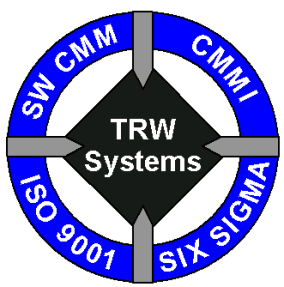
ScheduleMaker®

TRW

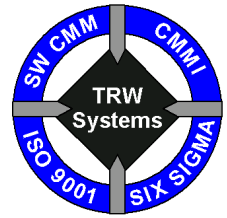
A Cost/Schedule Management Tool for Distributed Project Teams

Rick Hefner, TRW
Ann Maybury, ScheduleMaker

STC 2002
29 April – 2 May 2002

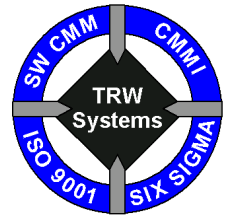


Topics



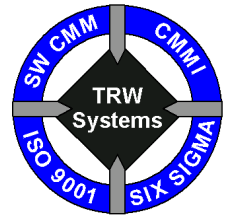
- Cost/Schedule Tool Needs
- ScheduleMaker Capabilities
- Cost/Schedule Vision, Roles, and Interactions
- Example – Senior Management Questions
- Summary

TRW Cost/Schedule Tool Needs



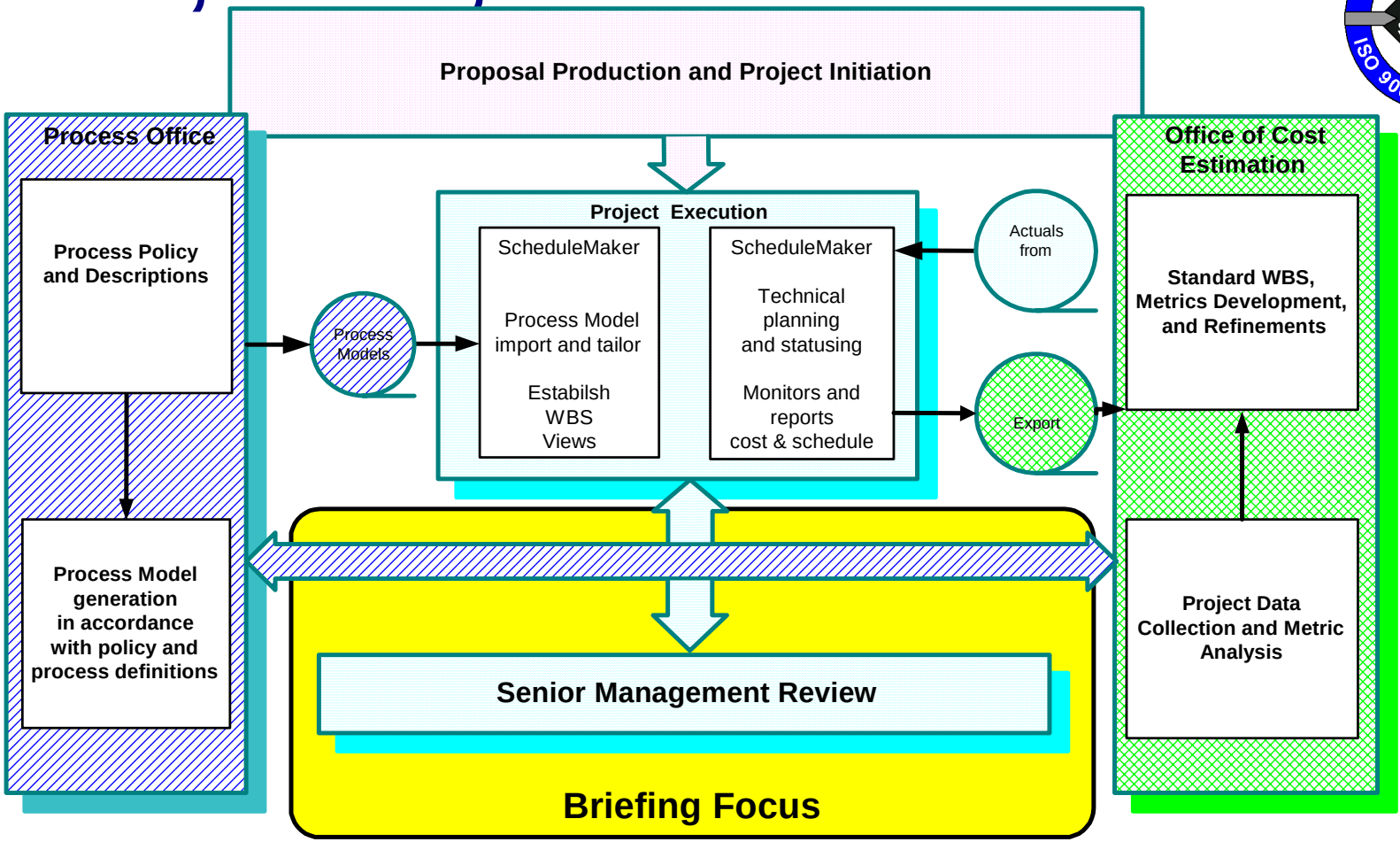
- **Support for many different types of projects**
  - Projects of ten to hundreds of engineers and managers
  - SW-CMM/CMMI Levels 3-5, ISO 9001, Six Sigma
  - Multiple levels of Integrated Product Teams
  - Geographically distributed teams
- **A comprehensive tool**
  - Customer/project/corporate reporting requirements
  - Support for corporate accounting systems and measurement repository
  - Interfaces with other scheduling tools
  - Quick tailoring capability (process models, WBSs, …)
  - Easy to use, easy to learn

