

PROJECT MANAGEMENT REPORTING 2006

One of the biggest challenges facing the Department of Energy (DOE) and its contractors is building an effective and consistent project management reporting system. While in theory, an Earned-Value Management System (EVMS) is a simple and standardized method for cost and schedule performance tracking and reporting for projects, as with any system, the output is only as valuable as the input. With the push of government to become smaller and more efficient, DOE and their contractors are under much higher scrutiny to demonstrate high performance on expensive projects if DOE and the contractors expect to continue to receive funding. In this quest, the pureness of the theoretical EVMS has been tarnished. The purpose of this paper is to discuss the current environment for both the contractors, and the Federal Project Directors (FPD), and to provide recommendations to improve upon the basics provided by traditional EVMS, such that accurate performance information can be generated and transmitted in a timely fashion, providing more effective project management—and reaping the associated benefits—throughout the complex.

Current Project Management Reporting Practice

Contractor performance reporting is currently done in a fairly consistent manner, using standard textbook EVMS terms and calculations. While there are myriad methods in collecting and presenting this information, most are focused on Gantt charts with summarized cost and schedule variances presented at the project level, or Level 1 of the WBS. Contractual requirements are typically generic, allowing for companies to create their own processes to comply with ANSI/EIA-748, which prescribes national guidelines of earned-value measurement for management of projects.

There are slight differences in guidance within the DOE complex, with primary differences being between EM and the rest of the DOE. NNSA has developed a set of requirements discrete to their organization, modeling their efforts to their specific needs after similar programs in the Department of Defense. NNSA focuses their analysis of the data taken at Level 3 of the work breakdown structure for line-item projects, which aids them in identifying leading performance indicators that can forecast trends at the Level 1 level, where ultimate performance is measured for each project. EM focuses their analysis at Level 1 of the WBS, which they have termed the Project Baseline Summary (PBS). In addition, EM has two reporting pathways: Integrated Planning, Accountability, and Budgeting System (IPABS) which is driven by the contractors as reported to EM, and the Project Assessment and Reporting System (PARS) which factors in baseline changes through the Energy Systems Acquisition Advisory Board (ESAAB) process, driven by EM as reported to DOE-HQ. SC and NNSA reporting systems are similar, however SC also establishes performance milestones and change thresholds at management levels that are discrete to Federal and Contractor management and institute a peer review system within SC (Office of Project Assessment Reviews) to validate accuracy and relevance.

There are several challenges associated with the current project management reporting structures, both at the contractor and FPD level that can be addressed to extract more value

out of project status reporting, leading to the improved project management sought by the Department of Energy.

Current Project Management Reporting Weaknesses

Project reporting is a critically important element for a few key outcomes on projects. First, it is the basis of formal management communication among all project participants. Second, the processes supporting project reports are the basis for baseline management—composed of scope, schedule, cost, and risk. Finally, project reporting is the mechanism by which the raw data that emerges from the project tools is turned into information used in decision making for variance assessments and corrective actions.

Common to most large organizations, many repetitive tasks are proceduralized to the point where the focus on the output of the task becomes muddled at best, and completely lost at worst. Project management is part art, and part science, and EVMS itself does not specify methods gathering and analyzing project management performance data which can be misleading to the detriment of the contractor and the DOE. With the renewed focus of the DOE on improving project management, and the overhaul of DOE Order 413.3, now is a great opportunity to focus on the outputs of project management reporting, and address current weaknesses that have seemingly become an accepted part of doing business in this sector.

Level 1 Performance Metrics

One of the more controversial issues or concerns, based on feedback from both the contractors and the governmental entities, appears to be the emphasis placed on the color metrics for line item projects, as reported to DOE-HQ. Currently, the projects are graded on a green-yellow-red scale, dependent upon the cost and schedule variance at Level 1, or the overall project level.

