In this lesson you will learn about how contractors measure progress and report program performance in the Integrated Program Management Report (IPMR).

The terminal learning objective for this lesson is to recognize the fundamentals of integrated performance measurement.

<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
<th>Duration</th>
<th>Baseline Start</th>
<th>Baseline Finish</th>
<th>Start</th>
<th>Finish</th>
<th>Actual Start</th>
<th>Actual Finish</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>Timing Analysis</td>
<td>8 days</td>
<td>Mon 10/6/14</td>
<td>Wed 10/15/14</td>
<td>Mon 10/6/14</td>
<td>Wed 10/15/14</td>
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<tr>
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<td>45 days</td>
<td>Thu 10/16/14</td>
<td>Wed 12/24/14</td>
<td>Thu 10/16/14</td>
<td>Wed 12/24/14</td>
<td>N/A</td>
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</tr>
</tbody>
</table>

This lesson includes three topics:

- **Topic 1:** The Control Account Plan
- **Topic 2:** EVM Progress Measures
- **Topic 3:** Statusing Work Packages
In this lesson you will learn about how contractors measure progress and report program performance in the Integrated Program Management Report (IPMR).

The terminal learning objective is to describe how contractors use EVM to measure progress and report program performance.

Long Description

Integrated Master Schedule, or IMS, excerpt displays schedule information for two representative WBS tasks. The IMS displays task duration; baseline, interim, and actual start and finish dates; and a Gantt chart with task milestones in addition to the baseline and actual schedule. Time now is also indicated on the Gantt chart.

This lesson includes three topics:

- **Topic 1:** The Control Account Plan
- **Topic 2:** EVM Progress Measures
- **Topic 3:** Statusing Work Packages
In this topic, you will:

- Given the Integrated Program Management Report (IPMR) Data Item Description (DID), identify Department of Defense (DoD) Earned Value Management (EVM) policy requirements for using the Integrated Master Schedule (IMS) to record and report the status of the project.
Measuring Progress

Based on the contractor’s management cycle, but at least monthly, contractors status the schedule tasks to reflect real progress in work accomplished. The contractor control account managers (CAMs) also determine their budgeted cost for work performed (BCWP). This information is reported in the IPMR to inform the Government of cost and schedule performance. All performance measures are dependent on an understanding of what was planned and what was accomplished.

Measuring Progress

Reporting Progress in the IPMR

The contractor measures progress against the plan:

- What is the current schedule, based on actual start and finish dates?
- What is the current and cumulative BCWP (BCWPcum) for the planned, authorized scope of work?
Measuring Progress

Statusing the schedule

"Statusing the schedule" is the act of recording progress against the plan. This work is performed by the project scheduler at least monthly, with input from the CAMs.

Based on the status of the schedule, managers (CAMs) also determine if the project is proceeding as planned.

You must select each tab to move on.
Measuring Progress

Based on the contractor’s management cycle, but at least monthly, contractors status the schedule tasks to reflect real progress in work accomplished. The contractor control account managers (CAMs) also determine their budgeted cost for work performed (BCWP). This information is reported in the IPMR to inform the Government of cost and schedule performance. All performance measures are dependent on an understanding of what was planned and what was accomplished.

Reporting Progress in the IPMR

The contractor submits current and cumulative planning and performance data for each required Work Breakdown Structure (WBS) element:

- The contractor reports to the Government through the IPMR in accordance with Contract Data Requirements List (CDRL)
- Progress is measured at the work package level, rolled up to control accounts, reporting levels, and total contract levels
- Schedule performance should reflect the performance found in the other IPMR Formats and is used to help identify total performance issue areas

You must select each tab to move on.
Measuring Progress

Based on the contractor's management cycle, but at least monthly, contractors status the schedule tasks to reflect real progress in work accomplished. The contractor control account managers (CAMs) also determine their budgeted cost for work performed (BCWP). This information is reported in the IPMR to inform the Government of cost and schedule performance. All performance measures are dependent on an understanding of what was planned and what was accomplished.

Reporting Progress in the IPMR

The contractor submits current and cumulative planning and performance data for each required Work Breakdown Structure (WBS) element:

- Budgeted cost for work scheduled (BCWS)
- Budgeted cost for work performed (BCWP)
- Actual cost of work performed (ACWP)
- Budget at completion (BAC)
- Estimate at completion (EAC)

and is used to help identify total performance issue areas.

You must select each tab to move on.
What is the Plan?

CAMs use their **Control Account Plans** as blueprints for performing their work. At its core, the Control Account Plan shows the time-phased BAC or BCWS within a control account. Earned value techniques are also identified for each work package. Below is the Control Account Plan for Lightweight, Assault and Reconnaissance (LAR) vehicle's Engine Critical Design, showing a total BAC of $148,368 for this control account.

![Control Account Plan for LAR Vehicle's Engine Critical Design](image.png)

### 1.1.3.1 Engine Critical Design

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
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<tbody>
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</tr>
<tr>
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<td></td>
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<td></td>
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**Total BAC: $148,368**

**Select the Control Account Plan to enlarge.**

Recall, Control Account Plans are internal contractor documents. The data is summarized up to IPMR reporting levels for the Government. Therefore, the Government Earned Value Management (EVM) analyst may not have visibility into this level of detail, unless the Program Management Office (PMO) specifically requested it, which happens at least during the preparation for IBR. The purpose here is to understand the contractor performance at this point in time.

Since the Defense Contract Management Agency (DCMA) has access to the Control Account Plans, the EVM analyst can request their assistance to obtain insight into the Control Account Plans if necessary.

---

**You must select Control Account Plans to continue**
What is the Plan?

CAMs use their Control Account Plans. The Account Plan shows the time-phased breakdown structure (WBS) and also identifies for each work package. Reconnaissance (LAR) vehicle’s Engine Critical Design is an example of a work package.

The Control Account Plan is created by the contractor as part of establishing the performance measurement baseline (PMB). It provides detailed data about each task’s resource plan, Earned Value Management (EVM) technique, and period of performance.

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<tr>
<th>Work Package</th>
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<tr>
<td>9 Finalize Design</td>
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<td></td>
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</tr>
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</table>

Total BAC: $148,368

You must select Control Account Plans to continue

Since the Defense Contract Management Agency (DCMA) has access to the Control Account Plans, the EVM analyst can request their assistance to obtain insight into the Control Account Plans if necessary.
What is the Plan?

CAMs use their Control Account Plans as blueprints for performing their work. At its core, the Control Account Plan shows the time-phased BAC or BCWS within a control account. Earned value techniques are

Long Description

Sample Control Account Plan for LAR WBS element 1.1.3.1 Engine Critical Design time-phased from August through December. Time Now is indicated at the end of October. Work package 1 Requirements Analysis: 0/100 EVM technique; BCWS of $14,112 in August; no BCWS in remaining months; BAC $14,112. Work package 2 Trade Studies: 0/100 EVM technique; BCWS of $5,760 in August; no BCWS in the remaining months; BAC $5,760. Work package 3 Functional Flow Analysis: 50/50 EVM technique; BCWS of $6,720 in August, $6,720 in September; no BCWS in the remaining months; BAC $13,440. Work package 4 Functional Block Diagram: 0/100 EVM technique; BCWS of $14,112 in September, no BCWS in other months; BAC $14,112. Work package 5 Functional Allocation: % complete EVM technique; BCWS of $3,360 in September and October, $2,880 in November, none in the other months; BAC $9,600. Work package 6 Timing Analysis: 0/100 EVM technique; BCWS of $14,784 in October, none in other months; BAC $14,784. Work package 7 Test Methods, Matrix, and Planning: M/S EVM technique; no BCWS in August and September; BCWS of $11,040 in October, $7,200 in November, $5,040 in December; BAC $23,280. Work package 8 Engineering Support: LOE EVM technique; BCWS of $9,984 in August, $9,984 in September, $10,483 in October, $8,986 in November, $10,483 in December; BAC $49,920. Work package 9 Finalize Design: 0/100 EVM technique; no BCWS August through November; BCWS of $3,360 in December; BAC $3,360. Total BAC for all tasks is $148,368. BCWS (current) by month is $36,576 for August, $34,176 for September, $39,667 for October, $19,066 for November, and $18,883 for December. BCWScum (cumulative) by month is $36,576 for August, $70,752 for September, $10,419 for October, $129,485 for November, and $148,368 for December.

Since the Defense Contract Management Agency (DCMA) has access to the Control Account Plans, the EVM analyst can request their assistance to obtain insight into the Control Account Plans if necessary.
Statusing the IMS

The network schedule is the plan for accomplishing the authorized scope of work; therefore measuring performance almost always begins with updating the progress of tasks held in the Integrated Master Schedule (IMS). The IMS must reflect actual progress, maintaining accurate start and finish dates for all tasks/activities and milestones.

The CAMs assess schedule progress, adjusting as necessary:

- The estimated remaining durations of tasks
- The actual and forecasted start and finish dates of tasks
- Other changes in the schedule as necessary to manage the effort

Maintaining an up-to-date schedule is necessary for a meaningful critical path. Up-to-date schedule forecast start and finish dates are also an important input into an up-to-date estimate at completion (EAC) in dollars. Therefore, it is essential that the contractor updates the entire IMS each reporting period, at a minimum monthly.

Note: The IMS update must coincide with the date that the EVM data was updated.
Example of Statusing a Control Account

Below is an example of two of the tasks from the LAR Engine Critical Design control account. As the schedule is updated for the October reporting period, it becomes evident that several tasks are late.

**Note:** Schedule updates must coincide with the update of the EVM data.

### IMS Before Update | IMS Updated

In the below IMS excerpt, you see the baseline schedule for the two tasks. The control account manager will status this schedule at the end of the reporting period, in this case October 31. Note that contractors may status their schedules more often (weekly for example), in accordance with their internal Earned Value Management System (EVMS) processes, which are documented in their EVMS description. Per Department of Defense (DoD) policy, they must update the schedule at least monthly as part of the IPMR submittal.

<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
<th>Duration</th>
<th>Baseline Start</th>
<th>Baseline Finish</th>
<th>Start</th>
<th>Finish</th>
<th>Actual Start</th>
<th>Actual Finish</th>
</tr>
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<tbody>
<tr>
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<td>8 days</td>
<td>Mon 10/6/14</td>
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<td>7</td>
<td>Test Methods, Matrix, and Planning</td>
<td>45 days</td>
<td>Thu 10/16/14</td>
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</tr>
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</table>
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**Note:** Schedule updates must coincide with the update of the EVM data.

### IMS Before Update

<table>
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<tr>
<th>WBS</th>
<th>Task Name</th>
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<th>Baseline Start</th>
<th>Baseline Finish</th>
<th>Start</th>
<th>Finish</th>
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</table>

Here, the CAM has updated the schedule with his latest estimates for when the work will start and finish. Based on these updates, the scheduling now shows that both tasks have slipped. Task 6 started in October, but about 16 work days later than planned in the baseline. Task 7 started into November. The CAM notes that these slips are caused by lack of available resources, and has also added 5 days to the duration of task 7 as a result.

CAM updated duration of task 7 to 50 days based on assessment of work status and resource availability.

This task won't start until the previous task finishes, so its Start has moved from 10/16 to 11/17. This is shown in the Gantt chart with the task "shifting to the right" on the chart, while its baseline (shown here in black) stays at the original dates.

