DOE PROJECT MANAGEMENT NEWS

Promoting Project Management Excellence

December 2024

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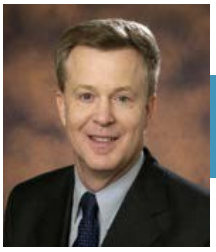


DIRECTOR'S CORNER

Construction projects can face schedule delays and cost overruns due to a variety of reasons, some foreseeable, some not. Many of the Department's projects currently in execution have experienced challenges. Some during the height of the COVID-19 pandemic, or some more recently as the construction industry continues to recover from lingering impacts to its workforce and supply chain. Learn about best practices for developing and executing a project recovery plan to mitigate risks, improve performance, and successfully deliver your project in the article on page 2.

The Office of Project Controls and Policy (PM-30) has successfully demonstrated an automated process to assist in the review of a contractor's earned value management (EVM) system description using an artificial intelligence tool. This automated process results in faster, more comprehensive, and consistent reviews. You can gain additional insight and understanding of how this tool ensures a contractor's EVM system is methodically compared against EIA-748. The tool helps enhance efficiency and improve consistency. See more on page 5.

Registration for the 2025 DOE Project Management Workshop opens for federal employees on December 16. See page 7 for more information. And don't forget to check out this month's Project Management Lessons Learned training snippet, *How to Initiate a New Project Management Lessons Learned* on page 6.

Keep Charging!

Paul Bosco

Developing and Implementing a Project Recovery Plan: Using Earned Value Management Techniques and Project Recovery Strategies

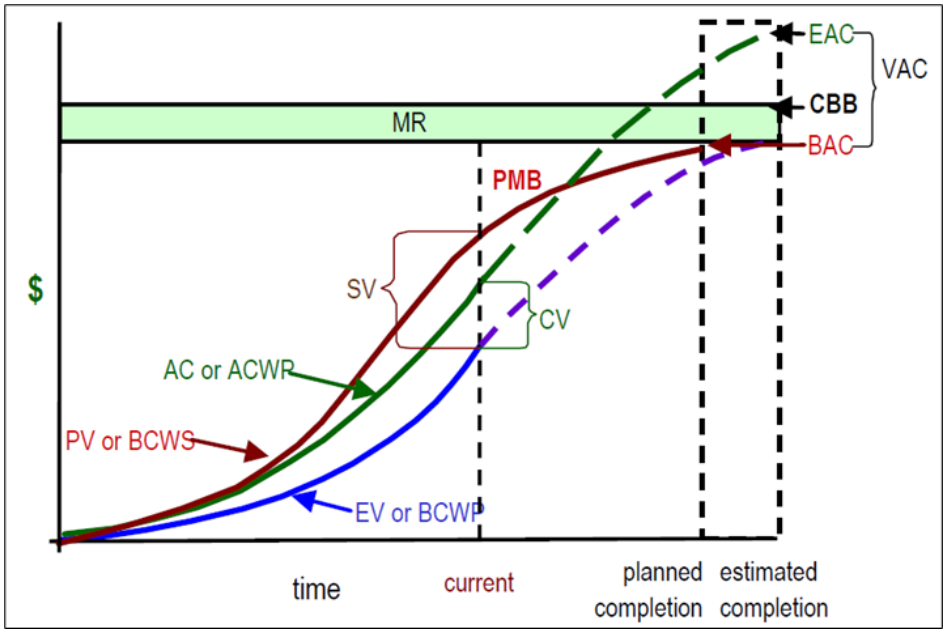
Catherine Donohue, Office of Project Analysis (PM-20)

Effective front-end project planning to establish an executable performance baseline (PB) is the best way to ensure project management success. Even with the best planning, large construction projects can experience schedule delays and cost overruns that create schedule and cost variances which may negatively impact the project. Some common causes for project delays and overruns are:

- Inadequate or overly optimistic initial planning
- Unforeseen technical challenges
- Resource shortages
- Subcontractor performance
- Factors external to the project (i.e., supply chain issues, competing priorities)
- Poor communication

The key to project success is how the integrated project team (IPT) reacts to the schedule and cost variances as they occur. Earned value management (EVM) is a valuable technique for variance analysis and its use is a management best practice for successful project management. Earned value (EV) data analysis provides all levels of management with early visibility of trending cost and schedule problems. The EVM system relates the time-phased budget's correlation to specific work breakdown structure (WBS) activities and provides the calculated earned value of the current period (time now).

