

EVMS Training Snippet Library: PARSII Analysis: Trend Reports



**Office of Acquisition and Project Management (OAPM) MA-60
U. S. Department of Energy
July 2014**

OVERSIGHT & ASSESSMENT

PROJECT PERFORMANCE

ALL REPORTS





SSS Reports

SSS Reports



All monetary values are


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  **Shared Reports**

Analysis Reports

Data Validity Check

  Schedule Health Assessment

+  Variance Analysis

  Trend Analysis

EAC Reasonableness

+ Predictive Analysis

+  APM DepSec Monthly Reports

- **Analysis Reports**

- Report use further explained in OAPM's EVMS Project Analysis Standard Operating Procedure (EPASOP)
- Trend Analysis Subfolder
 - Variance Analysis Cumulative (WBS Level)
 - MR Balance v. SV, VAC, & EAC Trends
 - Management Reserve (MR) Log
 - Performance Index Trends (WBS Level)
 - Baseline Volatility – Past and Near-Term (PMB Level)

- What do the contractor's performance trends indicate over time?
- Is the current level of contractor performance projected to continue and why?
- What performance changes are expected and what are the drivers?
- Are MR and Contingency burn rates and use acceptable?
 - Mask/hide cost overruns?



Variance Analysis Cumulative (WBS Level)



1	THRESHOLD		CHANGE		COMMENTS		
2	STATUS	MAX	STATUS	ARROW			
3	Red	0.80	Better	▲			
4	Yellow	0.90	No Change	-			
5	Green	1.00	Worse	▼			
6	WBS Number	DESCRIPTION	SV	CV	VAC	SPi	CPI
8	01.25.60.01.02.01.(	LAB EQUIP & CAP SPARES	▲	▼	▼	0.73	1.02
9	01.25.60.01.02.01.(	CONST PHASE PROJECT SL	▼	▼	▲	0.99	0.95
10	01.25.60.01.02.01.(	T3 - TITLE III ENGINEERING	-	▼	▼	1.00	0.98
11	01.25.60.01.02.01.(	CX - CONSTRUCTION MAN	-	▼	▲	1.00	1.01
12	01.25.60.01.02.01.(	PS - PROJECT MANAGEME	-	▼	▲	1.00	0.87
13	01.25.60.01.02.01.(	P&CS ENGINEERING	-	-	-	1.00	1.06
14	01.25.60.01.02.01.(	QA & QC	-	▼	▲	1.00	0.78
15	01.25.60.01.02.01.(	STARTUP SUPPORT	-	-	▲	1.00	0.99
16	01.25.60.01.02.01.(	ENGINEERING SUPPORT (D	▼	▼	▼	0.57	0.96

Directions REPORT DETAIL

Select destination and press ENTER or move ... 60%

1	B	C	D	E	F	G	H	I
1	WBS Number	DESCRIPTION	LEVEL	SV	CV	VAC	SPi	CPI
56	01.25.60.01.02	LAB EQUIP & CAP	8	(302,545)	17,474	20,837	0.73	1.02
57	01.25.60.01.02	LAB EQUIP & CA	9	(302,545)	17,474	20,837	0.73	1.02
58	01.25.60.01.02	CONST PHASE P	8	(351,503)	(2,281,860)	(13,341,105)	0.99	0.95
59	01.25.60.01.02	T3 - TITLE III EN	9		(514,424)	(4,291,325)	1.00	0.98
60	01.25.60.01.02	CX - CONSTRUCT	9		118,987	(3,530,672)	1.00	1.01
61	01.25.60.01.02	PS - PROJECT M	9		(1,281,335)	(3,768,269)	1.00	0.87
62	01.25.60.01.02	P&CS ENGINEE	9		76,754	53,202	1.00	1.06
63	01.25.60.01.02	QA & QC		(0)	(660,009)	(1,698,369)	1.00	0.78
64	01.25.60.01.02	STARTUP SUPP			(1,554,111)	(3,000,000)	1.00	0.99