**You must select each tab to move on.**
Example of Statusing a Control Account

Long Description

Integrated Master Schedule, or IMS, excerpt displays schedule information for two WBS tasks: Task 6 Timing Analysis and Task 7 Test Methods, Matrix, and Planning. The IMS displays task duration; baseline, interim, and actual start and finish dates; and a Gantt chart with task milestones in addition to the baseline and actual schedule. Timing analysis duration is 8 days; baseline start and finish are Monday October 6, 2014 and Wednesday October 15, 2014; interim start and finish are Monday October 6, 2014 and Wednesday October 15, 2014; and actual start and actual finish do not have dates. Gantt chart reflects these dates. Test Methods, Matrix, and Planning duration is 45 days; baseline start and finish are Thursday October 16, 2014 and Wednesday December 24, 2014; interim start and finish dates are Thursday October 16, 2014 and Wednesday December 24, 2014; actual start and finish do not have dates. Gantt chart reflects these dates. Integrated Master Schedule, or IMS, excerpt displays schedule information for two WBS tasks: Task 6 Timing Analysis and Task 7 Test Methods, Matrix, and Planning. The IMS displays task duration; baseline, interim, and actual start and finish dates; and a Gantt chart with task milestones in addition to the baseline and actual schedule. Timing analysis duration is 8 days; baseline start and finish are Monday October 6, 2014 and Wednesday October 15, 2014; interim start and finish are Monday October 6, 2014 and Wednesday October 15, 2014; and actual start and actual finish do not have a date. Test Methods, Matrix, and Planning duration has been updated to 50 days; baseline start and finish are Thursday October 16, 2014 and Wednesday December 24, 2014; interim start and finish have been updated to Friday November 7, 2014 and Thursday January 15, 2015; and actual start and finish do not have dates. The duration, interim start and finish dates, and actual start date for Task 7 Test Methods, Matrix, and Planning are highlighted. CAM updated duration of task 7 to 50 days based on assessment of work status and resource availability. This task won’t start until the previous task finishes, so its start has moved from October 16 to November 17. This is shown on the Gantt chart with the task shifting to the right on the chart, while its baseline, shown here in black, stays at the original dates.
Knowledge Review

Which of the following are requirements of the contractor for statusing the Integrated Master Schedule (IMS)?

Select all that apply.

- Accurate start and finish dates for all tasks and milestones
- Actual start and finish dates up to the status date
- Forecasted start and finish dates for all tasks and milestones occurring after the status date
- Actual finish dates for tasks in progress

Requirements for updating the IMS status include **actual start and finish dates for all tasks and milestones up to the status date**, as well as **forecasted start and finish dates occurring after the status date**.
The LAR Control Account Plan

The LAR Engine Critical Design Control Account Plan below shows the BCWS for the nine work packages in the control account, time-phased. The BCWS for all nine work packages is aligned with the schedule for those work packages. Contractor CAMs may have access to various software tools to maintain their baseline and IMS, but the start and finish dates must be consistent regardless of the tool or business system used.

The CAM will status each work package in the IMS and determine the BCWP for each work package monthly. By statusing the schedule, they have knowledge of which work packages were completed and which work packages were not completed. They gather information on the reasons, and develop work around plans. In addition, they hold discussions with their staff to determine how much real work progress has occurred.

It is important to understand that the BCWP is a measure of progress against the BCWS. This connection will become clearer as we explore some of the work packages below on the following pages.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique</th>
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<td>4 Functional Block Diagram</td>
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<td>5 Functional Allocation</td>
<td>% complete</td>
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<td>6 Timing Analysis</td>
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<td>$14,784</td>
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<td>7 Test Methods, Matrix, &amp; Planning</td>
<td>M/S</td>
<td>$11,040</td>
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<td>8 Engineering Support</td>
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<td>9 Finalize Design</td>
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| BCWS (current) | | | | | | | |
| $36,576 | $34,176 | $39,667 | $19,066 | $18,883 |
| BCWS cum (cumulative) | $36,576 | $70,752 | $110,419 | $129,485 | $148,368 |

How much BCWS was earned at this point? Another way of saying this is: What is the BCWP for each task?
The LAR Control Account Plan

The LAR Engine Critical Design Control Account Plan below shows the BCWS for the nine work packages in the control account, time-phased. The BCWS for all nine work packages is aligned with the schedule for those work packages. Contractor CAMs may have access to various software tools to maintain their baseline and IMS, but the start and finish dates must be consistent regardless of the tool or business system used.

The CAM will status each work package in the IMS and determine the BCWP for each work package monthly. By statusing the schedule, they have knowledge of which work packages were completed and which work packages were not completed. They gather information on the reasons, and develop work around plans. In

<table>
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<tr>
<th>Work Package</th>
<th>EVM Technique</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
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<td>1 Requirements Analysis</td>
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<td>2 Trade Studies</td>
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<td>3 Functional Flow Analysis</td>
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Total BAC: $148,368

BCWS (current) $36,576 $34,176 $39,667 $19,066 $18,883

BCWScum (cumulative) $36,576 $70,752 $110,419 $129,485 $148,368

How much BCWS was earned at this point? Another way of saying this is: What is the BCWP for each task?
The LAR Control Account Plan

The LAR Engine Critical Design Control Account Plan below shows the BCWS for the nine work packages in the control account, time-phased. The BCWS for all nine work packages is aligned with the schedule for the work packages.

**Sample Control Account Plan for LAR WBS element 1.1.3.1 Engine Critical Design**

time-phased from August through December. Time Now is indicated at the end of October. Work package 1 Requirements Analysis: 0/100 EVM technique; BCWS of $14,112 in August; no BCWS in September or October; November, December, and BAC are not visible. Work package 2 Trade Studies: 0/100 EVM technique; BCWS of $5,760 in August; no BCWS in September or October; November, December, and BAC are not visible. Work package 3 Functional Flow Analysis: 50/50 EVM technique; BCWS of $6,720 in August, $6,720 in September; no BCWS in October; November, December, and BAC are not visible. Work package 4 Functional Block Diagram: 0/100 EVM technique; BCWS of $14,112 in September, no BCWS in other months; BAC $14,112. Work package 5 Functional Allocation: % complete EVM technique; BCWS of $3,360 in September and October; November, December, and BAC are not visible. Work package 6 Timing Analysis: 0/100 EVM technique; BCWS of $14,784 in October, none in other months; BAC $14,784. Work package 7 Test Methods, Matrix, and Planning: M/S EVM technique; $0 BCWS in August and September; BCWS of $11,040 in October, $7,200 in November, $5,040 in December; BAC $23,280. Work package 8 Engineering Support: LOE EVM technique; BCWS of $9,984 in August, $9,984 in September, $10,483 in October, $8,986 in November, $10,483 in December; BAC $49,920. Work package 9 Finalize Design: 0/100 EVM technique; no BCWS August through November; BCWS of $3,360 in December; BAC $3,360. Total BAC for all tasks is $148,368. BCWS (current) by month is $36,576 for August, $34,176 for September, $39,667 for October, $19,066 for November, and $18,883 for December. BCWS_Cum (cumulative) by month is $36,576 for August, $70,752 for September, $10,419 for October, $129,485 for November, and $148,368 for December. How much BCWS was earned at this point? Another way of saying this is: What is the BCWP for each task?
In this lesson, you will:

- Recognize typical Earned Value Management (EVM) progress measures
Categorizing Work Packages: Groundwork for Measuring Progress

When the CAMs categorized the control account tasks into discrete, apportioned, and level of effort categories, they were laying the groundwork for how progress would be measured. In the next pages, various EVM progress measures are explored.

Most Objective Management Insight

Discrete effort

Apportioned effort

Level of effort

Least Objective Management Insight
Categorizing Work Packages: Groundwork for Measuring Progress

When the CAMs categorized the control account tasks into discrete, apportioned, and level of effort categories, they were laying the groundwork for how progress would be measured. In the next pages, various EVM progress measures are explored.

Most Objective Management Insight

Discrete effort

Apportioned effort

Level of effort

Least Objective Management Insight

Discrete effort

A discrete work package results in a tangible end product, such as software functionality or a manufactured item.
Categorizing Work Packages: Groundwork for Measuring Progress

When the CAMs categorized the control account tasks into discrete, apportioned, and level of effort categories, they were laying the groundwork for how progress would be measured. In the next pages, various EVM progress measures are explored.

Most Objective Management Insight

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

Least Objective Management Insight

**Apportioned effort**

An apportioned effort task is measured as a function of a discrete task or set of tasks, such as performing quality control assessments on the tangible product of a discrete work package.
Categorizing Work Packages: Groundwork for Measuring Progress

When the CAMs categorized the control account tasks into discrete, apportioned, and level of effort categories, they were laying the groundwork for how progress would be measured. In the next pages, various EVM progress measures are explored.

Most Objective Management Insight

Discrete effort

Apportioned effort

Level of effort

Least Objective Management Insight

Level of effort

An LOE task is reserved for general or supportive work that results in no end products, such as management and administrative tasks.
Categorizing Work Packages: Groundwork for Measuring Progress

When the CAMs categorized the control account tasks into discrete, apportioned, and level of effort categories, they were laying the groundwork for how progress would be measured. In the next pages, various EVM progress measures are explored.

Long Description

Discrete effort work packages provide the most objective management oversight. Level of effort work packages are the least objective in terms of management oversight. Apportioned effort work packages are in the middle.

Apportioned effort

Level of effort

Least Objective Management Insight
Measuring Earned Value on Discrete Effort

Discrete effort includes work packages (or lower-level tasks/activities) that are related to the completion of specific end-products or services and can be directly planned and measured. For example, a design engineering work package would have a design drawing as a discrete end product.

As CAMs lay out their discrete work package plans, they also consider how they will measure progress against those plans.

Below is a list of typical EVM progress measures for discrete work:

- Percent Start/Percent Finish
- 0/100
- Weighted Milestones
- Percent Complete
- Weighted Milestones with Percent Complete

Contractors may use these or different EVM methods. To determine what methods a specific contractor uses, check their EVMS description.
Percent Start / Percent Finish

The percent start/percent finish technique is an objective EVM technique tied to the start and completion of a work package task.

This technique is often referred to by the percentages assigned to the start and finish milestones, such as 0/100, 50/50, 25/75 or 20/80.

In this technique, the percent start is a percentage of the work package BAC budgeted as BCWS during the reporting period the work package is scheduled to begin. The percent finish is the remaining percentage of the BAC budgeted in the reporting period the work package is scheduled to finish. Budgeted cost for work performed (BCWP) is realized in the reporting periods the work actually starts and finishes.

This technique is best used for short duration work packages (start and finish within two reporting periods) because this provides a measure of progress in each reporting period. It is important to assess progress in each reporting period. If this technique is used over longer periods of time, the measure of progress is questionable (i.e., 50% performance claimed in first month, then no performance can be claimed regardless of effort, until the work is completed).

Learn more about this technique:

- Advantages
- Disadvantages
- Use

You must select Advantages, Disadvantages, and Use to move on.
The percent start/percent finish technique is an objective EVM technique tied to the start and completion of a work package task.

This technique is often referred to by the percentages assigned to the start and finish milestones, such as 0/100, 50/50, 25/75 or 20/80.

In this technique, the percent start is a percentage of the work package BAC budgeted as BCWS during the reporting period the percentage of the BAC advances cost for work performed.

Advantages of percent start/percent finish include:

- It can be a simple, effective method that lends itself to automation if applied correctly.

This technique is best used in fixed period because this process is claimed regardless of effort, until the work is completed.

Learn more about this technique:

Advantages
Disadvantages
Use

You must select Advantages, Disadvantages, and Use to move on.
Percent Start / Percent Finish

The percent start/percent finish technique is an objective EVM technique tied to the start and completion of a work package task.

This technique is often referred to by the percentages assigned to the start and finish milestones, such as 0/100, 50/50, 25/75 or 20/80.

In this technique, the percent start is a percentage of the work package BAC budgeted as BCWS during the reporting period the start of the work. The percent finish is a percentage of the BAC budgeted as actual cost for work performed during the reporting period the start of the work.

