

## **PARS II: Redefining Program Oversight & Assessment at the Department of Energy - 11363**

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### **ABSTRACT**

The United States Department of Energy (DOE) launched a project management reform initiative in June of 1999, designed to improve the Department's ability to gauge project performance and consistently apply Earned Value Management disciplines to billions of dollars in Federal projects. As part of this initiative, DOE implemented the Project Assessment and Reporting System (PARS), a web-based application that allowed Department contractors to report summary-level project performance information to DOE via the Internet. After several years, extensive internal reviews, and a Government Accountability Office assessment of the Department's project and contract management procedures, DOE made the decision to acquire and implement a new system, dubbed PARS II, to add functionality and ease of use to the Department's web-based project management efforts, replacing the original PARS.

Chief among the new requirements for PARS II was the ability for contractors to upload project performance data directly from their project management systems to a Department of Energy server. To form the basis of the new system, DOE and Energy Enterprise Solutions, a Federal IT contractor, selected the Dekker PMIS<sup>®</sup> from Dekker, Ltd. as a commercial-off-the-shelf product with functionality that met or exceeded Department requirements. Over the next three years, Dekker, Ltd. and EES worked in conjunction with the Department of Energy Office of Engineering and Construction Management (OECM) to implement the new, web-based system that captures accurate, timely, consistently reported, and auditable project performance data from multiple contractor sites around the country. This new system fosters greater transparency and provides project oversight staff a single, online, and secure vantage point from which to monitor up-to-date performance data generated directly from the project sites' Earned Value Management systems.

PARS II became the official System of Record for DOE in October, 2010, and has now been implemented successfully throughout the DOE complex, and at contractor sites around the country. This project, in conjunction with other ongoing efforts throughout DOE, continues to improve the Department's project management infrastructure and cultural foundations for effective contract management.

### **INTRODUCTION**

In 2010, the United States Department of Energy began implementing PARS II (Project Assessment and Reporting System, Version 2), a web-based resource designed to strengthen the Earned Value Management (EVM) reporting and analysis capabilities of the Department. PARS II allows government contractors to upload project performance data to a secure location, and then provides oversight, assessment, and reporting capabilities to Program Directors, Analysts, and other program and project stakeholders inside DOE. This implementation represents the finish line for one significant effort – the design and development of PARS II itself – and the starting gun for another – Department-wide deployment and contractor adoption. Leading the effort are the Office of Engineering and Construction Management (OECM) within DOE, Energy Enterprise Solutions (EES), the prime contractor on the project, and Dekker, Ltd., the technology and consulting company responsible for the physical development of the system.

Effective project and contract management is always an ongoing, evolving process, but in many ways PARS II represents the culmination of the Department of Energy's push toward improved project oversight efforts – a process that began in earnest in 1999.

## **HISTORY**

Earned Value Management has roots in the Department of Defense as far back as the 1960s, but it has only been within the last fifteen years that it has emerged as a major factor in project management undertakings in other agencies throughout the Federal government. In 1998, the American National Standards Institute (ANSI) took possession of the EVM standards (32 total), publishing ANSI/EIA 748-98, and in 2003, the Office of Management and Budget (OMB) adopted the ANSI standard and mandated it for major asset acquisitions across all government agencies. (U.S. Department of Defense, KM Systems Group, BAE Systems, Inc., Abba Consulting, Inc., 2006) The National Defense Industrial Association (NDIA) defines EVM as “a project management process that effectively integrates a project's scope of work with schedule and cost elements for optimum project planning and control.” (National Defense Industrial Association Program Management Systems Committee (NDIA PMSC), 2009) The Department of Energy currently mandates that Earned Value compliance be observed on all projects with a total cost greater than or equal to \$20 million, and projects with a total cost greater than or equal to \$50 million must earn either a DOE or FAA systems validation. (National Defense Industrial Association Program Management Systems Committee (NDIA PMSC), 2009)

In the late 1990s, DOE had many notable project successes, some of which came in as much as 35% under cost and 15 months ahead of schedule. This level of performance was not seen across the board, however, and as a result DOE launched a project management reform initiative in June 1999. (Glauthier, 1999) This initiative produced a number of important changes in DOE that helped overall major contract management efforts. DOE created the Office of Engineering and Construction Management (OECM) as an internal project management oversight body, issued a comprehensive project management policy, insisted that contractors follow mandated EVM policies, and created a certification program for the EVM systems in place at contractor sites. (Government Accountability Office, 2005)