ScheduleMaker Capabilities



- **A single tool providing an integrated cost and schedule management information system**
  - Developed in partnership with the vendor
  - Proven effective on TRW projects since l982
- **Meets our needs**
  - Reflects TRW financial methods; interfaces with TRW Accounting System
  - Supports small to large projects; development, maintenance, services, time & materials, etc.
  - Supports multiple accounting structures and views
  - Trains junior managers how to become senior managers
- **Distributed project subsets**
  - Automated data collection and reporting across subsets
  - Automated alert generation across subsets

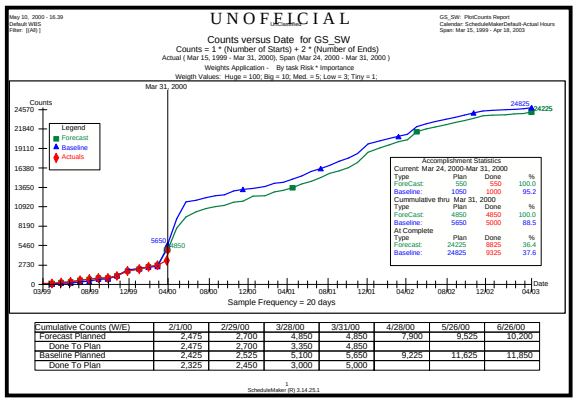
Vision, Roles, and Interactions



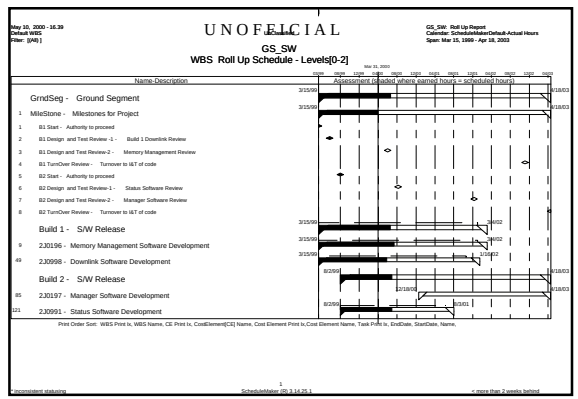
Legend and Current Status

- ScheduleMaker Project Initiation, Execution, and Oversight
- ScheduleMaker OCE PCDB in Beta
- Process office to projects templates and models in design.
- Proposal to Project Initiation in design.

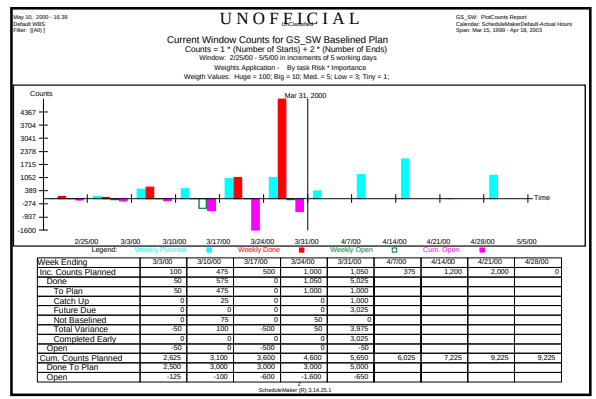
Samples of “At a Glance” Project Overview Status