This technique is best used in long projects (months of reporting periods) because this percent start/percent finish technique is best applied to work that takes more than one month to complete. Improperly applied, this technique may not provide EVM data to predict a significant project overrun and schedule slip. For example, an 80/20 EVM percent start/percent finish applied to an eight-month software development work package would:

- Allow the contractor to take credit for completing 80% of the work at the start of software development
- Demonstrate no progress for 6 months or more

Disadvantages

Disadvantages of percent start/percent finish include:

- Improperly applied, this technique may not provide EVM data to predict a significant project overrun and schedule slip. For example, an 80/20 EVM technique applied to an eight-month software development work package would:
  - Allow the contractor to take credit for completing 80% of the work at the start of software development
  - Demonstrate no progress for 6 months or more

Advantages

Disadvantages

Use

You must select Advantages, Disadvantages, and Use to move on.
The percent start/percent finish technique is an objective EVM technique tied to the start and completion of a work package task.

This technique is often referred to by the percentages assigned to the start and finish milestones, such as 0/100, 50/50, 25/75 or 20/80.

In this technique, the percent start is a percentage of the work package BAC budgeted as BCWS during the reporting period. The percentage of the BAC Use cost for work performed is claimed regardless of efforts.

This technique is best used for work packages that start and finish within two consecutive reporting periods.

The percentages chosen to measure BCWP must properly reflect the BCWS plan to complete the work.

Advantages

Disadvantages

Use

You must select Advantages, Disadvantages, and Use to move on.
The 0/100 EVM technique is a special case of the percent start/percent finish technique. In this technique, BCWP is tied only to the completion of a discrete task. No BCWP is recognized for beginning a task or for the partial completion of a task.

This technique has a tendency to understate performance since progress can only be claimed when the work package is 100% complete; the real status of the work package is not known until it is actually completed. For this reason, this technique should only be used when a work package is scheduled to start and complete in a single accounting period.

Learn more about this technique:

- Advantages
- Disadvantages
- Use

You must select Advantages, Disadvantages, and Use to move on.
The 0/100 EVM technique is a special case of the percent start/percent finish technique. In this technique, BCWP is tied only to the completion of a discrete task. No BCWP is recognized for beginning a task or for the partial completion of a task.

This technique has a tendency to understate performance since progress can only be claimed when the work package is 100% complete; the real status of the work package is not known until it is actually completed. For this reason, this technique should only be used when a work package is scheduled to start and complete in a single:

Advantages of 0/100 include:

- It lends itself to automation.
- Earned value is taken only when a task is completed.
The 0/100 EVM technique is a special case of the percent start/percent finish technique. In this technique, BCWP is tied only to the completion of a discrete task. No BCWP is recognized for beginning a task or for the partial completion of a task.

This technique has a tendency to understate performance since progress can only be claimed when the work package is 100% complete; the real status of the work package is not known until it is actually completed. For this reason, this technique should only be used when a work package is scheduled to start and complete in a single month.

Disadvantages of 0/100 include:

- If a task starts, but takes longer than one month, progress tends to be understated with this method.
- No interim progress can be recognized using this method, only 100% completion.
The 0/100 EVM technique is a special case of the percent start/percent finish technique. In this technique, BCWP is tied only to the completion of a discrete task. No BCWP is recognized for beginning a task or for the partial completion of a task.

This technique has a tendency to understate performance since progress can only be claimed when the work package is 100% complete; the real status of the work package is not known until it is actually completed. For this reason, this technique should only be used when a work package is scheduled to start and complete in a single accounting and reporting period (e.g., one month), because earned value is taken only when the task is completed.

Use

Using 0/100:

- It is best used for work packages scheduled to start and complete in a single accounting and reporting period (e.g., one month), because earned value is taken only when the task is completed.
- It is appropriate for relatively small-scoped, well-defined, short-duration work packages.
Percent Start / Percent Finish Applied

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>August</th>
<th>September</th>
<th>October</th>
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<tbody>
<tr>
<td>1</td>
<td>Requirements Analysis</td>
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<tr>
<td>2</td>
<td>Trade Studies</td>
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<tr>
<td>3</td>
<td>Functional Flow Analysis</td>
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<tr>
<td>4</td>
<td>Functional Block Diagram</td>
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Time Now
Text displays: percent start / percent finish. Notional schedule displays for Tasks 1 through 4 for the period of August through October. Time now is indicated between August and September. Task 1 Requirements Analysis and Task 2 Trade Studies started and finished in August. Task 3 Functional Flow Analysis started in August and was planned to complete in September. Task 4 Functional Block Diagram is planned to start and finish in September. Notional project status displays for Tasks 1 and 3. Task 1 Requirements Analysis has a BAC of $14,112 and uses the 0 / 100 technique. Task 3 Functional Flow Analysis has a BAC of $13,440 and uses the 50 / 50 technique. August BCWS for Task 1 displays: $14,112. Text displays at the beginning of Task 1: Start 0 percent and $0. Text displays at the end of Task 1: Finish 100 percent and $14,112. August BCWP for Task 1 displays: $14,112. August BCWS for Task 3 displays: $6,720. September BCWS for Task 3 displays: $6,720. August BCWP for Task 3 displays: $6,720. Text displays at the beginning of Task 3: Start 50 percent and $6,720. September BCWP for Task 3 displays: $6,720. Text displays at the end of Task 3: Finish 50 percent and $6,720.
Closed Captioning

EVM progress measures must be selected to measure progress on a task as effectively as possible. Let's look at how the percent start / percent finish EVM technique is applied.

Consider if we measure earned value on Tasks 1 and 3 during the August reporting period using the percent start / percent finish technique. For Task 1, requirements analysis, the BAC of $14,112 is planned as BCWS in August because the task is scheduled to complete in August.

Let’s assume Task 1 started and completed in the same reporting period, and because of this, the percent start / percent finish split was set as 0/100. When Task 1 started, the control account manager claimed 0% of its $14,112 BCWS as BCWP. When Task 1 finished, the control account manager claimed 100% its $14,112 BCWS as BCWP.

Because Task 1 started and finished in the same reporting period, the full BCWP for that task could be realized in the August reporting period. This method measures progress fairly accurately for this short-term task. The task has a duration equal to or less than 1 month so the control account manager can justify the 0/100 percentage chosen to represent progress in terms of the work plan.

Unlike Task 1, plans for Task 3, functional flow analysis, have the task starting in the August reporting period and completing in the September reporting period. Accordingly, the percent start / percent finish split was set as 50/50.

When Task 3 started, the control account manager claimed 50% of its $13,440 BCWS, or $6,720, as BCWP. By the end of the August reporting period, Task 3 has not finished and therefore, the other 50% of its BCWS cannot be earned as BCWP during the August reporting period. If the task completes in September as planned, the remaining 50% will be earned then.

For this task, the 50/50 method seems like a reasonable measure of progress. The task has a short duration (less than 2 months) and the control account manager can justify the 50/50 percentage chosen to represent progress in terms of the work plan.
Knowledge Review

Sample Task 5, Functional Allocation, spans two reporting periods. The task’s budget at completion is $2,450. Its earned value is being measured using the percent start/percent finish technique with a 50% / 50% split. As of the end of the current reporting period, indicated by the Time Now line, what is the budgeted cost for work performed (BCWP) the contractor can claim?

- $1,225. Only the start percentage can be claimed at this time.
- $2,450. As long as 50% of the work is completed, both the start and finish percentages can be claimed.
- $0. Neither the start nor the finish percentages can be claimed until the task is complete.
- $2,450. Both the start and finish percentages can be claimed when the task begins.

BCWP is $1,225 because the control account manager (CAM) has chosen the 50/50 method to measure progress. The schedule shows that the task has been started, but has not completed. Therefore, the BCWP is 50% of the BAC.
Knowledge Review

Sample Task 5, Functional Allocation, spans two reporting periods. The task’s budget at completion is $2,450. Its earned value is being measured using the percent start/percent finish technique with a 50%/50% split. As of the end of the current reporting period, indicated by the Time Now line, what is the budgeted cost for work performed (BCWP) the contractor can claim?

- $1,225. Only the start percentage can be claimed at this time.
- $2,450. As long as the task is not completed, both the start and finish percentages can be claimed.
- $0. Neither the start nor the finish percentages can be claimed when the task is complete.
- $2,450. Both the start and finish percentages can be claimed when the task begins.

Check Answer

BCWP is $1,225 because the control account manager (CAM) has chosen the 50/50 method to measure progress. The schedule shows that the task has been started, but has not completed. Therefore, the BCWP is 50% of the BAC.
Knowledge Review

Why is the 0/100 Earned Value Management (EVM) technique only appropriate for tasks that start and finish within a single reporting period?

- Because no other technique is appropriate to tasks with such short durations
- Because management would have no insight into progress made in any period other than the period the effort is 100% complete
- Because 100% of the budgeted cost for work performed (BCWP) is claimed when the task starts and there is no way to measure performance after that
- Actually, the 0/100 technique is appropriate for any task regardless of whether it spans multiple reporting periods

The 0/100 EVM technique is only appropriate for tasks that start and finish within a single reporting period because management would have no insight into progress made in any period other than the period the effort is 100% complete.
Weighted Milestones

So far, we've reviewed two EVM progress techniques that are appropriate for short duration tasks. Now let's look at some methods for longer duration tasks. The weighted milestone EVM technique is an objective EVM technique for discrete work.

With this technique:

- The CAM establishes a plan of progress milestones, logically suited for the expected accomplishment of work
- BCWS is based on the resources planned to achieve each milestone
- BCWP is realized after the milestone is complete

This method is one of a number of varieties of milestone methods for statusing progress. The advantage of milestone methods is that they allow for objective statusing of progress as often as required by management (typically monthly). Thus, any cost and/or schedule variances reported are based on objective measures assessed in each reporting period.

Learn more about this technique:

Advantages
Disadvantages
Use
Weighted Milestones

So far, we've reviewed two EVM progress techniques that are appropriate for short duration tasks. Now let's look at some methods for longer duration tasks. The weighted milestone EVM technique is an objective EVM technique for discrete work.

With this technique:

- The CAM establishes a plan of progress milestones, logically suited for the expected accomplishment of work.
- BCWS is based on cumulative earned value at the point of measurement.
- BCWP is realized at the point of measurement.

Advantages of weighted milestones include:

- There is at least one measurable milestone in each reporting period.
- Unfavorable cost and schedule EVM variances are the result of objective measurement of progress at the end of each reporting period.

Learn more about this technique:

Advantages
Disadvantages
Use

You must select Advantages, Disadvantages, and Use to move on.
Weighted Milestones

So far, we've reviewed two EVM progress techniques that are appropriate for short duration tasks. Now let's look at some methods for longer duration tasks. The weighted milestone EVM technique is an objective EVM technique for discrete work.

With this technique:

- The CAM establishes a plan of progress milestones, logically suited for the expected accomplishment of work.
- BCWS is based on objective measures.
- BCWP is realized as work is accomplished.

Disadvantages

Disadvantages of weighted milestones include:

- Untrained or junior CAMs may not have a background that allows them to produce accurate milestones without the assistance of senior members of the contractor team.
- This technique requires a close working relationship between the CAM, schedulers, and resource-estimators in order to set meaningful milestones for all work; a badly-formed or badly-working team will produce poor results.

Learn more about this technique:

- Advantages
- Disadvantages
- Use

You must select Advantages, Disadvantages, and Use to move on.
Weighted Milestones

So far, we've reviewed two EVM progress techniques that are appropriate for short duration tasks. Now let's look at some methods for longer duration tasks. The weighted milestone EVM technique is an objective EVM technique for discrete work.

With this technique:

- The CAM establishes a plan of progress milestones, logically suited for the expected accomplishment of work.
- BCWS is based on the plan.
- BCWP is realized at each milestone.

This method is one of a variety of milestone methods in project management (typically objective measures associated with work packages).

