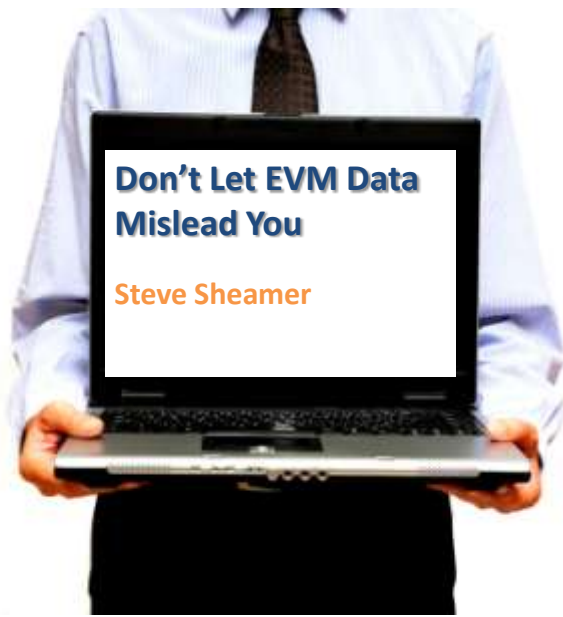


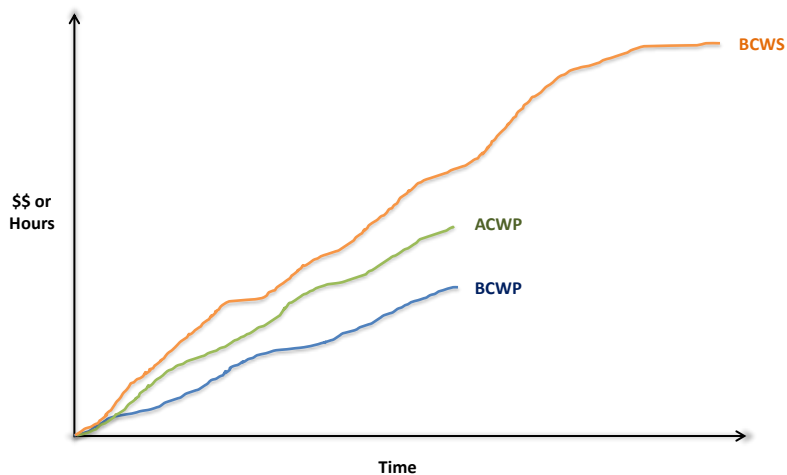
## Overview of Today's Discussion



- ✓ Brief Overview of EVM Concepts
- ✓ Why you can't trust BACs or EACs
- ✓ Why EVM progress is often overstated
- ✓ Why you need to account for schedule risk
- ✓ How to prevent yourself from being fooled



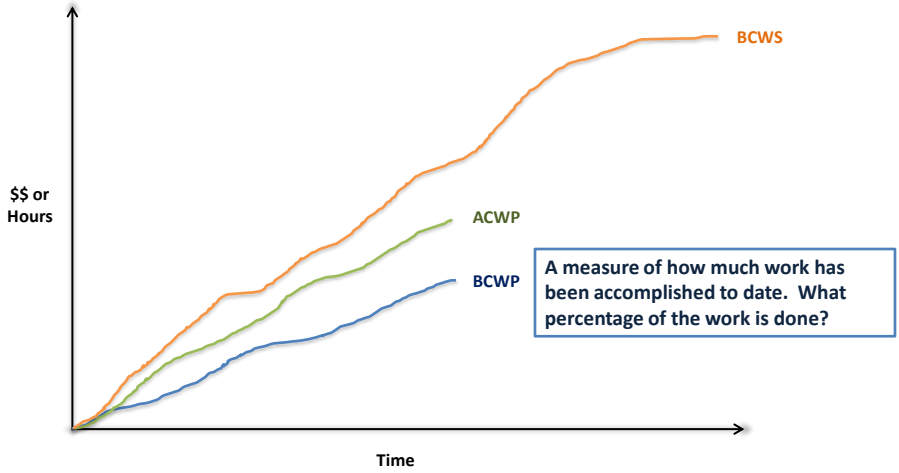
## In theory, EVM data provides everything a cost estimator needs to develop an estimate



2



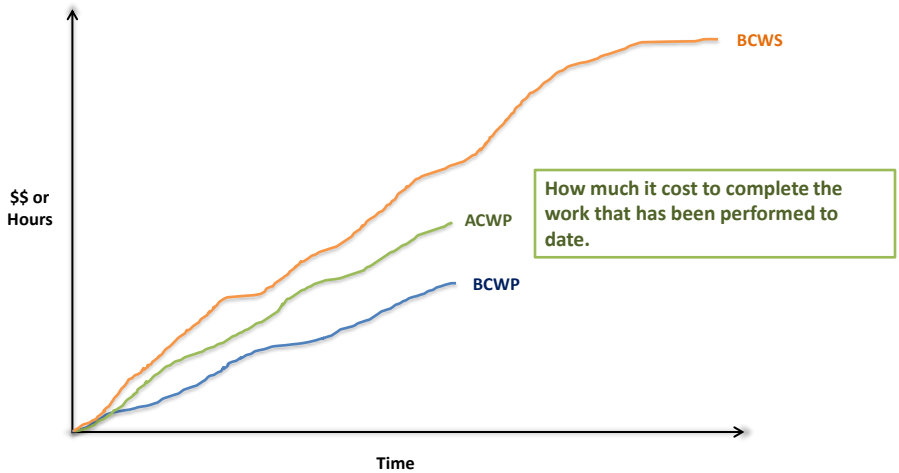
**In theory, EVM data provides everything a cost estimator needs to develop an estimate**



