

Project Control: Developing the As-Built S-Curves

Part #3

June 26, 2002

Hide/Unhide Exercises

Purpose

- ◆ Illustrate how to develop a set of As-Built S-Curves from field estimates developed during actual construction operations.
- ◆ Review the field construction process to the extent necessary to set the context.

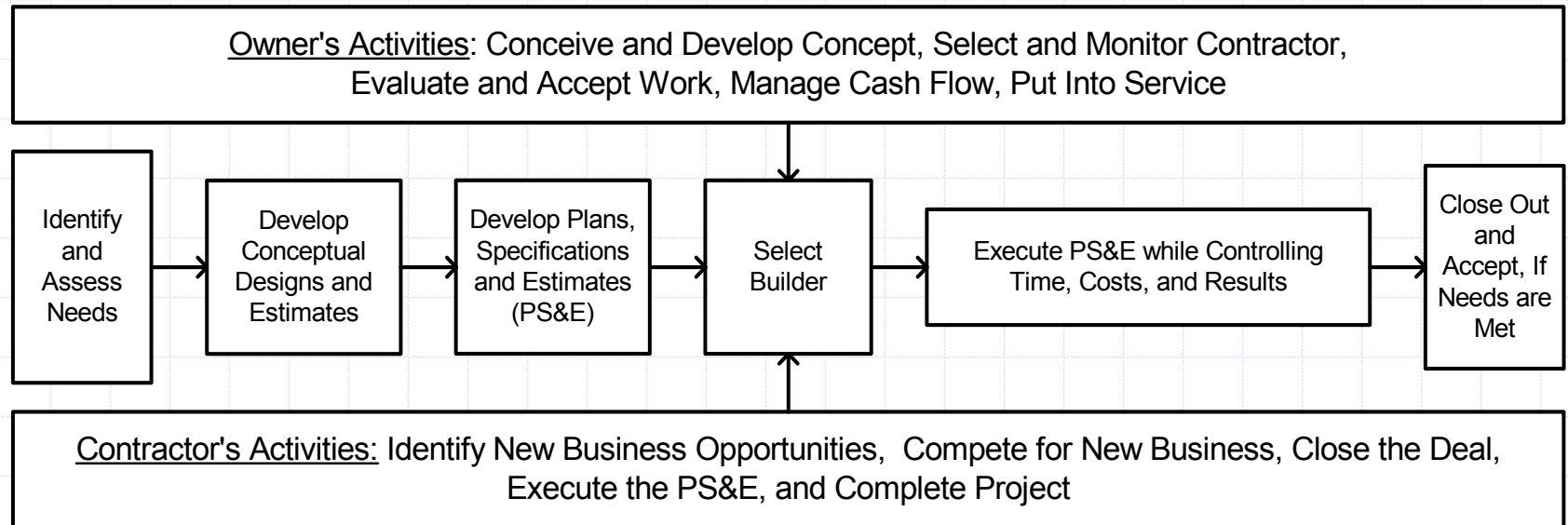
Learning Objectives

- ◆ Be able to construct a schedule of work and cost versus elapsed time from a typical (but simplified) set of observed field data.
- ◆ Be able to plot and identify the As-Built S-Curves best representing these schedules.
- ◆ With respect to chart layout, be able to label all curves and axes.

Who Collects The As-Built Information And When Is It Collected?

- ◆ We are going to assume that it is collected by the Contractor's Project Manager or Field Superintendent.
- ◆ We are going to assume that it is collected on a regular basis at the construction site.

The Traditional Project Development Process



Progress data should be collected on a regular basis during construction.

Class Exercise: 3.1

- ◆ As Individuals: At what point in the project is work accomplished measured?
- ◆ As Pairs: At what point in the project is cost information collected?
- ◆ As Teams: If you have a choice, is it better to collect cost and schedule information, toward the beginning, the middle, or toward the end of a project?