Learn more about this technique:

Advantages

Disadvantages

Use

Using weighted milestones:

- This technique is best for long-term discrete work packages.
- When establishing milestones, each milestone should have a clear definition and clear criteria for completion, represent work accomplishment, and tie in with the IMS.
- It is important to work with technical leads to evaluate milestones based on the approach the contractor is taking. The contractor should set the milestones based on technical accomplishments or deliverables within the work package. As an example, these accomplishments can be related to technical performance measures (TPMs).
Weighted Milestones

So far, we've reviewed two EVM progress techniques that are appropriate for short duration tasks. Now let's look at some methods for longer duration tasks. The weighted milestone EVM technique is an objective EVM technique for discrete work.

With this technique:

- The CAM establishes a portfolio of work.
- BCWS is based on planned milestones.
- BCWP is realized as milestones are achieved.

This method is one of a variety of milestone methods integrated with other management (typically objective measures associated with other techniques). Use milestones based on the rates established from analysis and definition of accomplishment parameters (KPPs) and Key System Attributes (KSAs).

Learn more about this technique.

Advantages

Disadvantages

Use

**technical performance measures (TPMs)**

TPMs are a subset of metrics and measures that evaluate technical progress. TPMs compare the actual versus planned technical development and design. They report progress in the degree to which system performance requirements are met. SE uses TPMs to balance cost, schedule, and performance throughout the life cycle when integrated with other management methods such as the WBS and EVM.

Effective TPMs support assessment of design and integration progress toward achieving Key Performance Parameters (KPPs) and Key System Attributes (KSAs).
Weighted Milestones Applied

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</tbody>
</table>

The chart shows the progress of various tasks from August to December. The milestones are marked with symbols A, B, and C, indicating the current time frame as 'Time Now'.
Weighted Milestones Applied

Long Description

Gantt chart displays the schedules for three tasks for the months of August through December. Time now is indicated at the end of November. Task 5, Functional Allocation, has been completed, starting in September, and finishing in October. Task 6, Timing Analysis, has been completed, starting in October, and finishing in November. Task 7, Test Methods, Matrix, and Planning, is partially completed through the end of October, and scheduled to finish in December. The schedule includes three milestones: Milestone A, which was completed at the end of October; Milestone B, which was completed at the end of November; and Milestone C, scheduled to complete in December. Text displays: Weighted Milestones. Weighted Milestones callout displays: TPM value used as criteria for earning milestone’s value. Weighted milestone information categories display for Task 7, Test Methods, Matrix, and Planning. Categories include: BAC; and BCWS cum and BCWP cum for the months of October, November, and December. Weighted Milestones callout displays: Weight = Cost to complete work required to meet milestone’s TPMs. BAC callout displays: \( BAC = \text{Sum of all milestone weights} \). Milestone values display: Milestone A 11,040 dollars; Milestone B 7,200 dollars; and Milestone C 5,040 dollars. Task 7 BAC value displays: 23,280 dollars. Task 7 BCWS cum values display: October 11,040 dollars; November 18,240 dollars; and December 23,280 dollars. Completed milestones and their values display: Milestone A 11,040 dollars; and Milestone B 7,200 dollars. The total value of completed Milestones A and B equals the November BCWScum of 18,240 dollars. Task 7 BCWP cum value for October displays: 11,040 dollars. Task 7 callout displays: TPM objectives met, BCWP earned. BCWP callout displays: \( BCWP = \text{Weight of achieved milestones} \). Task 7 BCWP cum value for November displays: 11,040 dollars. November BCWP callout displays: Work has not met TPMs for milestone B so the contractor can only claim BCWP for milestone A, not milestone B.
Let's look at how the weighted milestones EVM technique is applied.

Task 7, Test Methods, Matrix, and Planning, is a 3 month task. The control account manager wants to report progress monthly in as objective a manner as possible. Consider if we measure earned value on Task 7, Test Methods, Matrix, and Planning, during the November reporting period using the weighted milestone technique with a Technical Performance Measure, or TPM, value as the criteria for earning the milestone’s value.

TPMs are not necessarily used as a criterion for measuring progress on a milestone, but in this case the control account manager has chosen to do so. This is an excellent measure of progress because it quantifies progress in TPM terms, rather than just using percentages of BCWS as approximations of progress.

Each milestone is assigned a weight as a dollar value commensurate with the cost to complete the work required to meet the milestone's technical performance measurements, or TPMs. The sum of all weighted milestones within a task should equal the task's BAC.

Task 7 has three weighted interim milestones respectively equal to $11,040, $7,200, and $5,040, allocated from its BAC of $23,280. As of the time now line at the end of the month of November, two of the milestones were planned to have been completed. The cumulative BCWS through November is $18,240, reflecting the effort to accomplish those two milestones.

As the schedule indicates, however, work on the task is behind schedule. The TPM criteria for milestone B have not been met, with only milestone A requirements met. According to the method chosen by the control account manager in this example, BCWP can only be earned for the milestone if all the TPMs associated with that milestone have been met. Accordingly, the BCWP is limited to the BCWP claimed after meeting milestone A.
Percent Complete

With the percent complete method, the CAM establishes BCWP by determining a percentage of the BCWS completed. This is a method that can be used for longer duration tasks because it is flexible enough to allow the CAM to establish a progress measure (% complete) for each reporting period.

The flexibility of this technique is both a potential strength and a drawback. The technique provides the flexibility to assess progress accurately, but that very flexibility can also tempt managers to overstate progress early. To avoid this kind of subjectivity in progress measurement, the CAM using this method ideally should have some kind of quantifiable backup data to support the percent complete determination.

Learn more about this technique:

- Advantages
- Disadvantages
- Use
Percent Complete

With the percent complete method, the CAM establishes BCWP by determining a percentage of the BCWS completed. This is a method that can be used for longer duration tasks because it is flexible enough to allow the CAM to establish a progress measure (% complete) for each reporting period.

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Learn more about this technique:

Advantages

Advantages of percent complete include:

- It is easy to implement.
- It is a good technique when based on an underlying plan and measurable outputs.
Percent Complete

With the percent complete method, the CAM establishes BCWP by determining a percentage of the BCWS completed. This is a method that can be used for longer duration tasks because it is flexible enough to allow the CAM to establish a progress measure (% complete) for each reporting period.

The flexibility of this technique is both a potential strength and a drawback. The technique provides the flexibility to assess progress accurately, but that very flexibility can also tempt managers to overstate progress early. To avoid this kind of subjectivity in progress measurement, the CAM using this method ideally should have some kind of quantifiable backup data to support the percent complete determination.

Learn more about this technique:

**Advantages**

**Disadvantages**

Disadvantages of percent complete include:

- It can encourage subjective assessments of progress.
- Estimates are only as good as the estimator:
  - Estimates are often overly optimistic, causing the percent complete to move quickly to a high percentage complete and then creep forward 1% or 2% until completed.
  - This gives the PM a false sense of security early in the project.
  - The lingering end of the task creeps forward at an unrealistically low rate when compared to the resources that are being charged against it.
Percent Complete

With the percent complete method, the CAM establishes BCWP by determining a percentage of the BCWS completed. This is a method that can be used for longer duration tasks because it is flexible enough to allow the CAM to establish a progress measure (% complete) for each reporting period.

The flexibility of this technique is both a potential strength and a drawback. The technique provides the flexibility to assess progress accurately, but that very flexibility can also tempt managers to overstate progress early. To avoid this kind of subjectivity in progress measurement, the CAM using this method ideally should have some kind of quantifiable backup data to support the percent complete determination.

Learn more about this technique:

Advantages
Disadvantages
Use

Use

Using percent complete:

- Due to the subjective nature of this technique, it is best used only on short work packages (two months or less in duration).
- CAMs may have discrete criteria for measuring progress to support the percent complete BCWP assessment.
- If the CAM does have this detailed information on accomplishment criteria, then the Government should have greater confidence in their estimates. It may also be possible to convert to a weighted milestone EVM technique.
Knowledge Review

Which of the following is one reason the weighted milestones Earned Value Management (EVM) technique is typically more desirable than the percent complete technique?

- The weighted milestones approach is applicable to both short-term (two reporting periods or less) and long-term (more than two reporting periods) tasks while the percent complete approach is only applicable to short-term tasks.

- The weighted milestones approach is more subjective than the percent complete approach.

- The weighted milestones approach is not more desirable than the percent complete approach.

- The weighted milestone approach requires the control account manager (CAM) to determine objective milestones to represent progress whereas the percent complete approach may be prone to more subjective progress assessment.

The weighted milestones approach is typically more desirable than the percent complete approach because it requires the CAM to determine objective milestones to represent progress whereas the percent complete approach may be prone to more subjective progress assessment.
Knowledge Review

Consider a task that requires the compilation, submission, and review of survey results at several set intervals throughout the control account’s four-month schedule. This task involves a large number of similar activities that the control account manager (CAM) can use as quantitative back-up data to justify the percent complete. Which of the following Earned Value Management (EVM) techniques would be most appropriate to use in this situation?

- Percent start/percent finish
- 0/100
--percent complete
- 50/50

Percent complete would be the most appropriate technique because this task involves a large number of similar activities that would clutter the schedule if depicted individually. Due to its subjective nature, however, when using this technique on a Government Earned Value Management System (EVMS) contract, it is best to have discrete planning criteria for determining the budgeted cost for work scheduled (BCWS) percentage and accomplishment criteria for claiming budgeted cost for work performed (BCWP).
Knowledge Review

Which Earned Value Management (EVM) techniques can provide an effective measure of progress for a discrete task planned to start and finish in the same period?

Select all that apply.

- 50/50
- 0/100
- 0/50/100
- Level of effort

Because it starts and finishes in the same reporting period, the task would be best evaluated using the 0/100 or 50/50 techniques.
The Systems Engineering task of developing a functional block diagram for the preliminary design of the Lightweight Assault and Reconnaissance (LAR) Vehicle’s engine is a complex task that will span more than two reporting periods. Which Earned Value Management (EVM) technique can provide discrete monthly progress measures for this task?

- Percent start/percent finish
- Level of effort
- Weighted milestones

This task is complex and spans more than two reporting periods, so **weighted milestones** is the most appropriate progress measure. Since this task cannot be completed in two consecutive reporting periods, percent start/percent finish and percent complete are not appropriate progress measures.
Apportioned Effort

Apportioned effort is an EVM technique as well as a work package category. An apportioned effort work task is typically a support task or staff function that can be tied to a discrete task or a specific end item such as quality control, testing or maintenance of machinery used to produce an end product.

Apportioned effort is a method of planning and measuring the earned value for work that:

- Is related in direct proportion to measured (discrete) effort
- Is not, by itself, readily measurable or broken into discrete work packages

An apportioned effort BCWS is directly proportional to the associated discrete effort’s budget and time phasing. An apportioned effort BCWP is directly proportional to the associated discrete effort’s BCWP.

An example of a manufacturing apportioned effort could be a quality assurance function that inspects a statistical sample of finished products. If historical data shows the quality assurance effort required tends to be around 10% of manufacturing, that 10% could be used to determine the quality assurance BCWS. The quality assurance BCWP is also then measured at 10% of manufacturing BCWP.

Learn more about this technique:

- Advantages
- Disadvantages
- Use
Apportioned Effort

Apportioned effort is an EVM technique as well as a work package category. An apportioned effort work task is typically a support task or staff function that can be tied to a discrete task or a specific end item such as quality control, testing or maintenance of machinery used to produce an end product.

Apportioned effort is a method of planning and measuring the earned value for work that:

- Is related in direct proportion to measured (discrete) effort
- Is not, by its direct proportion to measured (discrete) effort

An apportioned effort may allow for phasing. An apportioned effort is work that is not readily measured or divisible into discretely planned work packages, but is directly proportional to the planning and performance of other discretely planned work.

An example of a measurement that may relate to a statistical sample is to be around 10%. The quality assurance plan must state whether or not this concept is to be applied.

Learn more about:

- Advantages
- Disadvantages
- Use

Advantages

- Provides the progress percentage for the apportioned account.

