EM-5.22 Lessons Learned Bulletin

July 2017

Value of Earned Schedule

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Date: **7/6/2017**

Statement:

The Lessons Learned Bulletin is intended to provide the Office of Environmental Management with recommendations which align with best practices or lessons from industry or from a government agency. These recommendations can help both headquarters and field staff with navigating the operations and project management.

Earned Value contains a weakness when providing schedule metrics for capital asset projects which are nearly complete or over schedule. Receiving a Schedule Performance Index of .99 means that 99% of the scope is complete, but is the project early, late, or on time? In 2003 Walter Lipke introduced Earned Schedule as a means of quantifying schedule performance as a factor of time and not cost. This metric requires no additional data and can support management's understanding of project liability.

Discussion:

Background

In the 1950s, an Industrial Engineer by the name of Ernest Fitzgerald coined the technique of Earned Value. What originally started as "classic work measurement" has undergone evolutions bridging the gaps of the original system with technical advancement and the increased need for more closely managed projects. Earned Value, as we know it now, is a means of analyzing and forecasting projects based on planned budget and cost. Earned Value addresses the elements of cost and schedule by identifying variances and developing index values used to report performance. These values can provide a cost perspective of the project and can provide support in forecasting project performance, including what actions and performances values are required to meet the final deliverable regarding schedule and cost.

Earned Schedule

Earned Schedule builds upon Earned Value techniques providing a metric which values the variance of time between the date of Earned Value and the time at which the Earned Value should have been accrued. The value is provided in units of time and is a metric which retains variance, unlike Earned Value's Schedule Variance (SV) and Schedule Performance Index (SPI) which zero out at the end of a project. Earned Schedule has the benefits of using existing data for Earned Value, the calculation is simple, and it supports management in forecasting and understanding schedule liability for the project.

Benefits

Data Availability

Earned Schedule calculations take advantage of the data already produced for Earned Value calculations. By using existing data, it relieves contractors from having to provide additional data to support the calculation. Since the data has already been provided on a regular basis, Earned Schedule calculations can be performed immediately on historic data to quickly provide trend information.

Ease of Use

Calculations for earned schedule are not complex and can be performed quickly. The equation for Earned Schedule is ES = Completed Units + $((EV-PV_1)/(PV_2-PV_1))$ where EV is the current Earned Value, PV1 is the time unit which Planned Value equals Earned Value, and PV2 is the time unit which is current for EV. The website

www.earnedschedule.com provides numerous examples of Earned Schedule calculations and should be referenced for additional support in performing Earned Schedule calculations.

Forecasting

Earned Value fails to provide supportive schedule performance values near the end of a project to include when a project exceeds its scheduled completion. Earned Value metrics demonstrate completion of scope but not impact to schedule. Earned schedule provides variances in time against the Performance Management Baseline, thus reporting performance as "ahead-of or behind schedule". These calculations provide management with a means to understand if enough schedule reserve exists to cover any overruns on a project. Management is also able to trend these values to forecast performance of the project with a more accurate completion date than what can be forecasted from SV and SPI based forecasts.

The graphic representation of Earned Schedule (taken from www.earnedschedule.com) is shown below. The value of Earned Schedule is represented by the black arrow which represents the variance between Earned Value and the time in which the Earned Value should have been accrued.

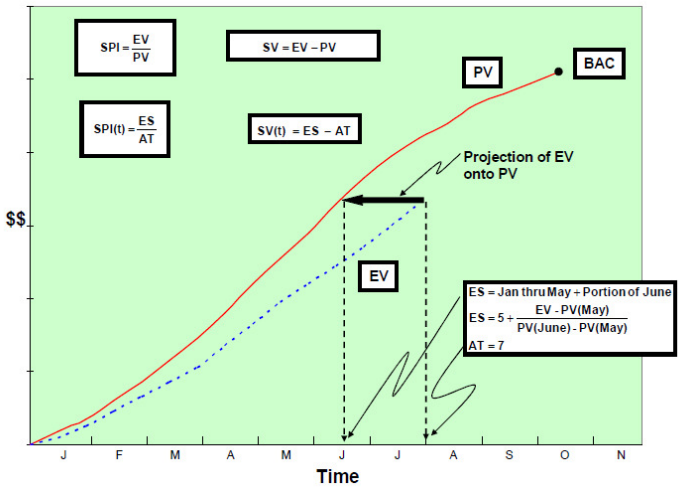

Figure 1 Earned Schedule

Conclusion

Several EM projects are nearing CD4 within the next year to year and a half. As these projects near completion, Earned Value schedule metrics will depict these projects finishing on time regardless of how well the projects keep to their schedules. Earned schedule is a simple way to provide management with more insight into the performance of these projects as they relate to schedule. The use of Earned Schedule will support management in forecasting completion dates of projects and will provide insight into project liability.

Recommended Actions:

The following recommendations:

1. Enhance Earned Value metrics with Earned Schedule to provide management with a more accurate representation of project schedule.
2. Use Earned Schedule values to support trending and forecasting of projects.

Critical Decision(s):	CD-3 to CD-4
Facility Type(s):	All
Work Functions(s):	Project/Program Management
Technical Discipline(s):	All

References:

1. J. Morin, How it All Began: The Creation Of Earned Value and the Evolution of C/SPCS and C/SCSC, The Quarterly Magazine of the College of Performance Management, January 2016.