Directions REPORT DETAIL

Ready Average: (711,817) Count: 45 Sum: (32,031,766) 75%

MR Balance v. CV, VAC, & EAC Trends



Status Date	MR	Cum CV	VAC	VAC + MR	MR as % of BCWR	MR as % of ETC	PMB	CBB	% Comp	% Sched	BAC	% Spent (BAC)	EAC	% Spent (EAC)
11/30/13	10,117,404	5,527,620	(24,714,690)	(14,597,286)	36%	17%	341,688,907	351,806,312	92%	96%	341,688,907	90%	366,403,597	84%
10/31/13	10,365,538	6,353,185	(23,218,880)	(12,853,342)	34%	17%	341,611,498	351,977,036	91%	95%	341,611,498	89%	364,830,378	83%
09/30/13	10,585,353	5,746,768	(8,226,187)	2,359,166	31%	22%	341,220,958	351,806,311	90%	95%	341,220,958	88%	349,447,145	86%
08/31/13	10,644,886	6,822,126	(7,279,084)	3,365,802	29%	21%	341,161,425	351,806,311	89%	94%	341,161,425	87%	348,440,509	85%
07/31/13	10,681,393	6,350,239	(7,444,703)	3,236,690	26%	19%	341,124,919	351,806,312	88%	92%	341,124,919	86%	348,569,622	84%
06/30/13	10,904,847	5,844,783	(4,409,812)	6,495,035	24%	20%	340,901,465	351,806,312	87%	91%	340,901,465	85%	345,311,276	84%
05/31/13	11,036,869	5,740,276	(4,388,218)	6,648,651	23%	19%	340,769,343	351,806,212	86%	89%	340,769,343	84%	345,157,561	83%
04/30/13	12,170,406	5,494,933	(4,711,629)	7,458,777	23%	19%	339,635,902	351,806,308	85%	87%	339,635,902	83%	344,347,530	82%
03/31/13	12,755,261	4,920,662	(4,840,984)	7,914,277	23%	19%	339,049,957	351,805,218	83%	86%	339,049,957	82%	343,890,941	81%
02/28/13	14,693,409	3,436,977	3,546,015	18,239,423	25%	25%	337,113,028	351,806,437	82%	84%	337,113,028	81%	333,567,014	82%
01/31/13	14,722,295	2,983,001	3,396,056	18,118,350	23%	23%	337,084,142	351,806,437	81%	83%	337,084,142	80%	333,688,086	81%
12/31/12	1,011,671	(1,142,240)	(55,359,146)	(54,347,475)	2%	1%	306,853,180	307,864,851	87%	97%	306,853,180	87%	362,212,326	74%

CHARTS (click on the desired chart to display it)

[- MR vs. CV Chart](#)

Used to demonstrate how usage of Management Reserve compares to trend of Cumulative Cost Variance.

[- MR vs. CV & VAC Chart](#)

Used to demonstrate how usage of Management Reserve compares to trend of Cumulative Cost Variance and Variance At Complete.

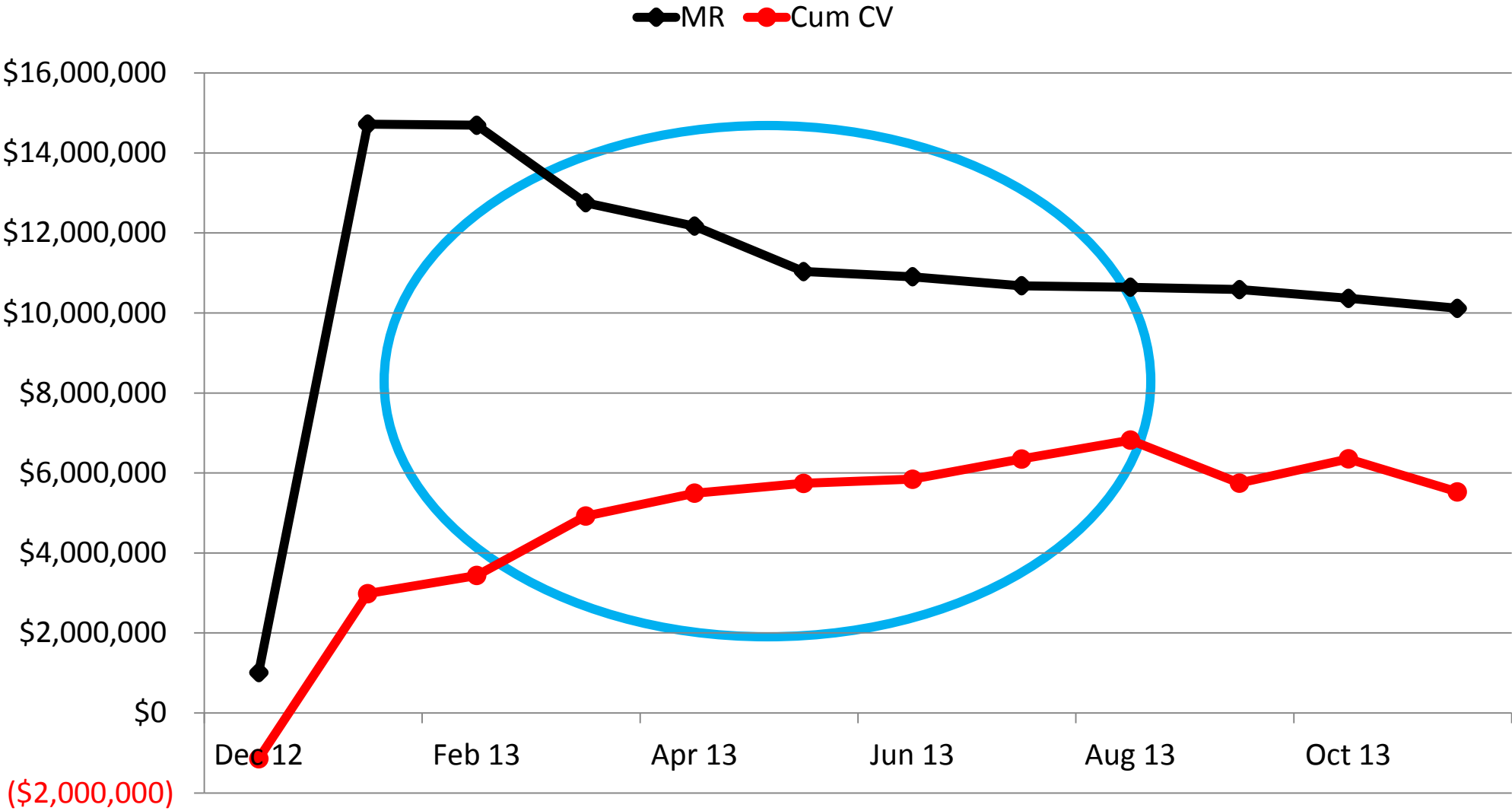
[- Budget vs. Forecast Chart](#)

