Advancing the State of EVMS

Earned Value Management System Overview and Panel

NDIA Integrated Program Management Division Meeting

March 13, 2024

Introduction - Panelists

Andrea Gilstrap, Moderator
Idaho National Laboratory
Manager, Project Management Policy & Assurance

Amber Young
DOE Office of Project Management
Project Controls and Policy Division (PM-30)

Doug Marbourg
Los Alamos National Laboratory
TRIAD Capital Projects EVMS Program Director

Brian Kong
DOE Office of Project Management
Project Controls and Policy Division (PM-30)

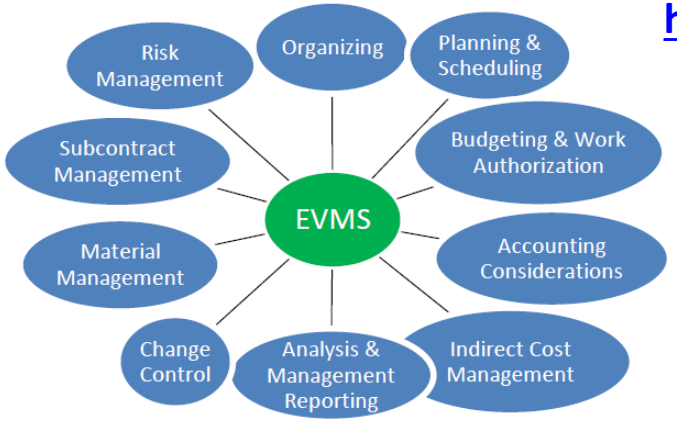
Greg Smith
Humphreys & Associates / WRPS
Vice President – Consulting Services

Kevin Carney
DOE Office of Project Management
Project Controls and Policy Division (PM-30)

Introduction - Topics

- Applying Integrated Project/Program Management Maturity and Environment Total Risk Rating (IP2M METRR)
- EVMS Self-Governance - “The Secret Sauce”
- Base Work Construct (BWC)

Quick Overview - IP2M METRR



https://ip2m.engineering.asu.edu

Maturity: 10 Sub-Processes, 56 Attributes (derived from 32 EVMS GLs) multiplied by their assessed score (1-5) weighted for their relative importance

- Each attribute has a relative weight associated with it;
- All maturity attribute scores roll up to a 1000-point scale (higher is better);.
- The score quantifies the overall level of EVMS maturity for the project/program being assessed.

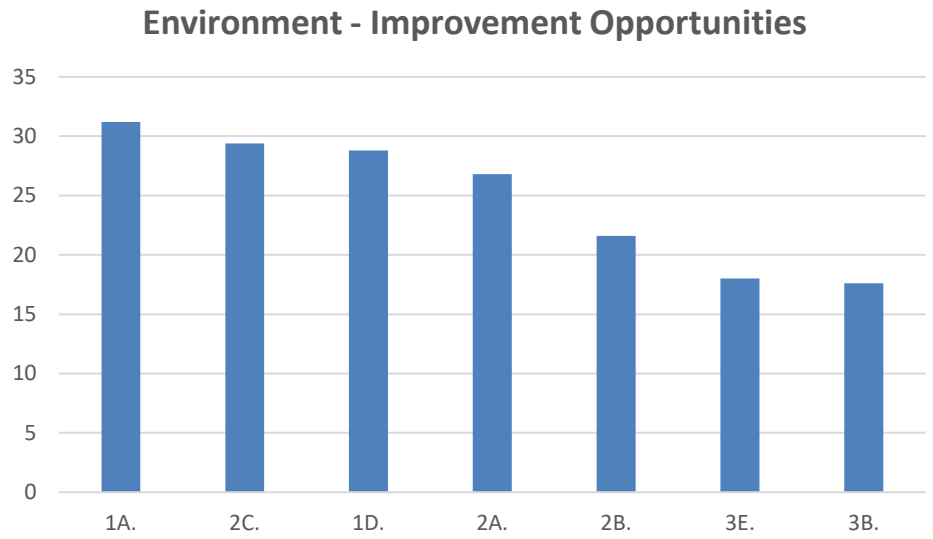
'traditional' EVMS compliance – but not performed/assessed in a 'traditional' way

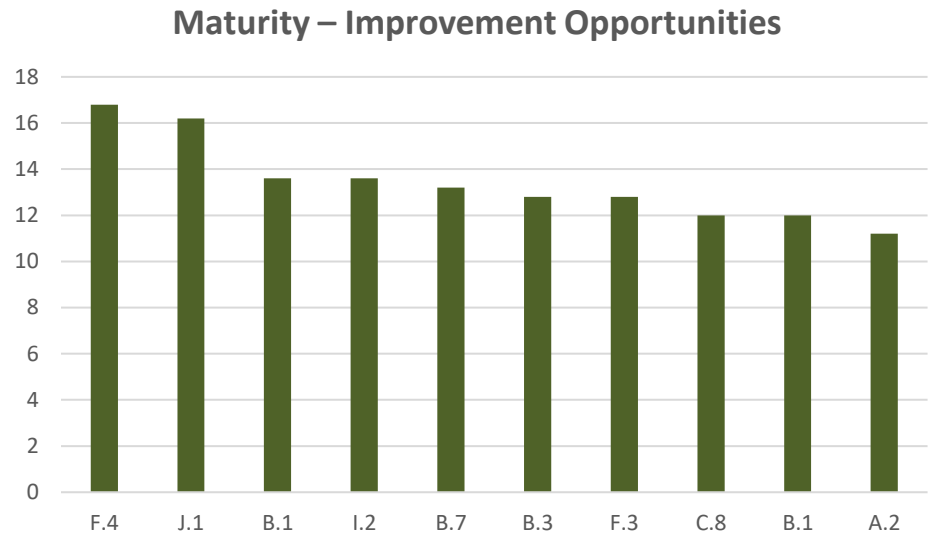
Environment: 4 Categories, 27 Factors (derived from various IPM sources) multiplied by their assessed score (5 values from 'Not Acceptable' to 'High Performing') weighted for their relative importance

- Each factor has a relative weight associated with it for all rating levels;
- All environment factor scores roll up to a 1000-point scale (higher is better);.
- The score quantifies the overall level of the project/program environment for the project/program being assessed.