Cost Incurred versus Work Actually Accomplished

- ◆ There are three elements: (1) Cost incurred to date and (2) Work actually completed, and (3) the schedule.
- ◆ There may be little relationship between cost and results. That is, the project may be incurring costs but there may be few results to show for it.
- ◆ Costs incurred are easy to measure; % complete (work accomplished) may be difficult to measure.
- ◆ Refer to CII Pub 6-5. It is in 08 Project Controls on the Web

There are Several Approaches Used to Collect the % Complete

- ◆ **Units Method** – easily measured pieces of work requiring about the same amount of effort.
- ◆ **Incremental Milestones** – any work item involving parts that must be handled in sequence.
- ◆ **Start/Finish** – any work item where a % complete is easy to measure or compute
- ◆ **Opinion** – any piece of work where other methods are too difficult.
- ◆ **Cost Ratio** – used only on administrative tasks active over the life of the project.

Exercise Set #3.2

- ◆ Think, Pair, Share on any or all of the topics on the previous slide. Have the students “brain storm” examples of each.
- ◆ To hold their interest, have the students turn in the results.

Example: Base Course Construction

Day	As-Planned Running Ft	As-Built Running Ft	As-Built %	% Complete	\$\$ Cost	% Cost
1						
2						
3	960	480	4.5%	5%	\$ 51,000	9%
4	960	720	6.8%	11%	\$ 102,000	18%
5	960	1,110	10.5%	22%	\$ 153,000	27%
6	960	1,110	10.5%	32%	\$ 204,000	36%
7	960	1,110	10.5%	43%	\$ 255,000	45%
8	960	1,110	10.5%	53%	\$ 306,000	55%
9	960	1,110	10.5%	64%	\$ 357,000	64%
10	960	1,110	10.5%	74%	\$ 408,000	73%
11	960	1,110	10.5%	85%	\$ 459,000	82%
12	960	1,110	10.5%	95%	\$ 510,000	91%
13	960	480	4.5%	100%	\$ 561,000	100%
14						
15						
16						
17						

The "learning curve" causes ramp-up and ramp-down which causes deviations from average.

Equipment breakdowns, rain days, etc. will also have an effect on the final outcome.

What Does All This Imply?

The may be no direct relationship between elapsed time, actual work and incurred cost.

For example, at the end of day 8 you have actually spent 45% of the budget and completed 55% of the work.

