of FPDs. This is reflected in the way in which the Department is organized and unclear expectations and definition of the federal ownership role. (Personnel Management)

- The decision making authority chain of command is often disregarded or directly bypassed by subordinate organizations. Frequently decisions are presented for approval where all alternative options are effectively eliminated from the decision maker's authority. (Personnel Management)

- NNSA is reviewing how it governs its contractors and is establishing a new governance model. This effort should streamline the federal and contractor roles, responsibilities, and accountability between federal and contractor personnel to enhance the ability to more effectively accomplish programmatic missions and achieve project schedule and cost baselines. (Acquisition Management)

Policies, Procedures, Plans, Processes, and Practices

- NNSA and EM continue to implement improved practices to ensure disciplined planning and execution of projects as well as continuous performance improvement. Further improvements are required to produce tangible and sustainable results. (Program/Project Integration)

- EM is implementing a planning approach that is national in scale and uses risk reduction as a major prioritization factor. The prioritization also considers the full lifecycle of scope, schedule, and cost to complete a specific mission, which may include both capital asset projects and operations activities. To establish priorities, EM ranks activities with the greatest risk reduction benefit driven by radioactive content and overlays its compliance and best practices to maximize cleanup progress. The EM method for prioritizing projects is influenced by external organizations (state and local governments, regulatory agencies, and citizen groups) to meet regulatory compliance commitments. (Program/Project Integration)

The EM prioritization methodology is focused on sites establishing integrated priority lists (IPLs) based on newly identified Capital Asset Projects and Analytical Building Blocks (ABBs) for operations activities. Funding for capital asset projects is established at the 80 percent confidence level. IPL sub elements are broken down into minimum safe/essential services for compliance and non-compliance; progress tied to compliance; progress tied to non-compliance; and emerging requirements. Targets are established by Headquarters and submitted to the field for IPL development. Once field IPLs are established, site managers present their specific IPL and adjustments are made as necessary by EM leadership. EM's base program consumes the majority of its funding and cleanup activities are prioritized according to the following:

- Maintain a safe, secure, and compliant posture across the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel (SNF) storage, receipt, and disposition
- Special nuclear material (SNM) consolidation, processing, and disposition
- High priority groundwater remediation
- Transuranic (TRU) and mixed/low level waste disposition
- Soil and groundwater remediation
- Excess facilities decontamination and decommissioning (D&D)

However, despite all the EM efforts to establish field IPLs, a consolidated and integrated EM Program Office IPL continues to be influenced to a large extent by political and funding realities.

- The federal program managers (FPMs) at the eight NNSA site offices are responsible for identifying projects consistent with achieving the NNSA's program mission and associated objectives. Near-term initiatives that must be completed within the year are differentiated from the longer duration efforts. The FPMs provide their candidate list of prioritized work initiatives to the Assistant Deputy Administrator (ADA) for Strategic Planning, Resources and Integration (NA-14) for review and assessment. Working with the Deputy Administrator for Defense Programs (NA-10) and other ADAs, NA-14 updates and revises project priorities, as appropriate, for use during the programming phase of the PPBE process (in accordance with BOP-001.2). (Program/Project Integration)

  Varieties of methods with varying degrees of rigor are available to NNSA managers to prioritize projects. Generally, they all involve the use of individual judgments or assessments provided by a structured group of SMEs. For example, when using the Delphi technique, SMEs provide

their judgments in an iterative process to reach consensus or converge on the "preferred or appropriate" priority scheme. A more rigorous and quantitative process to evaluate and prioritize competing projects includes establishing evaluation criteria, assigning numerical weights or scores to the criteria using expert judgment, and assessing and confirming the results.

NNSA headquarters has established an Integrated Construction Program Plan process that provides a prioritization and management framework for its construction projects. This formal process is documented in a NNSA publication entitled, *Integrated Construction Program Plan, Prioritization Description and Process Adjustment Update*. A key component of this process is the Construction Working Group (CWG), which has prioritization methodologies as one of its focus areas. The CWG uses a rating scheme comprised of three discretely defined core criteria and associated weighting methodology as follows:

- 25%—Supports Defense Programs operational and business goals: This criteria is used to rank a project on a scale from 1 to 10 using a variety of guidelines, including mission critical or support facility impact, consolidation, operational impact, risk management impact, and additional factors.

