



OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

AUDIT REPORT

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November 2016

**DEPARTMENT OF ENERGY
CONTRACTORS' IMPLEMENTATION OF
EARNED VALUE MANAGEMENT**



Department of Energy
Washington, DC 20585

November 17, 2016

MEMORANDUM FOR THE UNDER SECRETARY, OFFICE OF MANAGEMENT AND PERFORMANCE

Michelle Anderson
FROM: Michelle Anderson
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SUBJECT: INFORMATION: Audit Report on "Department of Energy Contractors' Implementation of Earned Value Management"

BACKGROUND

The Department of Energy uses Earned Value Management (EVM) as a project management tool to measure the value of completed work against the planned work schedule and estimated cost. The Office of Management and Budget requires Government EVM systems to comply with the guidelines found in the Electronic Industries Alliance (EIA) publication 748. These guidelines help ensure proper definition of project work scope and integration with time-phased budgets, reliable analysis and reporting of monthly performance, and accurate recording of project changes. The Department's Office of Project Management Oversight and Assessments (PM) is responsible for ensuring that contractors' EVM systems comply with EIA-748 guidelines. PM uses the Department's Project Assessment and Reporting System (PARS II) as the Department's central repository and system of record for contractor's EVM cost and schedule performance data. The analytical tools built into PARS II are one of the methods that the Department and its contractors use to identify potential problems in projects. Contractors also use their own corporate project management systems from which they feed data into PARS II through electronic uploads on a monthly basis.

As of July 2015, the Department's contractors had 29 post Critical Decision (CD) 2 capital asset projects worth approximately \$25 billion that were required to use EVM systems to track and manage project performance. Because EVM is used to manage the Department's projects and to provide an early warning of negative trends, we conducted this audit to determine whether the Department's contractors had effectively implemented EVM.

RESULTS OF AUDIT

To its credit, the Department's PM has identified deficiencies with the contractors implementing EVM. While we observed that reviews of some contractors' EVM systems were delayed, we noted that PM was taking corrective actions. For example, PM officials told us that:

- Two contractors did not have certified EVM systems because their EVM systems were deemed significantly noncompliant with EIA-748 based on reviews for cause (RFC); and
- Despite having certified systems, two contractors were reporting what is potentially incomplete and unreliable EVM data to the Department.

We also noted that PM was late in performing surveillance reviews for the EVM systems of six contractors with projects that had over \$100 million in total project costs. PM did not perform the reviews within the timeframes that were in effect at the time of our audit as specified in DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*.¹ However, in May 2016, the Department modified DOE Order 413.3B, removing the requirement for reviews every 2 years and replacing the reviews with a “risk-based, data-driven” assessment. When discussing our concerns regarding delays in performing surveillance reviews, PM officials stated that, in practice, they began implementing the risk-based, data-driven approach prior to the revision of the DOE Order, consistent with a Secretarial policy direction issued in June 2015. In addition, we found PM was taking steps to improve project reporting by upgrading the PARS II database; the upgrades are scheduled for completion in 2016.

System Certification

Two contractors were managing projects with uncertified EVM systems. In accordance with DOE Order 413.3B, contractor EVM systems used on Department projects must be certified as compliant with EIA-748 guidelines. PM certifies contractor EVM systems for projects with a total project cost at or above \$100 million.

According to PM, two contractors were managing four projects with EVM systems that were no longer certified as compliant with the requirements. Los Alamos National Security (LANS), which lost its EVM system certification in 2014 following an RFC by PM, managed three of these four projects. We noted that PM officials were working to help LANS resolve its outstanding certification issues.² Savannah River Nuclear Solutions (SRNS), which lost its EVM system certification in 2013 following an RFC by PM, managed the fourth project. In each case, LANS and SRNS continued to execute the projects and report performance data, but were required to implement other compensatory project controls measures. Without certification of compliance with EIA-748 guidelines, the EVM data on these projects may not be reliable and, therefore, may be of limited use.

Incomplete and Unreliable Reporting

The potentially incomplete and unreliable reporting by two contractors with certified EVM systems has been of concern to PM for several years and, according to PM, there is no

¹ In DOE Order 413.3B, Change 2, issued on May 12, 2016, the requirement for PM to conduct surveillance of a contractor system changed from a time and event basis (i.e., every 2 years following certification) to a risk and data-driven basis, consistent with project management control best practices implemented by the Department of Defense. This is consistent with Secretarial policy direction dated June 8, 2015.

² LANS was recertified on October 11, 2016, after audit fieldwork was completed.

expectation for improvement. The Department requires its contractors to report EVM data monthly for its capital asset projects with a total project cost at or above \$20 million. However, according to PM, these contractors have been reporting unreliable EVM data following concessions granted by Department officials within the program offices during project restructuring efforts.