3



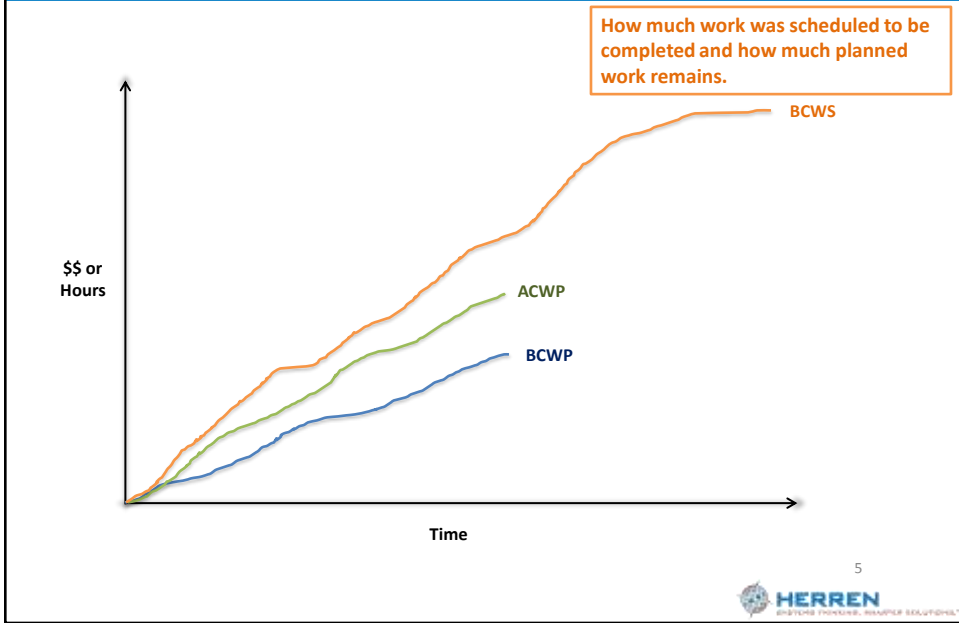
**In theory, EVM data provides everything a cost estimator needs to develop an estimate**



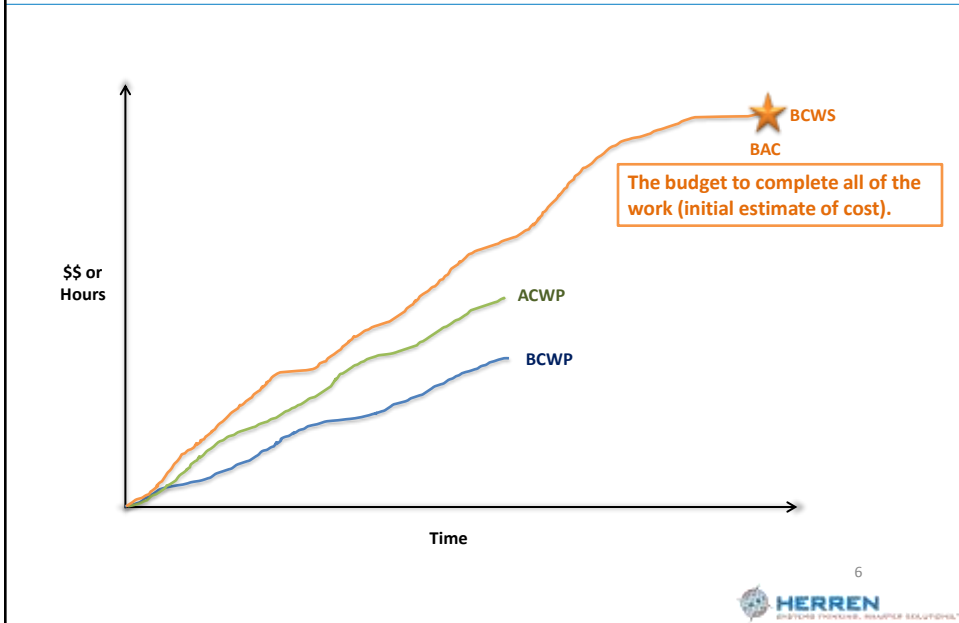
4



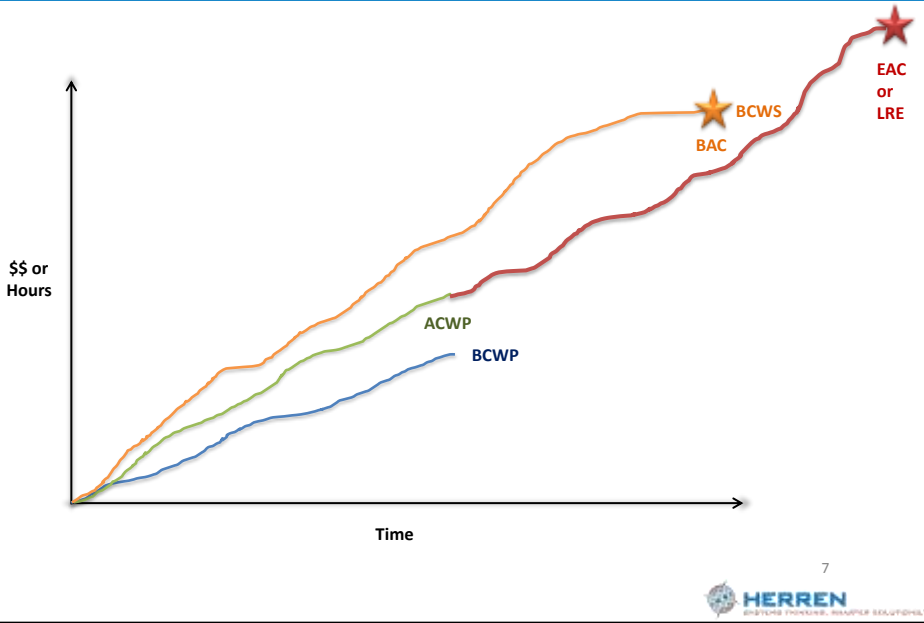
**In theory, EVM data provides everything a cost estimator needs to develop an estimate**