- 45%—Supports Defense Programs mission deliverables: This criteria is used to rank a project on a scale from 1 to 10 using several guidelines, including the project is required to meet a program deliverable, the project will mitigate a program deliverable risk, the project will directly improve efficiency or effectiveness in meeting program deliverables, or the project directly supports meeting a program deliverable.

- 30%—Improves Safety, Environmental, Security, or Readiness: This criterion is used to rank a project on a scale from 1 to 10, with a score of ten being applied to the project the yields the greatest safety, environmental, security, or readiness benefit.

The criteria and weights used to prioritize construction projects are generated using a combination of input from NNSA ADAs, stakeholders, program sponsors, and site managers over a course of three rounds of workshops, similar to a Delphi method. These inputs resulting from the workshops are considered by the CWG, which provides its recommended prioritization to NA-10.

- The Office of Science Associate Directors request and defend to Director, Office of Science their respective program budgets. Based on the summation of requests received from the SC Programs, and SC priorities, the final SC budget is submitted to the DOE Office. After SC receives the apportioned budget, it is distributed to the SC Programs where the Associate Directors are responsible for further distribution and management of the funds. For a project to be initiated, the Mission Need Statement needs to be approved by the Director, Office of Science. Without the ap-

proval of the Mission Need Statement and CD-0, a project budget request cannot be submitted. (Program/Project Integration)

- The extensive use of non-mandatory guides fosters a culture of voluntary and discretionary implementation of preferred or effective practices. Decisions to follow the content contained in the guides are largely left to the discretion of SC, NNSA, and EM. Effective contract and project management practices are documented; however, the establishment of minimum requirements by the Programs and enforcement related to their application is lacking. (Program/Project Integration)

Federal and Contractor Accountability (Including Performance Metrics)

- The DOE O 413.3A requirement of line management accountability for project performance needs to be more effectively practiced. The expectations are that contractors are directed as to "what" to do and then be held accountable for their performance to produce the appropriate deliverables or results (scope, quality, safety, schedule, and cost). However, increasingly more detailed direction from DOE that direct contractors not only "what" is expected, but also exactly "how" contractors should be accomplishing work. The more DOE directs contractors exactly how to manage work, the responsibility for outcomes transfers from the contractors to the Department. (Personnel Management)

- Accountability within DOE needs further improvement as well. Staff organizations (such as OECM and OPAM) should function in an integrated support role to SC, NNSA, and EM as they are not directly responsible for successful programmatic outcomes. DOE Program Office line managers need to be held more accountable for project cost and schedule performance. There have been instances of poor project performance by contractors working for DOE Programs, and it's not clear whether the responsible managers, both contractor and DOE, have been held accountable. Contractor past performance ratings need to be used more effectively for award/incentive fee determinations aligned with project cost and schedule performance, and also to the greatest extent possible in the selection of contractors for future work. (Personnel Management)

- DOE has not effectively used management tools including contractor performance metrics, incentives, and project performance data to provide adequate oversight of project scope, schedule, and cost performance and to hold contractors and federal personnel accountable for results. Large, complex projects often stretch the resources of DOE sites and project cost and schedule performance is generally not addressed as a significant portion of the annual contract performance fee in comparison to other fee-bearing portions of the contract. (Communications)

- All of EM’s existing line item projects are managed under FAR Part 15 contracts. At many sites, EM has implemented multiple contracts in lieu of a single M&O contract. EM uses a combination of contract types to execute capital asset and cleanup projects including predominantly cost

plus award fee (CPAF), and cost plus incentive fee (CPIF) contracts. The fees in CPAF and CPIF contracts are not fixed at the outset of the contract, but instead depend on contractor performance. CPIF contracts may provide for performance and delivery incentives as well as a formula that provides the fee that is initially negotiated and adjusted based on the relationship of total allowable cost to the total target cost. CPIF contracts specify a target cost, a target fee, minimum and maximum fees and a fee adjustment formula. The formula provides, within limits, for an increase in the fee paid to the contractor above the target fee when total allowable costs are less than the target cost. The formula also provides for a decrease in fee below the target fee when the total allowable costs exceed the target cost. This variation in fee provides an incentive for the contractor to manage the contract effectively. If the total allowable costs are greater to or less than the range of costs within which the fee adjustment formula operates, the contractor will earn the minimum or maximum fee, respectively (FAR 16.405-1). In addition, CPIF contracts may allow for delivery or performance incentive fees, where incentive fees are paid for meeting a contract performance requirement or a contract milestone. (Acquisition Management)

