

# Earned Value Project Management

Colonel John Keesee

# Objective

- To introduce and discuss the fundamentals of earned value project management
  - ◆ Work Breakdown Structures
  - ◆ Program plans and schedules
  - ◆ Earned value management systems
  - ◆ Cost and schedule variances
  - ◆ Estimates at completion

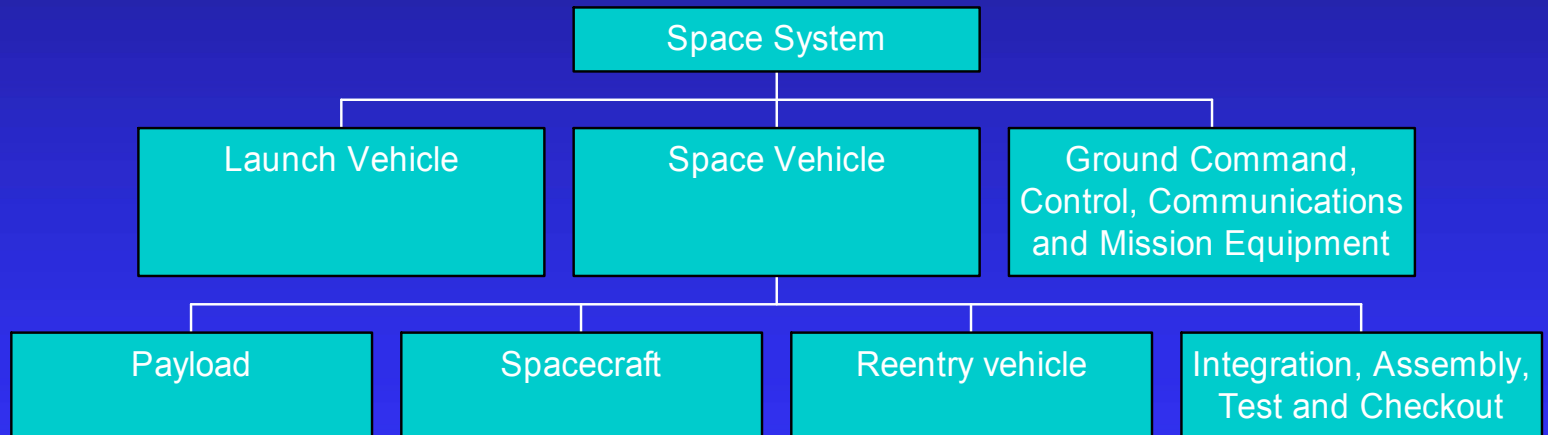
# Scenario

- You have been tasked to be the project manager for an important project
  - ◆ You have been directed to use an earned value management system
  - ◆ Time to market is critical for this development

# Work Breakdown Structure

- Identifies 100 % of the work to be accomplished
- WBS dictionary breaks the scope into measurable tasks
  - ◆ Each with an estimated value
  - ◆ Responsibility for each task assigned to individuals or work teams