A core component of the project management reform initiative was the creation of the first Project Assessment and Reporting System (PARS), a web-enabled distributed database designed to deliver project status and assessment information to DOE. (United States Department of Energy) The purpose of PARS was to serve as a central source of project information, baselines, and performance against those baselines, with reporting at the highest summary level. (Makepeace, 2009)

Using PARS presented a number of challenges, however. PARS was an application custom-designed for DOE that ran off of a proprietary database hosted outside of the Department, which resulted in significant downtime and sometimes slow performance. PARS relied on manual data entry and, by virtue of tracking only top-level data, the information the system collected often proved unreliable, incorrect, and/or incomplete. There was no departmental validation system in place to verify that the information contractors reported reflected accurate, timely project performance. (Makepeace, 2009)

## **THE PUSH FOR A NEW REPORTING SOLUTION**

In 2005, the United States Government Accountability Office released a report on the Department of Energy's major contract management effort, and produced 13 recommendations for executive action to improve Department performance. Chief among the GAO findings was that contractor data in PARS was not sufficiently reliable to ensure that the system was providing the type of project visibility DOE required for effective oversight and assessment. (Government Accountability Office, 2005) The

Department moved swiftly to address all 13 recommendations, implementing solutions that included expanding the requirements documentation in its Acquisition Guide, creating Earned Value training videos and support materials for all contractor sites, establishing the Project Management Career Development Program to help produce a greater number qualified project managers, and – most sweepingly – embarking on an action plan to completely replace PARS. OECM issued a Functional Requirements Document in June 2008 that stipulated the new PARS, Version 2, solution would interface automatically with the project management systems in place at geographically diverse contractor sites, and “allow senior DOE managers to (1) review the root cause of problems causing projects to re-baseline, (2) increase the accuracy of systems information, and (3) identify estimation and planning shortfalls prior to [Critical Decision 2].” (Government Accountability Office, 2005)

One of the GAO recommendations was aimed at linking contractor performance data with the original PARS system, but in the Department of Energy’s response to these recommendations, the Department favored a “more comprehensive exploration of options” in keeping with “the Department’s efforts to implement a Department-wide enterprise architecture solution.” (Government Accountability Office, 2005) It was this willingness on the part of DOE to reexamine its core assumptions and methods that made PARS II possible. As a 2002 National Research Council study pointed out, “Project managers at all levels are likely to be cynical...if DOE is not doing the projects that have been selected to start or continue based on a rigorous, fair, and tough, but transparent strategic planning process.” (National Resource Council, 2003, pp. 11-12) DOE recognized that peak project and contract management performance was not simply a function of providing a tool that would populate the right fields at the right time, but would be rather a natural outgrowth of putting into place the right strategic approach, people, and controls, all working in conjunction with a functional tool that supported, rather than slowed down, those efforts.

To implement PARS II, the Department of Energy contracted with Energy Enterprise Solutions (EES), an information technology support and services company. EES embarked on a market research period where they evaluated twelve commercial products from various software vendors, including Dekker, Ltd., Deltak, and others. EES ultimately recommended that the DOE deploy the Dekker PMIS™ (Program Management Information System) as the basis for PARS II, a recommendation the Department accepted after conducting a side-by-side evaluation of the finalists. (U.S. Department of Energy Office of Management, 2009)

The Dekker PMIS™ is classified as a commercial-off-the-shelf (COTS) solution, and integrates with industry-standard database clients. Some of the chief concerns with PARS, Version 1 – specifically, that it was a custom application and that it ran off of proprietary databases – were no longer issues once it was decided to move forward with Dekker, Ltd. (Makepeace, 2009) The Dekker PMIS™ consists of four separate but integrated software components, each responsible for specific functions that DOE would be implementing in PARS II. These components are illustrated in Figure 1, below.






Symbol	Product	Description
	<b>Dekker PMIS™</b>	Enterprise Program Management Information System (PMIS);
	<b>Dekker TRAKKER®</b>	Project Management And Earned Value Management Database Engine; Integrates Program And Project Management Data
	<b>Dekker iPursuit®</b>	Project Management And Earned Value Analysis
	<b>Dekker TRACTION™</b>	Issue Tracking; Risk Logs; Program Metrics; Goals And Objectives; Critical Program Decision Points
	<b>Dekker iPortfolio®</b>	Configurable Web Based Dashboard For Dekker PMIS™; Capable Of Providing Customizable Front Ends To Program And Project Management Information

Figure 1: Dekker PMIS™ Components (Courtesy of Dekker, Ltd.)