CPAF contracts are a special type of incentive contract where the fee may include a base amount that is fixed at the inception of the contract and an award amount that the contractor may earn in whole or in part during performance to provide motivation for excellence in such as areas as quality, timeliness, technical ingenuity, and cost-effective management. The amount of award fee to be paid in any given performance period is determined by the Government's judgmental evaluation of the contractor's performance in terms of the criteria stated in the contract. This determination and the methodology for determining the award fee are unilateral decisions that are made solely at the discretion of the Government (FAR 16.405-2).

In some cases, DOE EM contracts allow for provisional payment of CPIF and CPAF fees, such as for the partial completion of an incentive or the completion of milestones or other performance criteria as specified by the contract or in a Performance Evaluation and Measurement Plan. Provisional payments must be repaid to the Government, in whole or in part, if the incentive is not successfully completed.

EM contract performance metrics and associated fee reviewed included the Salt Waste Processing Facility (SWPF), the Nuclear Facility Decontamination and Decommissioning Project, and the Waste Treatment Plant. In accordance with established policy, EM uses fee plans for its contracts. Approaches include "pure" CPIF fee plans, and hybrid CPIF and CPAF fee plans (SWPF). For CPAF contracts, EM uses a combination of single and multi-year performance based incentives to incentivize results. EM, and other DOE Programs, needs to implement regular reviews of projects that fail to meet cost and schedule performance and establish and align fee-bearing incentives to reward improved performance.

- The principal management staffs at the eight NNSA site offices work with personnel at NNSA headquarters and the NNSA Service Center to implement strategies to ensure that appropriate contractor support is obtained. The NNSA is in the midst of re-engineering key elements of its contracting and acquisition strategy. The most significant contracting change is expected to have a far-reaching positive impact on the effectiveness of NNSA's business operations. Soon NNSA plans to competitively award a new Integration, Management and Execution (IME) Construction Management Contract. With this award, NNSA expects to improve overall construction management. Specifically, it hopes to avoid schedule creep and eliminate cost overruns that have plagued almost all of NNSA's construction projects in recent years. (Acquisition Management)

  Collectively, the NNSA M&O contractors at all NNSA laboratories and defense-related production sites focus on ensuring that nuclear security enterprise operations are responsive to programmatic mission objectives. Historically, the M&O contractors have also played a role in the management of construction projects at their respective sites—project management, including oversight. This has proved to be an inefficient use of resources. Execution of construction project management activities should be performed by the IME that has the design and construction expertise to implement this function more effectively and efficiently than the M&O contractors.

  NNSA contractor performance and award fee plans were reviewed for the Waste Solidification Building (WSB), the Mixed Oxide Fuel Fabrication Facility (MOX), and the National Ignition Facility. NNSA performance metrics and fee are directed at the implementation good project management practices and systems. An increased use of actual project cost and schedule performance incentives would improve alignment between fee payments and project performance.

- The Office of Science oversees the construction and operation of some of the nation's most advanced research facilities. These state-of-the-art facilities are shared with the scientific community, worldwide, and offer some technologies and instrumentation that are not available elsewhere. SC projects are executed by an M&O contractor under a Cost-Plus Incentive/Award Fee type contract arrangement via a work authorization. Each work authorization (project) includes cost, schedule, and performance incentives/awards and cost constraints, but does not have documented performance metrics, fee determination plans, or fee payment schedules. Incentives/awards are managed at Headquarters and administered at field contracting offices. Contractor performance is appropriately monitored (against established objectives) using EVMS, and performance achievements are independently verified by project peer review teams. Incentives/awards are paid based upon the successful completion of each project. (Acquisition Management)

  SC uses disciplined project and program management processes to oversee the activities essential to constructing and operating these facili-

ties, primarily housed at the national laboratories. In the facility design, construction, and fabrication phases, the SC Office of Project Assessment, working in close consultation with the SC Program Offices responsible for funding the facility, conducts independent technical, cost, schedule, and management peer reviews of SC construction projects and large experimental equipment. In addition to these formal reviews, day-to-day Federal oversight of ongoing construction projects is conducted on-site at the national laboratories by FPDs and the site offices.