Disadvantages

- Requires additional data collection and analysis.

Use

- Use in situations where work cannot be directly measured.

The concept of "apportioned effort" may be used when work of a supporting nature ties directly to a discrete technical activity. Apportioned effort is work that is not readily measured or divisible into discretely planned work packages, but is directly proportional to the planning and performance of other discretely planned work.

If the contractor chooses to use this technique, the EVMS documentation must cover the requirements for the use of this measurement technique and the need to document the factor used to establish the relationship; i.e., a direct, historical relationship between the base effort and the apportioned effort. It must also point out that the progress identified in the base account (percent complete) provides the progress percentage for the apportioned account.
Apportioned Effort

Apportioned effort is an EVM technique as well as a work package category. An apportioned effort work task is typically a support task or staff function that can be tied to a discrete task or a specific end item such as quality control, testing or maintenance of machinery used to produce an end product.

Apportioned effort is a method of planning and measuring the earned value for work that:

- Is related in direct proportion to measured (discrete) effort
- Is not, by itself, readily measurable or broken into discrete work packages

Advantages

Advantages of apportioned effort include:

- It simplifies the EVM of recurring support activities by defining standardized percentages for these tasks.
- BCWS and BCWP are directly tied to the associated discrete task.
Apportioned Effort

Apportioned effort is an EVM technique as well as a work package category. An apportioned effort work task is typically a support task or staff function that can be tied to a discrete task or a specific end item such as quality control, testing or maintenance of machinery used to produce an end product.

Apportioned effort is a method of planning and measuring the earned value for work that:

- Is related in direct proportion to measured (discrete) effort
- Is not, by itself, readily measurable or broken into discrete work packages

Disadvantages

Disadvantages of apportioned effort include:

- The CAM's management control is diminished.
- The performance claimed each month is tied to other efforts.

Learn more about this technique:

- Advantages
- Disadvantages
- Use
Apportioned Effort

Apportioned effort is an EVM technique as well as a work package category. An apportioned effort work task is typically a support task or staff function that can be tied to a discrete task or a specific end item such as quality control, testing or maintenance of machinery used to produce an end product.

Apportioned effort is a method of planning and measuring the earned value for work that:

- Is related in direct proportion to measured (discrete) effort
- Is not, by itself, readily measurable or broken into discrete work packages

An apportioned effort EVM phasing. An apportioned effort can be used in a statistical sample of financial transactions to be around 10% of material costs. The quality assurance inspection is intimately related to those in another (for example, quality inspections of completed parts are completed in tandem with completion of manufacturing of the parts).

Learn more about this

Advantages

Disadvantages

Use

Using apportioned effort:

- This technique is best used for support tasks or staff functions that can be tied to a discrete task or specific end items.
- Apportioned effort is very useful when efforts in one activity are intimately related to those in another (for example, quality inspections of completed parts are completed in tandem with completion of manufacturing of the parts).
- The proportion or percentage factor applied to the discrete task in order to determine the apportioned task should be derived from historical data taken from the same or similar projects.

You must select Advantages, Disadvantages, and Use to move on.
Level of Effort

LOE is an EVM technique in which earned value is measured by the passage of time; that is, where BCWP always equals whatever BCWS has been planned. LOE is only appropriate as an EVM measure for effort of a general or supportive nature that does not produce definite end products and cannot be practically measured by discrete EVM techniques.

For example, the PM's work effort is often categorized as level of effort because the PM effort supports all the discrete effort. In this case it makes sense to plan the BCWS as LOE. The PM effort earns value with the simple passage of time, by supporting the overall contract effort. There never is any schedule variance (SV) with the LOE measurement technique (BCWP - BCWS always = 0), but there can be a cost variance (CV).

Learn more about this technique:

- Advantages
- Disadvantages
- Use
Level of Effort

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Learn more about the advantages and disadvantages of LOE.

Advantages

An advantage of LOE is that it is simple to use since the only measure is time.
Level of Effort

LOE is an EVM technique in which earned value is measured by the passage of time; that is, where BCWP always equals whatever BCWS has been planned. LOE is only appropriate as an EVM measure for effort of a general or supportive nature that does not produce definite end products and cannot be practically measured by discrete EVM techniques.

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Learn more about the disadvantages:

Disadvantages

Its measurement of BCWP is based merely on the passage of time rather than any measurable events, which can affect EVM metrics in some unique ways:

- SV (BCWP-BCWS) is always 0, so if the contract is experiencing real schedule slippage, this must be considered in the EACs for LOE tasks
- If the contractor is having difficulty hiring necessary staff to support an LOE task, this may distort the cost variance metrics
  - BCWP continues to accrue with the passage of time, while ACWP is lower than planned, resulting in a favorable cost variance
Level of Effort

LOE is an EVM technique in which earned value is measured by the passage of time; that is, where BCWP always equals whatever BCWS has been planned. LOE is only appropriate as an EVM measure for effort of a general or supportive nature that does not produce definite end products and cannot be practically measured by discrete EVM techniques.

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Learn more about the

Advantages

Disadvantages

Use

You must select Advantages, Disadvantages, and Use to move on.
Much of the data needed to evaluate work progress is reported by the contractor through the IPMR Format 1. Format 1 details performance data, including the BCWS, BCWP, actual cost of work performed (ACWP), and schedule and cost variances. This performance data is provided for each WBS element being reported on.

Below is a snapshot of the LAR scenario IPMR Format 1. The LAR IPMR Contract Data Requirements List (CDRL) required the contractor to report on high risk elements at level 4, so the Format 1 includes the data for the level 4 WBS elements Engine, Cooling System, and Exhaust System. The basis for the BCWP numbers shown include all the EVM measures the contractor CAMs used to measure progress against their BCWS.

### Integrated Program Management Report, Format 1

#### 8. Performance Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Budgeted Cost</th>
<th>Current Period</th>
<th>Variance</th>
<th>Cumulative to Date</th>
<th>Variance</th>
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<tr>
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<td>BCWP</td>
<td>ACWP</td>
<td>Schedule</td>
<td>Cost</td>
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<tr>
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<td></td>
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<td>1.1.1 - Frame</td>
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<td>106.5</td>
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<td>1.1.3 - Power Package</td>
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<td>722.1</td>
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<td>1.1.3.1 - Engine</td>
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<td>133.2</td>
<td>112.6</td>
<td>71.5</td>
<td>20.5</td>
</tr>
</tbody>
</table>

*Note: IPMR Format 1 values are in thousands of dollars ($).*
**IPMR Format 1**

Much of the data needed to evaluate work progress is reported by the contractor through the IPMR Format 1. Format 1 details performance data, including the BCWS, BCWP, actual cost of work performed (ACWP), and schedule and cost variances. This performance data is provided for each WBS element being reported on.

Below is a snapshot of the LAR scenario IPMR Format 1. The LAR IPMR Contract Data Requirements List (CDRL) required the contractor to maintain the data shown, which include all the EVM data for the BCWP numbers shown include all the EVM data for the BCWP numbers shown include all the EVM data for the BCWP numbers.

![Long Description]

IPMR Format 1 sample shows section 8, Performance Data, which includes representative values for the WBS elements being reported on. Information on this section of Format 1 includes: WBS item numbers and descriptions; and current period and cumulative to date data for BCWS, BCWP, ACWP, and schedule and cost variances.

<table>
<thead>
<tr>
<th>Item</th>
<th>BCWS</th>
<th>BCWP</th>
<th>Schedule</th>
<th>Cost</th>
<th>BCWS</th>
<th>BCWP</th>
<th>Schedule</th>
<th>Cost</th>
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<tbody>
<tr>
<td>1.1 - Prime Vehicle</td>
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</table>

*Note: IPMR Format 1 values are in thousands of dollars ($).*
In this lesson, you will:

- Given a graphic depiction of a Control Account Plan that displays work packages with various EVM methods and associated monthly and cumulative budgeted cost for work scheduled (BCWScum), calculate budgeted cost for work performed (BCWP) for the work packages.
LAR Engine Critical Design CAP

This depiction of the Control Account Plan is a simplified representation of work package plans. The following pages will walk through how the CAM statuses work packages. "Time Now" is at the beginning of August before the work packages begin. Each month the CAM will status the work packages. Work packages will be filled in as they are completed.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
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<tbody>
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<td>△</td>
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</tbody>
</table>

Total BAC: $148,368

Select to enlarge the graphic.
LAR Engine Critical Design CAP

Long Description

Sample Control Account Plan for LAR WBS element 1.1.3.1 Engine Critical Design time-phased from August through December. Time Now is indicated at the beginning of August. Work package 1 Requirements Analysis: 0/100 EVM technique; scheduled start and completion in August; BCWS of $14,112 in August; no BCWS in remaining months; BAC $14,112. Work package 2 Trade Studies: 0/100 EVM technique; scheduled start and completion in August; BCWS of $5,760 in August; no BCWS in the remaining months; BAC $5,760. Work package 3 Functional Flow Analysis: 50/50 EVM technique; scheduled start in August, scheduled completion in September; BCWS of $6,720 in August, $6,720 in September; no BCWS in the remaining months; BAC $13,440. Work package 4 Functional Block Diagram: 0/100 EVM technique; scheduled start and completion in September; BCWS of $14,112 in September, no BCWS in other months; BAC $14,112. Work package 5 Functional Allocation: % complete EVM technique; scheduled start in September, scheduled completion in November; BCWS of $3,360 in September and October, $2,880 in November, none in the other months; BAC $9,600. Work package 6 Timing Analysis: 0/100 EVM technique; scheduled start and completion in October; BCWS of $14,784 in October, none in other months; BAC $9,984. Work package 7 Test Methods, Matrix, and Planning: M/S EVM technique; scheduled start in October, scheduled completion in December, with scheduled M/S in October, November, and December; no BCWS in August and September; BCWS of $11,040 in October, $7,200 in November, $5,040 in December; BAC $23,280. Work package 8 Engineering Support: LOE EVM technique; scheduled start in August, scheduled completion in December; BCWS of $9,984 in August, $9,984 in September, $10,483 in October, $8,986 in November, $10,483 in December; BAC $49,920. Work package 9 Finalize Design: 0/100 EVM technique; scheduled start and completion in December; no BCWS August through November; BCWS of $3,360 in December; BAC $3,360. Total BAC for all tasks is $148,368. BCWS (current) by month is $36,576 for August, $34,176 for September, $39,667 for October, $19,066 for November, and $18,883 for December. BCWS cum (cumulative) by month is $36,576 for August, $70,752 for September, $10,419 for October, $129,485 for November, and $148,368 for December.
Work Packages 1 & 2 - 0/100 Technique

Let’s take a look at the work packages in the LAR Engine Critical Design control account to see how the contractor CAM measures progress (realizes BCWP). The CAM has decided to use the 0/100 technique for both work packages 1 and 2 because they are both scheduled to start and complete in one month. With this technique, BCWP is realized only upon completion of the effort.

To understand how this works, consider work package 1, Requirements Analysis, shown below. The entire BAC of $14,112 was planned as BCWS in August. Triangles are used to show the scheduled start and completion of this work package in August.

At the end of August the CAM determines that the work did start and complete as planned. This is shown below by the darkened start and completion triangles. Since the work completed in August, the CAM realized the total BCWP of $14,112 in August.
Work Packages 1 & 2 - 0/100 Technique

Let's take a look at the work packages in the LAR Engine Critical Design control account to see how the contractor CAM measures progress (realizes BCWP). The CAM has decided to use the 0/100 technique for both work packages 1 and 2 because they are both scheduled to start and complete in one month. With this technique, BCWP is realized only upon completion of the effort.

