

Research Study: Improving the Reliability of EVMS Implementation

Melvin Frank

Project Controls Division (PM-30)

Office of Project Management (PM)

US Dept. of Energy



- Collaborative partnership between Government and Industry
 - People expert knowledge, proper attitude, communication skills
 - Time commitment to three year effort
 - Data sharing of EVMS successes/failures
- Objective: Investigate the EIA-748 EVMS related knowledge, attitudes, and behaviors across government and industry to:
 - Assess factors that contribute to a reliable EVMS and association to project outcomes (e.g., correlation to staying on schedule, EVMS Compliance, etc.)
 - Evaluate enabling factors that drive effective use (e.g., customer advocacy, intuitive nature of the system, the size and experience of the project team, etc.)
 - Assess investment cost to implement/maintain effective EVMS and resultant benefits to control/mitigate scope, schedule or cost impacts
 - Inform EIA-748(E) update



Compliant EVMS vs Effective EVMS

 <u>Compliant EVMS</u> should provide all users (CAM, PCE, PM, PD, AE, CO), confidence that the EVMS as implemented is an <u>Effective EVMS</u>

- Resultant schedule, cost, and technical performance data is trustworthy
 - Accurately represents technical/scope, schedule and cost status based on plan
 - Credibly predicts completion estimates
 - Identifies programmatic risks or other technical issues requiring corrective action
 - Availability of trustworthy data and information for management at all levels (CAM, PM, CO, AE, etc.) to make informed decisions and tradeoffs in order to maximize investment in achieving desired capability



Trustworthy Data and Information

from generating data for **reporting**

to producing trustworthy data and information for management

- Current As agreed to or directed, such as time now, end of reporting period, or a predetermined specific period of time.
- Accurate Without error, mistake, miscalculations, or anomalies.
- **Complete** Comprehensive, all inclusive, total, or entire.
- **Repeatable** Ability to reproduce current, accurate, complete, and auditable results.
- Auditable Ability to trace the source through the entire system/ process to validate the results.

- A method and tool to consistently assess
 - 1. the maturity of EVMS implementation
 - 2. the **accuracy** of EVMS due to contextual factors (e.g., resources, management support, contracting approach)
 - 3. the **effectiveness** of EVMS in relation to and impact on performance

Methodology

	Research Schedule							20	19												2	2020	0											20	021					
		J	F	N	1	Α	Μ	J	J	A	s	C)]	N :	D	J	F	Μ	Α	N	4]	Ţ,	Ј	Α	S	0	N	D	J	F	M	Α	N	1 J	J	A	s	О	N	D
	NDIA IPMD Conf.		4	•						•	•						•							•						•						•				П
	Team meetings (tentative)		,	•			A S U			•	•	A S U				A S U	*			•	•			*		A S U		A S U		•			A S U			•			*	•
	Interim Reports									•	•				•							*						•						4	,					П
	Training				T							Γ		T									$ \top $														•		•	П
1	Review of Literature and State of Practice																																							
2	Recruit Team												T	T	T					Г		T	T										Г							П
3	Define Project																																Γ							П
4	Finalize Scope and Objectives																																							
5	Questionnaire												T	\top	T							T	T										Γ		\Box					П
6	Develop Draft Assessment Tool																																							
7	Identify Data Sample				T															Γ		T	寸										Γ		\Box					П
8	Conduct Workshops				T																														Т					П
9	Finalize and Test				T									\top																										П
10	Synthesize Results into Guide																																							
11	Develop Publications and Presentations																																							



Role	Name	Organization	Name	Organization
Chair/Vice-Chair	Melvin Frank	DOE/PM-30	Amy Basche	Mission Support Alliance/EFCOG
Chair/Vice-Chair	Karen Urschel	DOE/PM-30/CS	Craig Hewitt	Contract Support/EFCOG
Principle Investigator (PI) /Co-PI	Edd Gibson	ASU	Mounir El Asmar	ASU
Grad Students	Namho Cho	ASU		ASU
Govt. /Industry Reps	Dave Kester	DOE/PM-30	Vicki Frahm	Sandia National Lab
Govt. /Industry Reps	Zac West	DOE/PM-30	Doug Marbourg	Los Alamos National Lab
Govt. /Industry Reps	Garrett Richardson	DOE/PM-30	Derek Lehman	Washington River Protection Solutions
Govt. /Industry Reps	Betsy Ballard	DOE/EM	Robert Sudermann	Fluor
Govt. /Industry Reps	John McGregor ¹	DoD/AAP	Tony Spillman	WRPS
Govt. /Industry Reps	Barry Levy ²	NRO/CS	John Post	Lawrence Livermore National Lab
Govt. /Industry Reps	Jerald Kerby/	NASA/CAIWG	Tom Carney/	Lockheed Martin
Govt. / maustry keps	Stefanie Terrell ³	NASA/CAIVVO	Vaughn Schlegel ⁴	LOCKITEEU WATEIT
Govt. /Industry Reps	Danielle Bemis	DoD/DCMA	Russ Rodewald	Raytheon
Govt. /Industry Reps	Ben Pina	DOE/NNSA	Paul Sample	CACI
Govt. /Industry Reps	Bill Weisler	DoD/DCMA	Jeffrey King	BAE

CS Contract Support

- 1) Emily Beltramo will represent John McGregor at 1st meeting due to conflict in John's schedule.
- 2) While Barry Levy will represent NRO/Ivan Bembers on the core team, Ivan is planning to attend the 1st meeting.
- 3) Stefanie and Jerald will alternate in representing NASA. Stefanie will attend the 1st meeting.
- 4) Vaughn is the alternate representative for Lockheed Martin and will attend when Tom is unable to attend