'NON-TRADITIONAL' IPM assessment – this is a NEW/"AH HAH!" process

Summary of Improvement Opportunities (example)





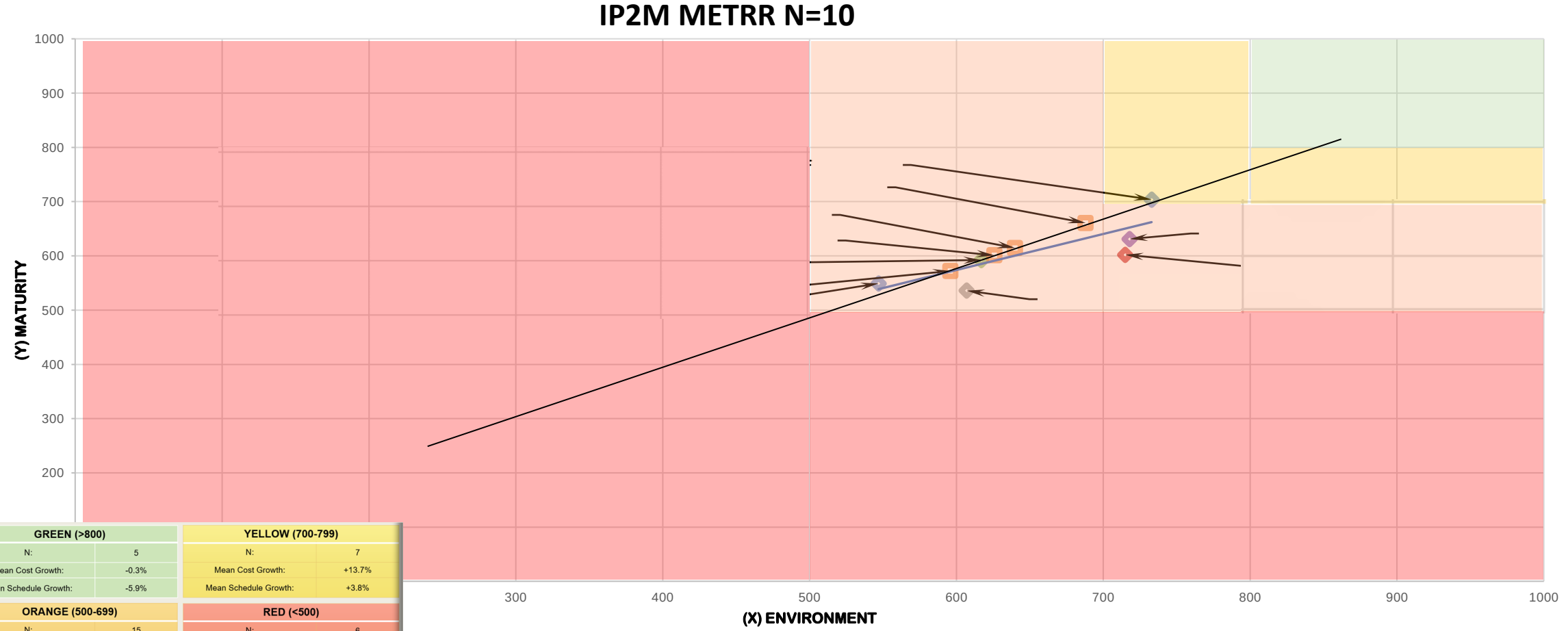
Environment

- 25% of environment factors contribute 55% of difference to get to High Performing score

Maturity

- 18% of maturity attributes contribute 38% of difference to get to Best in Class

Various DOE Projects – IP2M METRR Scores



GREEN (>800)	
N:	5
Mean Cost Growth:	-0.3%
Mean Schedule Growth:	-5.9%

YELLOW (700-799)	
N:	7
Mean Cost Growth:	+13.7%
Mean Schedule Growth:	+3.8%

ORANGE (500-699)	
N:	15
Mean Cost Growth:	+48.2%
Mean Schedule Growth:	+26.9%

RED (<500)	
N:	6
Mean Cost Growth:	+92.3%
Mean Schedule Growth:	+24.3%

U.S. Department of Energy

IP2M METRR
Environment Assessment
Case Study

Savannah River Operations Office (SROO)
Savannah River Mission Completion (SRMC)