The Dekker PMIS™, in encompassing a suite of products, each of which was developed with a specific, clearly defined function and engineered to all work together seamlessly, provided the basis for what would become the module-based structure of PARS II. Ultimately, PARS II would utilize the strengths and functionality of each component of the PMIS, funneled through the web-enabled framework provided by Dekker iPortfolio®.

## SYSTEM DESIGN

On June 3, 2008, DOE released a Statement of Work for the PARS II Project. This document called for not only system development, implementation, and data migration from PARS, but also providing Department-wide training and beta testing the new system at two pilot sites. (U.S. Department of Energy Office of Management, 2009, pp. 6-7) The core functionality of the new PARS II would include:

- Collecting contractor performance data via upload directly from the contractor sites to the DOE server. The system must have the ability to capture EV, schedule, variance, risk, and other data via this upload process, and will report down to the control account level,
- Enabling summary-level project assessments and estimated completion dates from multiple, defined stakeholders to be integrated with the project performance data provided by the contractors,
- Checking uploaded data against DOE data validation rules to ensure compliance
- Tracking Performance Baseline and Performance Measurement Baseline
- Drill-down functionality to view underlying performance data in detail, and extensive standard and custom reporting functionality, all available via secure Internet connection (U.S. Department of Energy Office of Management, 2009)

One of the keys to improving the project and contract management processes inside DOE was providing the Department with the ability to track projects specifically through the prescribed Critical Decision points each project must go through, according to DOE Order 413.3B, “Program and Project Management for the Acquisition of Capital Assets.” Published on November 29, 2010 under order of Deputy Secretary Daniel B. Poneman, DOE O 413.3B defines Critical Decisions as major milestones that represent “an increase in commitment of resources by the Department” and affirms that “there is a need that cannot be met through other than material means; the selected alternative and approach is the optimum solution; definitive scope, schedule and cost baselines have been developed; the project is ready for implementation; and the project is ready for turnover or transition to operations.” (U.S. Department of

Energy, 2010) The directive further outlines five Critical Decisions each project must successfully navigate, identified as CD-0 through CD-4, as illustrated in Table 1.

**Table 1: DOE Critical Decisions (Source: DOE O 413.3A)**

<b>CD</b>	<b>Purpose</b>	<b>Description</b>
CD-0	Approve Mission Need	A Program identifies a credible performance gap between its current capabilities and capacities and those required to achieve the goals articulated in its strategic plan. CD-0 approval allows the Program to request Project Engineering and Design funds for use in preliminary design, final design, and baseline development.
CD-1	Approve Alternative Selection and Cost Range	Marks the completion of the project Definition Phase, during which time the conceptual design is developed. This is an iterative process to define, analyze, and refine project concepts and alternatives. Additionally, long-lead procurements may be approved during this phase.
CD-2	Approve Performance Baseline	The Performance Baseline is developed based on a mature design, a well-defined and documented scope, a resource-loaded detailed schedule, a definitive cost estimate, and defined Key Performance Parameters. Approval of CD-2 authorizes submission of a budget request for the total project cost.
CD-3	Approve Start of Construction	Provides authorization to complete all procurement and construction and/or implementation activities and initiate all acceptance and turnover activities.
CD-4	Approve Start of Operations or Project Completion	Marks the achievement of the completion criteria defined in the Project Execution Plan and approval of transition to operations.

DOE O 413.3B is an important component in the effort to reform the project management culture inside the Department of Energy. 413.3B replaces 413.3A Chg 1, issued in 2008, and one of the most significant additions appearing in the new order concerns reporting into PARS II. DOE 413.3B establishes threshold values above which projects must begin reporting to PARS II, and outlines protocols for monthly reporting into the system, in addition to describing how projects within PARS II can be shepherded through the prescribed Critical Decisions. This effort is designed to help the Department better implement strategic decisions through its programs and projects.

Depending on the size and classification of the project, CD reviews are conducted by and approval authority rest with different individuals and offices. At each Critical Decision, if a cost or schedule deviation greater than a prescribed threshold occurs, the approving authority must make a specific determination whether to terminate the project or establish a new Performance Baseline. (U.S. Department of Energy, 2010) For that reason, it was essential that PARS II provide DOE Headquarters with not only the ability to view project performance data, but also the functionality to manage each project according to its Critical Decisions. Additionally, PARS II would have to include a mechanism for submitting and approving Baseline Change Proposals, track project-specific Key Performance Parameters beyond the prescribed CDs, and enable Red-Yellow-Green (RYG) performance assessments from multiple interested parties within DOE, including internal analysts, Federal Project Directors, and project managers.