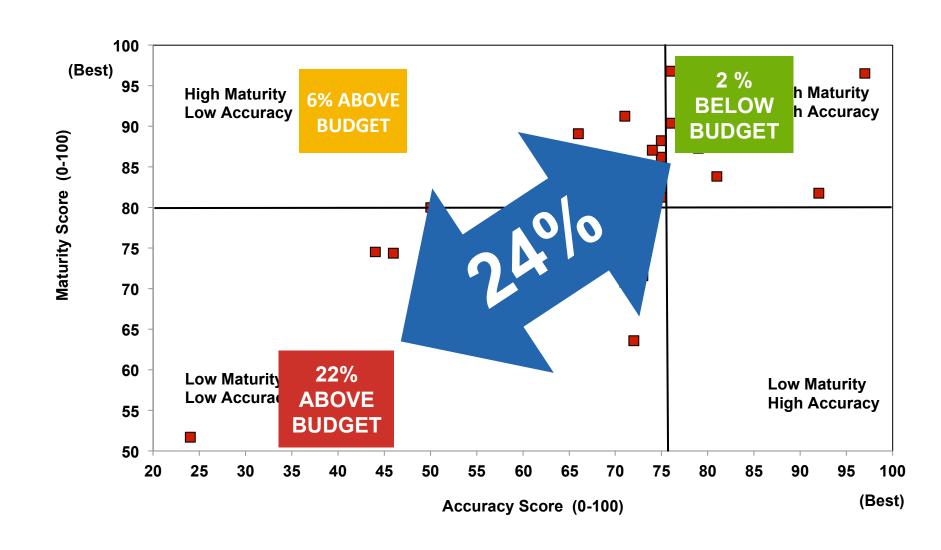
EVMS Maturity: Dimension #1

SECTION I – Organization			Definition	n Level		
	N/A	BEST		MEDIUM	V	WORST
I. ORGANIZATION	0	1	2	3	4	5
At, Define Work Scape (WBS) A WBS is a direct representation of the work scope in the project, documenting the hierarchy and description of the tasks to be performed and their relationship to the product deliverables. The WBS breaks down all authorized work scope into appropriate elements for planning, budgeting, scheduling, cost accounting, work authorization, measuring progress, and management control. The WBS must be extended to the level necessary for management action and control based on the complexity of the work. At a minimum, the WBS is extended to the level or levels at which control accounts are established. A WBS dictionary is typically used to define the work scope for each unique element in the WBS and should include cross references to the Statement of Work (SOW) or equivalent. The WBS includes fields to identify and include: Unique WBS number for each WBS element. Short description. Parent element identification (with the exception of the top WBS element). Contract line item number for cross-reference to the Statement of Work. Reporting level required for internal management and customer reporting purposes. The lowest level in the WBS is the control account level (typically level 4 or 5 in the WBS structure, depending on the needs of the project). The WBS Dictionary description should include, but is not limited to, specific details such as: End result or expected work product. Related work to identify dependencies between elements of work. Risk and opportunity factors. Assumptions or limitations. Technical specifications. Related documents or other materials that are required for the work team to successfully complete their assignment. Typical Work Products** Statement of Work (SOW) Work Breakdown Structure (WBS) Traceability matrix from Government requirements (e.g., SOW, Build Specifications) to WBS WBS index/dictionary	Not required for project.	The WBS has been defined and approved by key stakeholders. The WBS Dictionary is developed and approved by DOE (or other agency). The WBS contains all project work, including revisions for authorized changes and modifications. The WBS contains all contract line items and end items. The WBS is extended at a minimum to the level(s) at which control accounts are established. The WBS elements collectively provide a complete definition of work scope requirements.	Most of the WBS structure, descriptions, and WBS dictionary have been defined, documented, and are under review, but not yet approved. The WBS identifies all WBS elements specified for external reporting. The WBS Dictionary is ready for approval by DOE The WBS contains all project work, including revisions for authorized changes and modifications. The WBS contains all contract line items and end items. The WBS is extended at a minimum to the level(s) at which control accounts are established. The WBS elements collectively provide a complete definition of work scope requirements.	Some of the WBS structure and element descriptions have been defined. The WBS contains some project work and contract line items. Development of the WBS Dictionary has started. Some of the WBS elements provide definitions of work scope requirements.	Development of the WBS structure has started. The WBS structure is outlined but items are vague. The WBS contains little project work. The WBS is only defined at a high level and control accounts are not established. The WBS elements does not have detailed definition of work scope requirements.	$^{\circ}$ Not yet started.

THE OTHER

EVMS Accuracy: Dimension #2

		_								
Accu	iracy Types		Accura	cy Factors		Refe	rences			
	Project Leadership Team	b. Sta c. Pro d. Le e. Pro	evious experience planning, designir akeholders are appropriately represe oject leadership is defined, effective adership team and organizational cu oject leadership team's attitude is ak y personnel turnover, e.g., how long	ented on the project leadersh , and accountable. Ilture fosters trust, honesty, a ble to adequately manage cha	nd shared values.	Nelson and Winter (1 Nelson and Winter (1 CII (2005), CII (1999) CII (1998), CII (1999), CII (2005), Burke (20 Gibson and Hamilton Gibson and Hamilton	, CII (2005) 14), McLaughlir 1 (1994), <u>Piderit</u>	n (2017) (2000)		
	Project	b. Co	chnical capability and relevant traini intractor/Engineer's team experienc th FEED process.			Wei et al. (2005) Nelson and Winter (1 Skitmore et al. (1990),		
Z	Execution Team	d. Le e. Ke f. Co	akeholders are appropriately repres vel of involvement of design leads y personnel turnover including the -location of execution team memb am culture or history of the execut	HIGH PERFORMING	MEETS MOST	MEETS		IMPROV		NOT ACCEPTABLE
3	Project Management Process	a. Co b. Pri c. Or d. Sig e. Ad f. Ali g. Do	mmunication within the team is op iority between cost, schedule, and ganization implements and follows gnificant input of construction know lequate process for coordination be gnment of FEED process with avail- ocumentation used in preparing FEE view and acceptance of FEED by ap	Rating a factor High Performing indicates the factor's criteria are fully met within the context of their respective category, e.g., project leadership, execution, management, or	Rating a factor Meet Most indicates that the factor's criteria are consistently met and understood with minor deficiencies.	Rating a factor Some indicator the factor's are partially without implipations of the inject and the inject are partially project successions.	ates that criteria met and vement, cess could	Rating a far Needs Imp indicates the factor's crit not consisted meeting pro- expectation without imp the project	orovement nat the teria are tent in oject ns and provement,	Rating a factor Not Acceptable indicates that the factor's criteria are consistently below expectations and current performance is unacceptable. Project success
4	Project Resources	b. Ca c. Qu d. An e. Lo	emmitment of key personnel on the lendar time allowed for preparing leading of and level of engineering da nount of funding allocated to perfocal knowledge. Tailability of standards and procedu	project resources.		a A.		Substantial meet exped required.	I action to	cannot be achieved in this current state and actions are required to improve.





Project Assessment and Reporting System

Matthew "Zac" West, P.E., PMP General Engineer / Performance Team Lead Department of Energy, Office of Project Management

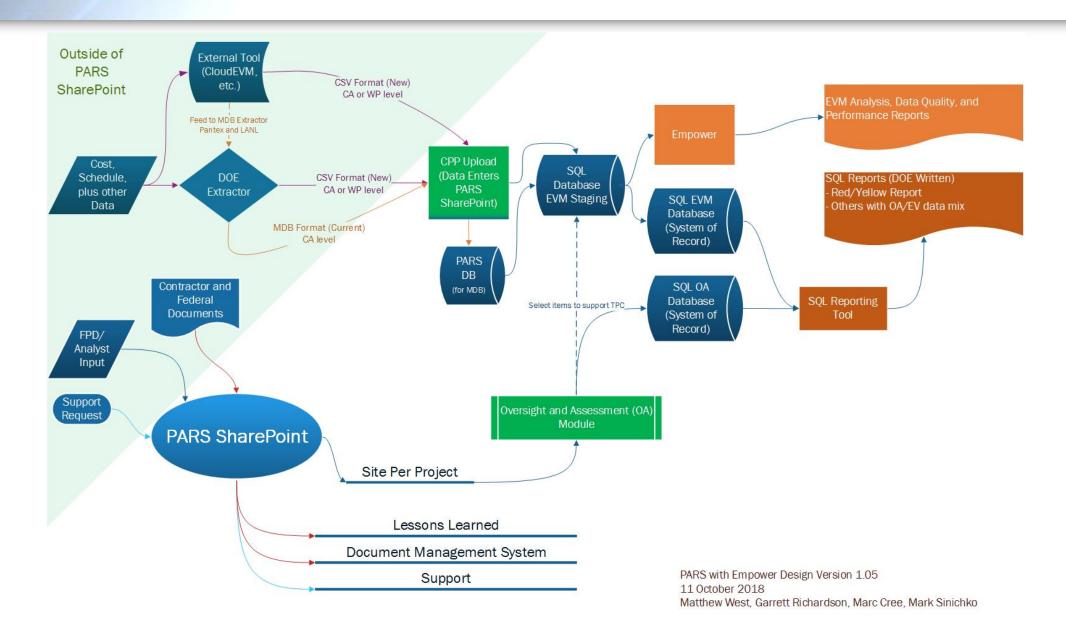


• The Project Assessment and Reporting System (PARS) is the Department of Energy's project management information system as recommended by PMI, GAO, and others.

 PARS is going through an update currently to add the commercial off-the-shelf analytical and reporting tool, Empower, which will go into production the first week of June 2019.