Demonstrates trend of Contract Budget Base over time as well as how budget is allocated between MR and PMB and at which point contractor EAC breaches approved budget.

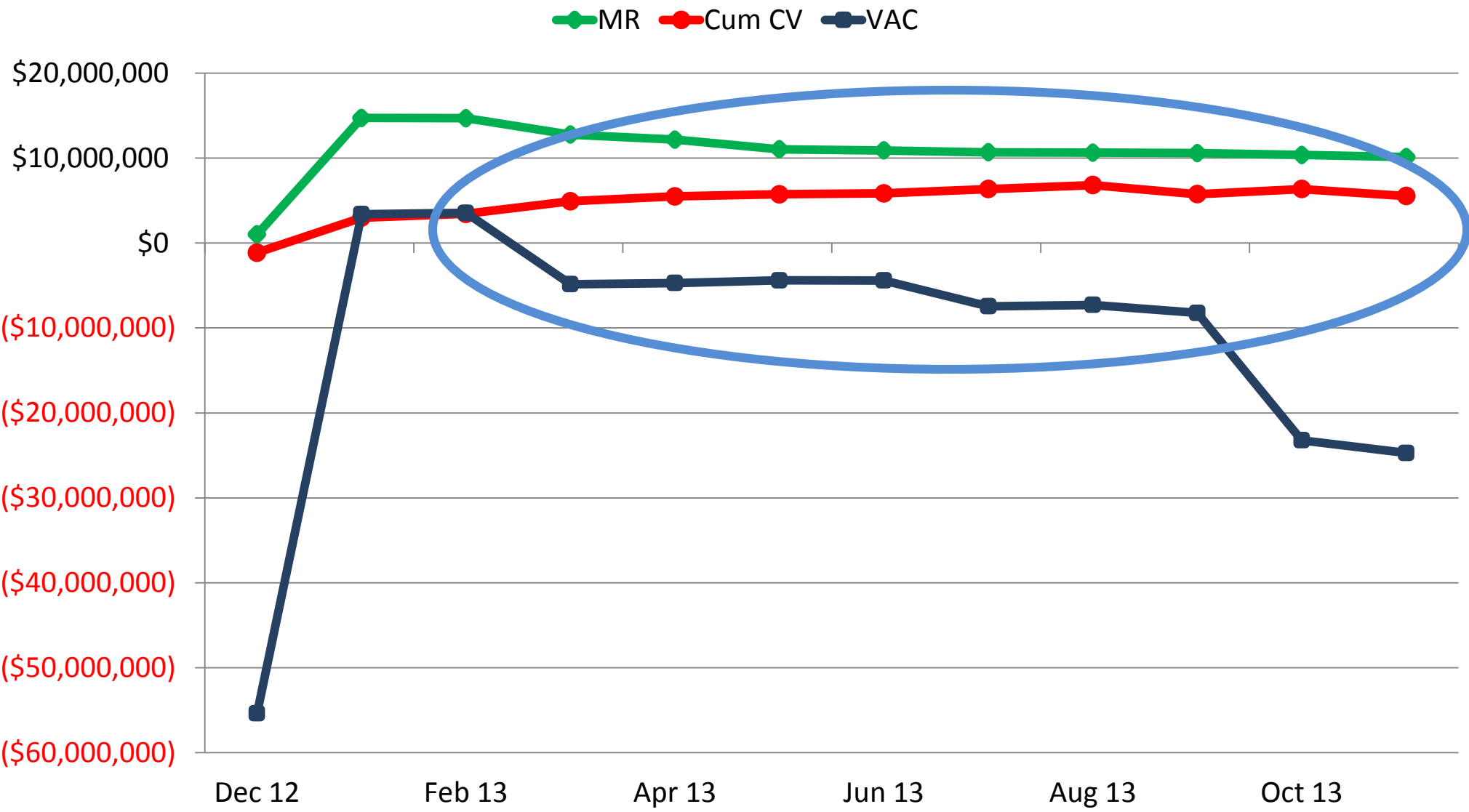
[- MR Coverage Trend Chart](#)

Demonstrates trend of MR balance remaining if MR is used to cover VAC at project completion.