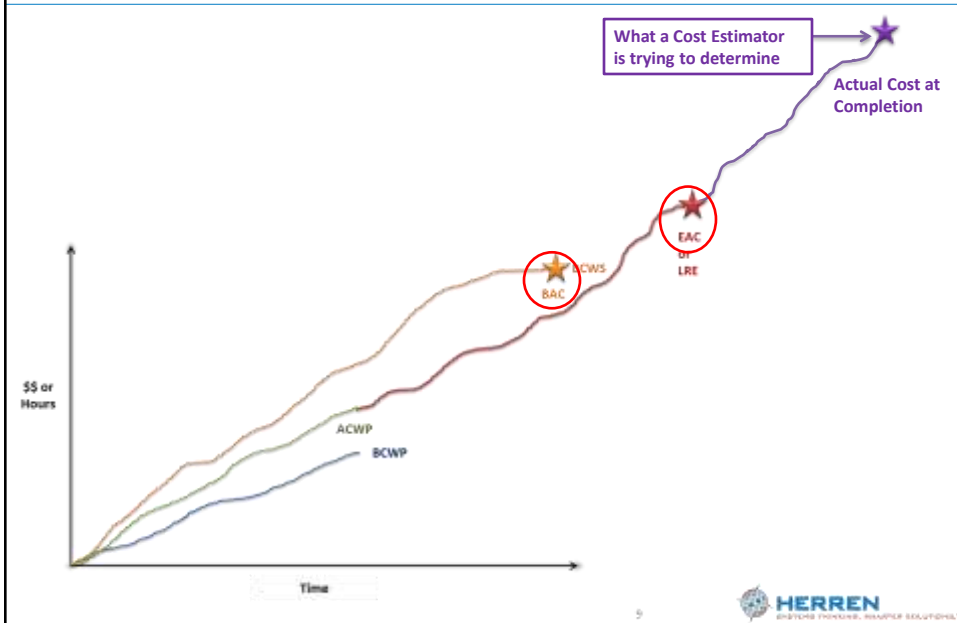
**In theory, EVM data provides everything a cost estimator needs to develop an estimate**



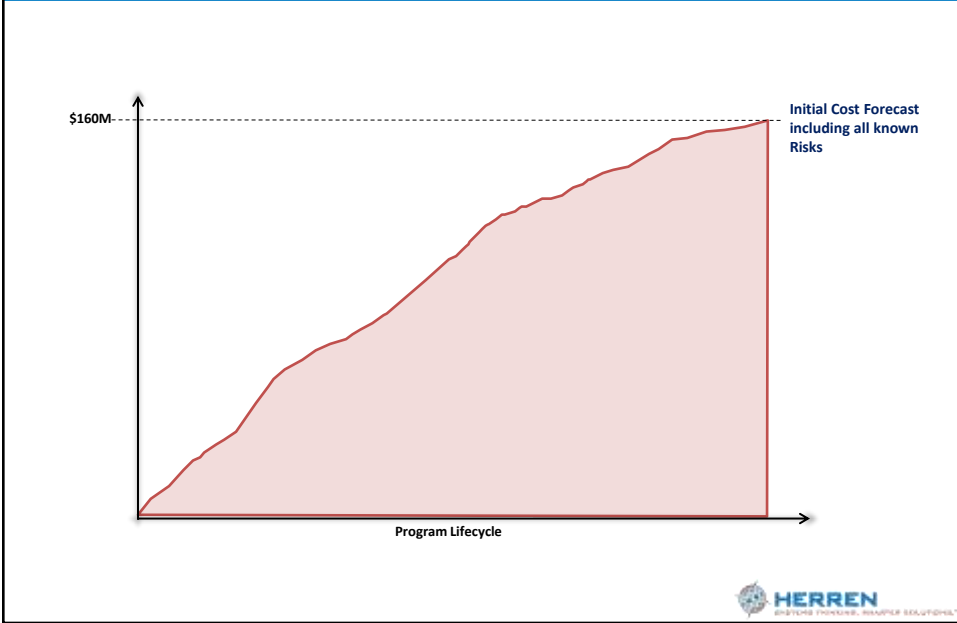
In addition to measures against the plan, EVM data also includes updated estimates of costs at completion



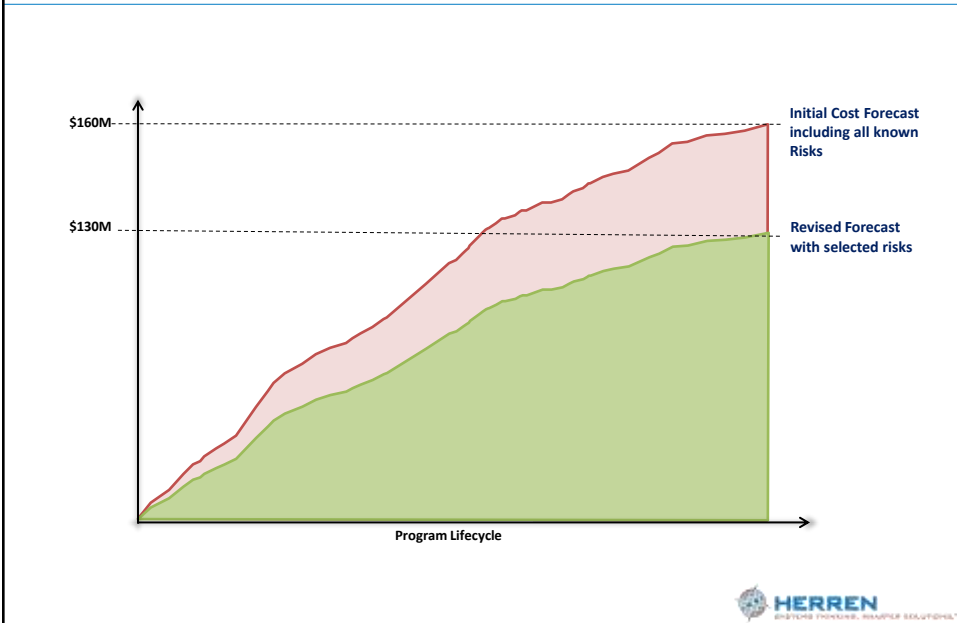
Issue #1: Budgets at Completion and Estimates at Completion (or LREs) are often significantly underestimated