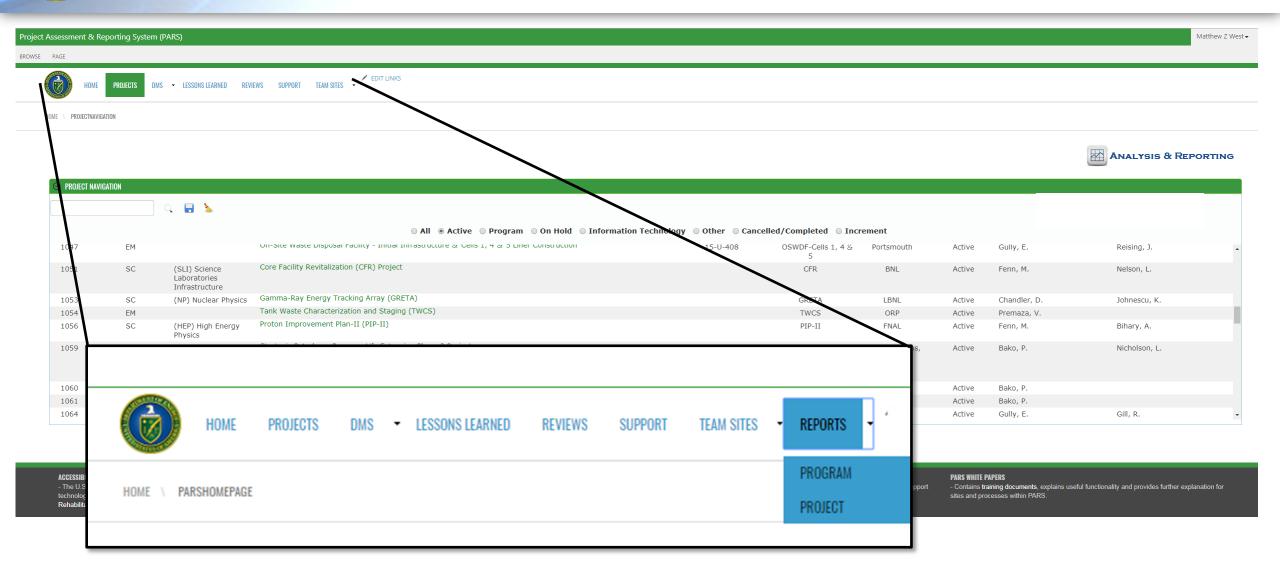


PARS Flowchart with Empower





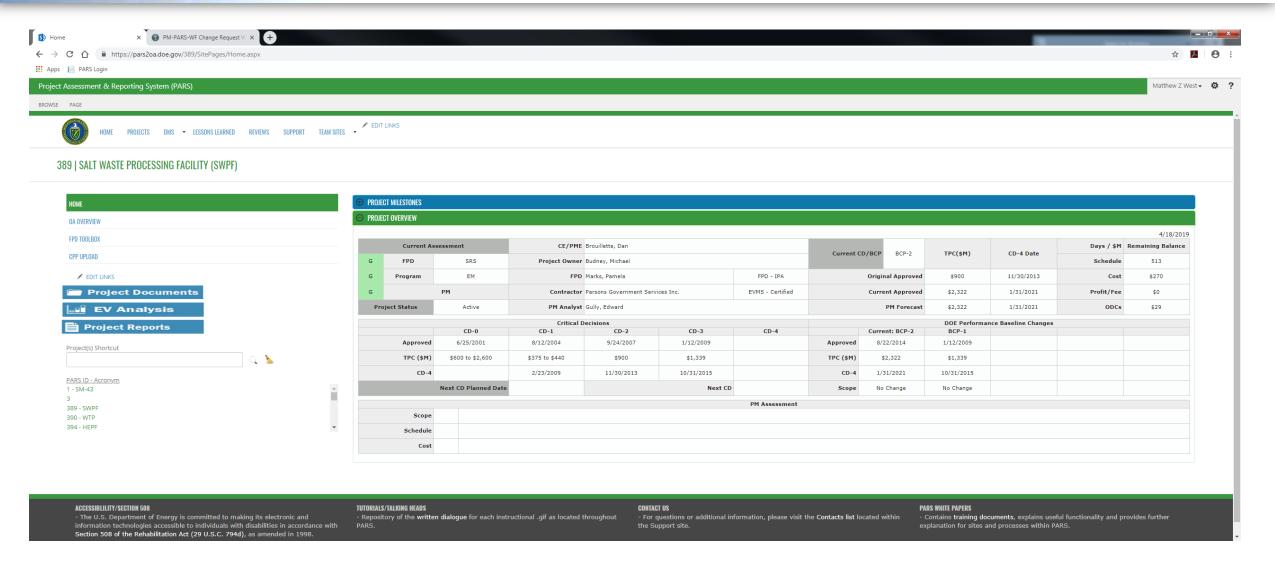
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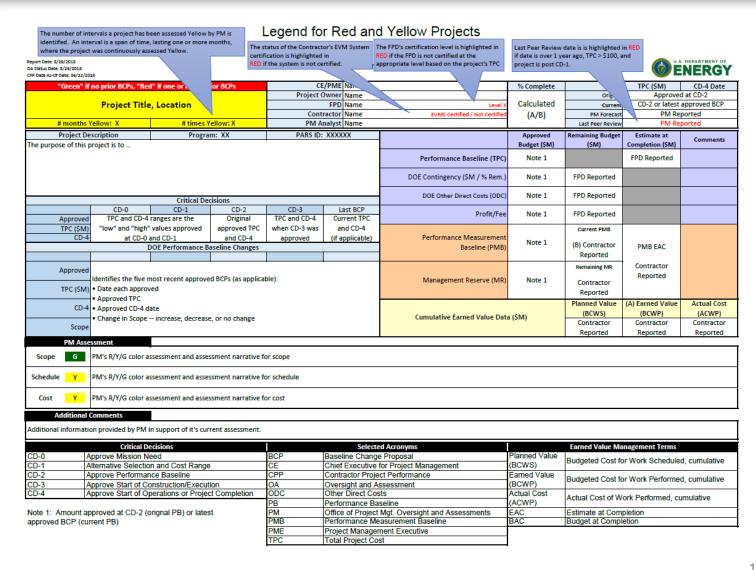
Project Overview Screen

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Reports which combine OA and EV data are built directly from the DOE SQL database.

- Project Reports
 - Red/Yellow/Green
 - Assessment
 - Project Summary (multiple)
- Program reports
 - Permission based
 - Monthly / Quarterly Status
 - ESAAB
 - Program Specific Reports
 - NA
 - FM
 - SC





SQL Report – Retroactive Change

LEGEND

Value for the performance period has been changed in historical period by more than 5%

Value for the performance period has been changed in historical period between 1% and 5%

Value for the current or previous historical period was nat reported

		02/10/2019			01/13/2019			12/16/2018			11/
Period Date	Cum BCWS	Cum BCWP	Cum ACWP	Cum BCWS	Cum BCWP	Cum ACWP	Cum BCWS	Cum BCWP	Cum ACWP	Cum BCWS	Cui
10/21/2018	(\$102,106,098)	(\$6,265,701)	\$45,952,849	(\$102,106,098)	(\$6,265,701)	\$45,952,849	(\$102,106,098)	(\$6,265,701)	\$45,952,849	(\$102,106,098)	(\$
11/18/2018	\$50,407,964	\$41,861,471	\$44,801,557	\$50,407,964	\$41,861,471	\$44,801,557	\$50,407,964	\$41,861,471	\$44,801,557	\$50,407,964	\$4
12/16/2018	\$42,188,724	\$43,164,381	\$44,577,543	\$42,188,724	\$43,164,381	\$44,577,543	\$42,188,724	\$43,164,381	\$44,577,543	\$42,188,724	
01/13/2019	\$40,004,228	\$35,909,485	\$35,706,307	\$40,004,228	\$35,909,485	\$35,706,307	\$40,377,232			\$40,072,010	
02/10/2019	\$44,331,471	\$39,287,840	\$46,622,320	\$46,286,420			\$43,715,316			\$43,176,354	
03/24/2019	\$70,600,105			\$72,510,806			\$66,071,016			\$64,407,333	
04/21/2019	\$48,990,670			\$49,858,091			\$48,294,437			\$47,131,995	
05/19/2019	\$45,131,680			\$45,846,621			\$44,461,604			\$43,599,747	
06/16/2019	\$45,067,818			\$44,458,122			\$43,241,589			\$42,354,232	
07/14/2019	\$44,676,522			\$44,817,799			\$43,631,009			\$42,867,762	
08/25/2019	\$64,829,116			\$64,591,882			\$63,453,098			\$61,617,558	
09/22/2019	\$136,199,907			\$136,722,952			\$136,173,932			\$135,476,416	
10/20/2019	\$36,925,819			\$39,003,810			\$38,880,020			\$38,772,881	
11/17/2019	\$35,510,610			\$38,127,954			\$37,771,893			\$41,596,077	
12/15/2019	\$34,386,506			\$36,773,413			\$36,611,984			\$36,688,827	
01/26/2020	\$52,434,407			\$58,510,798			\$58,660,726			\$58,657,267	
02/23/2020	\$39,815,264			\$44,049,753			\$42,258,610			\$42,257,290	

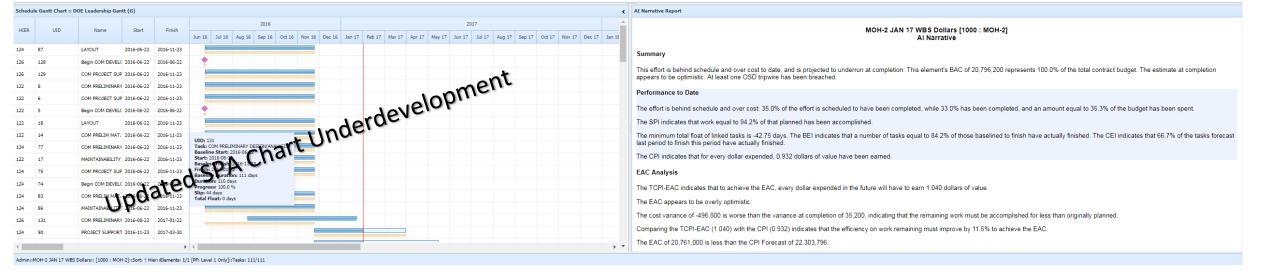
- For Empower allow users to get to data quickly
- DOE Dashboards initially planned under the KISS principle
 - Leadership
 - Data Validity
 - Schedule Health
 - Variance Analysis
 - Trend Analysis
 - Forecast
 - DOE PM EVMS Tests
- Considers all 317 current users.
- Balance of Empower Views, Charts, and Reports are available, except where they
 may not work in the PARS environment, i.e., WAD
- EVMS Project Analysis SOP will be updated to new tools.