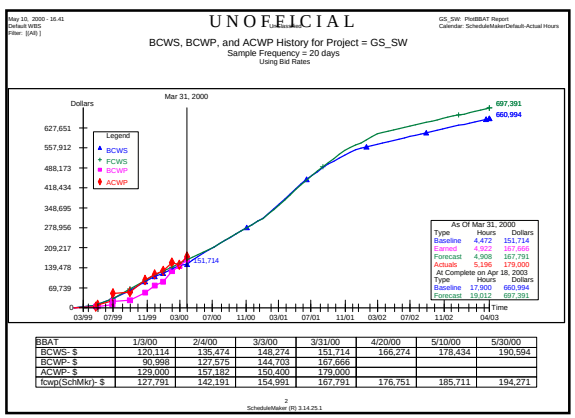
Cum. Accomplishment History



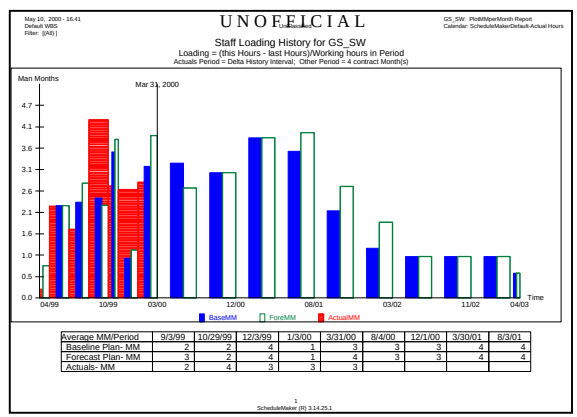
Schedule



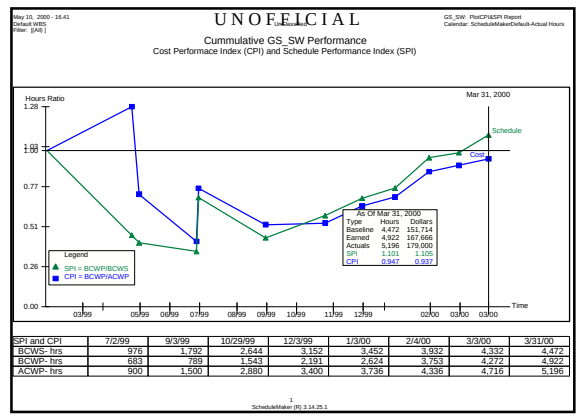
Rec. Accomplishment History



EVMS/CSCS Performance

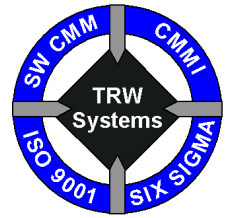


Staffing



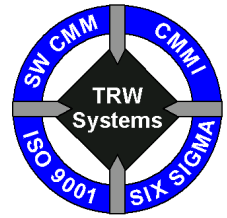
SPI and CPI

Different Roles Require Different Reports



- **Senior Management**
  - Standard overview set pinpoints areas needing more attention
- **Business and Finance**
  - Time Phased, Earned Value, Formal Reports (to Customer DIDs)…
  - Cost computations using either bid rates or employee wages
  - Correlated with actuals imported from the accounting system
- **Technical Management**
  - Network, Gantt, Rollups, Milestone Counts, …
  - Multiple WBS views
- **Software Engineering Process Group, Cost Estimation**
  - Automated export of Earned Value and Actuals (performance, improvement opportunities)
  - Project WBS elements mapped to standard corporate WBS
- **Pricing**
  - Export to Authorized Pricing System

Senior Management Questions



How good is the plan?

- **Schedule Quality Metric**
  - **Depth and distribution of plan**
- **Resource Loading by person by month**
  - **Large resource conflicts may indicate need for additional staff or planning**
- **Cost/Schedule Rollups at any level (top WBS to subtasks)**
  - **Resources and schedule for comparison to existing metrics**
- **Networks at various levels**
  - **Interconnections across the planned project entities**

Are we following the plan?

- **Management Oversight reports give quick insight**
  - **Mostly standard formats**
  - **Objective measures**
  - **Absolutely consistent across projects**
- **Detect anomalies and drill down to details**
  - **All reports available to all managers, so drill down happens before review**

How Good is the Plan?