DOE Complex – Savannah River Site (SRS)
FY2023 Budget: $48 billion

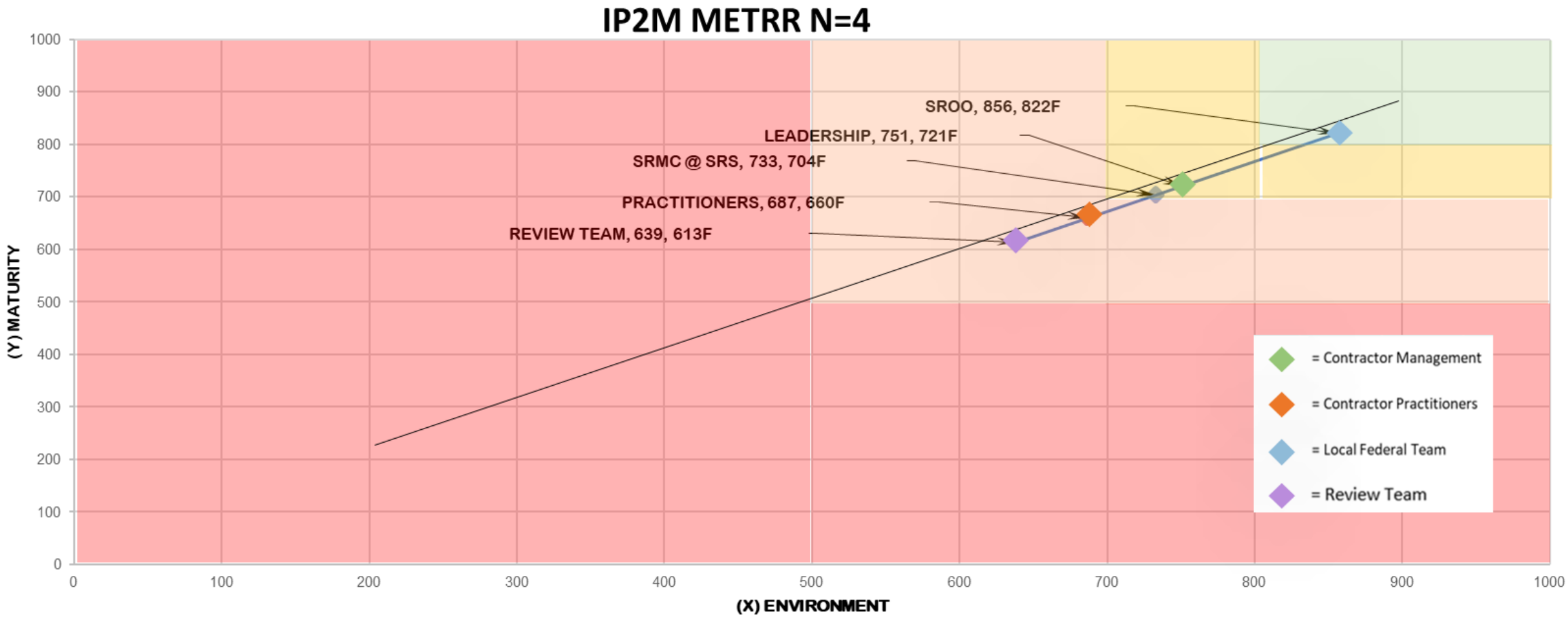
Savannah River Site (SRS):

- Funds the safe stabilization, treatment, and disposition of legacy nuclear materials, spent nuclear fuel, and waste at the Savannah River site