Leadership Dashboard

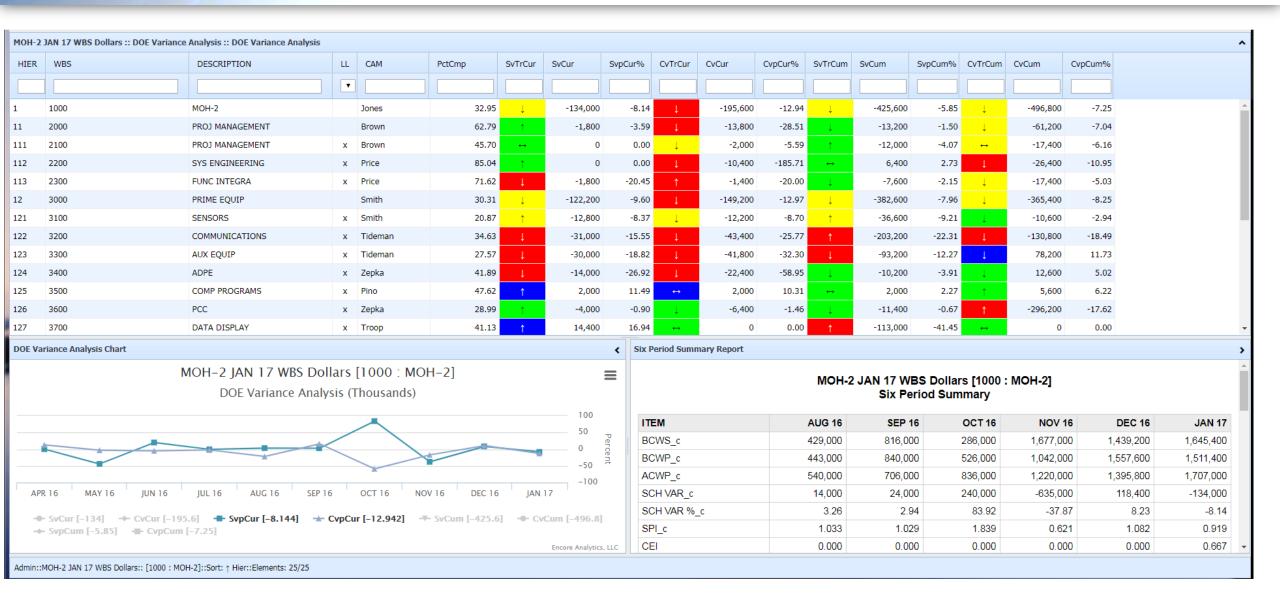
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	МОН-2	JAN 17 WBS Dollars :: DOE Leadersh	ip :: DOE Leadership												
	HIER	WBS	Description	DOE Program	Site	LL	Percent Complete	Variance at Completion	Baseline (Schedule) Execution Index	Variance Schedule	Variance Cost	Budget at Completion	Estimate at Completion	Variance at Completion	
DH-2 JAN 17 WBS Dollars :: IER WBS						•									
	1	1000	MOH-2	Mohawk Vehicle	Douglas		32.95	1	0.842	1	Ţ	20,796,200	20,761,000	35,200	
1000															





Variance Analysis Dashboard





EVMS Surveillance Test Report

GL.Attribute	Metric	Test	М	Value	Total	Percent	Goal	Note	
01.02	(11/2)	Number of incomplete BL activities where EVM WBS code does not match FC IMS WBS code		1,013	1,013	100.00%	0		
03.01		Number of incomplete WPs where linked activities physical % complete does not match physical % complete in EVMS		95	183	51.90%	<= 5%		
03.01	02	Number of incomplete CA/WP/PP where FC IMS start or finish do not align with EVMS ACWP/ETC		202	350	57.70%	0		
03.01	03	Number of incomplete discrete WP/PP/SLPP where FC IMS finish does not align with time-phased ETC in EVMS		117	240	48.80%	0		
03.01	(10)	Number of CA/WP/PP/SLPP having BL IMS WBS codes that do not match EVMS WBS code		349	349	100.00%	0	These are available	for all, but
05.01	01	Number of CAs with no responsible or more than one responsible OBS		2	59	3.40%	0	the primary users a	•
05.03	01	Number of CAs with no assigned or more than one assigned CAM		20	59	33.90%	0	subject to PM certif	ication
05.04	02	Number of CAs with greater than 7% L1 BAC and 10% L1 BCWS that exceed CV or SV thresholds in three consecutives periods		0	59	0.00%	0	and compliance over	
06.01	02	Number of incomplete discrete WP/PP/SLPPs from EVM system not represented in FC IMS		19	259	7.30%	0	enable their self-go	•
06.02	1 ()1	Number of activities with percent complete = 100 and no actual finish date in FC IMS		0	258	0.00%	0		
06.02	02	Number of activities identified as statused out of sequence in FC IMS		6	1,274	0.50%	0		
06.02		Number of activities missing actual start dates with physical percent complete > 0%		1	129	0.80%	0		
06.02	04a	Number of activities with actual start date different than prior report		0	386	0.00%	0		
06.02	04b	Number of activition Continues ferent than prior report		0	260	0.00%	0		
06.02	1 05	Number of incom represented in FC through to GL		0	1,013	0.00%	0		



EVMS Test Metric Specification Sheet

April/May 2019 NDIA IPMD

Department of Energy

Guide Line . Attribute . Metric 01 . 01 . 01

- 197 Tests
- Empower adding 106 automated or hybrid in Phase 1 (June 2019)

32 Guide Lines 82 Attributes 197 Tests

- Up to 70 more may be added in the future.
- Challenges include data collection and automation
- Spec sheet for each of the 197 tests to be attached to ECRSOP Appendix A https://community.max.gov/x/ao5tQw or https://bit.ly/2J42N9v

1. EIA-748 Guideline	2. Metric ID	3. Method	4. Frequency
01	01.01.01	automated/manual	initially & following implementation of customer changes
5. Attribute			
1. Is the product-oriented W	BS used for a given proje	ct extended to the control account	level as a minimum?
6. Test Description			
authorization, tracking, and	reporting purposes. The te BS. All elements of the Wi	BS should be defined in an accomp	akdown of work scope for work erables listed in the PEP (and other panying WBS Dictionary. Reference is
7. Test Metric			
groupings of project scope of PEP (and other scope docu	elements in the WBS diction ments)? Does the WBS di ents of work to be accomp	onary to organize and subdivide the ctionary define the products to be	the WBS. Is there product-oriented total work scope as defined in the developed or produced? Does the Il end product? Please reference the
8a. Max. Threshold(s)	8b. Max. Tolerance	8c. CRI Weighing	9a. CSV Tab/Other
0			
9b. Empower Optimized F	ormat		
10. Artifacts and Data Eler	ments Required		
Y artifact(s) FF01_{WBS} FF data elements		l ments, e.g., contract, PEP, design report,	
FF01_{WBS}_[C]_WBS FF01_{WBS}_[D]_title FF01_{WBS}_[J]_WBS_nar	rative		
11. NDIA Reference(s)			
	ing, and reporting purpose	oriented division of project tasks de es that facilitates traceability and pr	epicting the breakdown of work scope rovides a control framework for
12. Assumptions			
13. Instructions			
Determine Y items based or Count FF01_{WBS}_[C]_WI • FF01_{WBS}_[D]_title FF01_{WBS}_[J]_WBS_n	BS items and, if identified, sting>	with the following characteristics.	
Determine X items, a subse Manually count flagged item • Verify WBS is product orie	s based on the following o		/BS}_[J]_WBS_narrative.
Determine if X or X/Y excee	ds the metric threshold(s)		
14. Numerator Code			
AF Deceminates Code			
15. Denominator Code			

2019-03-14 Metric ID: 01.01.01 page 1 of 368

- New Extractor designed for Projects using COBRA and Primavera P6
- Old extractor remains an options for those not using COBRA
- Cost data provided to the WP level
- Other tools providing CSV for PARS
 - Cloud EVM
 - ForProject
 - Others welcome
- Required format to take advantage of EVMS Metric tests for self-surveillance