In terms of receiving contractor project performance data, PARS II faced a challenge. PARS I relied on manual data entry by federal site staff, but the entire impetus for PARS II began with the desire to allow contractors to upload data directly into the system. The Department had neither the desire nor the ability to compel Federal contractors to use one project management or Earned Value system over another, so PARS II would have to be system agnostic. Whether a contractor was using project management software tools from Dekker, Oracle Primavera, Deltek, or another system, PARS II would have to read in and use the data through a simple upload process. The Dekker PMIS<sup>®</sup> had a long track record of system integration, however, implementing systems that have integrated with over 100 different accounting systems, multiple scheduling systems, databases, and other off-the-shelf software such as Microsoft Project and Office. This flexibility made communication between PARS II and the project management system in place at any given contractor site possible.

PARS II was designed around two key modules: the Oversight & Assessment Module, and the Contractor Project Performance Module. As indicated in Figure 2 (below), each module plays a separate role in forming the complete picture of project performance. The Oversight & Assessment (OA) Module allows users with appropriate access rights to create a project, input monthly status assessments after reviewing the uploaded contractor data for the period, close reporting periods, manage Critical Decisions, KPPs, and baseline changes, match budgeted costs to allocated funding, and manage the project's attached documents. The Contractor Project Performance (CPP) Module provides the upload interface for contractors to send performance data to the server, and displays both current and historical project performance data in the CPR, Schedule, and Timephased dashboards, all of which are drilldown-enabled and can generate relevant reports. These dashboards provide information covering the data elements illustrated in Figure 2, which are laid out in the Department of Energy Gold Card.

Also crucial to the effectiveness of PARS II is the All Reports Module. The Dekker iPursuit<sup>®</sup> component of the PMIS suite provides the technical foundation of this module, deploying the Dekker Sort, Select, Summarize (SSS) reporting engine within PARS II. Microsoft Excel provides the presentation layer for all reports in PARS II. Through SSS reporting, users have access to over 100 built-in reports covering cost and schedule performance, resource availability, program-level and individual project performance against baseline, performance by WBS or OBS, and a set of PARS-specific reports. The system also produces standard Contract Performance Reports (CPR), Formats 1-5. Additionally, users can create custom and ad hoc reports by pulling information from over 30 distinct data sources and configuring the reports to display in any configuration possible within Microsoft Excel.