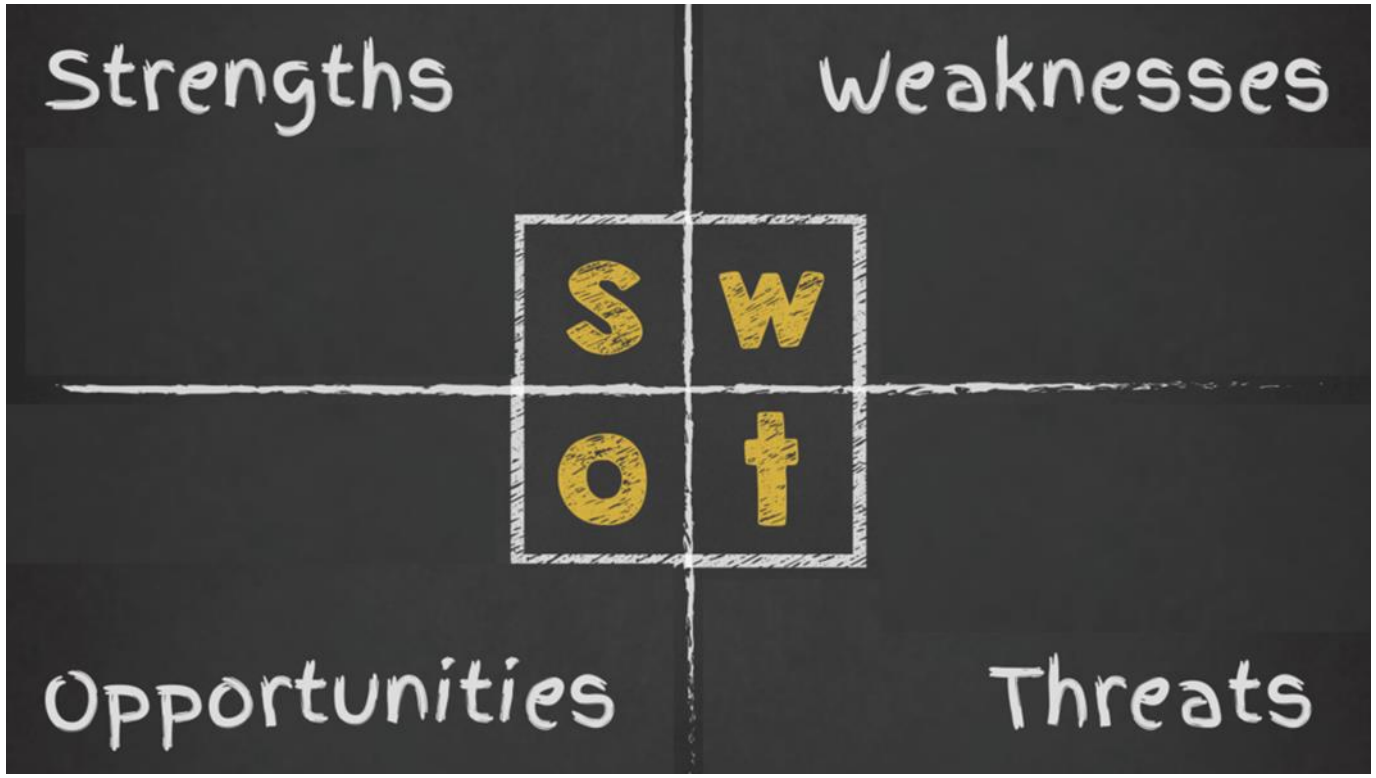
SRS SRMC SDU Project Background

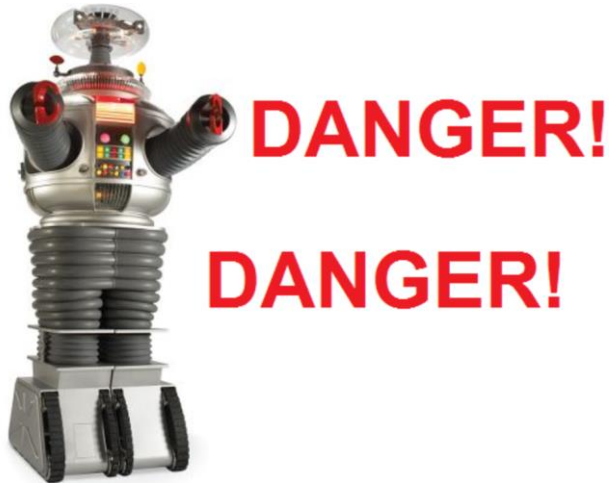
- The Savannah River Site (SRS), built in 1955 for the U.S. Atomic Energy Commission (precursor to DOE), had its origins in the early years of the Cold War as a facility to produce plutonium and tritium, materials essential to the nation's nuclear arsenal.
- The liquid waste contractor at SRS, Savannah River Mission Completion (SRMC), manages the construction and operation of the Saltstone Disposal Units (aka, SDUs)
- SDUs are the end of the salt waste processing path:
- The Salt Waste Processing Facility (SWPF) produces decontaminated material that is sent to the Saltstone Production Facility (SPF), where it is mixed with dry materials to make a cement-like grout
- Six mega-size SDUs can hold up to 33m gallons of Saltstone

SRMC IP2M METRR Scores



SRMC Environment Assessment – SWOT Analysis





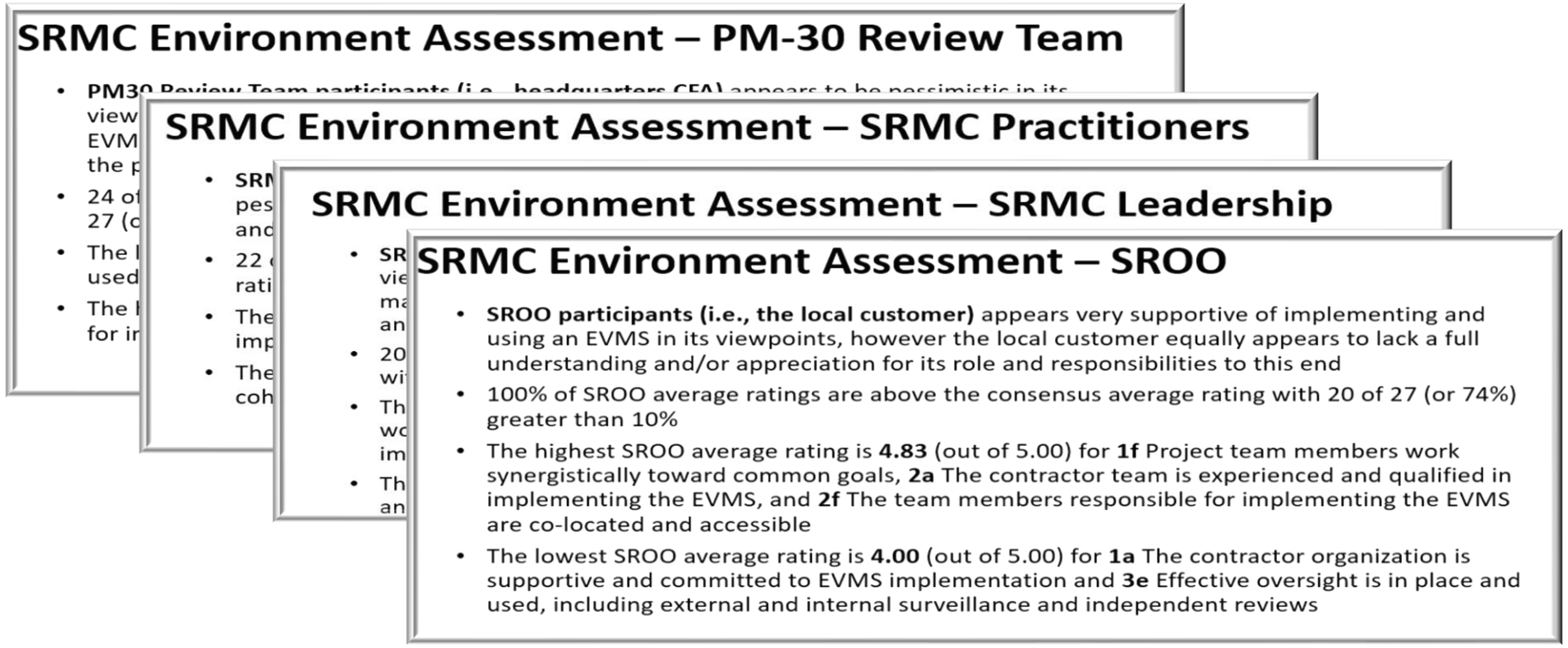
Disclaimer -To augment IP2M METRR generated data and information, analysis and interpretation has been assisted by Artificial Intelligence (AI)