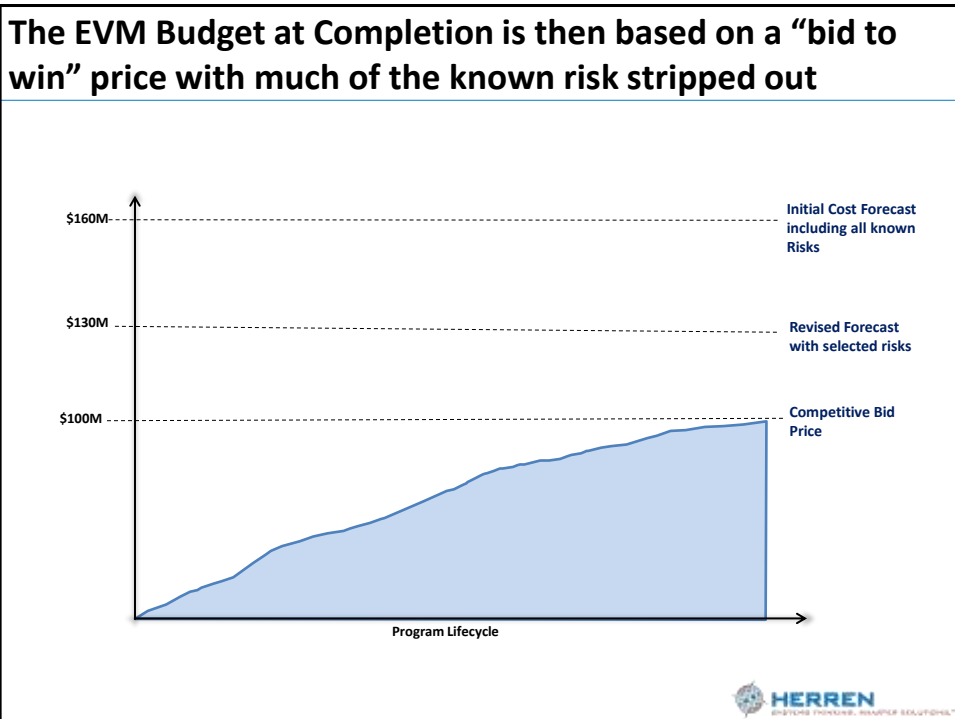
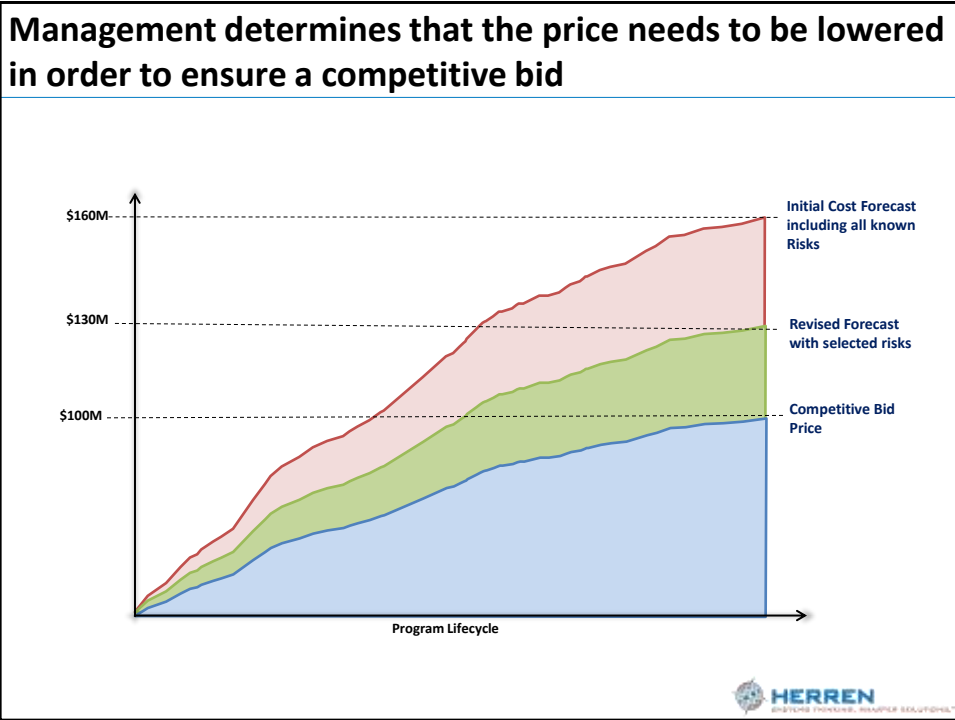


**Assume a company is submitting a bid on a competitive cost reimbursable contract that is over \$50M for a new product**

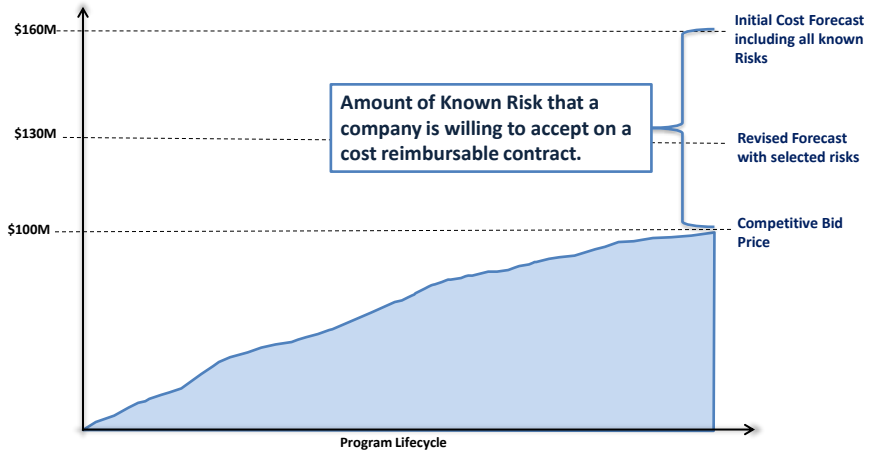


**The company decides that some risks are unlikely to occur and they are willing to accept these risks in their estimate**