Observations by many in the federal government indicate that this three-color metric is the sole focus of management. The sentiment of many federal project directors is that their individual performance, and corresponding advancement, is dependent upon keeping their project performance metric as “green” for all assigned work. Project management reporting needs to focus on including meaningful context and trending to the variance data, along with identifying problems and corrective actions, to provide a true picture of project status.

When project reporting is used to achieve artificial objectives, such as satisfying an “all green” policy, the professional practice accountabilities are skewed. At best, this raises an issue of trust within the project team and at worst raises an issue of artificial manipulation of project data to achieve policy objectives that may or may not be directly aligned with project objectives.

The limitations to the color metric at Level 1 are numerous:

High-Risk Projects: Many of the capital and operational campaign projects conducted for the Department of Energy are exceptionally complex, unique, and one-of-a-kind in nature. It is quite common for facilities to be designed and constructed to implement new and unique processes at scales not previously tested, using one-of-a-kind equipment and technologies, to complete project missions. Risk management plans for internal project risks are critically important, and often overlooked with respect to project reporting. Management reserve and contingency are budget elements that need to be strategically set and measured along with variances during periodic status reports.

When project reporting is influenced by external pressure, the reporting process minimizes the validity of risk management tools and baseline management discipline. There is a tendency to establish an early reporting objective that severely hampers the ability of the project to baseline high-risk projects appropriately and then manage in the context of an appropriate baseline. Variance management is a critical skill in project delivery and the external pressure to eliminate understood variances is poor management practice.

Factoring in the political environment responsible for much of the external pressures on these projects, there are times when significant planning could still result in unacceptable variances in baseline schedules and budgets that require management attention. When these external project risks pressure the project performance, both contractors and FPDs feel compelled to correct the variances, rather than address the problems through corrective action, and the quality of the data reported can deteriorate—to the detriment of the all parties involved. This is also where external stakeholders could develop cynicism for some of the more visible cleanup projects run by EM. This area of external project risk is an area where DOE can and should be proactive and develop win-win risk management plans for both themselves and the contractors.

Data Smoothing: NNSA has noted that by reporting at Level 1, especially as the project proceeds and the cost and schedule expended-to-date numbers rise, that a smoothing effect occurs in the cost and schedule variances, since individual tasks at lower levels cannot affect the larger-scale numbers to the same degree. In addition, major equipment or material purchases can also significantly adversely influence the reporting data an analysis. Based on this, it is often difficult to identify potential problems at Level 1. Conversely, it also makes it difficult to indicate performance improvements and corrective actions to mitigate such variances. As a result, NNSA has instituted Level 3 reporting into their quarterly review format; EM has instituted no similar facets, allowing contractors flexibility in selecting the EVMS data that is presented below Level 1.

Leading Indicators: Leading indicators have been a statistical tool used in almost every industry to drive efficiency improvements. Traders and equity firms have used these principles to generate large profits for their companies. While project reviews provide the opportunity for management to ask probing questions to gauge the quality of the project management metrics presented, there is no formal set of leading indicators which would lessen the risk that this context could provide. While the quarterly reports to both EM and DOE-HQ provide some context in terms of the raw EVMS data, further investigation of

variances would help identify hidden trends, and preclude immediate remedial actions to prevent “surprise” future performance deterioration.

Some field offices have developed a “Watch List Criteria”, a set of leading indicators to accompany Level 1 reporting on a monthly basis.

Other Performance Reporting Issues

Outside of the limitations of reporting at Level 1, there are other performance reporting topics that also should be addressed to improve overall project management.

Timeliness of Information: Within EM, IPABS and PARS often do not contain the same data, and what is reported via the PARS system reflected at DOE-HQ often lags what is reported at the contractor or EM field office level. IPABS is capable of processing Baseline Change Proposals (BCP) into the cost and schedule baseline relatively quickly, leading to timely reports incorporating fresh field data. These BCPs must be processed through the ESAAB process for DOE-HQ, prior to being incorporated into the PARS cost and schedule baseline data. While OECM and DOE-HQ are currently revamping the PARS, this duplication of effort does not seem to be adding value, and input from the FPDs may lead to streamlining the process, and improving the quality of data provided to and from DOE-HQ. NNSA does not have this duplication, and neither the contractors nor FPDs managing capital projects in that program have the same issues with timeliness of information.