SRMC Environment Assessment - Results

- **Conducted May 23 – 25, 2023 @ SRS**
- **44 people participated in three separate, three – hour facilitated sessions**
- **1,188 ratings and 987 comments for an 83% response rate identifying participants' beliefs, attitudes, and behaviors towards project environments @ SRS**
- **Sessions were conducted in person using the IP2M METRR model (online) with the understanding that ratings and comments would not be attributable to any one individual**
- **Artificial intelligence (AI) was utilized to assist in generating sentiment, behavior, and SWOT analyses**
- **Participant Groups:**
  - Leadership 11, 25%
  - Practitioners 17, 38%
  - SROO – Local Customer 6, 14%
  - PM30 Review Team 10, 23%

Analysis of Environment Scores

Analysis is performed on comments/scoring from different perspectives:

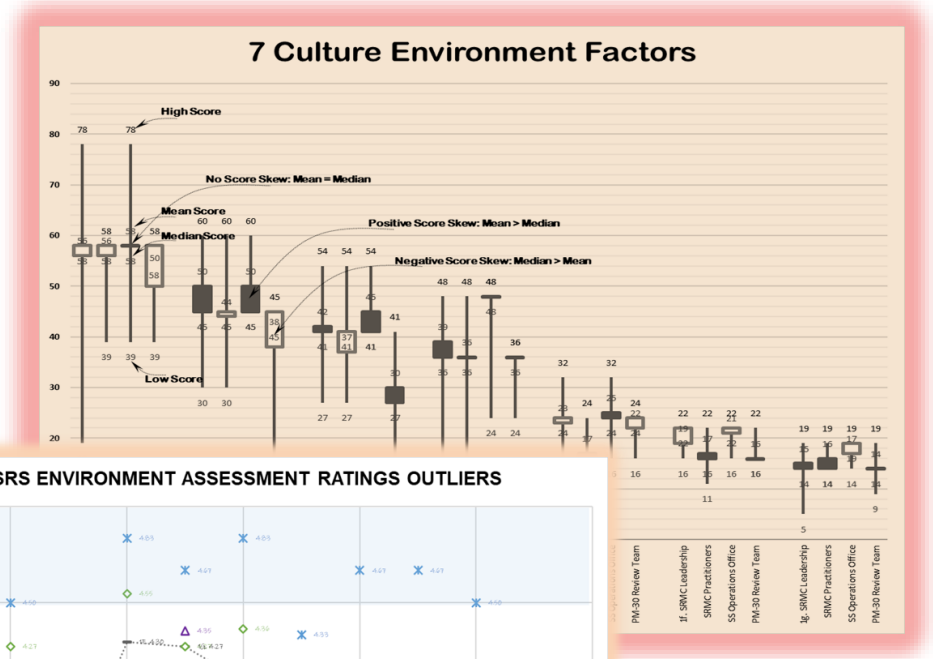


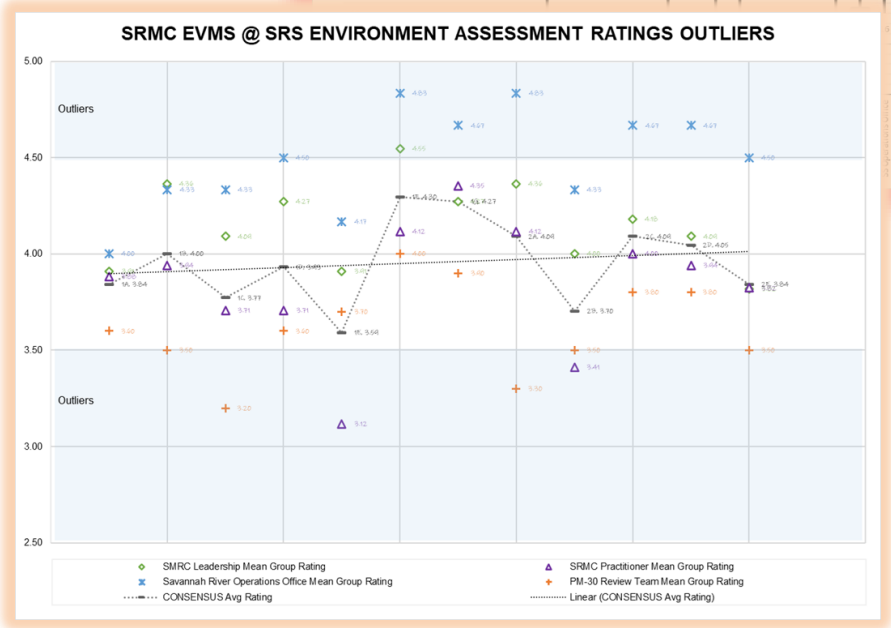
Focus on factors with wide differentiation between different participant groups, or significantly high/low scores (outliers)

Deep Dive Process – Factor 1c SWOT Analysis

Deep Dive Discussion – 1c

The customer organization is supportive and committed to the implementation and use of an EVMS





- **Below Consensus**
  - A sentiment analysis of the 14 **PM30 Review Team and SRMC Practitioner** comments for Factor 1c is separated into 32 parts
  - Despite having low average ratings for Factor 1c, many comment parts (12 com sen
  - The 1c a ★★★ custo ★★★ ★★★ the pa to the budge

