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Department of Mechanical, Materials and Manufacturing Engineering

Project Monitoring - Part 3

- *Other metrics in EVA*
- *Summary of the lecture in three main points*

Schedule Variance (SV) and Cost Variance (CV)

- It is usually more convenient to plot the variance of the BCWP and ACWP
- These are the Schedule Variance (SV) and the Cost Variance (CV). Plots of the variances give a better immediate visual impression of how the programme is progressing.
- Variance is based on the cumulative values of BCWS, BCWP and ACWP

	Cumulative BCWS	Cumulative BCWP	Cumulative ACWP
January	£10,000	£10,000	£12,000
February	£25,000	£25,000	£27,000
March	£37,000	£36,500	£40,000
April	£39,000	£38,000	£43,000
May	£41,000	£39,500	£46,000
June	£47,000	£41,000	£49,000
July	£53,000	£45,800	£53,000
August	£63,000	£52,600	£57,500

- The **Schedule Variance** is defined as

SV = BCWP - BCWS

  - Note SV compares the ***budgeted*** (not actual) values, so a negative value indicates that ***less*** work has been done than scheduled.
  - Expressed in money terms (budgeted cost)

- The **Cost Variance** is defined as

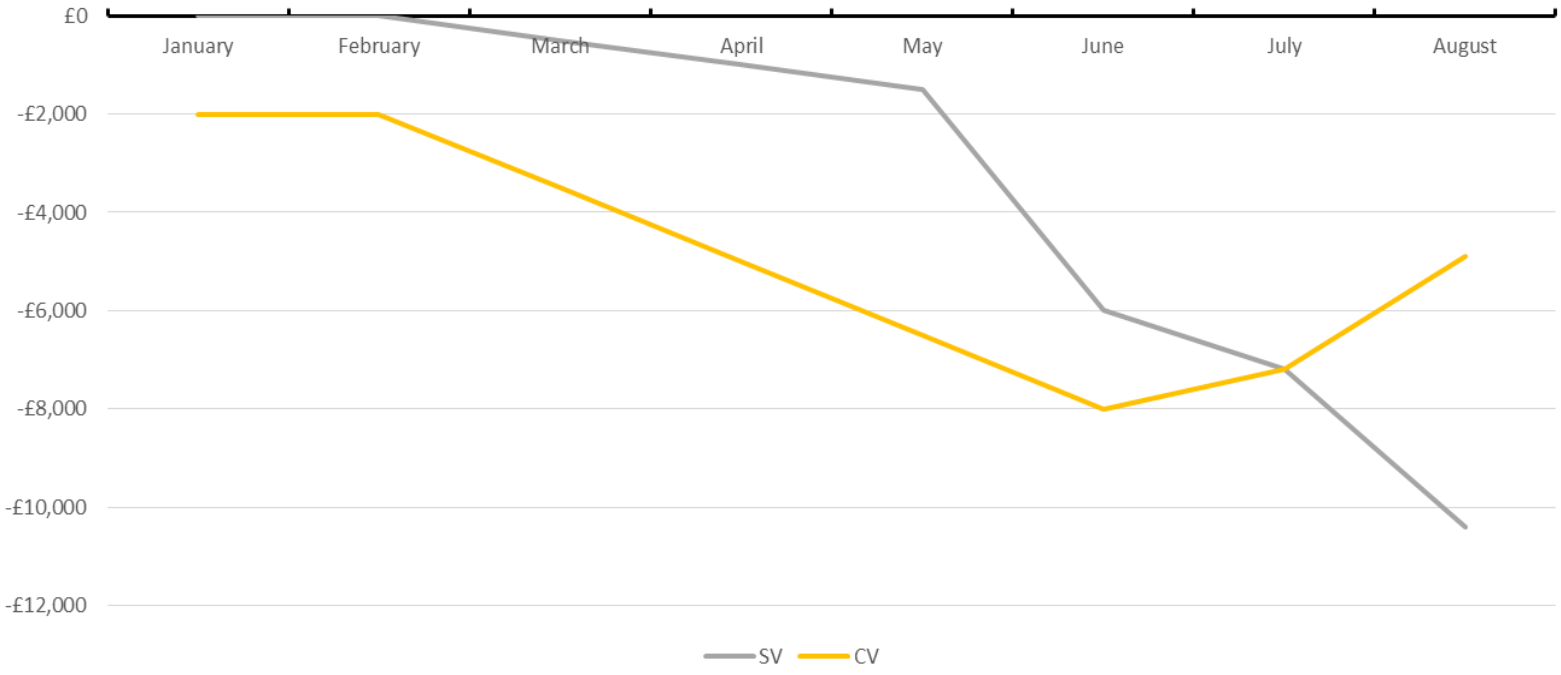
CV = BCWP – ACWP

  - Here the actual cost of the work performed is compared with the budgeted cost of that work. Negative values indicate that the work completed has cost ***more*** than expected.

- Using the definitions we calculate the schedule variance and cost variance

	Cumulative BCWS	Cumulative BCWP	Cumulative ACWP	SV	CV
January	£10,000	£10,000	£12,000	£0	-£2,000
February	£25,000	£25,000	£27,000	£0	-£2,000
March	£37,000	£36,500	£40,000	-£500	-£3,500
April	£39,000	£38,000	£43,000	-£1,000	-£5,000
May	£41,000	£39,500	£46,000	-£1,500	-£6,500
June	£47,000	£41,000	£49,000	-£6,000	-£8,000
July	£53,000	£45,800	£53,000	-£7,200	-£7,200
August	£63,000	£52,600	£57,500	-£10,400	-£4,900

Then we plot the schedule and cost variances



This gives a simple visual indication of the state of the programme!