MR vs. CV Chart



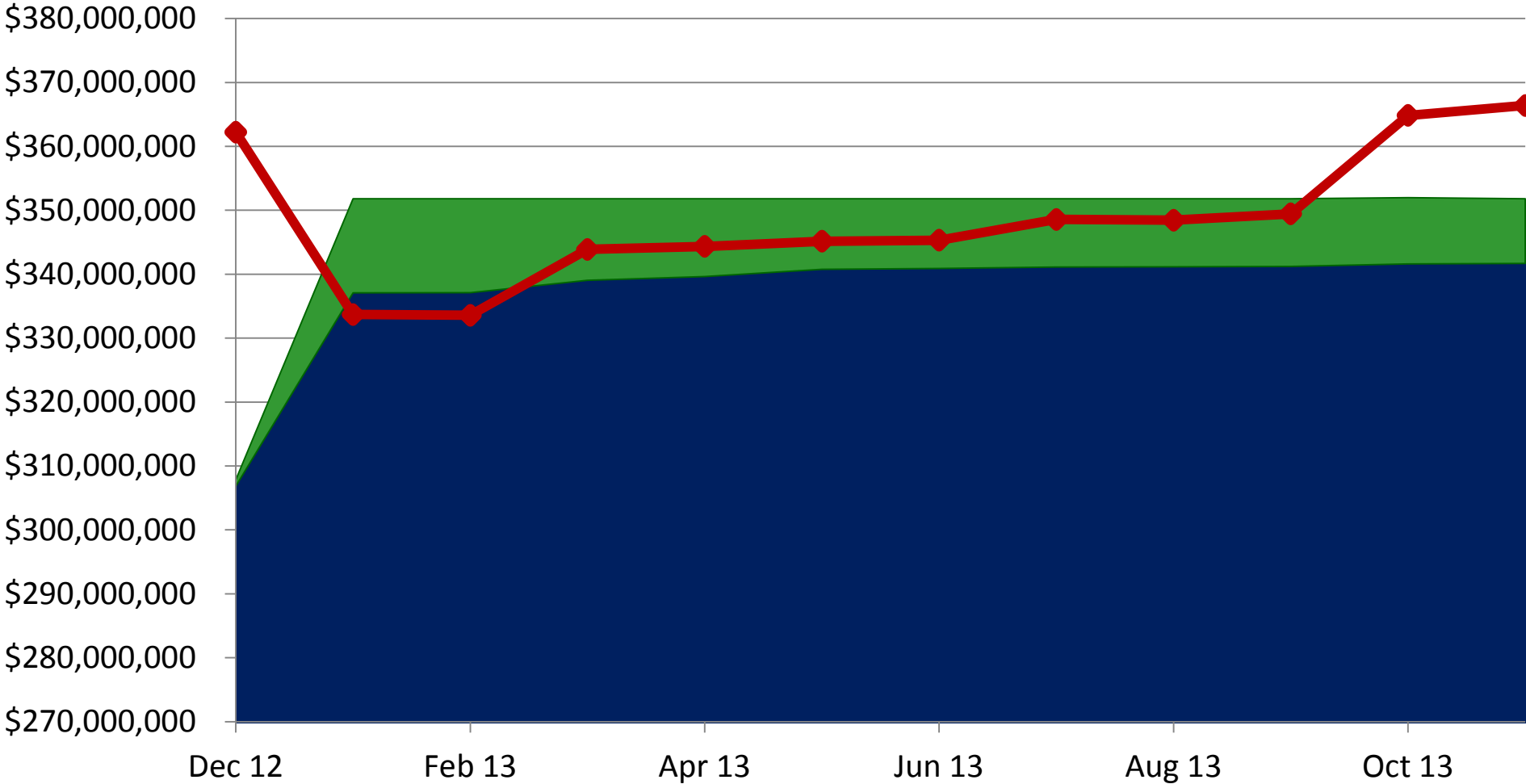
MR vs. CV and VAC Chart



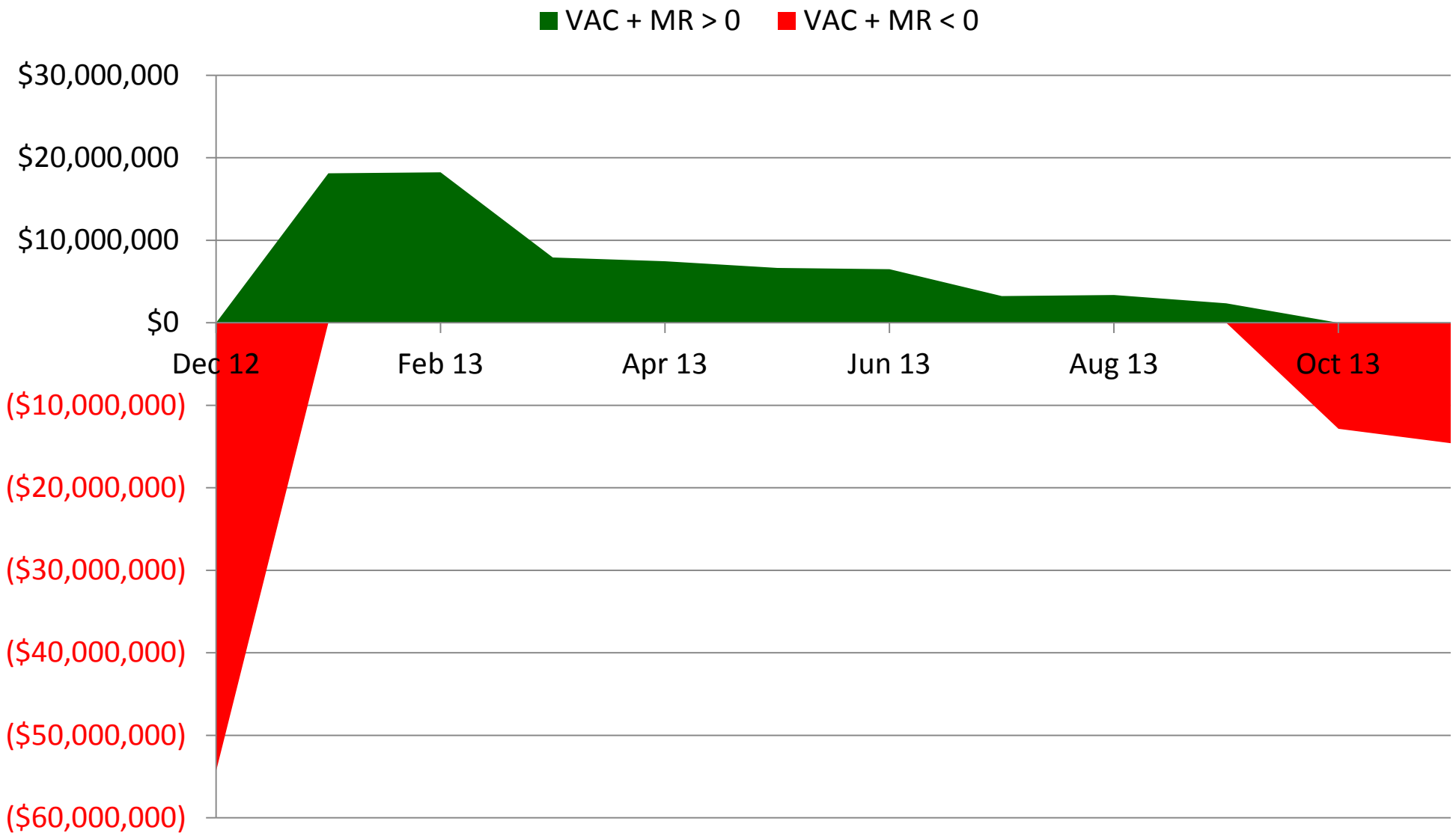
Budget vs. Forecast Chart



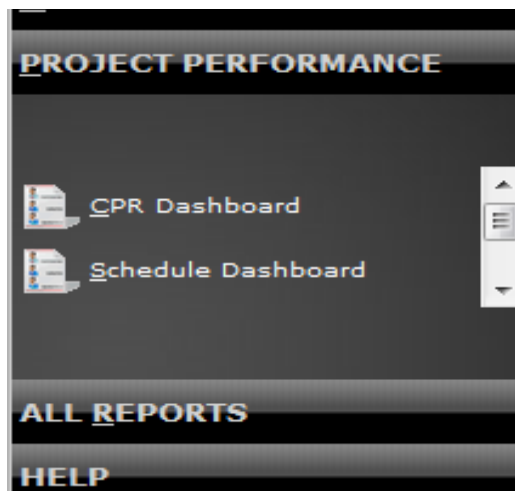
PMB MR EAC



MR Coverage Trend Chart



Management Reserve (MR) Dashboard



Attachment	Transaction	Balance	Credit	Debit	REMARKS
	12/14/2011	.00	.00	2,981,200.00	WBS:RL_0011_C1.99 OBS: Activity: Resource:
	7/13/2011	2,981,200.00	.00	3,619,400.00	WBS: RL_0011_C1.99.02.21 OBS: Activity: Resource:
	6/15/2011	6,600,600.00	1,706,600.00	.00	WBS:RL_0011_C1.99.02.21 OBS: Activity: Resource:
	4/19/2011	4,894,000.00	.00	706,000.00	WBS: RL_0011_C1.99.02.21 OBS: Activity: Resource:
	1/18/2011	5,600,000.00	5,600,000.00	.00	WBS: RL_0011_C1.99.02.21 OBS: Activity: Resource:



Click icon to see the MR Dashboard
Transaction Narrative for further details
for each log entry.