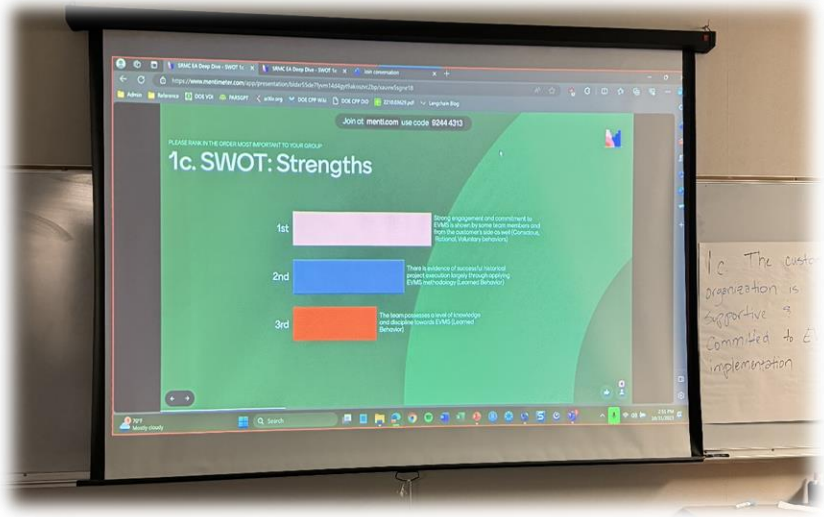
- **At or Above Consensus**
  - A sentiment analysis of the 17 **SROO and SRMC Leadership** comments for Factor 1c is separated into 26 parts
  - Most comment parts (21 of 26, or 81%) reflect a positive sentiment; 4 comment parts (or 15%) reflect a negative sentiment; and only 1 comment part reflects a neutral sentiment
  - This sentiment appears to align with the SROO and SRMC Leadership ratings of 4.33 and 4.09, respectively

★★★★★ "My rating is based on my experience working with this contractor for the past 8 years on the successful completion of SDU6 and SDU7 projects as well as the current success of SDU8/9 and SDU10-12 projects. The customer organization utilizes EVMS data to evaluate and manage the project effectively."

★★★★★ "The Customer is extremely engaged and openly encourages effective performance reporting. They are extremely aware of the EVMS performance data, what it is telling them, and why it is important, and are committed to the success of the SRMC projects."

Factor 1c SWOT Analysis – (S)trengths

- **What does the local customer do best?**
- **What unique knowledge, talent, or resources does the local customer have?**
- **What advantages does the local customer have?**
  - Strong engagement and commitment to EVMS is shown by some team members and from the customer's side as well (Conscious, Rational, Voluntary)
  - The team possesses a level of knowledge and discipline towards EVMS (Learned)
  - There is evidence of successful historical project execution largely through applying EVMS methodology (Learned)



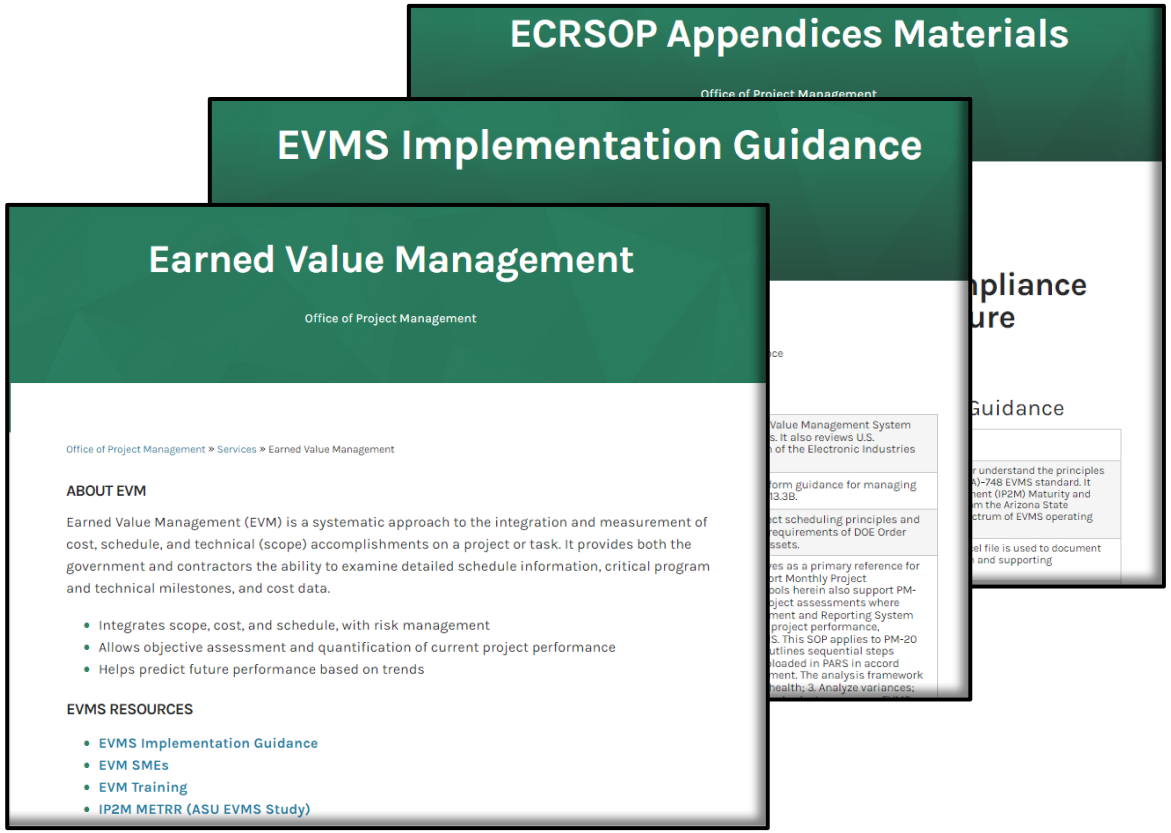
Factor 1c – Actionable Recommendations

- Enhance collaboration and knowledge sharing between the team members and customer with regards to training and usage of the EVMS
- Enforce periodical refresher training for all stakeholders involved on the importance of compliance to EVMS procedure and requirements, designed to reduce the existing inconsistencies in approach
- Identify and address any areas of complacency in the team by reinforcing the relevance of EVMS in maintaining historical project success rates
- Conduct regular checks to ensure that the convenience of operation is not being prioritized over the integrity of the EVMS protocols