Example of High Ratio of LOE to Measurable

M 3.5 Schedule Planning Quality for Project_XYZ

METRIC	Thru May 24, 2001		At Complete	
	Projected	Baseline	Projected	Baseline
Total All Scheduled Activities	275.0	183.0	337.0	220.0
Measurable Labor Activities Sub Total	211.0	139.0	230.0	142.0
Percent Measurable Labor Activities	76.7	76.0	68.2	64.5
Max Measurable Labor Work Days for any Task	183.0	110.0	183.0	110.0
Average Measurable Labor Work Days	15.4	14.4	15.2	14.7
Maximum Staff on any Measurable Labor Activity	8.0	8.0	9.0	9.0
Average Staff per Measurable Labor Activity	1.5	2.3	1.5	2.4
Level of Effort (LOE) Activities Sub Total	64.0	44.0	107.0	78.0
Percent LOE Labor Activities	23.3	24.0	31.8	35.5
Max LOE Labor Work Days for any Task	223.0	223.0	331.0	331.0
Average LOE Labor Work Days	17.2	18.7	56.1	62.3
Maximum Staff on any LOE Labor Activity	14.0	14.0	14.0	14.0
Average Staff per LOE Labor Activity	0.8	1.5	0.8	1.2
Non Labor Activities Sub Total	0.0	0.0	0.0	0.0
Percent Non Labor Activities	-0.0	-0.0	0.0	0.0

How Good is the Plan?

Example of Unreasonable Staff Planning Assumption

LABOR Usage in MM/Month
Filter Summary for Project: Project_XYZ
Usage Bold or Red Threshold = 1.600

