

APPENDIX 300C -- ILLUSTRATIVE EXPLANATION OF EARNED VALUE CONCEPT AND COST AND SCHEDULE VARIANCES FOR CAPITAL ASSETS

Introduction. Earned value is a management technique that relates resource planning to schedules and to technical cost and schedule requirements. All work is planned, budgeted, and scheduled in time-phased "planned value" increments constituting a cost and schedule measurement baseline. There are two major objectives of an earned value system:

- C To encourage contractors to use effective internal cost and schedule management control systems; and
- C To permit the Government to be able to rely on timely data produced by those systems for determining product-oriented contract status.

Baseline. The baseline plan in Table 1 shows that 6 work units (A-F) would be completed at a cost of \$100 for the period covered by this report.

Table 1. Baseline Plan

	Work Units						Total
	A	B	C	D	E	F	
Planned value (\$)	10	15	10	25	20	20	\$100

Schedule variance. As work is performed, it is "earned" on the same basis as it was planned, in dollars or other quantifiable units such as labor hours. Planned value compared with earned value measures the dollar volume of work planned vs. the equivalent dollar volume of work accomplished. Any difference is called a schedule variance. In contrast to what was planned, Table 2 shows that work unit D was not completed and work unit F was never started, or \$35 of the planned work was not accomplished. As a result, the schedule variance shows that 35 percent of the work planned for this period was not done.

Table 2. Schedule Variance

	Work Units						Total
	A	B	C	D	E	F	
Planned value (\$)	10	15	10	25	20	20	\$100
Earned value (\$)	10	15	10	10	20	---	\$65
Schedule variance	---	---	---	-15	---	-20	-\$35=-35%

Cost variance. Earned value compared with the actual cost incurred (from contractor accounting systems) for the work performed provides an objective measure of planned and actual cost. Any difference is called a cost variance. A negative variance means more money was spent for the work accomplished than was planned.

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Table 3 shows the calculation of cost variance. The work performed was planned to cost \$65 and actually cost \$91. The cost variance is 40 percent.

Table 3. Cost Variance

	Work Units						Total
	A	B	C	D	E	F	
Earned value (\$)	10	15	10	10	20	---	\$65
Actual cost (\$)	9	22	8	30	22	---	\$91
Cost variance	1	-7	2	-20	-2	---	-\$26=-40%

Spend comparison. The typical spend comparison approach, whereby contractors report actual expenditures against planned expenditures is not related to the work that was accomplished. Table 4 shows a simple comparison of planned and actual spending, which is unrelated to work performed and therefore not a useful comparison. The fact that the total amount spent was \$9 less than planned for this period is not useful without the comparisons with work accomplished.

Table 4: Spend Comparison Approach

	Work Units						Total
	A	B	C	D	E	F	
Planned value (\$).....	10	15	10	25	20	20	\$100
Actual cost (\$).....	9	22	8	30	22	---	\$91
Variance.....	-1	+7	-2	+5	+2	-20	-\$9=-9%