Questions / Answers

Answers:

DOE EVMS Reference page



https://www.energy.gov/projectmanagement/earned-value-management

Applying IP2M METRR - Questions/Discussion

- How do you use the results of the Environment Assessment to drive improvement?
- How can we improve culture, people, practices, and resources?

EVMS Self-Governance - The Secret Sauce

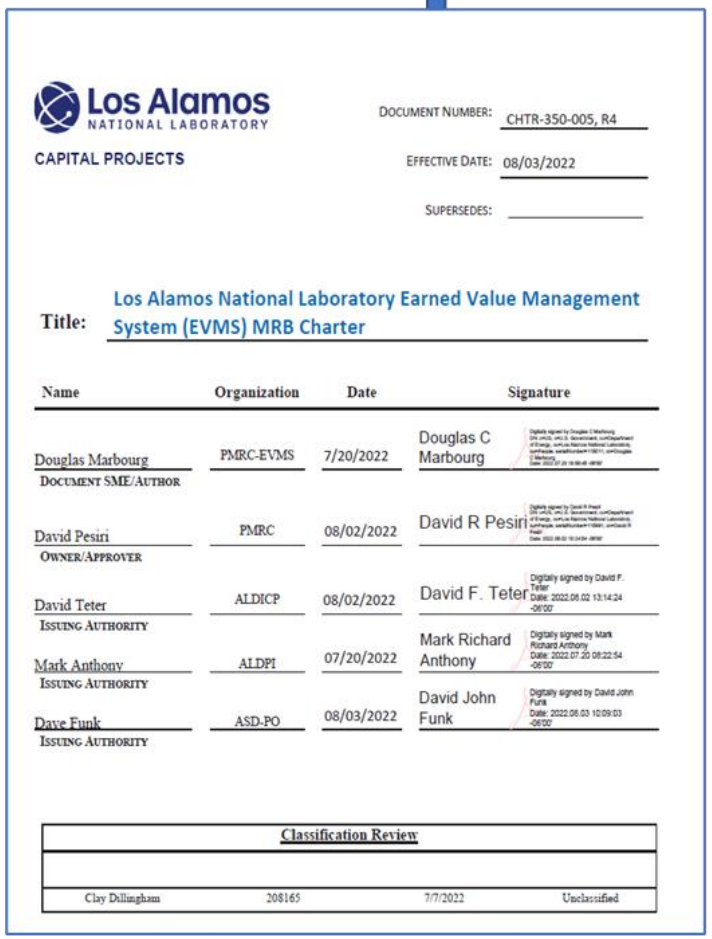
- **Key Tenants:**
  - **–Enable management to TRUST THE DATA**
  - **–Enhance customer and client trust (Speed of Trust*):**
    - Core 1, Integrity
    - Core 2, Intent
    - Core 3, Capabilities
    - Core 4, Results
  - **–Must be cost effective (ROI)**
    - **Ease of use**

Speed of Trust: Steven Covey 2024

Trust

- **Communication is Key!**
  - –Expectations *and* requirements must be agreed upon
- **Governance processes ensure accurate, timely and repeatable results**
  - –Accuracy of data paramount to trust