U.S. Department of Energy

Office of Project Management (PM-30)

PARS Extractor V2.0.25
Help/User Manual

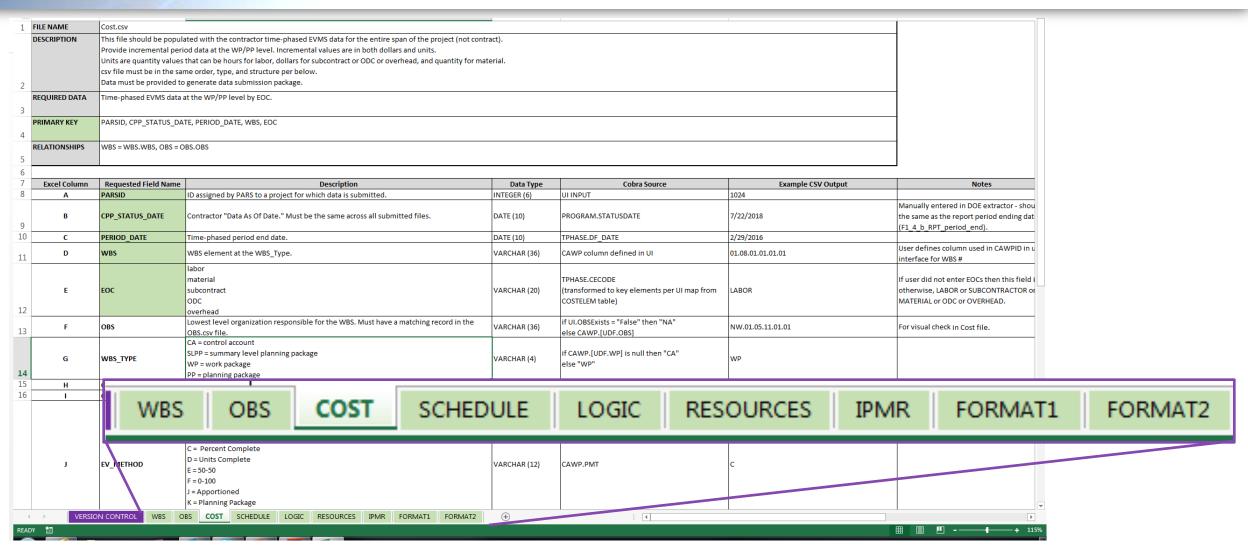
January 26, 2019

Submitted by



CSV Format – ECRSOP Appendix F

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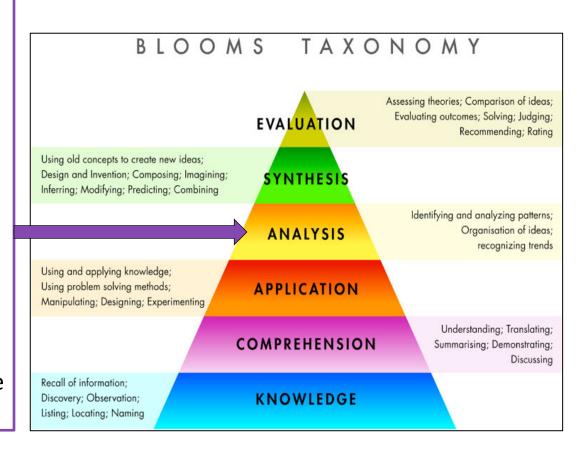


PARS User Training Objectives April to September 2019

- Understand the basic organization and operations of the PARS.
- Understand the document management system of PARS
- Understand user roles in PARS
- Understand EA Empower as part of PARS
 - How to get in
 - Layout, tool bar, and status bar
 - Exporting from Empower
- Use Empower views, charts, reports and dashboards to analyze a project
- Use Empower Filters and pre-filters to organize data for analysis
- Use advanced capabilities of Empower to analyze multiple projects
- Use DOE dashboards to quickly analyze and get to information
- Use DOE EVMS Metrics Tests in Empower for self-surveillance and compliance testing

AT COMPLETION - EARN 8 CEU/PDUS

- Federal Employees Will be added to CHRIS
- Contractor Employees Certificate will be emailed





Questions or Comments



BACK UP



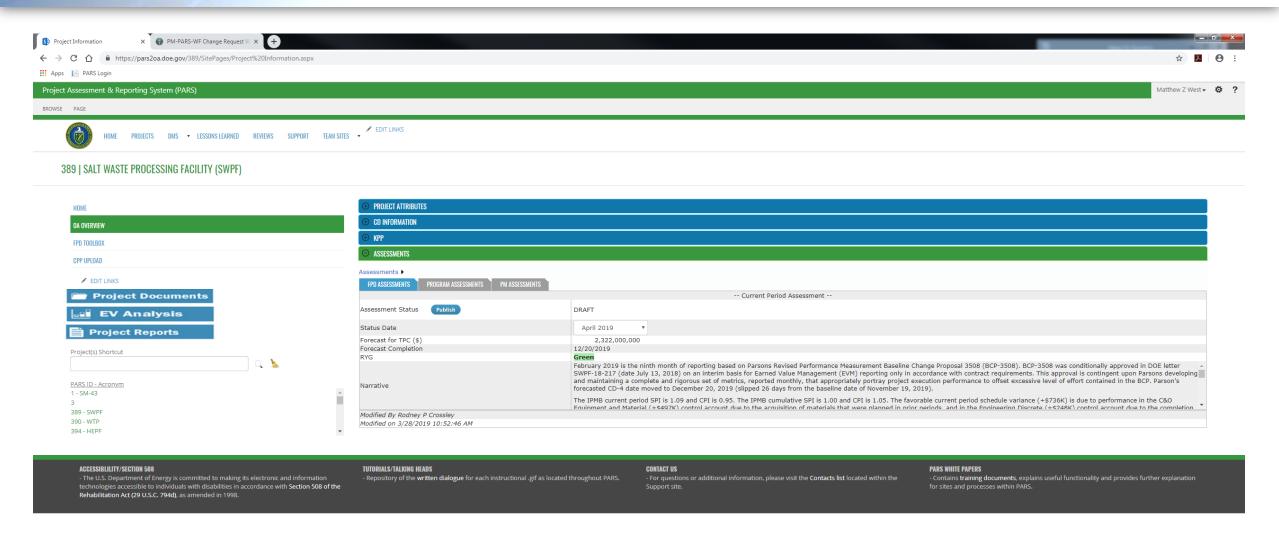
156 of the 317 or 49% of users to participate and comment.

Question	CIO	EM	FE	NA	NE	PM	SC	Grand Total
1. What do you like about PARS now (that we should not lose)?	1	3		2	1	3	4	14
2. What frustrates you about PARS (that we can try to address)?		2	3	1	1	3	5	15
3. What are the top 10 reports that you use?		5	1	1			5	12
4. What reports are not available now that would help you?	4	9	1	2		1	3	20
5. How do you use PARS to help assess projects?	3	3	7		1		2	16
6. How do you think DOE uses PARS to inform Senior Leaders?			1					1
7. What do you like about Empower?		1	1	2				4
8. What concerns do you have about the transition to Empower?	1	2	2	3		1	2	11
9. What more would you like PARS to have (functions, data, etc.)?		3		1	2	1	3	10
Grand Total	9	28	16	12	5	9	24	103



Project Assessments – FPD / Program /

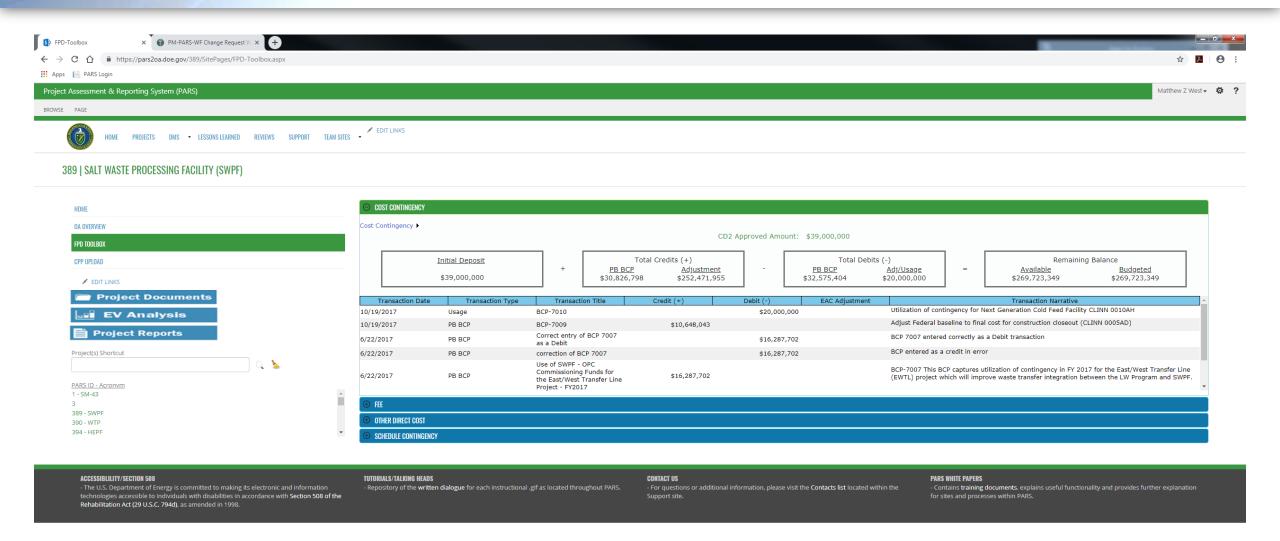
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Project FPD Toolbox (Checkbooks)