Cost Performance Index (CPI) and Schedule Performance Index (SPI)

- There are two difficulties with the SV and CV:

    1. Absolute value: to understand the significance of the variance, it is necessary to know the total value of the programme.

    2. It is counterintuitive the negative numbers represent an over-spend.

- These are overcome by introducing the SPI and CPI, which are simple ratios

→ Note that some Programme Managers prefer to use SV and CV because they give absolute values and they can immediately see to magnitude of any deviation in spend.

Note that CPI and SPI use the same "ingredients" as CV and SV!

The **Schedule Performance Index (SPI)** is defined as

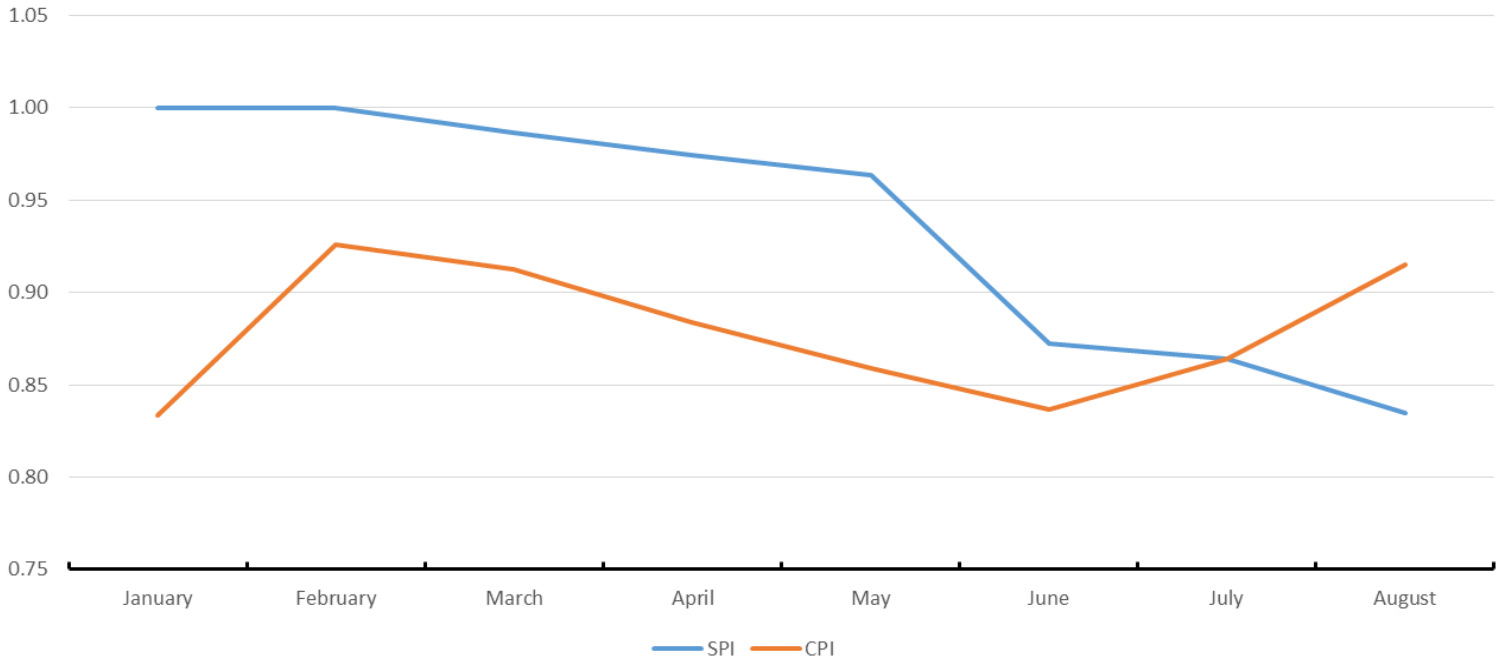
SPI = BCWP / BCWS

- This compares the Planned (budgeted) cost and the budgeted cost of the work completed.
- An index less than 100% indicates that less work has been completed than expected.

The **Cost Performance Index (CPI)** is defined as

CPI = BCWP / ACWP

- This compares the budgeted cost of the work that has been completed with what it has actually cost
- An index less than 100% indicates that the work has cost more than expected.



	Cumulative BCWS	Cumulative BCWP	Cumulative ACWP	SPI	CPI
January	£10,000	£10,000	£12,000	1.00	0.83
February	£25,000	£25,000	£27,000	1.00	0.93
March	£37,000	£36,500	£40,000	0.99	0.91
April	£39,000	£38,000	£43,000	0.97	0.88
May	£41,000	£39,500	£46,000	0.96	0.86
June	£47,000	£41,000	£49,000	0.87	0.84
July	£53,000	£45,800	£53,000	0.86	0.86
August	£63,000	£52,600	£57,500	0.83	0.91

Estimated Completed Time and Cost

Finally, we need to predict when the programme will be competed, and what it will cost. A simple and commonly method is to us the current SPI and CPI **(at the time of review)** for the prediction:

- **Estimated Completion time (ECT) = Planned Programme Duration / SPI**
  - For the powerboat programme this gives 11/0.82 = 13.4 months
- **Estimated Cost of Completion (ECC) = Budget at completion / CPI**
  - In this case we obtain £94,000 / 0.9 = £104,444.44
  - We use the total time and cost, not the values at the time of the review.

Lecture summary in three points

- Introduced to core questions of project monitoring
- Introduced to the idea of the Budgeted Cost of Work Performed.
- Seen what additional metric can be specified through EVA.

… read the notes for more detail and information!