Figure 1. Earned Value Management Systems Basics



The EVMS graph below depicts schedule variance (SV) and cost variance (CV). These performance indices derived from earned value (EV), planned value (PV), and actual cost (AC) are the keys to comprehensive analysis of project performance. The estimate at completion (EAC) can be determined and assessed against the budget at completion (BAC) which is set when baselining the project. EVM techniques are not only backwards looking but also enable the user to forecast future project performance.

EVM provides predictive insights to the federal project director (FPD) when monitoring and controlling the project. EV data analysis can assess performance down to the subtask levels. Understanding the root cause of any project challenge avails the FPD with the opportunity to discuss potential remedies with the contractor before the cost or schedule deviation becomes an insurmountable issue and allows the IPT to make necessary risk-informed adjustments to manage the project within the approved performance baseline.

Proactively addressing issues and making adjustments to reflect actual performance maintains the validity of EV data and provides accurate visibility of project performance. However, sometimes issues are not identified or addressed early enough and sustained negative performance may compound over time to create a situation that prompts a letter of concern from the contracting officer (CO) or their representative, the contracting officer's representative (COR), usually the FPD. This CO action requires a formal response or action by the contractor. Whether the response is called a corrective action plan or a recovery plan, it is meant for the contractor to systematically address project recovery. A corrective action plan will address the gaps identified through root cause analysis and a recovery plan will restore control of the project.

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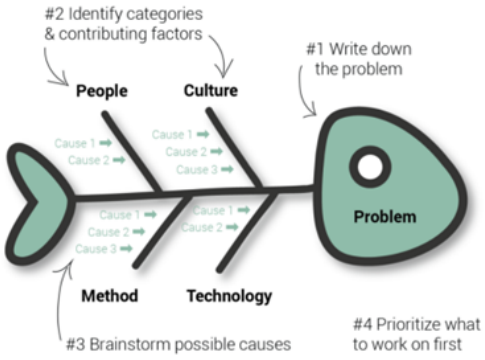
Before initiating the steps of a recovery plan, it is essential to understand why such a plan is necessary; what are the root causes of the variance? By understanding the root causes, the IPT can develop targeted strategies to address the specific issues and minimize the effects on interrelated task dependencies. It is also essential to understand the relationships of interrelated projects to avoid potentially affecting future portfolio costs negatively. Examples of techniques for conducting a thorough root causes analysis include but are not limited to:

- Failure Mode and Effects Analysis (FMEA)
- 5 Whys
- Fault Tree Analysis (FTA)
- Ishikawa Fishbone Diagram (See example graphic below)



The integrated master schedule (IMS) should be consulted to identify the activities that are slipping, determining how much earned value is remaining and targeting the most significant recovery options for optimization. See the Gantt chart below which shows task dependencies and variations in the planned schedule. Use EV tools to analyze and understand the root causes when developing recovery options. These mitigation measures should be risk informed and based on current risk management strategies.

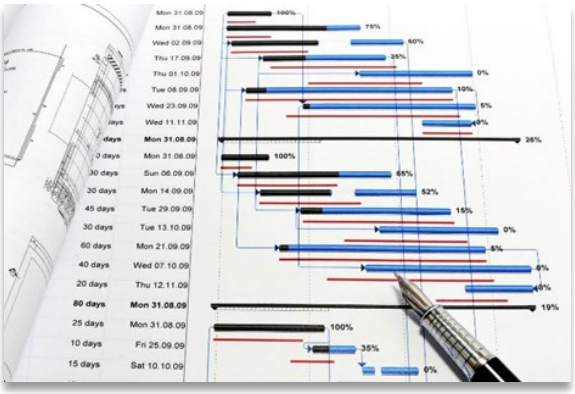


Figure 2. Gantt Chart Example Representing Schedule Slippage

Identification of the contributing factors driving negative schedule and cost variance, such as a project owner re-direction, realized risk, unforeseen conditions, or poor performance will shape the options for recovery. Tradeoffs should be evaluated, and budget reserves reviewed to determine what options are available. If the project is experiencing cost overruns, the IPT should look to reduce overall project duration, if possible. In construction projects, time is money. Completing the project early eliminates the monthly "hotel costs," and this saved budget can be reallocated for the overruns.