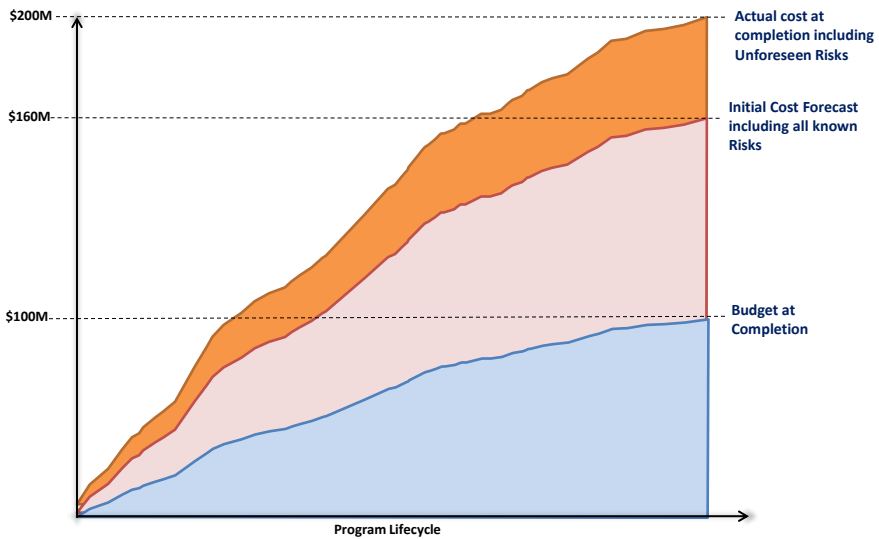




### Unfortunately, the known risk that a company has accepted is nowhere to be found in EVM reporting

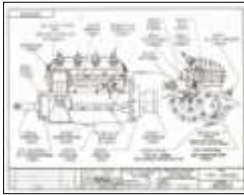


### Oftentimes a program runs into issues that were not anticipated when the budget or EACs were developed

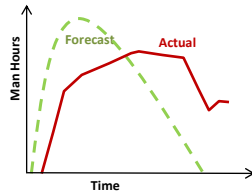


**Below are a few examples of potential unforeseen risks that may not be accounted for in BACs / EACs**

Late engineering, engineering changes, and scope creep



Optimistic Estimates



Tooling, equipment, facilities, and process issues



Material Delays / Quality issues



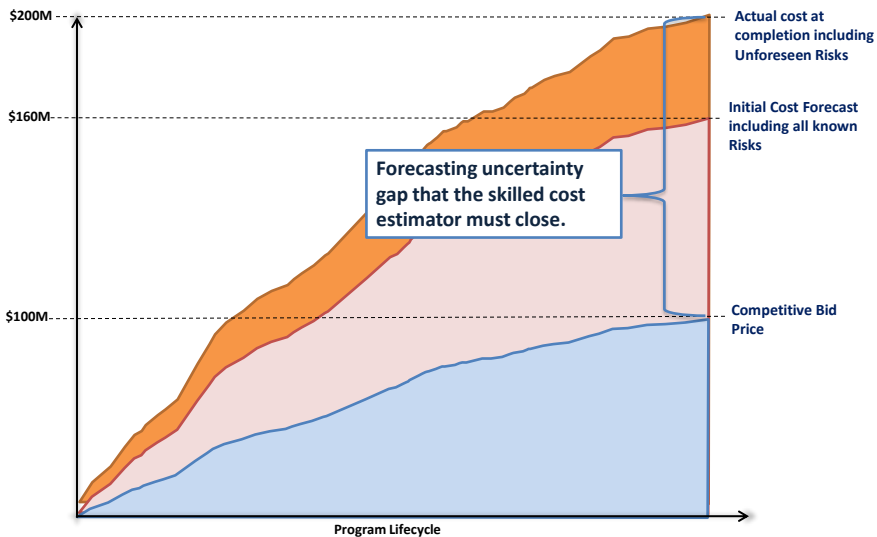
Excessive Re-work / Re-testing



Environmental Issues (e.g., weather delays, labor strikes)