To understand how this works, consider work package 1, Requirements Analysis, shown below. The entire BAC of $14,112 for Requirements Analysis is time-phased from August through December. Work package 1 uses a 0/100 EVM technique; has scheduled start and completion in August; BCWS (current) of $14,112 in August; no BCWS in remaining months; and BAC $14,112. Excerpt of the Engine Critical Design Control Account Plan for work package 1 Requirements Analysis statused as of Time Now at the end of August. Work package 1 started and completed in August; has BCWS (current) and BCWP (current) of $14,112 in August; and BAC $14,112. BCWP (current) is highlighted.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>Time Now</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requirements Analysis</td>
<td>EVM Technique: 0/100</td>
<td>Completed</td>
<td>BCWS (current)</td>
<td>$14,112</td>
<td>BCWP (current)</td>
<td>$14,112</td>
</tr>
</tbody>
</table>

Realized the total BCWP of $14,112 in August.
Work Package 3 - Percent Start/Percent Finish (50/50)

Work Package 3, Functional Flow Analysis, has a scheduled August start triangle and a scheduled September complete triangle. The contractor CAM split the BAC of $13,440 for this task evenly between August and September, with each month having $6,720 BCWS to complete this effort. The CAM chose the 50%/50% EVM technique as a good measure of progress for this work package.

Below you can see how the CAM measured progress in August and September. During the month of August, the task began on time (represented by the darkened start triangle), and so the full BCWS for the month of August or $6,720, was earned, indicated as BCWP (current). In the month of September, the task did not complete as planned, so the CAM could not claim any BCWP.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$13,440</td>
</tr>
<tr>
<td>Functional Flow Analysis</td>
<td>EVM Technique: 50/50</td>
<td>▲</td>
<td>△</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCWS (current)</td>
<td>$6,720</td>
<td>$6,720</td>
<td></td>
<td></td>
<td></td>
<td>$13,440</td>
</tr>
<tr>
<td>BCWP (current)</td>
<td>$6,720</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When work completed in October, shown by the darkened triangle slipping into October, the remaining 50% of the BAC ($6,720) was realized as BCWP in October.
Work Package 3 - Percent Start/Percent Finish (50/50)

Work Package 3, Functional Flow Analysis, has a scheduled August start triangle and a scheduled September complete triangle. The contractor CAM split the BAC of $13,440 for this task evenly between August and September, with each month having $6,720 BCWS to complete this effort. The CAM chose the 50%/50% EVM technique as a good measure of progress for this work package.

Below you can see how the CAM measured progress in August and September. During the month of August, the work package was started. During the month of September, the work package was completed.

Long Description

Excerpt of the Engine Critical Design Control Account Plan for work package 3 Functional Flow Analysis statused as of Time Now at the end of September. Work package 3 uses a 50/50 EVM technique, started in August and is scheduled to complete in September. It has BCWS (current) and BCWP (current) of $6,720 in August, BCWS (current) of $6,720 and zero BCWP (current) in September, and BAC of $13,440. BCWP (current) for August and September are highlighted. Excerpt of the Engine Critical Design Control Account Plan for work package 3 Functional Flow Analysis statused as of Time Now at the end of October. BCWS (current) for August and September is $6,720. The September BCWS (current) scheduled to complete in September slipped and completed in October. BCWP (current) is $6,720 for August, zero for September, and $6,720 for October. The BCWP values are highlighted.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique: 50/50</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Functional Flow Analysis</td>
<td>$6,720</td>
<td>$6,720</td>
<td>$0</td>
<td></td>
<td></td>
<td>$13,440</td>
<td></td>
</tr>
</tbody>
</table>
Work Package 4 - 0/100 Technique

Task 4, Functional Block Diagram, also uses the 0/100 technique. Remember, when using this technique, budget is only earned upon completion of the work package.

This work package was scheduled to start and complete in the month of September, so the entire BCWS of $14,112 is scheduled in September, as you can see in the graphic. This work package started on time, which is indicated by the darkened start triangle. However, the work package was not completed, and as a result the completion triangle is not darkened in on the graphic. Therefore, the CAM could not claim any BCWP in that month. In the graph, you can see the BCWP is $0 for the month of September.

The work package completed in October, as indicated by the darkened completion triangle in October. As a result, the CAM claimed the full BCWP of $14,112 for this work package in that month.
Work Package 4 - 0/100 Technique

Task 4, Functional Block Diagram, also uses the 0/100 technique. Remember, when using this technique, budget is only earned upon completion of the work package.

This work package was scheduled to start and complete in the month of September, so the entire BCWS of $14,112 is scheduled in September, as you can see in the graphic. This work package started on time, which is indicated by the darkened start triangle. However, the work package was not completed, and as a result, any BCWP earned was not claimed.

Long Description

Excerpt of the Engine Critical Design CAP for work package 4 Functional Block Diagram statused as of Time Now at the end of October. Work package 4 uses a 0/100 EVM technique, started in September, was scheduled to complete in September, but slipped and completed in October. It has BCWS (current) of $14,112 in September, zero BCWP (current) in September, $14,112 BCWP (current) in October, and BAC of $14,112. BCWP (current) for September and October are highlighted.

The work package completed in October, as indicated by the darkened completion triangle in October. As a result, the CAM claimed the full BCWP of $14,112 for this work package in that month.
Work Package 5 - % Complete

Work Package 5, Functional Allocation, uses the % complete technique, where BCWP is earned by the percentage of work that has actually been accomplished. The CAM should preferably be able to support the % complete using some objective method with quantifiable backup data such as percent of required drawings completed.

The CAM planned 35% of the total BAC of $9,660 for work in September, 35% for work in October, and the remaining 30% for work in November. This spread is shown in the BCWS (current) values below.

In September the CAM assessed the work package progress and determined that 35% was completed, and therefore claimed BCWP of $3,360 ($9,600 X 35%). In October, the CAM claimed an additional 45% of the BAC of $9,600, or BCWP of $4,320 as completed. Each month the CAM will continue to determine, using the quantitative backup data, how much of the work package effort is complete until the entire work package is complete.

In the month of October, because more work was accomplished than planned, you can see that the BCWP is greater than the BCWS in that month.

More work was completed ($4,320) than planned ($3,360)
Work Package 5 - % Complete

Work Package 5, Functional Allocation, uses the % complete technique, where BCWP is earned by the percentage of work that has actually been accomplished. The CAM should preferably be able to support the % complete using some objective method with quantifiable backup data such as percent of required drawings completed.

The CAM planned 35% of the total BAC of $9,660 for work in September, 35% for work in October, and the remaining 30% for work in November. The BAC of the work package is $9,660.

In September, 35% of the total BAC was planned and therefore 35% of the BAC of $9,660 was planned or $3,360 in BCWS. As of the end of October, the BCWS for the work package is $3,360. The BCWS (current) for October is $3,360. The BCWS (current) for October is $3,360.

In the month of October, because more work was accomplished than planned, you can see that the BCWP is greater than the BCWS in that month.

More work was completed ($4,320) than planned ($3,360).
Knowledge Review

Work Package 6 uses the 0/100 technique. As shown here by the darkened start triangle, work started in October. However, work did not complete in October, and therefore the completion triangle is not darkened in. How much budgeted cost for work completed (BCWP) can the control account manager (CAM) claim in October?

- $0
- $100
- $7,393
- $14,784

BCWP is $0. The work package was not completed in October, as originally planned. Remember, with the 0/100 technique, BCWP is earned upon completion of a work package.
Knowledge Review

Work Package 6 uses the 0/100 technique. As shown here by the darkened start triangle, work started in October. However, work did not complete in October, and therefore the completion triangle is not darkened in. How much budgeted cost for work completed (BCWP) can the control account manager (CAM) claim in October?

Check Answer

BCWP is $0. The work package was not completed in October, as originally planned. Remember, with the 0/100 technique, BCWP is earned upon completion of a work package.
Knowledge Review

For work package 7, Test Methods, Matrix and Planning, the control account manager (CAM) chose the weighted milestones technique to determine budgeted cost for work performed (BCWP). The CAM can realize BCWP only after the milestone is achieved. Work started in October and the progress status at the end of October is shown below. How much BCWP can the CAM claim?

<table>
<thead>
<tr>
<th>Work Package</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Test Methods, Matrix, &amp; Planning</td>
<td></td>
<td></td>
<td>$11,040</td>
<td>$7,200</td>
<td>$5,040</td>
<td>$23,280</td>
</tr>
</tbody>
</table>

BCWP is $11,040. The one milestone scheduled for completion in October was achieved.
For work package 7, Test Methods, Matrix and Planning, the control account manager (CAM) chose the weighted milestones technique to determine budgeted cost for work performed (BCWP). The CAM can realize BCWP only after the milestone is achieved. Work started in October and the progress status at the end of October is shown below. How much BCWP can the CAM claim?

- **$0**
- **$5,040**
- **$7,200**
- **$11,040**

**Check Answer**

BCWP is **$11,040**. The one milestone scheduled for completion in October was achieved.
Work Package 8 - Level of Effort

Work package 8, Engineering Support, uses the level of effort (LOE) technique, where BCWP always equals whatever BCWS has been planned. LOE is only appropriate as an EVM measure for effort of a general or supportive nature that does not produce definite end products and cannot be practically measured by discrete EVM techniques.

In this example, the Engineering Support effort has earned value with the simple passage of time. It is not associated with specific tasks.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique: LOE</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Engineering Support</td>
<td>▲</td>
<td></td>
<td></td>
<td>▲</td>
<td></td>
<td>$49,920</td>
</tr>
<tr>
<td></td>
<td>BCWS (current)</td>
<td>$9,984</td>
<td>$9,984</td>
<td>$10,483</td>
<td>$8,986</td>
<td>$10,483</td>
<td>$49,920</td>
</tr>
<tr>
<td></td>
<td>BCWScum (cumulative)</td>
<td>$9,984</td>
<td>$19,968</td>
<td>$30,451</td>
<td>$39,437</td>
<td>$49,920</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BCWP (current)</td>
<td>$9,984</td>
<td>$9,984</td>
<td>$10,483</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BCWPcum (cumulative)</td>
<td>$9,984</td>
<td>$19,968</td>
<td>$30,451</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that with the passage of time the BCWPcum values also increase accordingly.
Work Package 8 - Level of Effort

Work package 8, Engineering Support, uses the level of effort (LOE) technique, where BCWP always equals whatever BCWS has been planned. LOE is only appropriate as an EVM measure for effort of a general or supportive nature that does not produce definite end products and cannot be practically measured by discrete EVM techniques.

In this example, the Engineering Support effort has earned value with the simple passage of time. It is not associated with any physical output.

<table>
<thead>
<tr>
<th>Work Package 8</th>
<th>Engineering Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCWS (current)</td>
<td>$9,984 in August, $9,984 in September, $10,483 in October</td>
</tr>
<tr>
<td>BCWP (current)</td>
<td>$9,984 in August, $9,984 in September, $10,483 in October</td>
</tr>
<tr>
<td>BCWS (cumulative)</td>
<td>$8,986 in November, $10,483 in December</td>
</tr>
<tr>
<td>BCWPcum (cumulative)</td>
<td>$8,986 in November, $10,483 in December</td>
</tr>
<tr>
<td>BAC</td>
<td>$49,920</td>
</tr>
</tbody>
</table>

Note that with the passage of time the BCWPcum values also increase accordingly.
Knowledge Review

Work package 8, Engineering Support, uses the level of effort (LOE) technique. How much cumulative budgeted cost for work performed (BCWP<sub>cum</sub>) can be claimed at the end of the November reporting period?

- $0
- $8,986
- $10,483

$39,437

BCWP $39,437. Task 8 is a LOE work package, which is supportive in nature and not associated with a specific item or product.
Knowledge Review

Work package 8, Engineering Support, uses the level of effort (LOE) technique. How much cumulative budgeted cost for work performed (BCWPcum) can be claimed at the end of the November reporting period?