Key stakeholders, such as affected functional units, vendors, and suppliers should be consulted by the IPT to identify and discuss factors contributing to the issues impacting the project schedule and determine realistic updates to secure support for the revised plan.

Techniques should be tailored to the operating environment of the specific project and special attention should be given to interrelated projects. Examples of strategies for recovery and acceleration are highlighted below, obtained from Table 6 of the Government Accountability Office (GAO) Schedule Assessment Guide, Best Practices for Project Schedules, Best Practice #10. Project managers can effectively address delays by strategically employing techniques such as fast-tracking, crashing, re-sequencing, etc. Each technique has its advantages and disadvantages. A review of each strategy and what the project can withstand is needed to select the optimal combination of these techniques to enhance the likelihood of successful schedule recovery.

IPTs should be looking for opportunities to recover from schedule slippage and should consider strategies for recovery and acceleration. The most commonly used of these strategies are crashing and fast tracking. Crashing is one technique to shorten the duration of critical tasks by increasing the resources to targeted activities. Early completion of one or more critical tasks may recover the delayed project schedule so that dependent tasks can start and be completed earlier, moving other dependent tasks to the left.

Along with allocating additional resources, overtime options could be reviewed to determine if extending the work week by a day or extending the workday by one or two hours may increase efficiency and shorten the durations of critical activities.

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Table 6: Strategies for Recovery and Acceleration

Technique	Description	Side effects
Crashing	Add resources to time-dependent activities to complete work faster	Requires additional resources and thus increases costs; may also reduce quality if activities are executed faster and with less-experienced labor
Fast tracking	Reduce the sequential dependencies between activities to partial dependencies. For example, F–S logic is reduced to S–S logic to force parallel work	Resources may become overallocated; quality may also be reduced and risk introduced if activities ideally executed in sequence are now executed in parallel
Split long activities	Split long activities into shorter activities that can be worked in parallel	Resources may become overallocated
Review constraint and lag assumptions	Reassess assumptions related to forcing activities to begin on certain dates	If the original date constraint or lag is justified, removing the constraint or lag may not be realistic
Review duration estimates	Revisit duration estimates using progress records as actual effort is recorded	
Add overtime and reduce vacations	Review nonworking periods and assign overtime work	Costs will increase over standard labor rates; as overtime increases, morale decreases, eventually affecting the quality of the product negatively
Reduce scope	Decrease scope to reduce both duration and costs	Scope is the primary reason for performing the work, and it may not be possible to delete some requirements
Schedule contingencies	Allocate contingency to absorb delay in accordance with identified risk mitigation plans	Using contingency too early in a project reduces the likelihood of the program's completing on time, particularly if the reason for a delay was a risk that was not previously identified and quantified

Source: GAO and NDIA | GAO-16-89G.

Adding a back shift to accelerate critical tasks that impact dependent activities is another opportunity to explore.

Fast tracking is another proven technique for recovery. There may be viable opportunities for shortening critical task durations by identifying tasks with the greatest schedule delay impact. Consider breaking tasks down further and performing activities in parallel rather than in sequence to accelerate time to shorten the project's overall duration.

More than likely, senior management will take notice of a poor performing project. The EVM data, mitigation proposals, and recovery plan will help communicate the intricacies of the project's issues and regain organization confidence in the project. Delays happen; it's what we do about them that can impact overall mission. Increased management and monitoring of the recovery actions is prudent to determine if any further course corrections are needed as the recovery plan is implemented. It is important to go back to planning fundamentals and determine realistic durations and dependencies to minimize introduced bias to the recovery plan. Actual productivity rates should be analyzed when developing the recovery plan.

Implementing a recovery plan is not just about addressing immediate issues but also about fostering a culture of continuous improvement and incorporating documented lessons learned from the recovery process to enhance future project planning and execution. This includes identifying best practices, refining risk management strategies, and improving resource allocation processes.