# Work Breakdown Structure



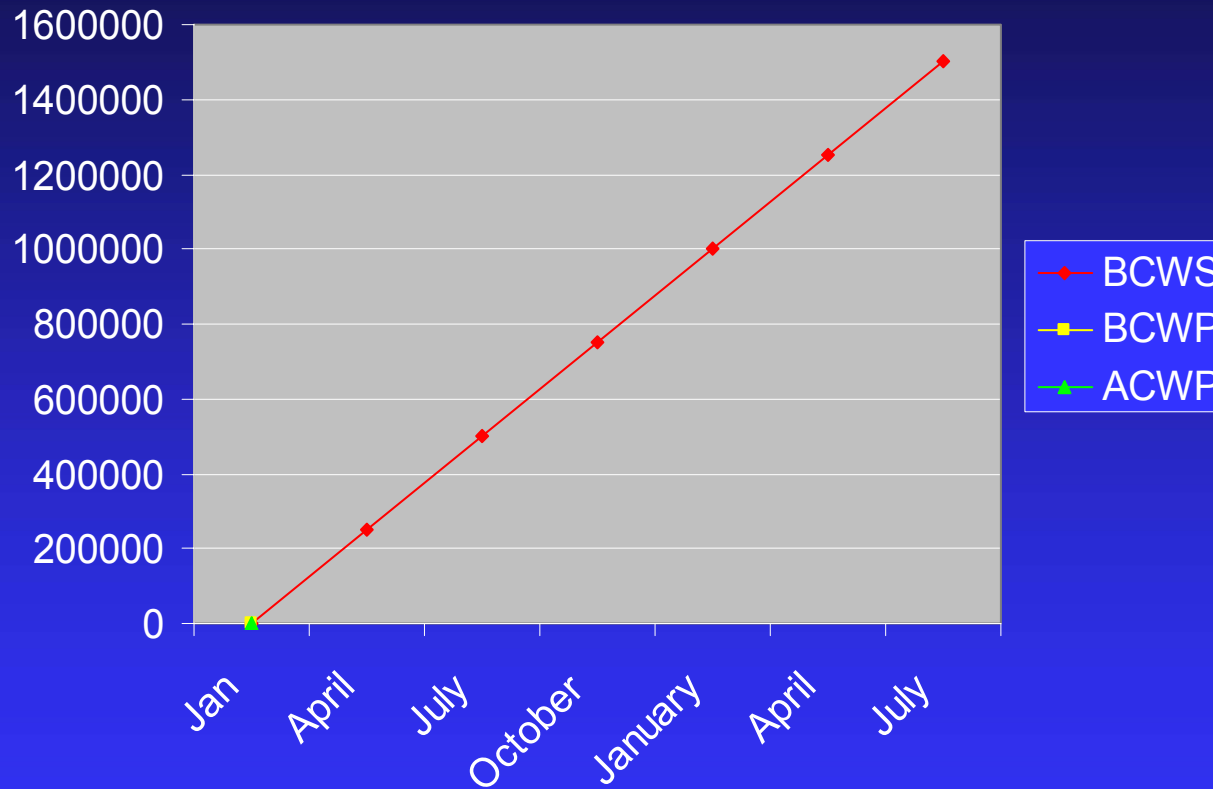
# Project Master Schedule

- Detailed plan and schedule
- Identified dependencies between tasks
  - ◆ 18 months
- Estimated resources for each task
  - ◆ 10 units at \$150K each

# Project Master Schedule

Task/Event	Jan - Jun	Jul - Dec	Jan - Jun
Award	^		
Design	^		
Buy specifications	^		
Vendor quotes	^		
Purchase orders	^		
Receive materials		^	
Factory plans	^		
Tool design	^		
Tool fabrication	^		
Parts fabrication		^	
Assembly: sub and final			^
Test & checkout			^

# Project Performance Display





# Plan Review Before Go-Ahead

## ■ CEO:

- ◆ “Time to market is critical. You have 12 months.”
- ◆ “This looks gold-plated at \$1.5M. You have \$1.0M.”
- ◆ “Go ahead, but come back to me with your progress in three months.”

# The Three Month Review

- Three units scheduled for completion
- Two units actually completed
- \$300,000 budgeted at this point
- \$300,000 actually spent
- Optimist PM: “A little behind schedule but right on the cost plan.”