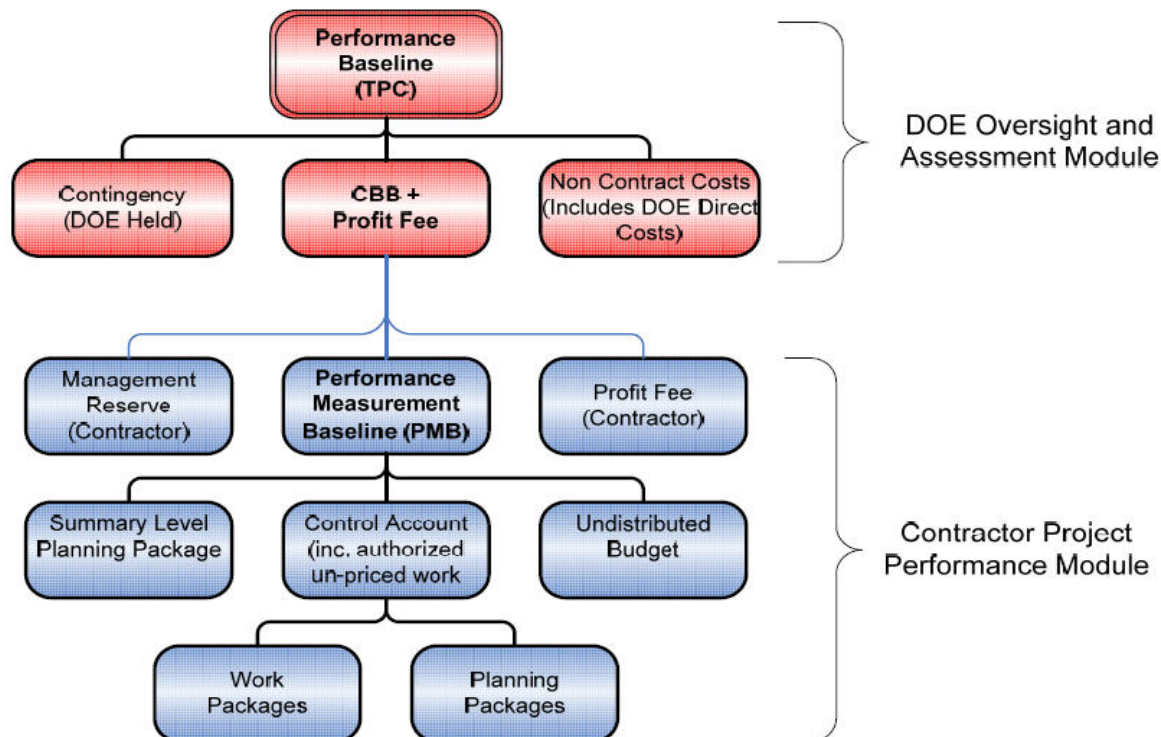


Figure 2: DOE Gold Card Data Elements & Hierarchy (Source: Draft of Concept of Operations for PARS II)

PARS II was designed to be extensively rights-managed, and through the Administration Module, System Administrators can assign individual rights, group rights, and project-specific rights. This module also provides the window into the key configurable elements within PARS II. Administrators can define the organizational hierarchy, programs, project types, gateways (Critical Decisions), user types, and the fields within the other PARS II modules. This flexibility means that PARS II will remain a viable solution for the Department’s project and contract management efforts, even as those efforts evolve over time in the Department of Energy’s continuing effort to shepherd its funding dollars in the most cost-effective ways attainable.

## IMPLEMENTATION

The PARS II implementation schedule called for full deployment Department-wide by September 30, 2010. At that time, it was expected that all relevant projects would be able to upload into the system, and PARS II would become the Department’s official System of Record for capital asset project performance information. (Department of Energy Office of Management)

The PARS II Site Project Team, consisting of members from DOE, EES, and Dekker, Ltd., began visiting contractor sites in December, 2008. These discovery visits allowed the PARS II team to assess contractor scheduling systems, level of technology, and availability of resources. (U.S. Department of Energy Office of Management, 2009) PARS II initially began testing at two DOE Office of Environmental Management (EM) sites: the Waste Treatment Plant in Richland, Washington, and Sodium Bearing Waste disposition facility in Idaho Falls, Idaho. (Makepeace, 2009) The system then expanded to include testing at two more field sites. (Poneman, 2010)

After completing the design phase and conducting extensive verification of the contractor data being uploaded into the PARS II test environment, the requirements gathering phase segued into User Acceptance Training and Testing (UAT). In this effort, users undertook a rigorous testing routine

designed to verify that all of the system's features were operational and behaving as designed. The system passed all tests, and on May 17, 2010, Deputy Secretary of Energy Daniel B. Poneman issued a memorandum informing the Department of Energy complex that PARS II was ready for deployment across the complex, and would be implemented by OECM throughout the remainder of 2010. (Poneman, 2010)

Through the joint effort of the Department of Energy, EES, and Dekker, Ltd., the PARS II project delivered on time, on September 30, 2010, and became the official DOE System of Record the following day, October 1, 2010. (Department of Energy Office of Management)

## **LESSONS LEARNED**

On whatever scale, from a project manager working on a spreadsheet to track a single project to a government agency allocated billions of dollars in Federal money and responsible to Congress for its efficient use, effective project management is a cultural phenomenon. The Department of Energy understood this when it undertook to improve its project management efforts. As the 2002 DOE Assessment from the National Resource Council points out, "Without a [strong], ongoing strategic planning process, project managers will...have inconsistent responses to the Department's need for high-quality project management procedures." (National Resource Council, 2003, p. 12) Organizations that look to a particular project management tool to solve all of their problems will inevitably be disappointed. No software tool can motivate project team members, make difficult decisions, or form a strategy to guide coordinated project efforts.

Tools can become an impediment to project success, however. While there was much to recommend the original version of PARS, some of the biggest barriers to its success were issues that related to user friendliness. While there were undoubtedly certain shortcomings in the system related to its ability to aggregate reliable data, the way project team members had to interact with the system could result in a level of frustration that prevented them from using it to its full capacity. Downtime, slow performance, and redundant data entry (Makepeace, 2009), when combined with a user interface described as "non-intuitive" (U.S. Department of Energy Office of Management, 2009, p. 11), created an atmosphere in which the system was not openly embraced by many who had to use it.