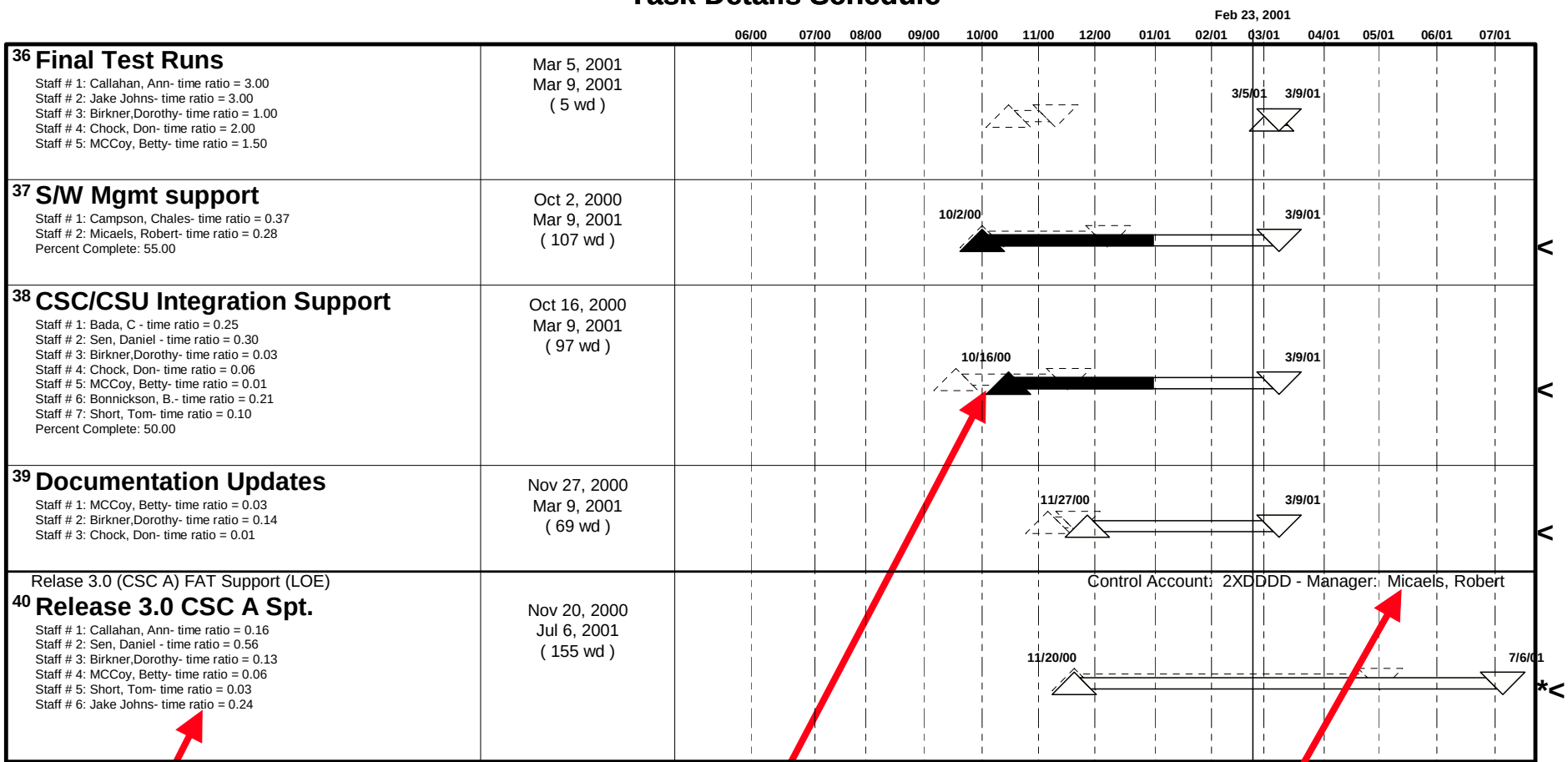
	2000 Apr	2000 May	2000 Jun	2000 Jul	2000 Aug	2000 Sep	2000 Oct	2000 Nov	2000 Dec	2001 Jan	2001 Feb	2001 Mar	2001 Apr	2001 May	2001 Jun	2001 Jul	2001 Aug	ITD
Amberik, T J	.	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	8.00
Ashla, S R	.	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	3.20
Backus, F	.	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	17.60
Bada, C	0.00	1.57	**2.20**	1.55	1.34	0.69	1.01	1.50	**1.71**	**1.71**	0.46	0.28	0.22	0.22	0.22	0.22	0.22	15.10
Birkner,Dorothy	0.00	0.90	1.05	1.56	**1.91**	**1.78**	**1.99**	1.34	1.36	1.54	1.42	1.24	0.77	0.71	0.35	0.24	0.22	18.37
Blackwell, L J	.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	16.00
Bonnickson, B.	.	0.09	0.18	0.82	0.43	0.83	0.56	1.06	1.36	**1.91**	1.25	0.94	0.71	0.92	.	.	.	11.07
Cadwell, M E	.	0.42	0.98	**1.67**	0.47	0.75	1.35	1.26	1.42	1.59	1.18	1.17	0.58	0.58	0.22	0.22	0.22	14.09
Callahan, Ann	0.00	.	.	.	0.47	0.24	1.13	0.54	1.08	**1.73**	**4.00**	**3.24**	1.26	1.16	0.16	0.03	.	15.06
Campbell, Craig	0.00	0.39	0.63	0.62	1.09	0.97	0.90	1.28	1.44	**1.60**	0.37	0.37	0.22	0.22	0.22	0.22	0.22	10.75
Campson, Chales	0.00	0.73	0.90	0.74	0.60	0.73	1.19	0.88	1.56	**1.70**	**1.62**	0.88	0.82	0.82	0.22	0.22	0.22	13.83
Chock, Don	.	0.86	0.88	0.83	1.03	1.00	1.18	0.90	1.26	**1.69**	1.59	1.28	0.83	0.86	0.27	0.27	0.27	15.01
Consultants	.	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	8.00
Hamiter, J T	.	0.23	0.40	0.95	0.31	0.09	0.18	0.03	.	.	.	.	.	.	.	.	.	2.19
Jake Johns	0.00	.	.	.	0.70	0.69	0.88	1.14	1.48	**1.69**	0.99	0.99	0.84	1.24	0.24	0.04	.	10.93
Joe Newnam	.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.	.	.	13.00
Jones, Jane	.	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**1.89**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	.	.	.	25.89
Linde, D J	.	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	8.00

Overloaded Staff

Are We Following the Plan?

All Baseline and Projected Activities Not Done on Schedule

Project: Project_XYZ
Task Details Schedule



Staff on Task

Forecast vs. Baseline

Manager

Are We Following the Plan?

Alerts, Baseline vs. Forecast Schedule, and Projected Cost

M 3.1 Schedule and Milestones for Project_XYZ

WBS Roll Up Schedule - Projected Costs for Levels[0-1]

	Name-Description	Hours(PAC)	$(PAC_Bid)	wd	Status: EarnedHours
	1.1.2.4.1.3 - PxP	**66,846**	**7,789,177**	**598**	5/5/00 — 9/27/02 *
	Bias	0	0	598	
1	**MileStone - Milestones**	**0**	**0**	**354**	5/5/00 — 10/3/01 *<
	CLIN 1 - Project_XYZ Program	**65,738**	**7,550,123**	**452**	5/5/00 — 3/1/02 *
	Bias	0	0	452	
	CLIN 2 - Communication	**265**	**127,612**	**597**	5/8/00 — 9/27/02
	Bias	0	0	597	
	CLIN 3 - Task Orders	**844**	**111,442**	**451**	5/8/00 — 3/1/02 <
	Bias	0	0	451	