In conclusion, a recovery plan, underpinned by accurate EVM data, is a proven technique for bringing a struggling project back towards meeting its project baseline. As a project deviates from the baseline, proactively developing and implementing a recovery plan for cost and schedule issues is a crucial aspect of project management. The IPT has an opportunity to navigate the challenges of cost overruns and schedule delays to a successful outcome while learning lessons for continuous improvement and contributing to the project management body of knowledge. Embracing a proactive and strategic approach to recovery not only enhances project outcomes but also builds a resilient and adaptable organizational culture. Conducting root cause analysis (e.g., the 5 Whys), engaging with key stakeholders, and recovery planning is foundational in managing and anticipating project risk. Continuous performance monitoring of EV data will effectively keep the IPT ready to tackle any project issue that occurs and return the project on a positive path from initial negative variance signals.

Using Artificial Intelligence to Automate Reviews of Contractor Earned Value Management System Descriptions—Increasing Efficiency and Consistency

Robert Loop, Office of Project Controls and Policy (PM-30)

The DOE's Office of Project Management (PM) has successfully demonstrated an automated process to assist in the review of a contractor's earned value management (EVM) system description using an artificial intelligence (AI) tool. This automation results in faster, more comprehensive, and consistent reviews. The process outlined in this initiative serves as a blueprint for future automated document reviews.

The AI Process:

Implementing an AI approach requires careful planning. AI excels at comparing smaller datasets against larger ones and performing grammar checks. The recommended setup involves:

1. Define the overall process and establish clear objectives.
2. Create a comprehensive overview of the desired outcomes to guide the AI.
3. Organize and format the data if needed for more effective processing.
4. Specify the format and structure of the output.
5. Ensure a human is in the loop to review and validate the results.

The DOE PM Compliance Reference Crosswalk (CRC) is an important tool used to compare contractor EVM system descriptions against EIA-748, the industry standard for EVMS. Manually reviewing an EVM system description and completing the CRC to verify compliance with EIA-748 takes a significant amount of time and man-hours of effort. To streamline this process, PM-30 identified a detailed but concisely worded listing of expectations based on EIA-748 of what an EVM system description should discuss.

Prompting scripts were then created for each EVMS subprocess area, with specific instructions to guide the AI tool. The scripts, the list of EIA-748 expectations, and the contractor EVM system description were then processed through the AI tool. The scripts were refined through trial and error to achieve the desired output.

Preliminary Testing Results:

PM-30 determined that the AI tool using the defined scripts and expectation list accurately assessed the high-level intent of whether an expectation was met or not met but was not as capable in more stratified assessments such as partially met.

It was also found that large datasets had to be broken into smaller chunks in order to be processed. This issue will be mitigated in the future with planned AI system upgrades. In addition, scripts with clear logic and specific instructions improved the AI accuracy and reliability.

PM-30 conducted a pilot test of the CRC automated review process by comparing the results of a manual review of an EVM system description against an AI run using the scripts and list of EIA-748 expectations. Where the manual review consumed several days of effort, the automated CRC review including human oversight of the results was completed in about half a day. The AI process found all the manually identified issues plus several additional ones that were missed. There was only one false positive identified in the human validation of the results. Automation improves accuracy and consistency, allowing contractors to receive more timely assessments during the compliance review process.

Lessons Learned:

1. AI "Memory" Limitations: Overcome data input limitations by running queries in smaller, more manageable chunks.
2. Error Handling: Address incomplete outputs by rerunning the prompt or by running additional smaller sections.
3. Output Formatting: Ensure consistent formatting when merging results in MS Excel.
4. Meaningful Output: Ensure the output is meaningful by refining the script and using quotes around text to prevent column splits.

Conclusions:

Approaching the automation logically and incrementally can significantly improve the consistency and efficiency of document reviews, saving considerable time. The success of this initiative demonstrates the potential for AI to enhance project management processes within DOE. By leveraging AI, PM-30 not only streamlined the CRC review process but also set a precedent for future automated document reviews.

Continued on Page 6.

The automated approach has proven to be more accurate and consistent, allowing for more timely assessments. As PM-30 continues to refine and expand the use of AI, the benefits of automation will become increasingly evident, driving further improvements in project management efficiency and effectiveness.

Project Management Lessons Learned (PMLL) Training of the Month

PMLL Training Snippet 3: How to Initiate a New Project Management Lessons Learned

The Department of Energy (DOE) utilizes project management lessons learned in the execution of DOE capital asset projects to improve current and future projects. Lessons learned can be a good work practice or innovative approach that is captured and shared to promote repeat application, or an adverse work practice or experience that is captured and shared to prevent recurrence. Project management lessons learned are collected and shared in the Office of Environment, Health, Safety and Security lessons learned database (DOE OPEXShare).