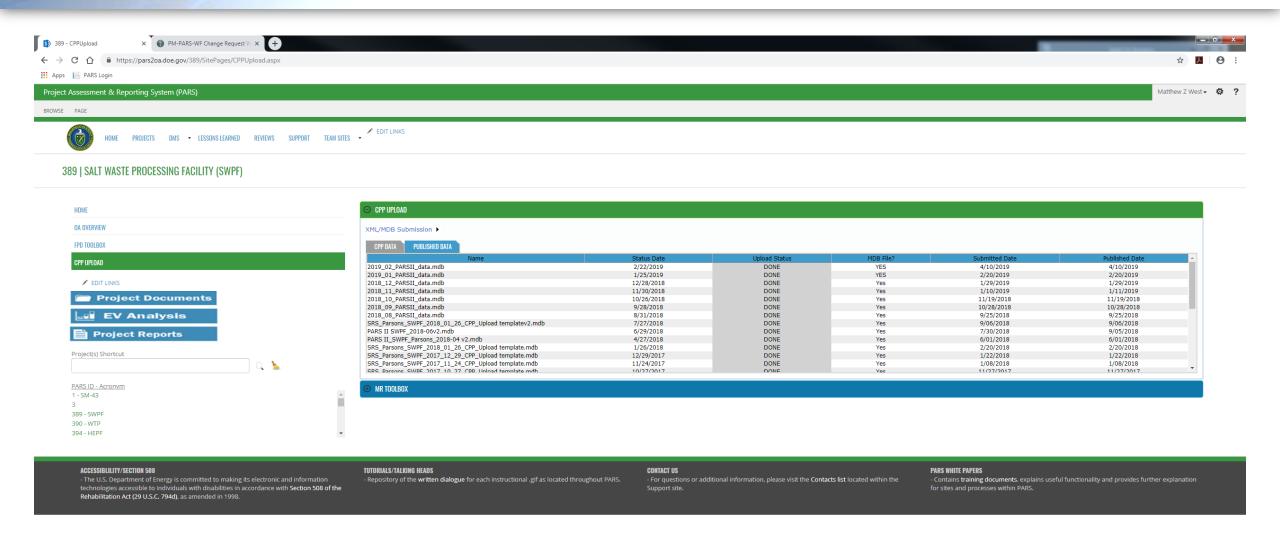
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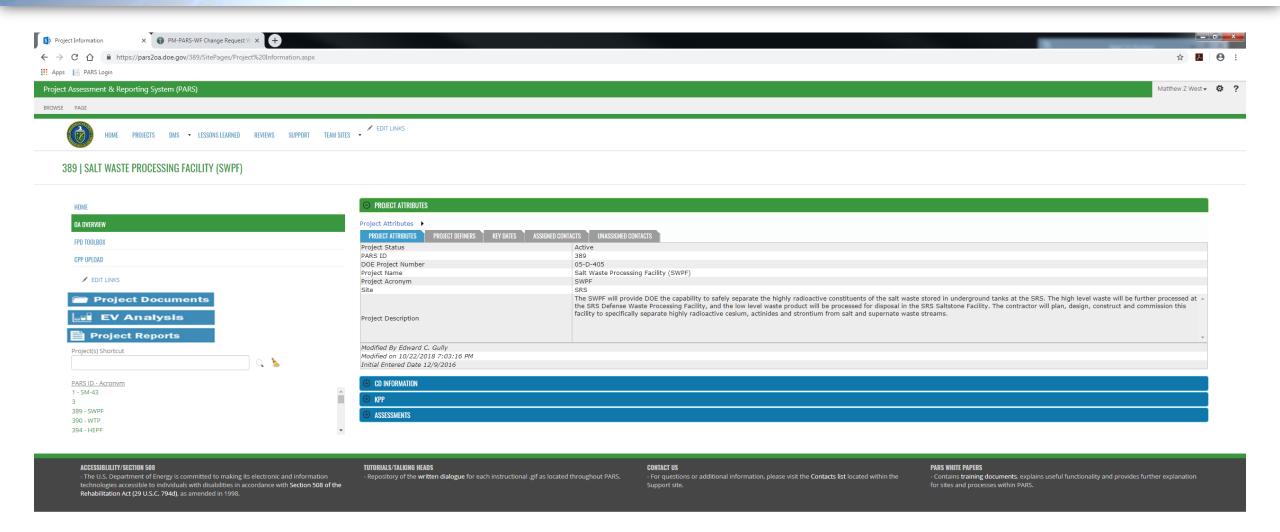