SC also evaluates the scientific, technological, managerial, and operational performance of its contractors who manage and operate the national laboratories through the SC annual laboratory appraisal process. The appraisal process uses a common structure across all ten SC laboratories that are comprised of eight Performance Goals, each with a set of underlying Performance Objectives (i.e., statements of desired results for an organization or activity that are scored and reported each year). SC has specifically designed Goal 2.0 as a tool to evaluate the laboratories' ability to provide for efficient and effective design, fabrication, construction, and operations of research facilities. Exceptionally good or poor performance of a laboratory contractor in these endeavors may also be considered in SC's evaluation of Goal 4.0, which reflects the performance of the laboratory and contractor leadership teams in stewarding the laboratory.

For ongoing construction projects like the National Synchrotron Light Source II (NSLS-II) at the Brookhaven National Laboratory, at the conclusion of a given fiscal year, SC uses the results of its peer reviews and other relevant performance information that may become available to evaluators throughout the rating period as the basis for its evaluation of the laboratory in providing effective facility designs to support laboratory programs and in providing effective and efficient construction of facilities and/or fabrication of components, as appropriate. Likewise, for facilities like the Spallation Neutron Source (SNS) at the Oak Ridge National Laboratory and the Linac Coherent Light Source (LCLS) at the SLAC National Accelerator Laboratory which have been constructed and are now in the operational phase, SC uses its annual appraisal process to evaluate the performance of the laboratory in operating the facility and in delivering impactful science and benefits to external user communities.

SC does not directly tie performance incentives or awards to a contractor's ability or failure to successfully complete project milestones, but instead uses the evaluations from the annual SC laboratory appraisal process as the basis for determining the amount of annual performance-based fee and other incentives earned by the contractor, as appropriate. Thus, performance in the areas of Goal 2.0 and/or Goal 4.0 will inform SC's incentive and award determinations, but they do not comprise the entire basis for those decisions.

- DOE does not routinely complete comprehensive contractor evaluation documentation. Furthermore, the solicitation process tends to minimize past performance during the contractor selection process because the allowance for Limited Liability Corporations (LLCs) to be used to produce teaming arrangements. LLCs are anew corporate entity so although the participants may be well-known, past performance data from a previous LLC to a new and different LLC is not directly comparable. Thus, even if the Department had contractor past performance evaluations, DOE would not be able to use them to a great extent in the selection process. DOE needs to develop a mechanism to include prior LLC and individual corporate past performance evaluations in future solicitations where new and different LLCs are proposed. (Acquisition Management)

4.2 RECOMMENDATIONS TO IMPROVE PERFORMANCE

Based on the aforementioned observations, the CM 7 team recommends the following to improve contract and project management within the Department.

- **Maintain a Contract and Project Management Champion at the Highest Level of the Department.**

  The champion's role is to ensure that a focus on the importance of contract and project management, and the associated integration of both, is established and maintained, including adherence to established policy and procedures. This includes ensuring compliance with DOE Order 413.3A, Project Management for the Acquisition of Capital Assets. As is currently the case with MA-1, this position should be maintained as a career federal position as opposed to a political appointee. (Personnel Management)

- **Improve and Expand the Use of Deputy Secretary Reviews, Independent Project Reviews, Construction Project Reviews, Peer Reviews, Independent Cost Reviews, and External Independent Reviews.**

  Expand the breadth and depth of review lines of inquiry. This also includes reviews during front-end planning of projects before authorization to assure that the appropriate level and detail of planning and project definition has been completed. (Communications)

  - Reviews of all projects with a Total Project Cost (TPC) greater than $20M should be conducted in some form. The scope and content of the review should be tailored to the complexities and characteristics of the project, especially for those between $20M and $50M. Tailoring reviews to the complexity of the project ensures the resources expended are commensurate with the benefit. Procedures exist for waiving independent reviews for a routine project when justified, and there are procedures for tailoring reviews as well.