<table>
<thead>
<tr>
<th>Work Package</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$8,986</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$10,483</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$39,437</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Excerpt of the Engine Critical Design Control Account Plan for work package 8 Engineering Support as of Time Now at the end of November. Work package 8 uses the LOE EVM technique, started in August and is scheduled to complete in December. It has BCWS (current) and BCWP (current) of $9,984 in August, $9,984 in September, and $10,483 in October. It has BCWS (current) of $8,986 in November and $10,483 in December, and BAC $49,920. It has BCWScum (cumulative) and BCWPcum (cumulative) of $9,984 in August, $19,968 in September, and $30,451 in October. It has BCWScum (cumulative) of $39,437 in November and $49,920 in December. BCWP (current) and BCWPcum (cumulative) are blank for November and December.

BCWP $39,437. Task 8 is a LOE work package, which is supportive in nature and not associated with a specific item or product.
Knowledge Review

Work package 9, Finalize Design, uses the 0/100 technique. What is the budgeted cost for work performed (BCWP) for Time Now?

- $0
- $100
- $3,360
- $6,720

BCWP is $0. Work package 9 earns no value in the October reporting period because the work package has not been completed; the work package is not due to start until December.
Knowledge Review

Work package 9, Finalize Design, uses the 0/100 technique. What is the budgeted cost for work performed (BCWP) for Time Now?

- $0
- $100
- $3,360
- $6,720

Check Answer

BCWP is $0. Work package 9 earns no value in the October reporting period because the work package has not been completed; the work package is not due to start until December.

Excerpt of the Engine Critical Design Control Account Plan for work package 9 Finalize Design as of Time Now at the end of October. Work package 9 uses the 0/100 EVM technique and is scheduled to start and complete in December. It has BCWS (current) of $3,360 in December and BAC of $3,360. BCWP (current) value is blank.
Below, the CAM has statused all of the work packages for the LAR Engine Critical Design Control Account Plan through the month of October.

**1.1.3.1 Engine Critical Design Status**

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Analysis</td>
<td>0/100</td>
<td>$14,112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$14,112</td>
</tr>
<tr>
<td>Trade Studies</td>
<td>0/100</td>
<td>$5,760</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$5,760</td>
</tr>
<tr>
<td>Functional Flow Analysis</td>
<td>50/50</td>
<td>$6,720</td>
<td>$6,720</td>
<td>$14,112</td>
<td></td>
<td></td>
<td>$13,440</td>
</tr>
<tr>
<td>Functional Block Diagram</td>
<td>0/100</td>
<td>$14,112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$14,112</td>
</tr>
<tr>
<td>Functional Allocation</td>
<td>% complete</td>
<td>$3,360</td>
<td>$3,360</td>
<td>$2,880</td>
<td></td>
<td></td>
<td>$9,600</td>
</tr>
<tr>
<td>Timing Analysis</td>
<td>0/100</td>
<td>$14,784</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$14,784</td>
</tr>
<tr>
<td>Test Methods, Matrix, &amp; Planning</td>
<td>M/S</td>
<td>$11,040</td>
<td>$7,200</td>
<td>$5,040</td>
<td></td>
<td></td>
<td>$23,280</td>
</tr>
<tr>
<td>Engineering Support</td>
<td>LOE</td>
<td>$9,984</td>
<td>$9,984</td>
<td>$10,483</td>
<td>$8,986</td>
<td>$10,483</td>
<td>$49,920</td>
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<tr>
<td>Finalize Design</td>
<td>0/100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$3,360</td>
<td>$3,360</td>
</tr>
</tbody>
</table>

**Select to enlarge the graphic.**

Select the October BCWP (current) and BCWPCum to review how they were calculated.
LAR Engine Critical Design CAP After Statusing

Below, the CAM has statused all of the work packages for the LAR Engine Critical Design Control Account Plan through the month of October.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3, 4, 5, 7, 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work package 5</td>
<td>$4,320</td>
<td>$14,112</td>
<td>$13,440</td>
<td>$14,112</td>
</tr>
<tr>
<td>Work package 6</td>
<td>$14,784</td>
<td>$14,784</td>
<td>$14,784</td>
<td></td>
</tr>
<tr>
<td>Work package 9</td>
<td>$10,483</td>
<td>$5,040</td>
<td>$49,920</td>
<td>$23,280</td>
</tr>
<tr>
<td>Total BAC</td>
<td>$46,675</td>
<td>$96,595</td>
<td>$148,368</td>
<td></td>
</tr>
</tbody>
</table>

The October BCWP (current) of $46,675 is the monthly increment by which the BCWPcum increases from $49,920 to $96,595.
Sample Control Account Plan for LAR WBS element 1.1.3.1 Engine Critical Design time-phased from August through December, with Time Now at the end of October. Work package 1 Requirements Analysis: 0/100 EVM technique; started and completed in August; BCWS of $14,112 in August; no BCWS in remaining months; BAC $14,112. Work package 2 Trade Studies: 0/100 EVM technique; started and completed in August; BCWS of $5,760 in August; no BCWS in the remaining months; BAC $5,760. Work package 3 Functional Flow Analysis: 50/50 EVM technique; started in August, scheduled to complete in September, but slipped and completed in October; BCWS of $6,720 in August, $6,720 in September; no BCWS in the remaining months; BAC $13,440. Work package 4 Functional Block Diagram: 0/100 EVM technique; started in September, scheduled to complete in September, but slipped and completed in October; BCWS of $14,112 in September, no BCWS in other months; BAC $14,112. Work package 5 Functional Allocation: % complete EVM technique; started in September and scheduled to complete in November; BCWS of $3,360 in September and October, $2,880 in November, none in the other months; BAC $9,600. Work package 6 Timing Analysis: 0/100 EVM technique; scheduled to start and complete in October, but slipped and has not started; BCWS of $14,784 in October, none in other months; BAC $14,784. Work package 7 Test Methods, Matrix, and Planning: M/S EVM technique; scheduled to start in October and complete in December, with scheduled M/S in October, November, and December; the October M/S was not completed; no BCWS in August and September; BCWS of $11,040 in October, $7,200 in November, $5,040 in December; BAC $23,280. Work package 8 Engineering Support: LOE EVM technique; started in August and scheduled to complete in December; BCWS of $9,984 in August, $9,984 in September, $10,483 in October, $8,986 in November, $10,483 in December; BAC $49,920. Work package 9 Finalize Design: 0/100 EVM technique; scheduled to start and complete in December; no BCWS August through November; BCWS of $3,360 in December; BAC $3,360. Total BAC for all tasks is $148,368. BCWS (current) is $36,576 for August, $34,176 for September, $39,667 for October, $19,066 for November, and $18,883 for December. BCWScum (cumulative) $36,576 for August, $70,752 for September, $10,419 for October, $129,485 for November, and $148,368 for December. BCWP (current) is $36,576 for August, $13,344 for September, and $34,675 for October. BCWPCcum (cumulative) is $36,576 for August, $49,920 for September, and $84,595 for October.
TPMs - Using Objective Completion Criteria

Measuring performance requires objective and quantifiable measures, such as the work package:

- Has started and/or completed
- Is in progress with specific goals achieved

In statusing the previous work packages, the CAM used objective completion criteria. One way to measure completion objectively and realize BCWP is to use a **Technical Performance Measurement (TPM)**.

TPMs should be used in the consideration of when performance (BCWP) can be earned; technical performance status should "tell the same story" as EVM performance.

### 1.1.3.1 Engine Critical Design Status

<table>
<thead>
<tr>
<th>Work Package</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Test Methods, Matrix, &amp; Planning</td>
<td>EVM Technique: M/S</td>
<td>Δ</td>
<td>Δ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCWS (current)</td>
<td>$11,040</td>
<td>$7,200</td>
<td>$5,040</td>
<td></td>
<td>$23,280</td>
<td></td>
</tr>
<tr>
<td>BCWP (current)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Draft test matrix complete**  
**Final test matrix complete**  
**Final summary results report delivered**

In this example, a TPM has been used as criterion toward achieving a milestone on a lengthy task.
TPMs - Using Objective Completion Criteria

Measuring performance requires objective and quantifiable measures, such as the work package:

- Has started and/or completed
- Is in progress with specific goals achieved

In statusing the previous work packages, the CAM used objective completion criteria. One way to measure completion objectively and realize BCWP is to use a Technical Performance Measurement (TPM).

Technical Performance Measurement (TPM)

Each task may have TPMs associated with it. While the Control Account Plan identifies the budget and schedule associated with each task, the TPMs identify the performance requirements the task must meet.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique: M/S</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Methods, Matrix, &amp; Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCWS (current)</td>
<td>$11,040</td>
<td></td>
</tr>
<tr>
<td>BCWP (current)</td>
<td>$7,200</td>
<td>$5,040</td>
</tr>
<tr>
<td></td>
<td>$23,280</td>
<td></td>
</tr>
</tbody>
</table>

In this example, a TPM has been used as criterion toward achieving a milestone on a lengthy task.
TPMs - Using Objective Completion Criteria

Measuring performance requires objective and quantifiable measures, such as the work package:

- Has started and/or completed
- Is in progress with specific goals achieved
- Will be completed with all work finished

In statusing the previous work packages, the CAM used objective completion criteria. One way to measure completion objectively and realize BCWP is to use a Technical Performance Measurement (TPM).

TPMs should be used in the consideration of when to divide the work into manageable steps for measuring progress and performance.

Excerpt of the Engine Critical Design Control Account Plan showing work package 7 Test Methods, Matrix & Planning statused through Time Now at the end of October. Work package 7 uses a M/S EVM technique is scheduled to start in October and complete in December, with scheduled M/S in October, November, and December. There no BCWS in August and September; BCWS of $11,040 in October, $7,200 in November, $5,040 in December; and BAC of $23,280. TPMs are used as criteria toward achieving milestones: October, draft test matrix complete; November, test results show threshold for associated TPMs can be achieved within 10% of planned value; December, final summary results report delivered.
Knowledge Review

Technical Performance Measures (TPMs) can be used in the consideration of when performance (budgeted cost for work performed, or BCWP) can be earned.

- True
- False

This is a true statement. TPMs should be used in the consideration of when performance can be earned (BCWP). Technical performance status should "tell the same story" as EVM performance.
Using the IPMR

The contractor reports the cost and schedule performance information in the IPMR. The IPMR also includes the entire IMS, as statused by the CAMs, in Format 6. It also includes the actual cost of work performed, which flows from the contractor’s accounting system into the appropriate control accounts.

Below is an excerpt of the LAR program IPMR Format 1. The Engine Critical Design task is one of many control accounts within the Engine WBS element. Its cost and schedule performance information is rolled up into the Engine WBS element for Government reporting.

<table>
<thead>
<tr>
<th>Item</th>
<th>Current Period</th>
<th>Cumulative to Date</th>
<th>At Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Budgeted Cost</td>
<td>Variance Schedule</td>
<td>Budgeted Cost</td>
</tr>
<tr>
<td></td>
<td>BCWS</td>
<td>BCWP</td>
<td></td>
</tr>
<tr>
<td>1.1 - Prime Vehicle</td>
<td>1416</td>
<td>1959</td>
<td>1790</td>
</tr>
<tr>
<td>1.1.1 - Frame</td>
<td>105.7</td>
<td>106.5</td>
<td>82.3</td>
</tr>
<tr>
<td>1.1.2 - Suspension/Steering</td>
<td>343.7</td>
<td>379.6</td>
<td>497.8</td>
</tr>
<tr>
<td>1.1.3 - Power Package</td>
<td>395.5</td>
<td>853.8</td>
<td>722.1</td>
</tr>
<tr>
<td>1.1.3.1 - Engine</td>
<td>128.4</td>
<td>277.1</td>
<td>234.4</td>
</tr>
</tbody>
</table>

*Note: IPMR Format 1 values are in thousands of dollars ($).
Using the IPMR

The contractor reports the cost and schedule performance information in the IPMR. The IPMR also includes the entire IMS, as statused by the CAMs, in Format 6. It also includes the actual cost of work performed, which flows from the contractor's accounting system into the appropriate control accounts.