In February 2012, Bechtel National, Inc., the contractor for the Waste Treatment and Immobilization Plant at the Hanford Site, which has experienced significant cost and schedule slippage, was granted a waiver from reporting some EVM data by the contracting officer until the project could be baselined again. PM originally expected the new baseline to be completed by December 2012, but it had not yet been completed as of June 2016. In October 2014, the contractor instituted an internal EVM forecast system and suspended comprehensive EVM uploads to PARS II. While limited project status information has been provided to PARS II since that time; PM stated these results may not be fully reliable.

URS Energy and Construction, a contractor at the Knolls Atomic Power Laboratory, has reported EVM data for two projects at the Separations Process Research Unit as one project since October 2012. However, these two projects were not officially approved as one project until July 2014. While the contractor had not exceeded the total project cost estimates at the time of the change, the Department was aware that the combined project would exceed estimated costs before the end of the year and require establishing a new baseline. To date, URS Energy and Construction reports the EVM data as a single project in PARS II, while PM reports it as two separate projects in PARS II. A new performance baseline has not yet been approved, and PM is uncertain whether the EVM data is reliable and representative of actual performance. In addition, pressure to report accurate EVM data may have been reduced because a cost cap was placed on the combined project that requires the contractor to incur all costs over a specified amount. While this arrangement may protect the Department from escalating costs on a troubled project; inaccurate reporting may distort cost and schedule performance for the project.

In addition to these data reliability issues, PM noted concerns with the basis and reliability of contractors' estimates at completion (EAC). If the basis of the EAC update is not reliable, escalations in cost and schedule could go unnoticed until the project requires baselining again. By enforcing accurate reporting of the EAC element of EVM, the Department can improve its project management overall and potentially reduce costs.

Recent actions by PM may serve to improve EVM data reliability. PM recently issued the *EVMS Interpretation Handbook* in October 2015, which describes how to apply the guidelines found in EIA-748. Contractor officials managing the project we reviewed indicated that they had been using the new handbook and found it very useful during the EVM reporting process. PM plans to followup with Department-wide training on EVM requirements and implementation of the handbook.

System Reviews

We also noted that surveillance reviews of contractor EVM systems were late, as measured against the requirements in place during the course of this audit. DOE Order 413.3B required

that EVM systems on projects with a total project cost at or above \$100 million be reviewed every 2 years, or at contract mid-point. Based on this requirement, there were six projects that did not undergo surveillance reviews on time. However, we noted that in May 2016, the Department modified the requirements in DOE Order 413.3B. PM is now required to perform risk-based, data-driven surveillance reviews of EVM systems on projects with a total project cost at or above \$100 million during the tenure of the contract, effectively removing the direction on the timing of these reviews.³ PM officials also told us that, in practice, they began implementing the risk-based, data-driven approach prior to the revision of the DOE Order, consistent with a June 2015 Secretarial policy directive and to be more consistent with Department of Defense best practices.

We observed that, as of December 2015, PM was behind schedule in conducting surveillance reviews of six contractors with projects over \$100 million in total project costs.⁴ PM officials stated that they had prioritized their reviews in order to focus their limited resources on either certifying the EVM system of the contractors that needed certification or conducting surveillance reviews of the contractor systems that were being used on the Department's most complex, costly, and highest risk projects. Only the first three surveillance reviews on PM's FY 2016 schedule had actual timeframes established for the review. The remaining surveillance reviews only included "to be determined" as a review date. Contractors for two of those reviews with an established timeframe were not ready for a review, and PM was uncertain when this would change. One contractor had been working with PM to initiate a review but had not made enough progress in correcting system deficiencies to warrant continuing the review. The other contractor did not want to disrupt its construction progress with a surveillance review, and the Department agreed to postpone the review. In the past, it has taken an average of 6 to 9 months to complete an EVM system review; however, PM expects that it may now take some contractors over a year to complete a review because of the renewed focus on fundamental aspects of a compliant EVM system that it is expecting contractors to understand and implement within their systems (e.g., planning and scheduling, cost and schedule integration, variance analysis and corrective action, baseline stability, and EAC). To increase understanding of EVM system compliance expectations, PM is including program personnel on its EVM review teams. PM anticipates that increased understanding of the expectations will mitigate future non-compliance issues once a contractor system is certified.