Contractor Project Performance (CPP) Upload



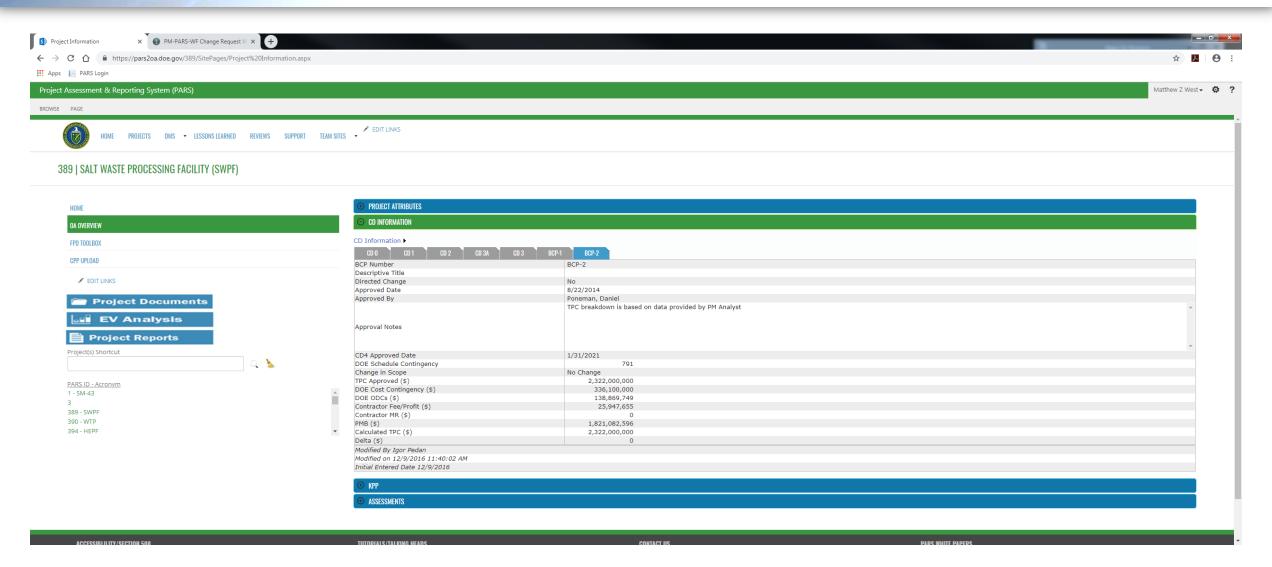


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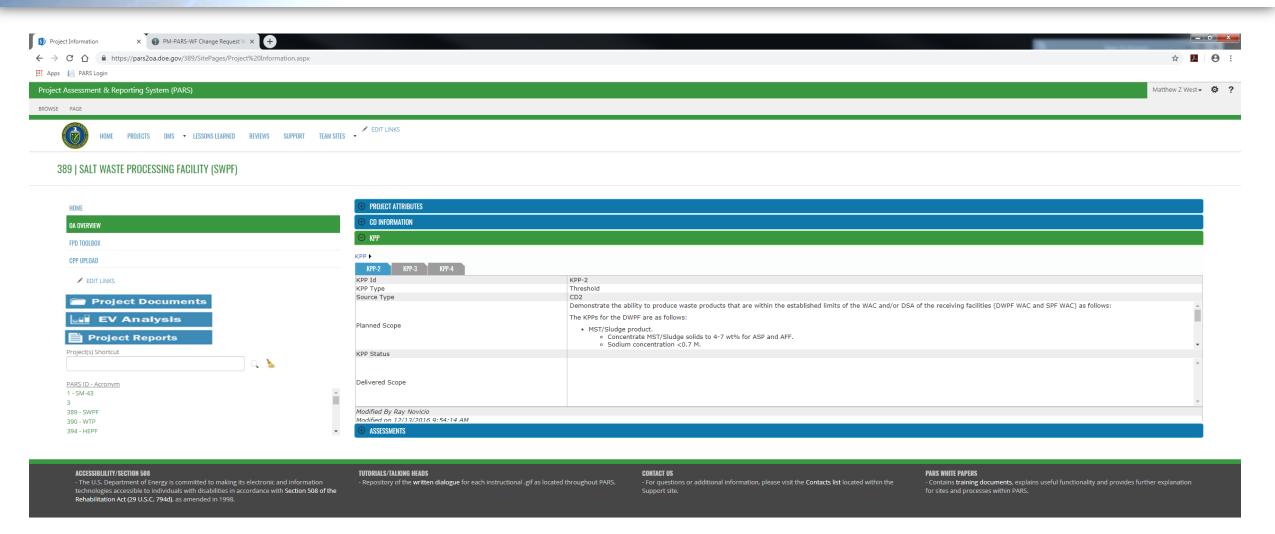
Project Critical Decision (Phase Gates) Department of Energy





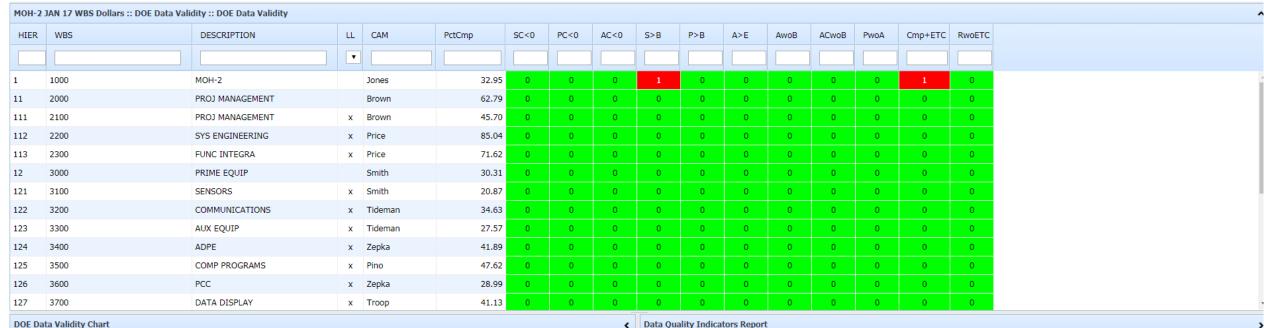
Project Key Performance Parameters

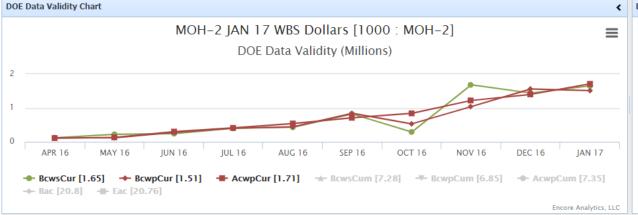
April/May 2019 NDIA IPMD Department of Energy



Data Validity Dashboard

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MOH-2 JAN 17 WBS Dollars [1000 : MOH-2] Data Quality Indicators Report

Ref: DCMA-EA PAM 200.1, EVMS Program Analysis Pamphlet (PAP), Mar 2016
Planning & Scheduling Excellence Guide (PASEG), June 2012
DCMA EVMS Testing Protocols (DETP) 3.0

WARNING		
BCWS CUM > BAC	Е	PAP, 5.1
LOE with CUM SV	Ε	PAP, 5.7
LOE with CUR SV	Е	PAP, 5.7
Completed work with ETC	Е	PAP, 5.9

Admin::MOH-2 JAN 17 WBS Dollars:: [1000 : MOH-2]::Sort: ↑ Hier::Elements: 25/25



Schedule Health Dashboard

April/May 2019 NDIA IPMD Department of Energy





Linked Complete Incomplete Planned Actual Relationship Incomplete Tasks Tasks Completions Count Tasks Discrete Tasks Completions 27 84 75 111 19 16 124

Metric	Description	Goal	Percent	Count
Missing Task Links	Number of tasks not linked to cost elements in the current structure	0 %	0.00 %	0 / 111
Invalid Task Links	Number of tasks linked to an invalid cost element in the current structure	0 %	0.00 %	0 / 111
Pacolino Execution Index	Porformanco rolativo to bacolino	> 0E 0/₁	0// 2/1 0/-	16 / 10

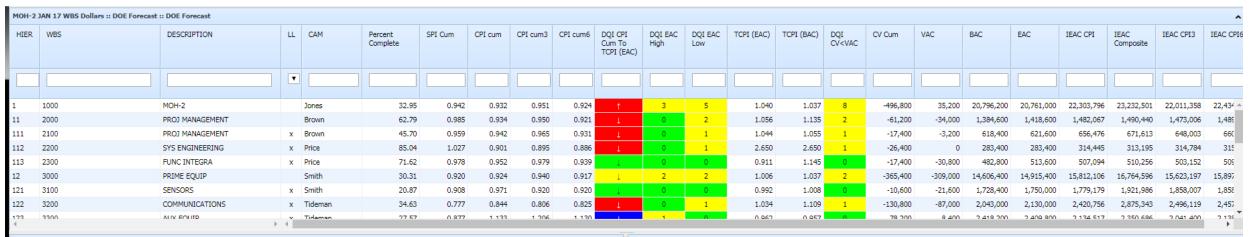
Admin::MOH-2 JAN 17 WBS Dollars:: [1000 : MOH-2]::Sort:

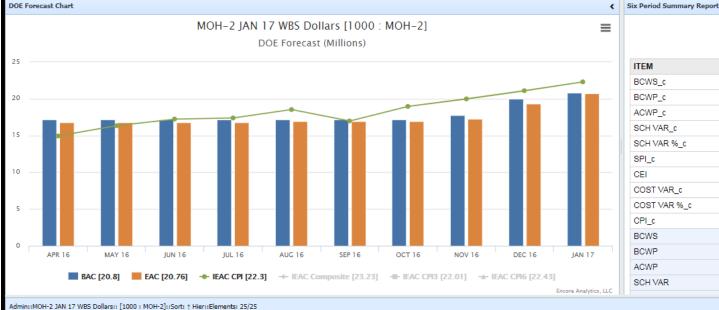
Hier::Elements: 25/25



Forecast Dashboard

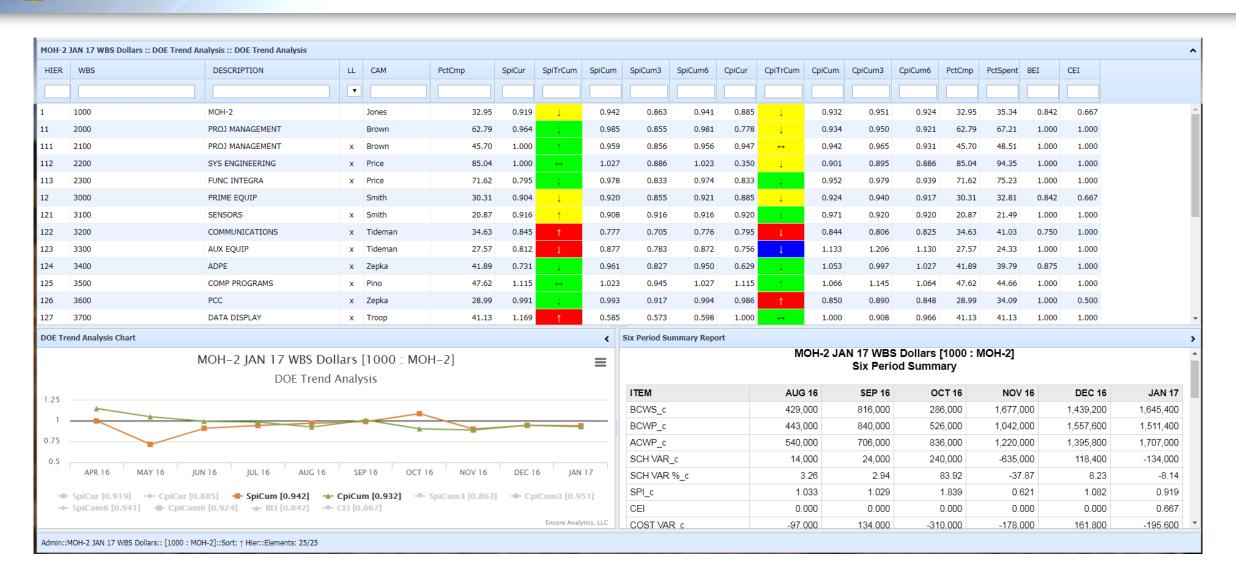
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	MOH-2 JAN 17 WBS Dollars [1000 : MOH-2] Six Period Summary												
ITEM	AUG 16	SEP 16	OCT 16	NOV 16	DEC 16	JAN 17							
BCWS_c	429,000	816,000	286,000	1,677,000	1,439,200	1,645,400							
BCWP_c	443,000	840,000	526,000	1,042,000	1,557,600	1,511,400							
ACWP_c	540,000	706,000	836,000	1,220,000	1,395,800	1,707,000							
SCH VAR_c	14,000	24,000	240,000	-635,000	118,400	-134,000							
SCH VAR %_c	3.26	2.94	83.92	-37.87	8.23	-8.14							
SPI_c	1.033	1.029	1.839	0.621	1.082	0.919							
CEI	0.000	0.000	0.000	0.000	0.000	0.667							
COST VAR_c	-97,000	134,000	-310,000	-178,000	161,800	-195,600							
COST VAR %_c	-21.90	15.95	-58.94	-17.08	10.39	-12.94							
CPI_c	0.820	1.190	0.629	0.854	1.116	0.885							
BCWS	1,415,000	2,231,000	2,517,000	4,194,000	5,633,200	7,278,600							
BCWP	1,376,000	2,216,000	2,742,000	3,784,000	5,341,600	6,853,000							
ACWP	1,485,000	2,191,000	3,027,000	4,247,000	5,642,800	7,349,800							
SCH VAR	-39,000	-15,000	225,000	-410,000	-291,600	-425,600							

April/May 2019 NDIA IPMD Department of Energy



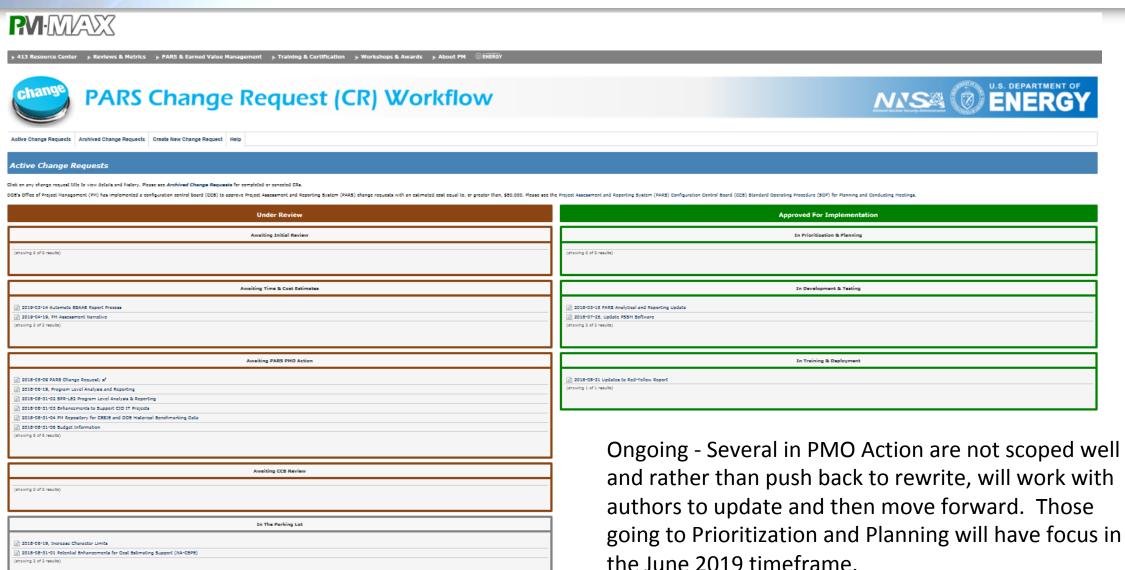
State	Active Users	%	Active Projects	%
CA	17	5%	14	16%
СО	2	1%	0	0%
HQ	130	42%	0	0%
ID	13	4%	2	2%
IL	16	5%	7	8%
LA	4	1%	1	1%
NJ	3	1%	0	0%
NM	15	5%	13	14%
NY	10	3%	7	8%
NV	7	2%	3	3%
OH	9	3%	2	2%
SC	16	5%	9	10%
TN	42	14%	19	21%
TX	2	1%	2	2%
VA	4	1%	1	1%
WA	20	6%	8	9%
WV	1	0%	0	0%
TBD			2	2%
Total	311	100%	90	100%

- Course are in CHRIS and locations are below.
- Targets primary locations of users
- 26 April Washington DC FORS Confirmed
 - CHRIS CODE 003077/0028
 - FORS Room 4A-104 8:00 AM to 5:00 PM
- 13 to 17 May One Event Richland on May 16th Aligns with EFCOG) Confirmed
- 21 May Aiken, SC (SRS) Confirmed
- 23 May Oak Ridge, TN (Y-12, ORNL) Confirmed
- 10 June Albuquerque, NM (24/311 NM, TX, NV) Confirmed
- 13 June Chicago, IL Confirmed (potential for VTC with other)
- 17 and 18 July Washington D.C. Confirmed
- 5-8 August Online course 2.25 hours X 4 days (1:00 to 3:15 pm EDT each day) - Confirmed
- 16-19 September Online course 2.25 hours X 4 days (9:45 to 12:00 EDT each day) - Confirmed
- November forward Deskside delivery 8 X 1 hour blocks



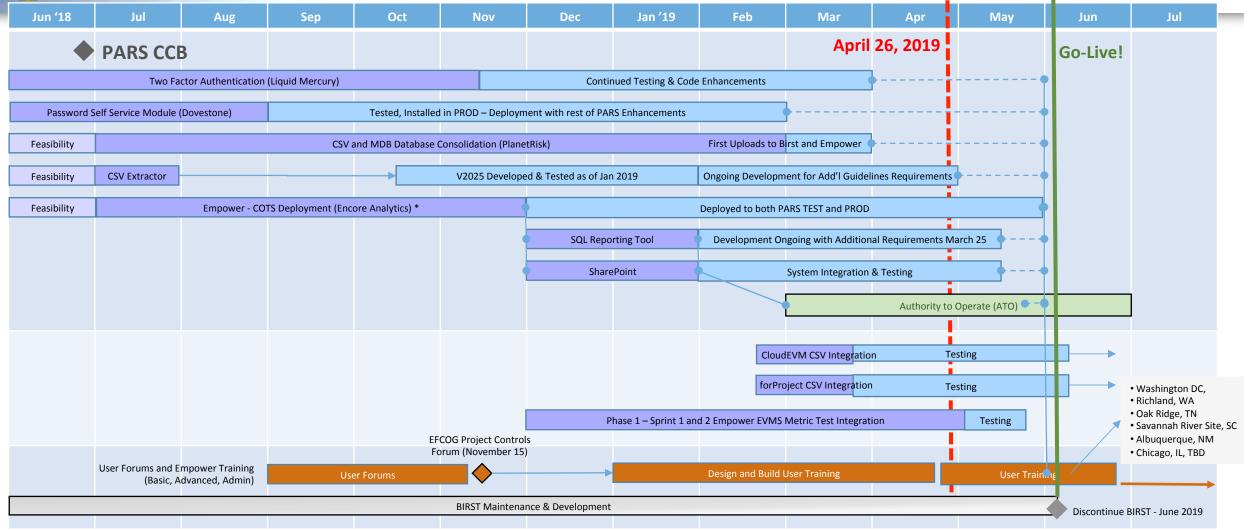
PARS Change Requests (as of April 24, 2019)

April/May 2019 NDIA IPMD Department of Energy





PARS Updated Top Level Schedule Department of Energy



^{*} Optimized CSV format.