Reviewing the GAO recommendations issued in 2005 to help improve contract management for major projects, the thrust of each recommendation was cultural, and the Department's responses sometimes sought to push the cultural needle even farther in the right direction. The GAO recommended improving acquisition strategies and documentation, expanding training, creating clear career paths for project managers inside the Department, and expanding DOE self- and contractor site assessments. The GAO recommendations that focused on PARS similarly focused on the cultural aspect of the system, advocating an electronic linkage to contractor systems both to ensure data integrity and improve ease of use. (Government Accountability Office, 2005) PARS II was designed with this end in mind.

The overwhelming push behind PARS II focused on creating the most reliable pathway for project performance data to travel, and contextualizing the Department's high project management standards in an interface that is easy to understand and navigate. DOE directives such as DOE O 413.3A and the DOE Earned Value Management Gold Card lay out appropriate project management structures and procedures that have been developed in accordance with accepted best practices. It was crucial that any tool put in place to serve as an integral component of DOE project management efforts fully support and reinforce the standards established in these documents.

One of the inevitable aspects of cultural change is resistance to that change. It is an accepted adage that even when things are not going particularly well, people will often rather stick with a flawed system they



know than move to embrace a new system that may ultimately prove equally flawed. The Department of Energy, along with EES and Dekker's team of developers and project consultants, worked to make this cultural transition as smooth as possible by addressing the needs of all of the stakeholders involved — contractors, Federal Project Directors (FPDs), analysts, programs, the Deputy Secretary and the Department of Energy leadership, all the way up to the GAO. Though PARS II has only been in place for a few months at the time of this writing, early reception has been positive, and the system is proving an integral role in the Department's push for reliable Earned Value data and effective contract management. PARS II now provides reliable monthly status data reviews for DOE HQ, and this in turn offers OECM an unprecedentedly detailed window into contractor project performance. This expanded transparency will inevitably enhance the Department of Energy's ability to apply its strategic initiatives across its entire program and project spectrum.

## Works Cited

Department of Energy Office of Management. (n.d.). *Welcome to PARS II*. Retrieved November 16, 2010, from U.S. Department of Energy: [http://www.management.energy.gov/online\\_resources/pars2.htm](http://www.management.energy.gov/online_resources/pars2.htm)

Energy Enterprise Solutions. (n.d.). *About EES*. Retrieved November 16, 2010, from Energy Enterprise Solutions, LLC: <http://www.eesllc.net/about.htm>

Glauthier, T. (1999, July 1). Project Management Reform Initiative. *Memorandum for all Departmental Offices* .

Government Accountability Office. (2005). *Department of Energy: Further Actions are Needed to Strengthen Contract Management for Major Projects*. Washington, D.C.: United States Government Accountability Office.

Makepeace, J. (2009, January 27). *PARS II: Project Assessment and Reporting System*. Retrieved November 12, 2010, from Energy Facility Contractors Group: <http://www.efcog.org/wg/pm/events/Jan09mtg/PARS%20Briefing%20by%20John%20Makepeace.pdf>

National Defense Industrial Association Program Management Systems Committee (NDIA PMSC). (2009, December 1). *Federal Agency EVM Policy Summary*. Arlington, VA, United States of America.

National Resource Council. (2003). *Progress in Improving Project Management at the Department of Energy: 2002 Assessment*. National Resource Council of the National Academies, Division on Engineering and Physical Sciences. Washington, D.C.: The National Academies Press.

Poneman, D. B. (2010, May 17). *Project Assessment and Reporting System (PARS II)*. Washington, D.C.

U.S. Department of Defense, KM Systems Group, BAE Systems, Inc., Abba Consulting, Inc. (2006). *Earned Value Management*.

U.S. Department of Energy. (2010, November 29). DOE O 413.3B. Washington, D.C.

U.S. Department of Energy Office of Management. (2009, July 28). *Draft Concept of Operations for PARS II*. Retrieved November 16, 2010, from Department of Energy Office of Management: [http://management.energy.gov/documents/PARS\\_II\\_ConOps\\_20090728.pdf](http://management.energy.gov/documents/PARS_II_ConOps_20090728.pdf)

United States Department of Energy. (n.d.). *Project Assessment and Reporting System (PARS)*. Retrieved November 12, 2010, from U.S. Department of Energy: [http://management.energy.gov/online\\_resources/1410.htm](http://management.energy.gov/online_resources/1410.htm)