- Establish and implement a procedure to ensure that ongoing projects are re-evaluated frequently in light of changing conditions. Projects with a TPC greater than $100M should be reviewed at least annually and more frequently for the most complex projects or those experiencing performance challenges.

- DOE should continue to conduct project reviews by the Deputy Secretary (Deep Dives) to focus the required senior management attention on specific projects.

- Reviewers from SC, EM and NNSA should be included on cross-program project review teams to foster increased learning, and staff offices (OECM and OPAM) should be included as observers to foster improved communication.

- Project review outcomes should be published, reported, and recommendations should be acted upon and monitored by their respective PMSOs. Lessons learned should be documented and published.

- Improve policy and guidance on independent cost estimating. DOE should mandate the development of independent cost estimates and the conduct of independent cost reviews at the appropriate CD gateways. Also, DOE should ensure adequate federal personnel are in place to gauge the quality of contractor's cost estimates and to independently validate these estimates.

- **Increase the Investment in Acquisition and Project Management Career Development Programs and Other Training.**

  Increase the investment in human capital by providing training and career development in acquisition and project management career development programs for personnel other than FPDs. Also, continue support for PMP and CCE certifications within OECM and other program and project offices. Evaluate the development of a course that trains an IPT at the beginning of a project in order to foster project integration and oversight. (Personnel Management)

- **Align and Integrate a More Rigorous Identification and Control of Project and Contract Changes.**

  Improve the alignment, coordination, and integration of contract and project management functions particularly integrated and timely change control. Improve the discipline and structure for approving and controlling changes to projects and contracts. Revise DOE O 413.3A to strengthen alignment and integration of project and contract changes and develop a supporting guide to provide recommended best practices. (Program/Project Integration)

- **Align the Appropriate Authority with the Responsibility of Project Directors and Ensure Accountability for Project Results.**

  The Department should expand the responsibility of the AE beyond merely approving the appointment of the FPD and approval of the PEP and Acquisition Strategy and Plan. This responsibility includes ensuring the FPD appointed to a project has the appropriate qualifications, competencies, and communication and leadership skills prior to designation by interviewing the proposed FPD for each project. When the FPD is not a designated career federal civil servant (e.g., contracted project manager) or is contracted through an Intergovernmental Personnel Act (IPA) Agreement, the AE must approve their appointment. Once selected, DOE needs to provide FPDs, as Contracting Officer Technical Representatives, with the appropriate authority to accept or reject contractor's project management documents and project performance reports, including authority to control project scope, budget, and schedule. The contract management training of FPDs should be increased, and within the major Programs, FPDs should report directly to their respective PMSOs, and have a dotted line reporting relationship with site managers. (Personnel Management)

- **Document and Communicate the Roles, Responsibilities, and Accountability of Federal Contract, Project, and Program Management Personnel at Headquarters and in the Field.**

  Provide clear definitions of responsibility, authority, and accountability for all personnel involved in projects. Improve accountability at the individual and organizational level for Federal personnel using performance evaluations reviews and plans. (Personnel Management)

  - Clearly delineate DOE Headquarters, Field Office and contractor oversight and management roles, responsibilities, authorities, and relationships. Review and complete the draft project and contract management roles and responsibilities matrix developed as part of the DOE federal staffing corrective measure.

  - Define authorities, roles, and responsibilities for the principal management and oversight functions in a single document for all organizational entities represented. Pattern after the DOE safety oversight model including: establishing goals and work monitoring processes, identifying formal and informal oversight practices, certifying the competencies of federal personnel, describing DOE oversight processes in contracts, and documenting expectations in performance metrics and evaluations.

  - Perform reviews and develop measures to ascertain whether managers understand their project management responsibilities.

- Apply greater rigor when assigning management responsibilities, and verify competency.

- Document program and project management responsibilities in the revised DOE O 413.3A and the supporting IPT guide.