06/00 10/00 02/01 06/01 09/01 01/02 05/02 09/02

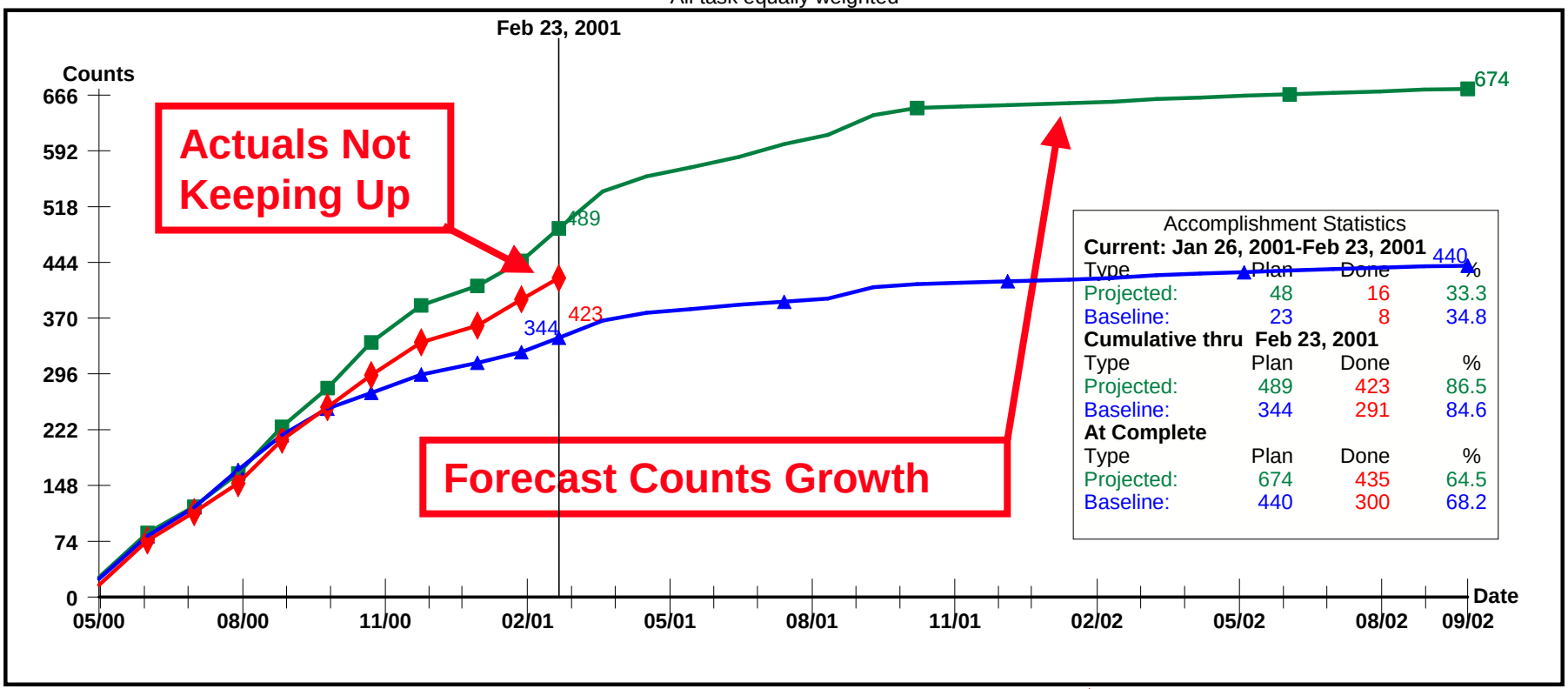
Print Order Sort: WBS Order Ix, WBS Name, CA Order Ix, CA Name, CE Order Ix,CE Name, Task Order Ix, EndDate, StartDate, Name,

More Than 2 Weeks Behind Alert

Inconsistent Status Alert

Are We Following the Plan?