MR Dashboard Transaction Narrative on 11/30/20XX

Changes: Create a System Turnover Coordination Team
Change Description and Justification:





This PCR will create a System Turnover Coordination Team work package over the Construction Staff account. Based on the current status of the project, a shift in the need for a constructability review team was no longer required. These personnel will be transferred to the Construction group to prepare for system testing and coordination. This group will prepare turnover sequences in detail to support an efficient transition between the construction installation team to the Commissioning team. The budget for this new work package will come from Management Reserve.
There are no schedule impacts as a result of this change.

Risk Assessment Management Plan Identified Risk:

Risk Number: N/A
Risk Description: N/A



Management Reserve (MR) Log

Attachment	Transaction	Balance	Credit	Debit	REMARKS
	11/25/2011	8,949,946.08	.00	822,386.19	WBS:2.3.5.1.1 OBS:07 Activity: Resource:
	11/25/2011	9,772,332.27	822,386.17	.00	WBS:2.3.4.01.01 OBS:05 Activity: Resource:
	9/30/2011	8,949,946.10	.00	46,496.77	WBS:5.0 OBS: Activity: Resource:
	9/30/2011	8,996,442.87	262,025.00	.00	WBS:4.2 OBS: Activity: Resource:

Examine log and attachments to assess:

- What is changing and why
- MR burn rate and how that may impact the project
- Appropriate or inappropriate uses of MR



4/24/2009	98,379,219.67	.00	987.12	WBS:2.3.1.01.04 OBS:03 Activity: Resource:
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Performance Index Trends (WBS Level) Report



Level	WBS Number	Description	Type	06/30/2013	07/31/2013	08/31/2013	09/30/2013	10/31/2013	11/30/2013
9	01.25.60.01.02.0	DA - DESIGN AUTHOR	SPI	1.00	1.00	1.00	1.00	1.00	1.00
		View SPI/CPI Trend Chart	CPI	1.09	1.10	1.10	1.11	1.11	1.11
		View Actual vs. Projected Performance	TCPI To EAC	0.79	0.68	0.64	0.60	0.42	0.39
		View All Indices Trend Chart	TCPI To BAC	0.74	0.70	0.66	0.61	0.57	0.54
9	01.25.60.01.02.0	SU - TESTING & START	SPI	0.65	0.58	0.53	0.48	0.44	0.41
		View SPI/CPI Trend Chart	CPI	0.98	1.00	1.00	1.00	0.97	0.95
		View Actual vs. Projected Performance	TCPI To EAC	0.81	0.74	0.75	0.77	0.70	0.70
		View All Indices Trend Chart	TCPI To BAC	1.01	1.00	1.00	1.00	1.02	1.03
9	01.25.60.01.02.0	STARTUP MANAGEME	SPI	1.00	1.00	1.00	1.00	1.00	1.00
		View SPI/CPI T						1.20	1.20
		View							0.08
		View							0.22

In this control account, we see the SPI and CPI have been degrading in recent months. Indication of a problem and possible lack of corrective action. Need to investigate.