Below is an excerpt of the LAR program IPMR Format 1. The Engine Critical Design task is one of many control accounts within the Engine WBS element. Its cost and schedule performance information is rolled up into the Engine Long Description.

<table>
<thead>
<tr>
<th>Item</th>
<th>Budgeted BCWS</th>
<th>At Completion</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 - Prime Vehicle</td>
<td>1416</td>
<td>37517</td>
<td>-1216</td>
</tr>
<tr>
<td>1.1.1 - Frame</td>
<td>105.7</td>
<td>2781.3</td>
<td>-71.6</td>
</tr>
<tr>
<td>1.1.2 - Suspension/Steering</td>
<td>343.7</td>
<td>379.6</td>
<td>497.8</td>
</tr>
<tr>
<td>1.1.3 - Power Package</td>
<td>395.5</td>
<td>853.8</td>
<td>722.1</td>
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<td>128.4</td>
<td>277.1</td>
<td>234.4</td>
</tr>
</tbody>
</table>

*Note: IPMR Format 1 values are in thousands of dollars ($).
Lesson Summary

Congratulations! You have completed the Measuring Progress lesson. You should now know the following key points about measuring progress:

- The networked schedule drives BCWP, and therefore measuring performance almost always begins with updating progress of tasks held in the IMS.
- Each month, contractors status the IMS for each control account’s tasks to reflect real progress in work accomplished as of the IPMR status date:
  - Measure progress against the plan.
  - Submit current and cumulative BCWS, BCWP, and ACWP for each required WBS element.
  - Measure progress at the control account level, and then roll up reporting levels through the IPMR in accordance with the CDRL.
- The Government evaluates IPMR cost and schedule data against planned performance to understand the status of the program.

<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
<th>Duration</th>
<th>Baseline Start Date</th>
<th>Baseline Finish Date</th>
<th>Start Date</th>
<th>Finish Date</th>
<th>Actual Start</th>
<th>Actual Finish</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Timing Analysis</td>
<td>8 days</td>
<td>Mon 10/6/14</td>
<td>Wed 10/15/14</td>
<td>Mon 10/6/14</td>
<td>Wed 10/15/14</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Test Methods, Matrix, and Planning</td>
<td>45 days</td>
<td>Thu 10/16/14</td>
<td>Wed 12/24/14</td>
<td>Thu 10/16/14</td>
<td>Wed 12/24/14</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The IMS shall reflect actual progress and maintain accurate start and finish dates for all tasks/activities and milestones. Maintaining an up-to-date schedule is necessary for a meaningful critical path and up-to-date Estimate at Completion.
Lesson Summary

Congratulations! You have completed the **Measuring Progress** lesson. You should now know the following key points about measuring progress:

- The networked schedule drives BCWP, and therefore measuring performance almost always begins with updating progress of tasks held in the IMS.
- Each month, contractors status the IMS for each control account’s tasks to reflect real progress in work completed.
  - Measure progress at all levels through tasks.
  - Submit data for two representative WBS tasks.
  - The Government monitors all tasks/activities and milestones. Maintaining an up-to-date schedule is necessary for a meaningful critical path and up-to-date estimate at completion.
- The IMS displays task duration; baseline, interim, and actual start and finish dates; and a Gantt chart with task milestones in addition to the baseline and actual schedule. The IMS shall reflect actual progress and maintain accurate start and finish dates for all tasks/activities and milestones. Maintaining an up-to-date schedule is necessary for a meaningful critical path and up-to-date estimate at completion.

<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Timing Analysis</td>
<td>8 days</td>
<td>Mon 10/6/14</td>
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<td>Wed 12/24/14</td>
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</tr>
</tbody>
</table>

The IMS shall reflect actual progress and maintain accurate start and finish dates for all tasks/activities and milestones. Maintaining an up-to-date schedule is necessary for a meaningful critical path and up-to-date estimate at completion.
The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

**Discrete**
You can measure earned value on discrete effort using one of the following:

- Percent Start/Percent Finish
- 0/100
- Weighted Milestones
- Percent Complete

**Apportioned Effort**
You measure earned value on apportioned effort by measuring the earned value of the discrete effort the apportioned effort is tied to.

In other words, the apportioned effort is not what is actually measured; instead, the performance of the discrete task the apportioned effort supports accomplishing is measured and that is what is used to determine the earned value provided by the apportioned effort task.

**Level of Effort**
You measure earned value on level of effort work by the passage of time. BCWP always equals whatever BCWS has been planned.
Lesson Summary, Cont.

The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
  
  A discrete work package results in a tangible end product, such as software functionality or a manufactured item.

- **Apportioned effort**
  
  You measure earned value on apportioned effort by measuring the earned value of the discrete effort the apportioned effort is tied to.

  In other words, the apportioned effort is not what is actually measured; instead, the performance of the discrete task the apportioned effort supports accomplishing is measured and that is what is used to determine the earned value provided by the apportioned effort task.

- **Level of effort**
  
  You measure earned value on level of effort work by the passage of time. BCWP always equals whatever BCWS has been planned.
Lesson Summary, Cont.

The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

### Discrete

You can measure earned value on discrete effort using one of the following:

- Percent Start/Percent Finish
- 0/100
- Weighted Milestones
- Percent Complete

### Apportioned Effort

An apportioned effort task is measured as a function of a discrete task or set of tasks, such as performing quality control assessments on the tangible product of a discrete work package.

### Level of Effort

You measure earned value on level of effort work by the passage of time. BCWP always equals whatever BCWS has been planned.

**Apportioned Effort**

You measure earned value on apportioned effort by measuring the earned value of the discrete effort the apportioned effort is tied to.

In other words, the apportioned effort is not what is actually measured; instead, the performance of the discrete task the apportioned effort supports accomplishing is measured and that is what is used to determine the earned value provided by the apportioned effort task.
The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

**Discrete**
You can measure earned value on discrete effort using one of the following:

- **Percent Start/Percent Finish**
- **0/100**
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- **Percent Complete**

**Apportioned Effort**
You measure earned value on apportioned effort by measuring the earned value of the discrete effort the apportioned effort is tied to.

In other words, the apportioned effort is not what is actually measured; instead, the performance of the discrete task the apportioned effort supports accomplishing is measured and that is what is used to determine the earned value provided by the apportioned effort task.

**Level of Effort**
You measure earned value on level of effort work by the passage of time. BCWP always equals whatever BCWS has been planned.
The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

**Discrete**

You can measure earned value on discrete effort using one of the following:

- **Percent Start/Percent Finish**
- **0/100**
- **Weighted Milestones**
- **Percent Complete**

---

**Percent Start/Percent Finish**

In this technique, the percent start is a percentage of the work package BAC budgeted as BCWS during the reporting period the work package is scheduled to begin.

The percent finish is the remaining percentage of the BAC budgeted in the reporting period the work package is scheduled to finish. BCWP is realized in the reporting periods the work actually starts and finishes.

This technique is best used for work packages that start and finish within two consecutive reporting periods.
The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

**Discrete**

You can measure earned value on discrete effort using one of the following:

- **Percent Start/Percent Finish**
- **0/100**
- **Weighted Milestones**
- **Percent Complete**

**0/100**

This technique is a special case of the percent start/percent finish technique. In this technique, both BCWS and BCWP are tied only to the completion of a task. No BCWS or BCWP is recognized for beginning a task or for the partial completion of a task.

This technique is best used for work packages scheduled to start and complete in a single accounting and reporting period (e.g., one month), because earned value is taken only when the task is completed.

That is what is used to determine the earned value provided by the apportioned effort task.
Lesson Summary, Cont.

The tasks in work packages can be categorized as one of three types of work effort:

- Discrete effort
- Apportioned effort
- Level of effort

**Discrete**

You can measure earned value on discrete effort using one of the following:

- Percent Start/Percent Finish
- 0/100
- Weighted Milestones
- Percent Complete

**Weighted Milestones**

In this technique:

- The CAM establishes objective interim progress milestones, preferably for each interim reporting period.
- Budgets are appropriately weighted based on the resources required to achieve each interim milestone.
- The CAM computes BCWS based on the milestone’s schedule and realizes BCWP only after the milestone is achieved.

This technique is best for long-term discrete work packages.

that is what is used to determine the earned value provided by the apportioned effort task.
Lesson Summary, Cont.

The tasks in work packages can be categorized as one of three types of work effort:

- **Discrete effort**
- **Apportioned effort**
- **Level of effort**

### Discrete

You can measure earned value on discrete effort using one of the following:

- **Percent Start/Percent Finish**
- **0/100**
- **Weighted Milestones**
- **Percent Complete**

### Percent Complete

In this technique, the CAM estimates the percentage of work on a task that he believes can be completed during each reporting period the task spans. The BCWS for each reporting period is a percentage of the task's BAC equal to the percent of work on the task the CAM estimated would be completed. CAMs may have discrete criteria for measuring progress to support the percent complete BCWP assessment.

Due to the subjective nature of this technique, this technique is best used only on short work packages (two months or less in duration) that is what is used to determine the earned value provided by the apportioned effort task.
Lesson Summary, Cont. 1

- Each month, the contractor determines how much of the work was actually accomplished up to and including the current reporting period.
- Measuring performance requires an objective and quantifiable measure, such as the work package:
  - Has started
  - Has completed
  - Is in progress with specific goals achieved
- One way to measure completion objectively and realize BCWP is to use a TPM. TPMs should be used in the consideration of when performance (BCWP) can be earned; technical performance status should "tell the same story" as EVM performance.

<table>
<thead>
<tr>
<th>Work Package</th>
<th>EVM Technique</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>BAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Analysis</td>
<td>0/100</td>
<td>$14,112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$14,112</td>
</tr>
<tr>
<td>Trade Studies</td>
<td>0/100</td>
<td>$5,760</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$5,760</td>
</tr>
<tr>
<td>Functional Flow Analysis</td>
<td>50/50</td>
<td>$6,720</td>
<td>$6,720</td>
<td>$6,720</td>
<td>$13,440</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson Summary, Cont. 1

- Each month, the contractor determines how much of the work was actually accomplished up to and including the current reporting period.

- Measuring performance requires an objective and quantifiable measure, such as the work package:
  - Has started
  - Has completed
  - Is in progress with specific goals achieved

- One way to measure completion objectively and realize BCWP is to use a **TPM**. TPMs should be used in the consideration of what performance status should "tell the same story".

<table>
<thead>
<tr>
<th>1.3.1 Engine Critical Design Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work Package</strong></td>
<td><strong>EVM Technique</strong></td>
<td><strong>BAC</strong></td>
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<td>$13,440</td>
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</tbody>
</table>

**TPM**

Each task may have TPMs associated with it. While the Control Account Plan identifies the budget and schedule associated with each task, the TPMs identify the performance requirements the task must meet.
Lesson Summary, Cont. 1

- Each month, the contractor determines how much of the work was actually accomplished up to and including the current reporting period.
- Measuring performance requires an objective and quantifiable measure, such as the work package:
  - Has started

**Long Description**

Excerpt of the Control Account Plan for LAR WBS element 1.1.3.1 Engine Critical Design time-phased from August through December. Time Now is indicated at the end of October. Work package 1 Requirements Analysis: 0/100 EVM technique; started and completed in August; BCWS of $14,112 in August; no BCWS in remaining months; BAC $14,112. Work package 2 Trade Studies: 0/100 EVM technique; started and completed in August; BCWS of $5,760 in August; no BCWS in the remaining months; BAC $5,760. Work package 3 Functional Flow Analysis: 50/50 EVM technique; started in August, scheduled to complete in September, but slipped and completed in October; BCWS of $6,720 in August, $6,720 in September; no BCWS in the remaining months; BAC $13,440.
You have completed the content for this lesson.

To continue, select another lesson from the Table of Contents on the left.

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