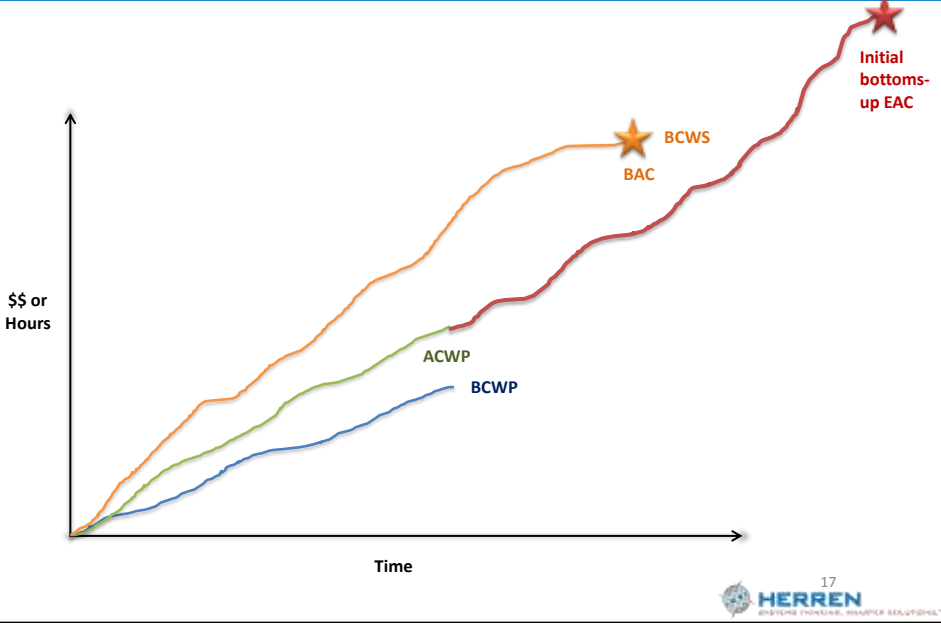


**It is up to the skilled cost estimator to determine the gap between the budget and the actual cost at completion**

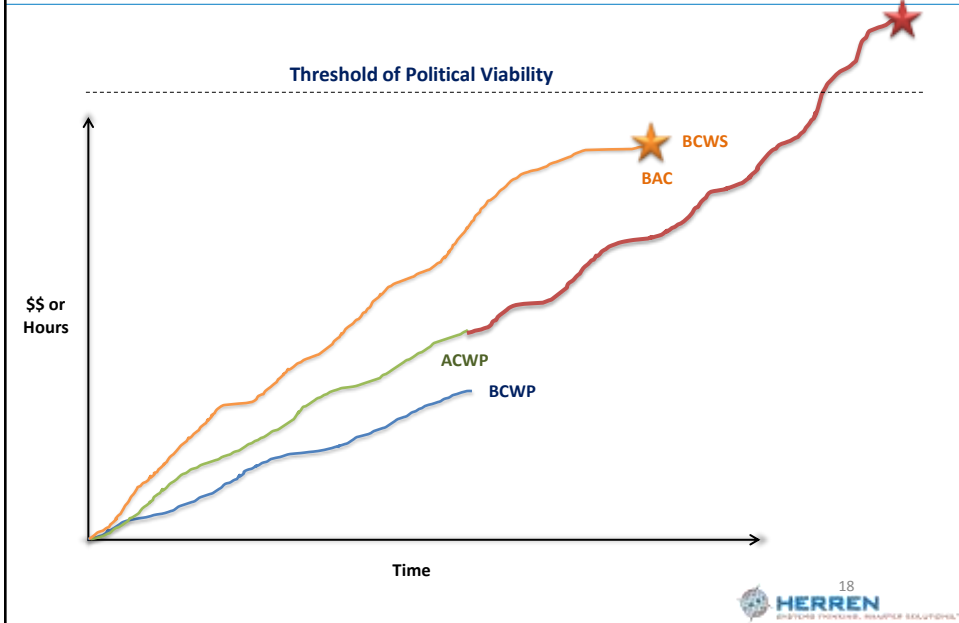




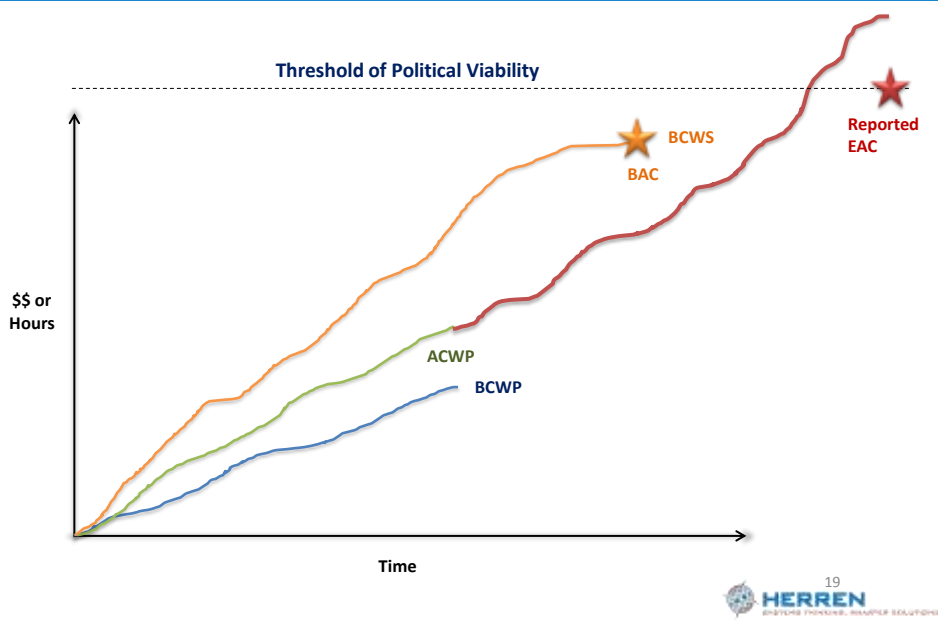
**EACs are carefully managed by program managers and often adjusted downward for political reasons**



**EACs are carefully managed by program managers and often adjusted downward for political reasons**



## Remember the Threshold of Political Viability when deciding whether or not to trust a reported EAC



## Consider the role of the EVM analyst relative to the role of the cost estimator when analyzing EVM data

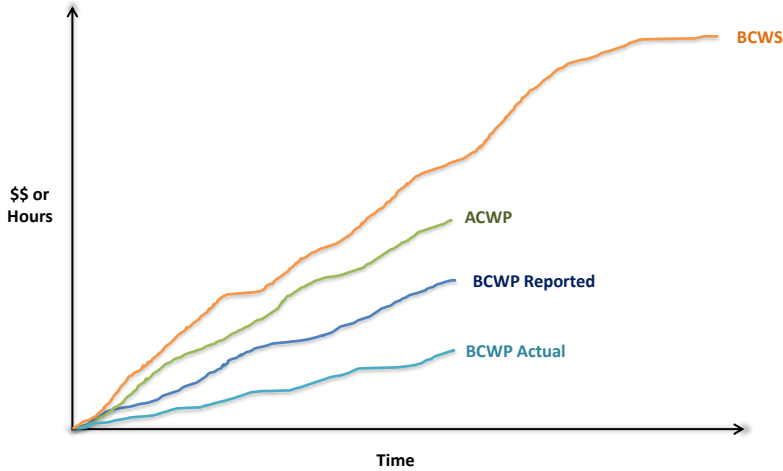


- ❖ Develop a plan to execute within budget (whether realistic or not)
- ❖ Ensure reported EACs are acceptable to management
- ❖ Strike a balance between budgeting for risk and padding estimates
- ❖ Explain variances to plan and make adjustments to the plan as needed