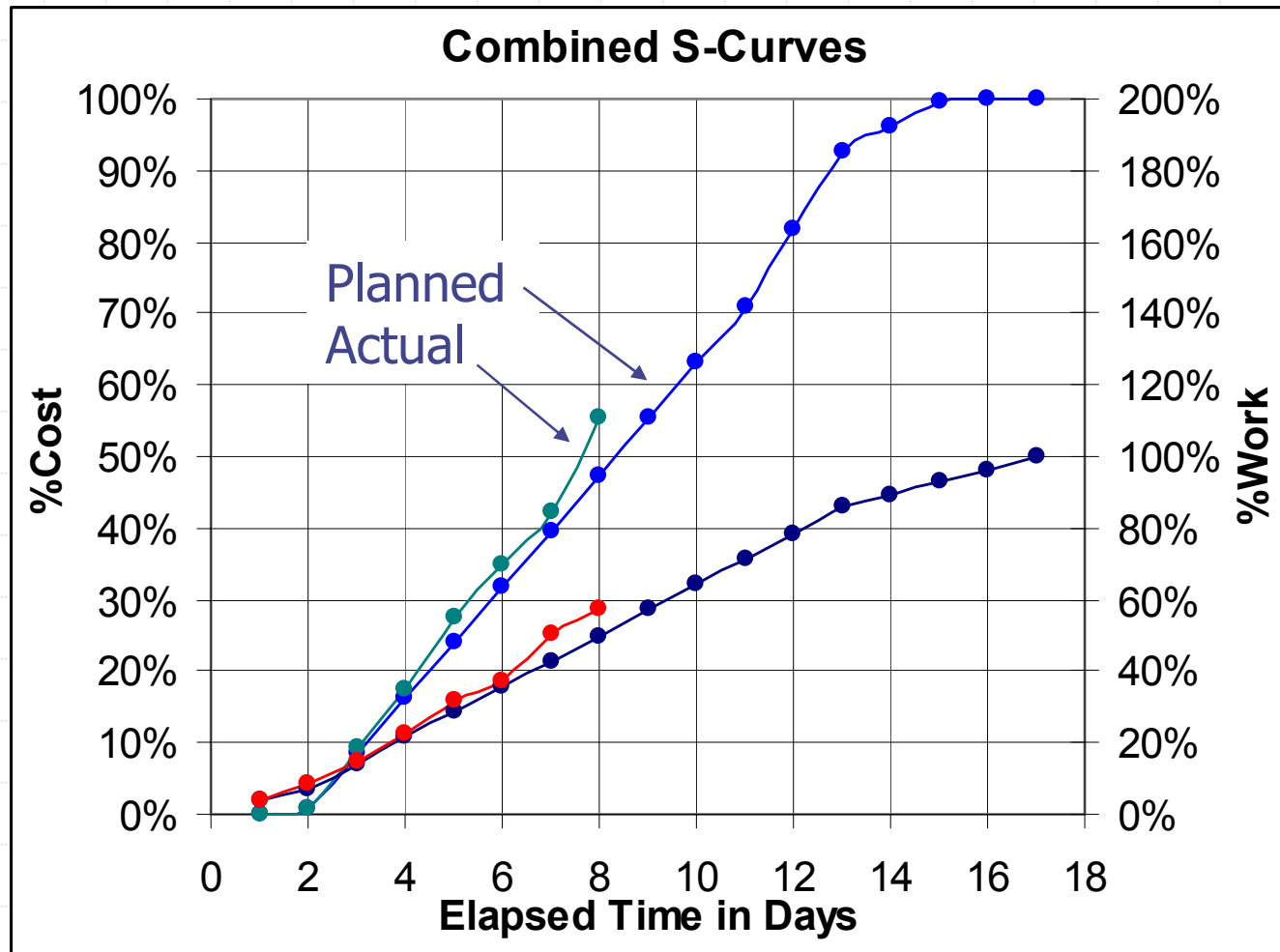
Day	Cost %	Work %
1	0%	3%
2	1%	7%
3	9%	12%
4	18%	18%
5	29%	24%
6	36%	30%
7	44%	37%
8	54%	40%
9		
10		
11		
12		
13		
14		
15		
16		
17		

Combine As-Planned and As-Built

At the end of day 8
we are 7% (55-47)
over budget and 7%
ahead of schedule
based upon elapsed
time.

Day	Cost %	Work %	Cost %	Work %
1	0%	4%	0%	4%
2	1%	7%	1%	8%
3	9%	14%	9%	15%
4	16%	21%	17%	22%
5	24%	29%	28%	32%
6	32%	36%	35%	37%
7	40%	43%	42%	50%
8	47%	50%	55%	57%
9	55%	57%		
10	63%	64%		
11	71%	71%		
12	82%	79%		
13	92%	86%		
14	96%	89%		
15	100%	93%		
16	100%	96%		
17	100%	100%		

Combining the As-Built with the As-Planned.



Class Exercise 3.3

Plot and
Label the
S-Curves
for these
data.

Day	Cost %	Work %	Cost %	Work %
1	0%	4%	0%	4%
2	1%	7%	1%	8%
3	9%	14%	9%	15%
4	16%	21%	17%	22%
5	24%	29%	28%	32%
6	32%	36%	35%	37%
7	40%	43%	42%	50%
8	47%	50%	55%	57%
9	55%	57%		
10	63%	64%		
11	71%	71%		
12	82%	79%		
13	92%	86%		
14	96%	89%		
15	100%	93%		
16	100%	96%		
17	100%	100%		

Reminder!

Class Assessment Questions

- ◆ In 1 sentence what was the muddiest part of this module?
- ◆ In 1 sentence, what part of this module could be improved the most?