Quality of Data: At the lower levels of activities, reporting progress-to-date is an area where liberties can, and often are, taken with respect to shaping performance reports. Traditional project management theory provides for many methods in determining percent complete for a given activity. For instance, some conventions allow for 50% progress to be claimed immediately upon the start of an activity. It is common at the contractor level to observe optimistic percent complete being reported on lower-level activities, which can result in impacts at Level 3 and higher, if left unchecked and the culture supports it. It is imperative that project managers associated with the contractors and DOE be vigilant in assessing the quality of the data by asking detailed questions during reviews and understanding the scope of the project. The higher the quality of data being reported, the better the performance reporting tools become.

Training/Personnel Selection: Commercial contractors have personnel development programs for project management career paths in place. When these policies are implemented, they serve as a valuable tool to create and deploy outstanding project managers, capable of executing projects and delivering on commitments, creating win-win situations for their companies, and the clients. Seasoned, trained project managers are able to easily identify the weaknesses listed in this section, and take steps to ensure that these pitfalls have a minimal chance of affecting their projects. The Department of Energy has also instituted their own programs for FPDs, emphasizing the potential value in the training and qualifications of project management personnel, and making a strong effort to expend resources to exploit these opportunities.

Recommendations

Recommendation 1: DOE should develop and implement a standard reporting template. This template should require reporting on project activities down to Level 3 of the project WBS, along with providing status at the Level 1 as required.

The intent of developing and implementing this reporting format for line item projects is to focus on Level 3 schedule items that show high variance and on corrective action plans and execution. By proactively managing at the Level 3, variance at the Level 1 of the WBS can be managed more effectively.

The following is a suggested outline, based on the NNSA guidance, for quarterly review format and content:

1. Summary Page – General project information
2. Project Description – Scope, Schedule, Cost
 - a. Basic scope statement
 - b. Project completion date (CD-4)
 - c. Total Project Cost (TPC) and Total Estimated Cost (TEC)
 - d. Gantt schedule showing:
 - Level 2 activities with progress-to-date
 - Critical milestones/activities (CDs, EIR, IPRs)
 - e. Table of CD/EIR/IPR and all Level 1 BCPs, listing baseline and forecasted start and finish dates for these items.
3. Baseline Management
 - a. Scope
 - Performance Outcome Assessment
 - Change Management
 - b. Schedule
 - Performance Issues / Variances
 - Point and Cumulative Index Reporting
 - Change Management
 - c. Budget
 - Performance Issues / Variances
 - Point and Cumulative Index Reporting
 - Change Management
 - d. Risk
 - Current risk retirement status
 - 90 day look ahead for emerging risks
 - Opportunities emerging based on retired risk
 - e. List sources and uses for current funding.
 - f. Provide details for:

- Prior years costed
 - Carryover funds
 - Uncosted funds
 - Unobligated funds
 - Committed but uncosted funds.
- g. Details for rescissions, reprogramming, or other funding adjustments.
- h. Current FYNSP profile.
- i. Details regarding contingency funding status:
- Amount at start of project
 - Amount at end of previous quarter
 - Amount at end of current quarter
 - Calculate burn rate to determine account solvency

4. Level 3 EVMS Status

- a. Table of Level 3 activities providing the following for each:
- Identification of current Level 3 critical path activities
 - Ensure new critical path activities are denoted
 - Cumulative CPI/SPI for the current and previous two months
 - Percent complete
 - Color coding
- b. Discussion of all activities in critical path coded as “Yellow” or “Red”:
- Succinctly list objective reason for variance
 - Identify problems/issues
 - List specific recovery plan
 - Identify where HQ assistance is required/beneficial
 - Provide expected recovery results in terms of cost and schedule
- c. Discuss recovery actions prescribed from previous quarters.