Performance Index Trends (WBS Level) Report



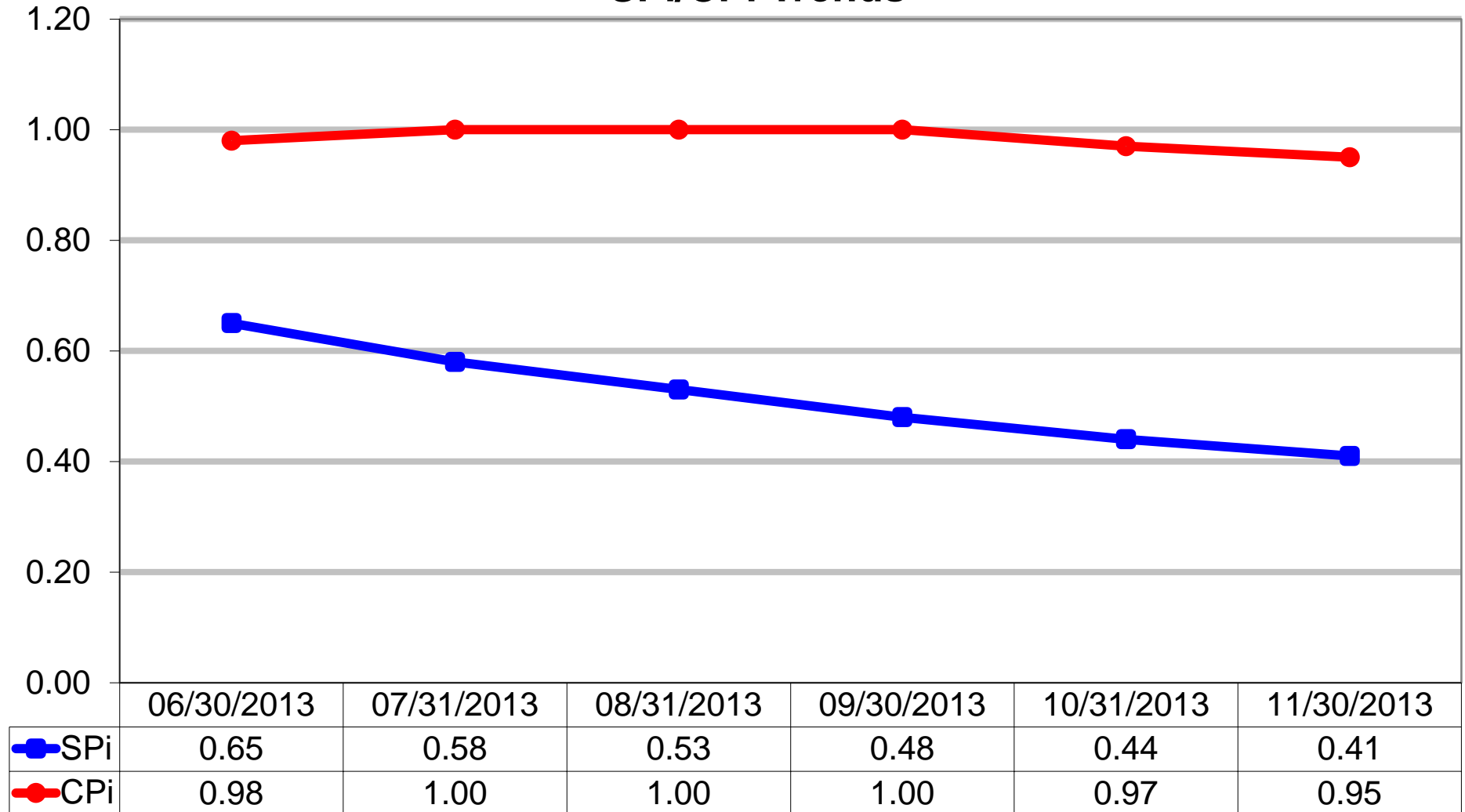
- First select the control account that is showing signs of trouble.
- Next select the charts for more trend information.

Level	WBS Number	Description	Type	06/30/2013	07/31/2013	08/31/2013	09/30/2013	10/31/2013	11/30/2013
340	9	01.25.60.01. SU - TESTING & STARTUP	SPi	0.65	0.58	0.53	0.48	0.44	0.41
341		View SPi/CPI Trend Chart	CPI	0.98	1.00	1.00	1.00	0.97	0.95
342		View Actual vs. Projected Performance Chart	TCPI To EAC	0.81	0.74	0.75	0.77	0.70	0.70
343		View All Indices Trend Chart	TCPI To BAC	1.01	1.00	1.00	1.00	1.02	1.03

SPI / CPI Trends Chart



SPI/CPI Trends



- **Baseline Volatility may equal Baseline Churn**
- **Provides early warning indication of project's time-phasing and control of budget volatility**
- **Churn may indicate**
 - The significance of departure from the original plan
 - Contractor has inadequate plans in place
 - The performance metrics may be unreliable
 - Metric manipulation may be intentional
 - Concerns with
 - Project performance
 - EVMS compliance



PARS II Baseline Volatility (PMB Level) Report



Status Date	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14
Dec-12	\$609,941											
Jan-13	\$5,759,851	\$5,423,132										
Feb-13	\$5,405,201	\$5,525,582	\$3,813,921									
Mar-13	\$5,717,399	\$5,938,036	\$4,202,624	\$3,426,994								
Apr-13	\$5,818,516	\$5,972,320	\$4,369,789	\$3,574,685	\$3,472,571							
May-13	\$5,978,392	\$6,509,450	\$4,438,304	\$3,703,715	\$3,584,600	\$2,745,977						
Jun-13	\$5,323,088	\$6,137,419	\$4,806,491	\$3,771,259	\$3,671,234	\$2,827,360	\$2,648,205	\$2,407,753	\$1,816,105	\$680,732	\$667,166	\$667,063
Jul-13		\$6,051,202	\$4,451,319	\$3,648,447	\$3,478,387	\$2,856,652	\$2,527,176	\$2,239,032	\$3,053,832	\$680,732	\$670,399	\$667,063
Aug-13			\$4,451,319	\$3,515,505	\$3,475,939	\$2,919,423	\$2,555,784	\$2,249,292	\$3,065,562	\$680,732	\$670,399	\$671,703
Sep-13				\$3,515,505	\$3,434,083	\$2,919,423	\$2,559,873	\$2,325,314	\$3,078,573	\$680,732	\$670,399	\$693,258
Oct-13					\$3,434,083	\$2,932,638	\$2,593,776	\$2,538,691	\$3,123,455	\$743,802	\$670,399	\$693,258
Nov-13						\$2,926,603	\$2,520,060	\$2,304,567	\$3,136,139	\$757,781	\$684,199	\$743,854