- ❖ Determine if the plan is **reasonable** and **executable**
- ❖ Ensure EACs are **accurate** and reflect all remaining work
- ❖ Evaluate **risk** and ensure the estimate includes an appropriate level of risk
- ❖ Use independent data to **cross-check** EACs and estimating assumptions

### Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks



21



### Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks



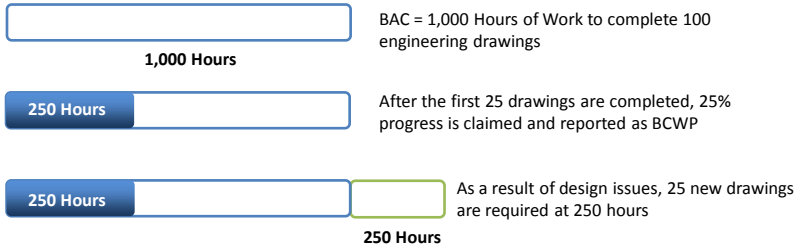
BAC = 1,000 Hours of Work to complete 100 engineering drawings



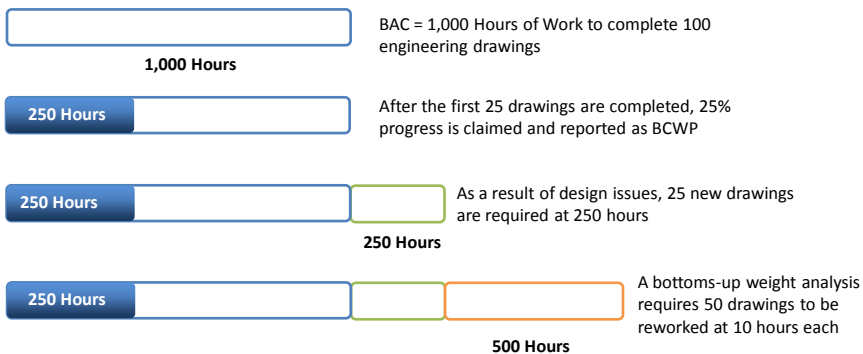
After the first 25 drawings are completed, 25% progress is used to calculate BCWP (250 hours)



### Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks



### Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks



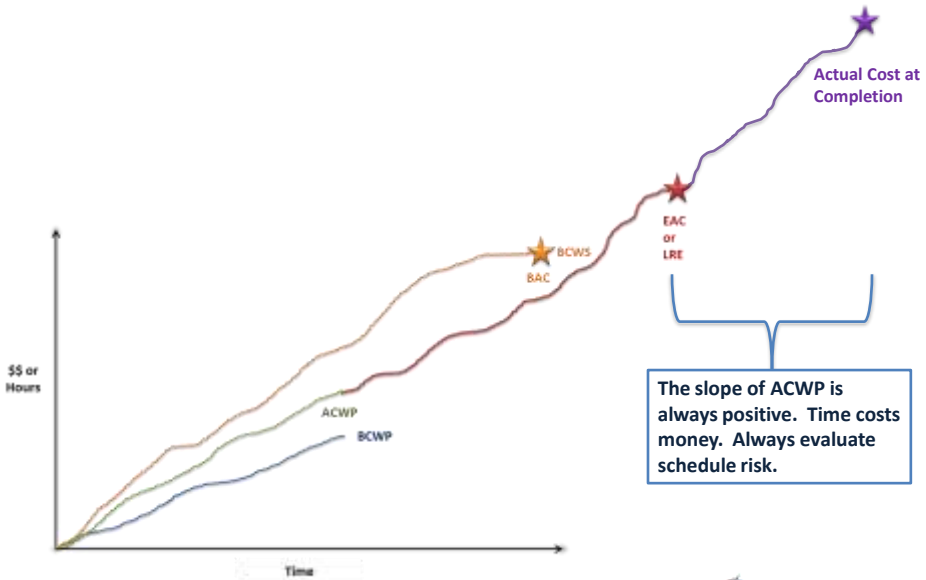
### Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks



After accounting for the additional in-scope work, the actual percent complete is ~14% instead of the reported 25%.



### Issue #3: Schedule risk is rarely accounted for in BACs or EACs



**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



BAC =1,000 Hours of LOE Systems Engineering Support over 10 months



**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



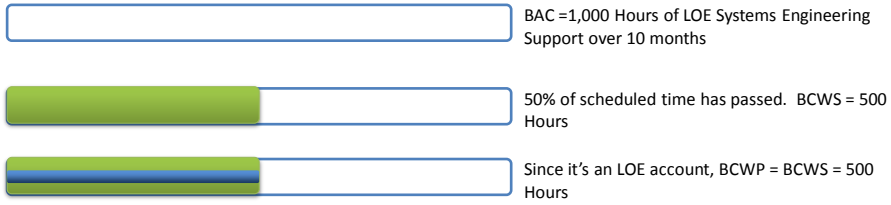
BAC =1,000 Hours of LOE Systems Engineering Support over 10 months



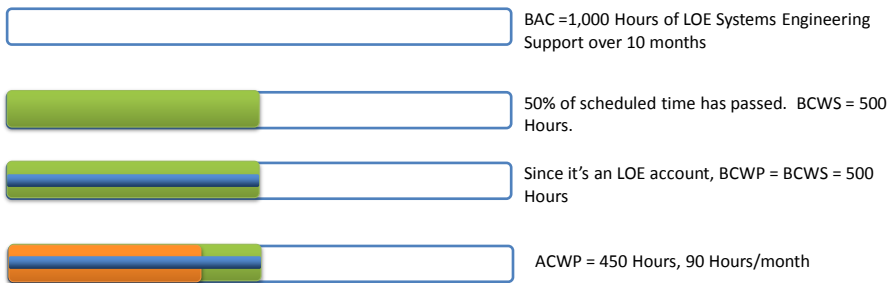
50% of scheduled time has passed. BCWS = 500 Hours.