5. Other Project Issues/Risks

- a. List of issues/risks not reflected in EVMS data that could affect future performance.

Recommendation 2: DOE should develop a set of standard leading indicators, to be reported and analyzed on a monthly basis, to further facilitate robust discussion of status and associated risks during project reviews.

Much like the ubiquitous “safety pyramid” where 600 minor safety transgressions, if left unchecked, can forecast the one catastrophic event we all seek to avoid, leading indicators can and should be developed to aid with project management. This can be especially helpful to DOE, since many of these projects employ new technologies or deal with unique design and construction issues, resulting in high risk projects that can be relatively difficult to plan and control.

Based on the premise of the “safety pyramid”, it has been shown that a set of dashboard metrics for health and safety has resulted in dramatically-improved safety performance DOE projects. An analogous set of metrics can be developed and implemented for project management reporting. This set of metrics can be termed a “Watch List Criteria”, to (1) provide leading indicators of project performance trending which is not easily captured by EVMS data, and (2) compensate for inaccuracies that may be inherent to the EVMS data. Reporting at the Level 1 allows for too much variation in reporting, which can lead to “surprise” performance deterioration. This set of metrics will also help manage at the Level 3, as prescribed in the first recommendation above.

The following is a proposed set of “Watch List Criteria” which should be assessed by the FPD to determine significance and relevance. Elements or grouping of these could be reported on a monthly basis from contractors to DOE in accordance with the documented reporting expectations defined in the Project Execution Plan:

1. **Any unfavorable Variance at Completion beyond FPD Authority.** This applies to projects operating in the “Red” color coding, or greater than 15% negative variance.
2. **Statistically-significant and not clearly understood unfavorable trend in CPI or SPI.**
3. **Any increase in the number of Critical/Near Critical tasks.** This monitors the status of the critical path, and identifies trends related to critical path activities added via risk mitigation or corrective action pathways by the contractor to maintain performance.
4. **Any increase in usage of Free Float.**
5. **Any forecast IPABS Milestone delay.**
6. **Any forecast Regulatory Milestone delay.** This primarily identifies risks associated with outside regulatory agencies that are very difficult to forecast at times, but can substantially affect project progress and performance.

7. **Any forecast Risk Mitigation activity delay.** Should the contractor be required to take actions as specified in the risk analysis done for the project, this needs to be monitored closely to ensure that the project performance does not suffer.
8. **Any forecast Corrective Action Implementation delay.** If corrective actions are prescribed by DOE, or self-initiated by the contractor to address looming or actual performance issues, close monitoring is required.
9. **Any deficiency in CD prerequisites for the current phase.**
10. **Any change requests not dispositioned within 60 days.** This is exceptionally important to maintain the quality of the EVMS reporting. Without a solid and understood baseline, reporting effectiveness becomes highly subjective to the detriment of the DOE and the contractors.
11. **Any usage of Management Reserve or Contingency in excess of planned use in the risk management baseline.** This keeps project costs more transparent.
12. **Any two-quarter unfavorable trend in ESH&Q metrics.** This has been a big victory for DOE-Richland and Fluor Hanford. Everybody wins on every level with improved safety.
13. **Any violation of Conditional Payment of Fee (CPOF) thresholds.** CPOF an example of a mechanism which can use to withhold fee from contractors. CPOF-type clauses exist for many project performance and health and safety metrics.
14. **Any reduction of Performance Baseline “Confidence Factor”.** This allows the contractor project management to provide the FPD with their opinion on project performance. There are times when metrics may not be fully representative of the confidence that a project manager may have. This allows to for open, human communications between contractor and DOE. While this is subjective, human interaction and trust with stakeholders is an important part of project management, and needs to be included.

The detail of this list can be scaled up or down depending on project size and complexity; however, the intent of the list is to provide more details and context to the data required for performance reporting. Lack of detail and context are a major cause of not recognizing the need or effectiveness of corrective actions, which is the crux of project management and effective performance reporting.