- **Establish and Maintain More Robust Contract and Project Management Communication.**

  Create a more focused continuous performance improvement program, including the use of internal and external contract and project management benchmarking data and a more structured lessons learned program. Develop or improve early warning systems so that program and line managers are kept informed in a timely manner. DOE should increase its focus on senior management involvement and FPD accountability in reporting and reviews, including quarterly reviews focusing on yellow and red projects. Establish full-time liaison positions to improve inter-office communication and cooperation and enforce more formal mechanism for periodic intra-office communication and coordination at headquarters. (Communications)

- **Continue to Strengthen the Alignment of Project Management Support Offices with Direct Reporting to their Organization's Senior Leadership.**

  The DOE PMSOs should be responsible for, and empowered to control, all project management activities. The PMSOs should be direct reports (organizationally and in practice) to the organization's senior leadership. The PMSOs within the Programs should become the centers of excellence in project management, and should be held accountable for the successful planning and execution of all capital asset and cleanup projects. (Personnel Management)

- **Augment Non-Mandatory Guides with Program Minimum Requirements and Permit a Graded Approach to Implementation.**

  Program Offices should establish a minimum set of requirements supported by tailoring of non-mandatory guides to reinforce the implementation of effective practices. The minimum set of requirements and tailoring approach should be determined by the Program Offices and approved by the AE. (Program/Project Integration)

- **Develop and Implement an Integrated Multi-Year Program Planning, Budgeting, and Execution Process that Integrates Project Prioritization and Optimizes Project Execution.**

  DOE should have a more structured and integrated project prioritization process similar to that used by the Navy within the Department of Defense. This includes a multi-year Program Planning, Budgeting, and Execution (PPBE) process that provides for more certainty in project planning, budgeting and execution. The Navy employs a disciplined and

structure multi-year programming process for developing and obtaining approval and funding for military construction projects. This process includes: identification, development, and validation of projects by installations and submittal to respective Regions. Regions then prioritize and submit an Integrated Priority List (IPL) to Headquarters for review. Each project is assessed and scored and then a draft military construction programming board IPL is sent out to the Regions in advance of a Programming Board review. Each Region then presents their respective projects at the Programming Board. Subsequent to presentations, a Programming Board IPL is developed and sent to regional and installation personnel for review and pending further modifications and revisions, a final military construction IPL is submitted to the Navy comptroller to support the Navy budgeting process. DOE can benefit from a more structured and disciplined transparent prioritization system and process with clearly defined criteria, internal review boards, and revised integrated priority lists that are developed at the Program level and not the site or field level within a Program. The latter permits a greater element of external influence and compromises the true value of integration and prioritization. There is some visible evidence within DOE of progress in establishing integrated project priorities; however, more structure and transparency in the process is required to achieve the desired results. The project prioritization process must also provide for integration with the full portfolio of programs, projects, and activities to ensure project prioritization decision processes are not placed in conflict with budgetary and regulatory decision processes. (Program/Project Integration)

- **Review and Align Contractor Performance Plans and Fee on a Regular Basis to Incentivize Improved Project Cost and Schedule Baseline Performance.**

  For M&O contracts, under which capital asset projects are executed, the fee structure for projects with a total project cost greater than $100 million should be reviewed and revised as necessary to incentivize baseline cost and schedule performance. The project fee structure should be revisited on an annual basis until the project is completed. The use of fee and its application to address the management of projects within DOE should be limited to projects executed under Department of Energy Acquisition Regulation (DEAR) contracts. Contractor past project performance evaluations should be included as a requirement of DOE O 413.3A, and these evaluations should be completed routinely, and used in the contractor selection process. Use PARS on a monthly basis to assess management reserve and contingency usage and fee paid to contractors. Fee payments that are not in conformance with project performance need to be identified and more critically reviewed. (Acquisition Management)

DOE's commitment to real and tangible improvement in contract and project performance can be realized by implementing the aforementioned recommendations. These recommendations, when implemented, will help resolve several of the contract and project management issues and root causes which have challenged DOE for years.

The Department is in the process of developing and issuing an RCA and CAP closure report to document all of the deliverables, accomplishments and improvements resulting from the RCA CAP. At the same time, the long-standing RCA/CAP Executive Steering Committee (ESC) is transitioning to a Contract and Project Management Reform ESC. This new ESC on behalf of the Deputy Secretary will conduct a Contract and Project Management Summit in December 2010 to address continuing GAO concerns with contract management and oversight. This new ESC will also ensure past improvements are sustained and future improvements are implemented. Therefore, the recommendations contained in this report not documented as closed in the RCA and CAP closure report, will be carried forward as continuous improvement opportunities under the new ESC structure.