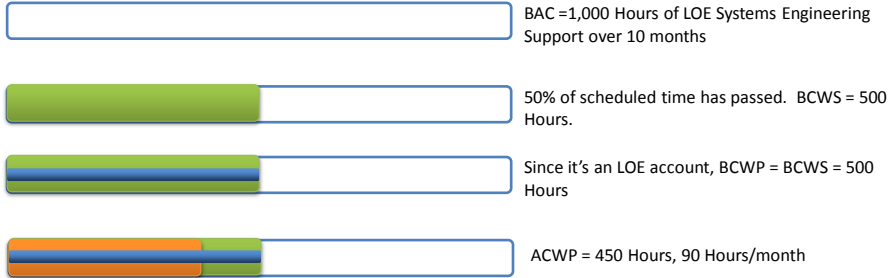
**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



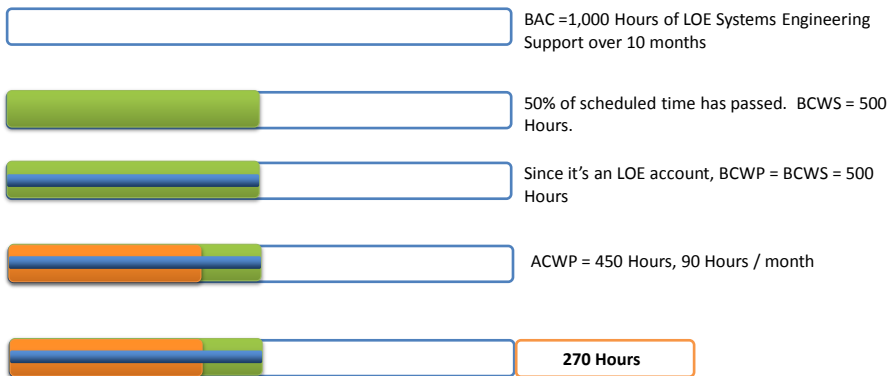
**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



Using the Gold Card Formulas gives SPI = 1.0, CPI = 1.1 and EAC equal to 900 Hours.



**The following illustrates the need to account for schedule risk using an LOE control account as an example.**



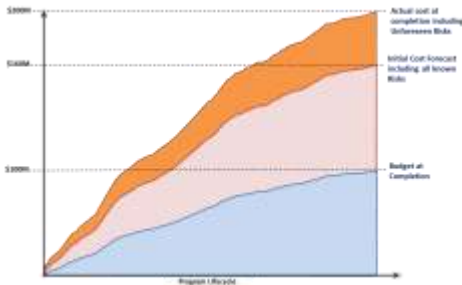
A schedule risk assessment indicates the schedule is likely to slip 3 months resulting in an additional 270 hours and a risk-adjusted EAC of 1,170 hours. This is 30% higher than the EAC derived from the gold card formula.





## Despite the issues with EVM, there are steps you can take to avoid being misled by the data

Issue #1: Budgets at Completion and Estimates at Completion (or LREs) are often significantly underestimated

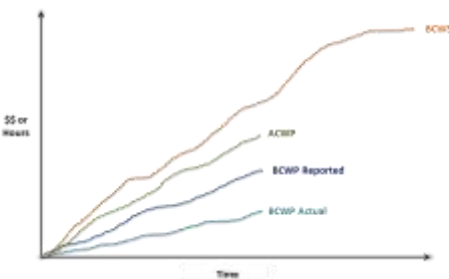


- ✓ Ensure that all known risks have been accounted for in EAC projections
- ✓ Get the program risk log or risk register and ensure that all risks are included in your estimate
- ✓ Look at what went wrong on similar programs; it may give you clues into unknown risks that you should factor into your estimate
- ✓ Participate in Integrated Baseline reviews; ask probing questions to see if risks have been accounted for
- ✓ At a minimum, ask about rework and retesting as nearly all programs will realize these risks



## Despite the issues with EVM, there are steps you can take to avoid being misled by the data

Issue #2: Progress is often overstated due to unplanned work and the realization of known and unknown risks

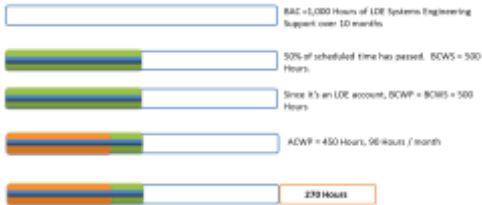


- ✓ Use EVM data from programs that are greater than 80% complete to make EAC projections if available
- ✓ Evaluate the progressing method for % complete and ask about risk, rework, and unplanned work
- ✓ Read the variance reports to see if issues are being deferred which may lead to work being “pushed to the right”
- ✓ Monitor risks to see if risks that are realized are appropriately incorporated into EACs



## Despite the issues with EVM, there are steps you can take to avoid being misled by the data

Issue #3: Schedule risk is rarely accounted for in BACs or EACs



✓ Get smarter about schedule analysis; it is often the biggest cost driver and cost estimators don't study it enough

✓ Ensure that a proper Schedule Risk Assessment is conducted; review schedule risks regularly

✓ Build your cost model so that schedule risk can be incorporated and updated regularly; determine where schedule will drive costs

✓ At a minimum, ensure all LOE accounts incorporate schedule risk



## Questions?