When we discussed our concerns about the late surveillance reviews of contractor EVM systems with PM, management informed us that because of the need to focus limited resources on higher cost and more complex projects, they began an earlier implementation of the "risk-based, data-driven" process consistent with the Department of Defense approach. The Secretary of Energy's memorandum on "Project Management Policies and Principles," issued in June 2015, stated the intent to adopt project management control best practices equivalent to those implemented by the

³The threshold for a contractor's EVM system to be certified as compliant changed from the previous tiered threshold (\$20 million to \$50 million contractor self-certify, \$50 million to \$100 million project management support offices certify, and \$100 million and over PM certify) to require that only projects with a total project cost at or above \$100 million require a contractor EVM system certified by PM; for projects between \$20 million and \$100 million the contractor is required to maintain an EVM system compliant with EIA-748C, but no certification review is mandated.

⁴ After completion of audit fieldwork, a surveillance review was completed and a report issued on October 18, 2016, for the CB&I AREVA MOX Services, LLC EVM system that resulted in decertification of that system.

Department of Defense. However, we note that there was no mention of a change in requirements for surveillance reviews in the Secretary's policy memorandum. We also note that at the time of our early discussions with PM officials, they were still operating under the surveillance requirements in place during the course of the audit. However, we acknowledge PM's perspective that it implemented expected policy changes early; changes that were not formalized until May 2016.

Database Upgrades

The PARS II database requires certain upgrades to expand the project data that may be maintained in the system and to make the information more useful for both Federal and contractor project personnel. For example, when PM conducts surveillance reviews, it must obtain a significant amount of the project data from the contractors in addition to what it can obtain through PARS II because contractors do not use PARS II to manage their projects. Planned upgrades include adding document encryption and user authentication to PARS II to enable inputting sensitive project information into the database as well as using an industry standard format for performance data collection. Upgrading an oversight and assessment module and developing additional project management tools will provide additional tracking and reporting capabilities. PM has prepared a schedule for implementing these changes that began in December 2015 and should be complete by the end of 2016. In addition, PM plans to provide training on the changes through webinars and classes.

PATH FORWARD

The deficiencies we observed, if not corrected, could significantly affect the Department's ability to properly manage its projects. Without certifying compliance with EIA-748 and conducting surveillance reviews to ensure that contractors properly implement their certified EVM systems, the Department cannot ensure that the EVM data it receives from the contractors are reliable. Granting concessions from EVM reporting to troubled projects further impedes Department decision makers.

We noted that upgrades are planned for the PARS II database to improve the usefulness of the system. While the planned improvements to PARS II are not yet complete, they should help the Department identify potential project management issues and make needed corrections. However, without concerted effort by the Department to address fundamental EVM system deficiencies, these planned improvements may be limited in their effectiveness.

Accordingly, we suggest that the Under Secretary for Management and Performance:

1. Work with program and project management support offices to:
 - a. Ensure that all applicable projects with a total project cost at or above \$100 million are managed with certified EVM systems and that contractors update their project EAC, as appropriate, and

- b. Expediently resolve the issues that led to the incomplete and unreliable EVM reporting for the projects listed in the report; and
2. Continue efforts to improve PARS II capabilities to provide more detailed data on individual projects, including the status of site and contractor surveillance reviews.

Attachment

cc: Deputy Secretary
Administrator, National Nuclear Security Administration
Chief of Staff
Director, Office of Project Management Oversight and Assessments

OBJECTIVE, SCOPE, AND METHODOLOGY

OBJECTIVE

We conducted this audit to determine whether the Department of Energy contractors effectively implemented Earned Value Management (EVM).

SCOPE

This audit was performed between July 2015 and November 2016 at the Office of Project Management Oversight and Assessments (PM) in Washington, DC, and the Saltstone Disposal Unit Number 6 project at the Savannah River Site near Aiken, South Carolina. The audit was conducted under Office of Inspector General project number A15ID046.

METHODOLOGY

To accomplish our audit objective we:

- Reviewed applicable laws and regulations pertaining to EVM;
- Analyzed project data for the Saltstone Disposal Unit Number 6 operations;
- Reviewed planned EVM oversight activities, including PM review schedules, PARS II upgrades, and the *EVMS Interpretation Handbook*;
- Analyzed data included in monthly status reports regarding EVM performance on capital asset projects;
- Evaluated management actions related to EVM project results; and
- Interviewed PM and Federal and contractor project personnel to gain an understanding of EVM implementation.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. Accordingly, the audit included tests of controls and compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed compliance with the GPRA Modernization Act of 2010 and found that the Department had established performance measures for EVM. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. Finally, we conducted an assessment of computer-processed data relevant to our audit objective and deemed the data sufficiently reliable for the purposes of our report.

We held an exit conference with management on September 29, 2016.

FEEDBACK

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