Click here to view Project Management Lessons Learned Training Snippet – How to Initiate a New Project Management Lessons Learned

Summary: This snippet provides users with instructions on how to suggest new lessons learned content for publication in the DOE lessons learned system of record, called DOE OPEXShare.

Continuous Learning Points (CLPs): Reviewing one hour of snippets will equate to one CLP. To receive credit, FPDs can submit a CLP request under the PMCDP menu in their ESS account. All others may send an email (indicating the snippets viewed) through their respective supervisor to DL-PM-40 to receive a certificate with the appropriate CLPs awarded.

You can find additional Lessons Learned training at the following links:
https://community.connect.gov/display/DOEExternal/PM+Lessons+Learned

Congratulations To Our Newly Certified FPDs!

Level I

Michael Elliott (CR)

Hyeon Lee (NE)

Level III

Jonathan Caldwell (NA)

David Lundquist (NA)

PMCDP FY2025 Training Schedule

The training schedule is posted on PM-Connect. Save the direct link to the Project Management Career Development Program training schedule to your favorites: https://community.connect.gov/x/BgZcQw

Course Title	LN Code	Dates	CLPs	Details
Acquisition Management for Technical Personnel	000145	December 10-12, 2024	16	10:30am-4:30pm ET Webinar Daily
Scope Management Baseline Development	001036	January 7-10, 2025	24	10:30am-4:30pm ET Webinar Daily
Project Risk Analysis and Management	001033	January 13-17, 2025	28	10:30am-4:30pm ET Webinar Daily
Leadership Through Effective Communication	002366	January 21-23, 2025	24	10:30am-4:30pm ET Webinar Daily
Front-End Planning (FEP): Getting to CD-1	003176	January 28-February 13, 2025	20	1-3pm ET Tuesdays/Thursdays (5 sessions)
Quantitative Risk Analysis	0062022	February 10-13, 2025	20	10am-3pm ET Webinar Daily
Capital Planning for DOE O 413.3B Capital Asset Projects	002152	February 18-20, 2025	16	10:30am-4:30pm ET Webinar Daily

Registration opens December 16!

2025 DOE Project Management Workshop

Washington DC ***April 22-23, 2025****

**** Plus: Optional Project Controls Session April 24, 2024***

A limited block of rooms (Book Early!) for the PM Workshop has been reserved at the venue: Hilton Washington DC National Mall the Wharf, 480 L'Enfant Plaza SW, Washington DC. Ctrl+Click to follow the hotel link :

2025 DOE Project Management Workshop - Booking Link Room Reservation

If you would like to contribute an article to the Newsletter or want to provide feedback, please contact the Editor at DL-PM-40.

Find up-to-date information and resources anytime!

All PMCDP Course Descriptions and Course Materials can be found in the Course Catalog on PM-CONNECT

Save the direct link to your favorites: **https://community.connect.gov/x/UAT3Rw**

Or, download the Interactive Curriculum Map: **https://community.connect.gov/x/sQd1Qw**

Have a question, bug or glitch in a PMCDP online course, or want to provide feedback? Submit your questions through: **PMCDPOnlineCourseSupport@hq.doe.gov**.

Contact Us!

The Office of Project Management welcomes your comments on the Department's policies related to DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. Please report errors, omissions, ambiguities, and contradictions to: PMpolicy@hq.doe.gov.

If you have technical questions about Project Assessment and Reporting System (PARS), such as how to reset your password, please contact the PARS Help Desk at: PARS_Support@Hq.Doe.Gov. And, as always, PARS documentation, frequently asked questions (FAQs) and other helpful information can be found at Support : PARS Support (doe.gov). The current PARS reporting schedule is located on PM-Connect at the following link: https://community.connect.gov/x/m4lIY

Need information to apply for Federal Project Director (FPD) certification? The Certification and Equivalency Guidelines (CEG) can be found here: https://community.connect.gov/x/lQd1Qw

Can't put your finger on a document or information you were told is available on PM-Connect? Looking for information on DOE project management? Submit your questions and queries to: PMWebmaster@doe.gov.

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