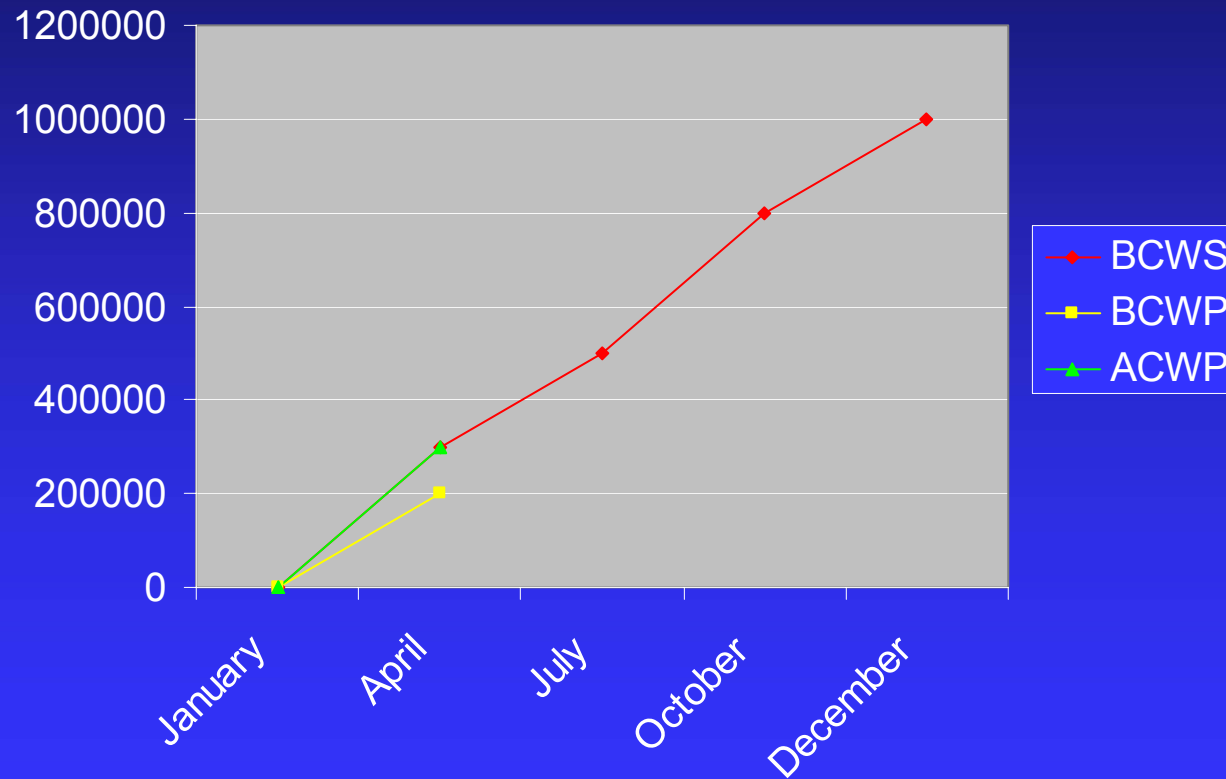
# Earned Value System

- Requires a detailed, bottoms-up performance plan
- Performance measured against the plan
- Provides forecast of final expected results based on data

# Earned Value Measurements

1. Work scheduled
2. Budgeted cost of work scheduled (BCWS)
3. Work performed
4. Budgeted cost of work performed (BCWP)
5. Actual cost of work performed (ACWP)
6. Schedule variance (SV) = BCWP - BCWS
7. Cost Variance (CV) = BCWP - ACWP

# New Project Performance Display



# Estimate at Completion

- Cost efficiency  $CPI = BCWP/ACWP$
- Schedule efficiency  $SPI = BCWP/BCWS$
- Estimate at completion

$$EAC_1 = \frac{BAC}{CPI}$$

$$EAC_2 = ACWP + \frac{BAC - BCWP}{CPI * SPI}$$

# Management Reserve

- Budgeted to provide the ability to adjust for uncertainty
- Always accounted at the total project level
- Normally retained and controlled at the total project level
- Must not be eliminated by negotiations

# Summary

- Earned value management system provides a key link between the cost, schedule, and technical aspects of a project
- Provides an early and reliable prediction of future performance



# References

- Fleming, Quentin W. and Joel M. Koppelman, Earned Value Project Management, PMI, Newtown Square, PA 2000
- Lewis, James P., Fundamentals of Project Management, AMACOM, NY 2002