Baseline, Completed, and Forecast Counts



Cumulative Counts (W/E)	10/26/00	11/27/00	1/2/01	1/30/01	2/23/01	3/23/01	4/20/01	5/18/01	6/18/01
Projected Planned	338	387	413	446	489	538	558	570	584
Planned & Done By Date	294	338	360	395	423				
Baseline Planned	271	295	311	325	344	367	377	382	388
Planned & Done By Date	224	242	256	275	291				

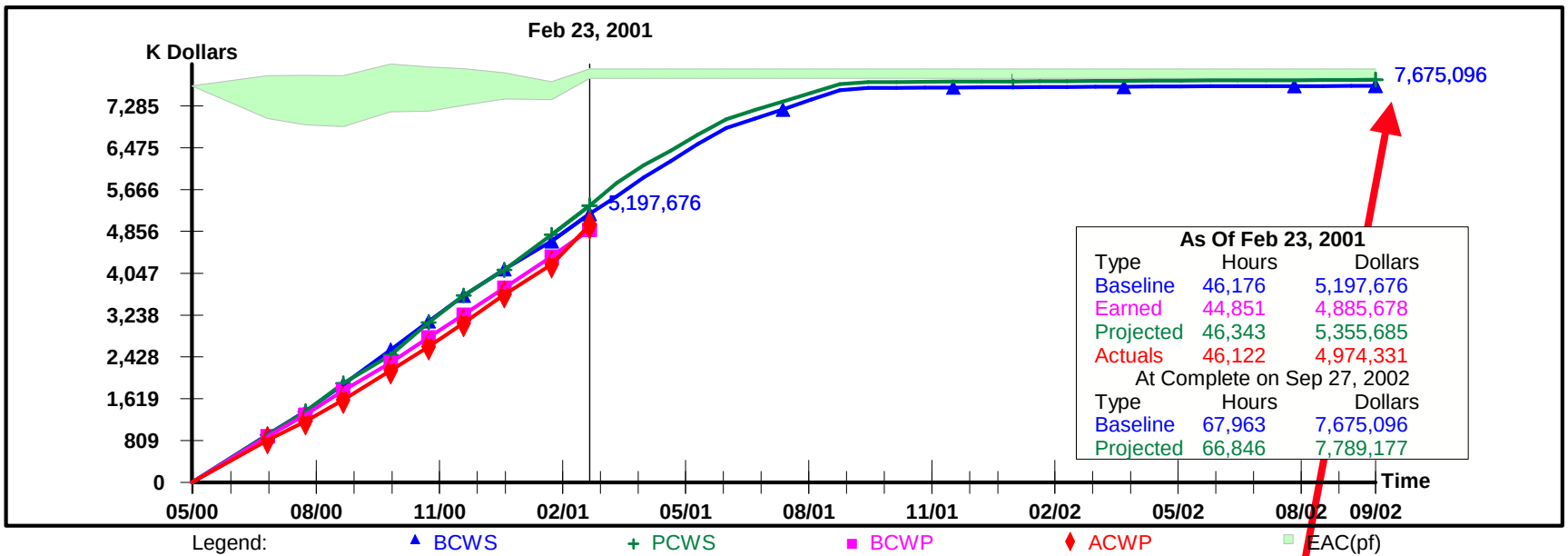
Are We Following the Plan?

Bottoms up Forecast Closely Agrees With Imputed EAC

M 2.2 & M 2.3 Earned Value Effort and Forecast Trend History for Project_XYZ

Sample Frequency = 20 days

Using Bid Rates - Active Tasks Adjusted for initial conditions



Cummulative	10/27/00	11/22/00	12/22/00	1/26/01	2/23/01	3/15/01	4/4/01	4/24/01	5/14/01
BCWS(No Bias)-K $	3,118	3,609	4,124	4,666	5,197	5,533	5,901	6,219	6,551
BCWP(No Bias)-K $	2,807	3,247	3,761	4,369	4,885				
ACWP(No Bias)-K $	2,628	3,085	3,635	4,219	4,974				
PCWS(No Bias)-K $	3,094	3,619	4,111	4,787	5,355	5,793	6,133	6,415	6,725
BAC(No Bias)-K $	7,675	7,675	7,675	7,675	7,675				
EAC(cpi)(No Bias)-K $	7,186	7,291	7,417	7,411	7,814				
EAC(spi)(No Bias)-K $	8,037	8,006	7,925	7,749	7,941				
EAC(sci)(No Bias)-K $	7,692	7,760	7						
EAC(wtAve)(No Bias)-K $	7,334	7,417	7						

Imputed EAC Near Bottoms Up EAC

Are We Following the Plan?