6 MONTHS PRIOR TO REPORT PERIOD

REPORT PERIOD

6 MONTHS BEYOND REPORT PERIOD



Average Percent Change

	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14
Min	\$609,941	\$5,423,132	\$3,813,921	\$3,426,994	\$3,434,083	\$2,745,977	\$2,520,060	\$2,239,032	\$1,816,105	\$680,732	\$667,166	\$667,063
Max	\$5,978,392	\$6,509,450	\$4,806,491	\$3,771,259	\$3,671,234	\$2,932,638	\$2,648,205	\$2,538,691	\$3,136,139	\$757,781	\$684,199	\$743,854
% Change	880%	20%	26%	10%	7%	7%	5%	13%	73%	11%	3%	12%
<div>MIN/MAX Comparison</div>							Avg % Change last 6 months					
							158%					
							Avg % Change next 6 months					
							19%					
First	\$609,941	\$5,423,132	\$3,813,921	\$3,426,994	\$3,472,571	\$2,745,977	\$2,648,205	\$2,407,753	\$1,816,105	\$680,732	\$667,166	\$667,063
Last	\$5,978,392	\$6,137,419	\$4,451,319	\$3,515,505	\$3,434,083	\$2,932,638	\$2,520,060	\$2,304,567	\$3,136,139	\$757,781	\$684,199	\$743,854
% Change	880%	13%	17%	3%	-1%	7%	-5%	-4%	73%	11%	3%	12%
<div>FIRST/LAST Comparison</div>							Avg % Change last 6 months					
							153%					
							Avg % Change next 6 months					
							15%					

- Why was there an 880% change to BCWS made to June 2013?
- What was the scope and was the change government approved?
- The churn continues over several months. What is the reason for the substantial continual churn of more than 5%?



Current Period Changes

6 MONTHS PRIOR TO REPORT PERIOD

Prior	\$5,978,392	\$6,137,419	\$4,451,319	\$3,515,505	\$3,434,083	\$2,932,638
Current	\$5,323,088	\$6,051,202	\$4,451,319	\$3,515,505	\$3,434,083	\$2,926,603
% Change	-11%	-1%				0%
Average % Change last 6 months						-2%

- Why was an 11% reduction made between 1 – 30 June 2013?
- Why was a 1% reduction made between 1 – 31 July 2013?
- Where was the budget moved and why?

- **Trend Analysis**

- Examine the trends over time
- Compare trends of different indices to see how one may offset or impact the other
- Ask questions based on what the data is showing
 - Are the trends expected to continue along the path shown?
 - What performance changes are expected, when, and what are the drivers?
 - Are the MR use rates and purpose acceptable, or is MR being used to mask/hide cost overruns?

DOE OAPM EVM Home Page



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EARNED VALUE MANAGEMENT

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Earned Value Management (EVM) is a systematic approach to the integration and measurement of cost, schedule, and technical (scope) accomplishments on a project or task. It provides both the government and contractors the ability to examine detailed schedule information, critical program and technical milestones, and cost data.

- [EVMS Surveillance Standard Operating Procedure \(ESSOP\)](#) - 26 Sep 2011 (pdf)
 - [EV Guideline Assessment Templates](#) - (MS Word)
 - [DOE EVMS Cross Reference Checklist](#) - (pdf)
 - [DOE EVMS Risk Assessment Matrix](#) - (MS Word)
- [Formulas and Terminology "Gold Card"](#) - Sep 2011 (pdf)
- [Slides from the OECM Road Show: Earned Value \(EV\) Analysis and Project Assessment & Reporting System \(PARS II\)](#) - May 2012 (pdf)
- [DOE EVM Guidance](#)

EVM TUTORIALS

[Module 1 - Introduction to Earned Value](#) (pdf 446.86 kb) July 17, 2003

This module is the introduction to a series of online tutorials designed to enhance your understanding of Earned Value Management. This module's objective is to introduce you to Earned Value and outline the blueprint for the succeeding modules. This module defines Earned Value management. It looks at the differences between Traditional management and Earned Value management, examines how Earned Value management fits into a program and project environment, and defines the framework necessary for proper Earned Value management implementation.

<http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>