Formal Reports Perfectly Consistent with All Other Data

COST/SCHEDULE STATUS REPORT — DOLLARS IN Thousands

1. CONTRACTOR	2. CONTRACT	3. PROGRAM	4. REPORT PERIOD
a. NAME ABC Corp	a. NAME Project_XYZ	a. NAME Project_XYZ	a. FROM (YYMMDD) 010126
b. LOCATION (Address and ZIP Code) 1229 La Place Somewhere, Calif 90531	b. NUMBER K9321ab	File: Project_XYZ	b. TO (YYMMDD) 010223
	c. TYPE CPAF / d. SHARE RATIO n/a	b. PHASE (x one) x RDT&E / PRODUCTION	

5. AUTHORIZED CONTRACTOR REPRESENATIVE			
a. NAME (Last, First, Middle) Joe Doakes	b. TITLE Contract Manager	c. SIGNATURE	d. DATE SIGNED (YYMMDD)

6. CONTRACT DATA			
a. ORIGINAL CONTRACT TARGET COST 20,543.	b. NEGOTIATED CONTRACT CHANGES 151.	c. CURRENT TARGET COST (a. + b.) 20,695.	d. ESTIMATED COST OF AUTHORIZED UNPRICED WORK 0.
e. CONTRACT BUDGET BASE (c. + d.) 20,695.	f. MANAGEMENT ESTIMATE AT COMPLETION 20,431.	g. VARIANCE AT COMPLETION (e. - f.) 264.	h. OVER TARGET BASELINE DATE (YYMMDD) N/A

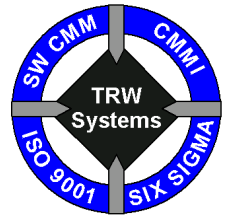
7. PERFORMANCE DATA

ITEM	CUMULATIVE TO DATE: BUDGETED COST WORK SCHEDULED	BUDGETED COST WORK PERFORMED	ACTUAL COST WORK PERFORMED	VARIANCE SCHEDULE	VARIANCE COST	AT COMPLETION: BUDGETED	ESTIMATED	VARIANCE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
a. WORK BREAKDOWN STRUCTURE ITEM										
1.1.2.4.1.3	17,778.	17,466.	17,580.	-312.	-115.	20,255.	20,249.	7.		
CLIN 1	11,164.	10,852.	11,054.	-312.	-202.	13,567.	13,646.	-78.		
1.1.2.4.1.3.1	1,271.	1,271.	984.	0.	287.	1,286.	999.	287.	V	
1.1.2.4.1.3.2	704.	361.	266.	-343.	96.	780.	719.	61.	V	
1.1.2.4.1.3.3	294.	325.	100.	31.	225.	695.	493.	202.	V	
1.1.2.4.1.3.4	8,896.	8,896.	8,785.	0.	110.	10,807.	10,515.	292.		
1.1.2.4.1.3.8	0.	0.	919.	0.	-919.	0.	919.	-919.	V	
CLIN 2	204.	204.	184.	0.	20.	278.	261.	17.		
1.1.2.4.1.3.5	204.	204.	184.	0.	20.	278.	261.	17.		
CLIN 3	401.	401.	307.	0.	93.	401.	307.	93.		
1.1.2.4.1.3.6	401.	401.	307.	0.	93.	401.	307.	93.	V	
COMPLETED	6,008.	6,008.	6,034.	0.	-26.	6,008.	6,034.	-26.		
1.1.2.4.1.3.7	6,008.	6,008.	6,034.	0.	-26.	6,008.	6,034.	-26.		
b. COST OF MONEY	151.	151.	166.	0.	-15.	163.	182.	-20.		
d. UNDISTRIBUTED BUDGET						0.	0.	0.		
e. SUBTOTAL (Performance Measurement Baseline)	17,929.	17,617.	17,747.	-312.	-130.	20,418.	20,431.	-13.		
f. MANAGEMENT RESERVE						277.				
g. TOTAL	17,929.	17,617.	17,747.	-312.	-130.	20,695.				

DD FORM 2735, JUN 95 (Tailored) — Bid Rates — ScheduleMaker (R) 3.19.0.3

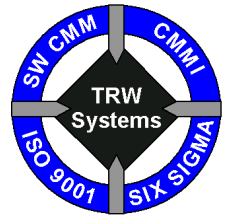
Variance Needed

Summary



- **Modern organizations have unique needs in a cost/schedule tool**
  - **SW-CMM/CMMI Levels 3-5, ISO 9001, Six Sigma**
  - **Support for corporate accounting systems and CMMI Level 3/4/5 measurement repository**
  - **Multiple levels of Integrated Product Teams**
  - **Geographically distributed teams**
- **ScheduleMaker fully meets our needs**
  - **An integrated cost and schedule management system, proven over 20 years of use**
  - **Supports pre-proposal planning through project execution and metrics collection/analysis**
  - **Technical and Business Staff now talk a common language**

Contact Information



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