Communication – Key to Trust and Action



Los Alamos NATIONAL LABORATORY

CAPITAL PROJECTS

DOCUMENT NUMBER: CHTR-350-005, R4

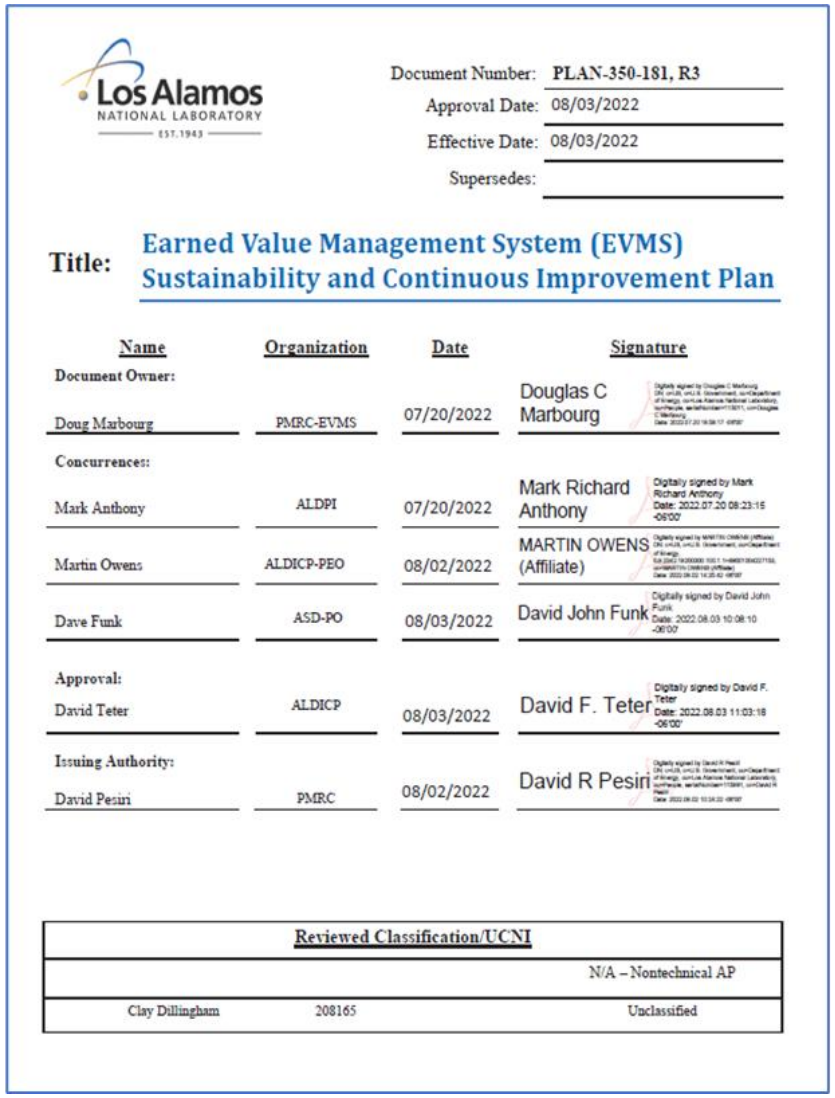
EFFECTIVE DATE: 08/03/2022

SUPERSEDES:

Title: Los Alamos National Laboratory Earned Value Management System (EVMS) MRB Charter

Name	Organization	Date	Signature
Douglas Marbourg DOCUMENT SME/AUTHOR	PMRC-EVMS	7/20/2022	Douglas C Marbourg
David Pesiri OWNER/APPROVER	PMRC	08/02/2022	David R Pesiri
David Teter ISSUING AUTHORITY	ALDICP	08/02/2022	David F. Teter
Mark Anthony ISSUING AUTHORITY	ALDPI	07/20/2022	Mark Richard Anthony
Dave Funk ISSUING AUTHORITY	ASD-PO	08/03/2022	David John Funk

Classification Review			
Clay Dillingham	208165	7/7/2022	Unclassified



Los Alamos NATIONAL LABORATORY EST. 1943

Document Number: PLAN-350-181, R3

Approval Date: 08/03/2022

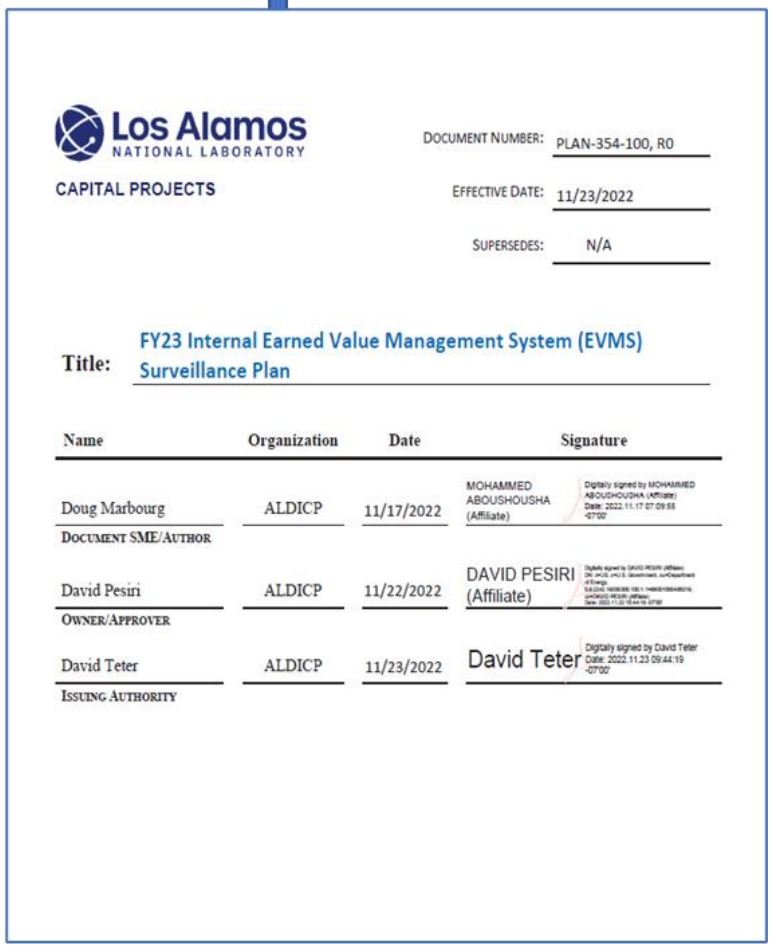
Effective Date: 08/03/2022

Supersedes:

Title: Earned Value Management System (EVMS) Sustainability and Continuous Improvement Plan

Name	Organization	Date	Signature
Document Owner:			
Doug Marbourg	PMRC-EVMS	07/20/2022	Douglas C Marbourg
Concurrences:			
Mark Anthony	ALDPI	07/20/2022	Mark Richard Anthony
Martin Owens	ALDICP-PEO	08/02/2022	MARTIN OWENS (Affiliate)
Dave Funk	ASD-PO	08/03/2022	David John Funk
Approval:			
David Teter	ALDICP	08/03/2022	David F. Teter
Issuing Authority:			
David Pesiri	PMRC	08/02/2022	David R Pesiri

Reviewed Classification/UCNI		
		N/A – Nontechnical AP
Clay Dillingham	208165	Unclassified



Los Alamos NATIONAL LABORATORY

CAPITAL PROJECTS

DOCUMENT NUMBER: PLAN-354-100, R0

EFFECTIVE DATE: 11/23/2022

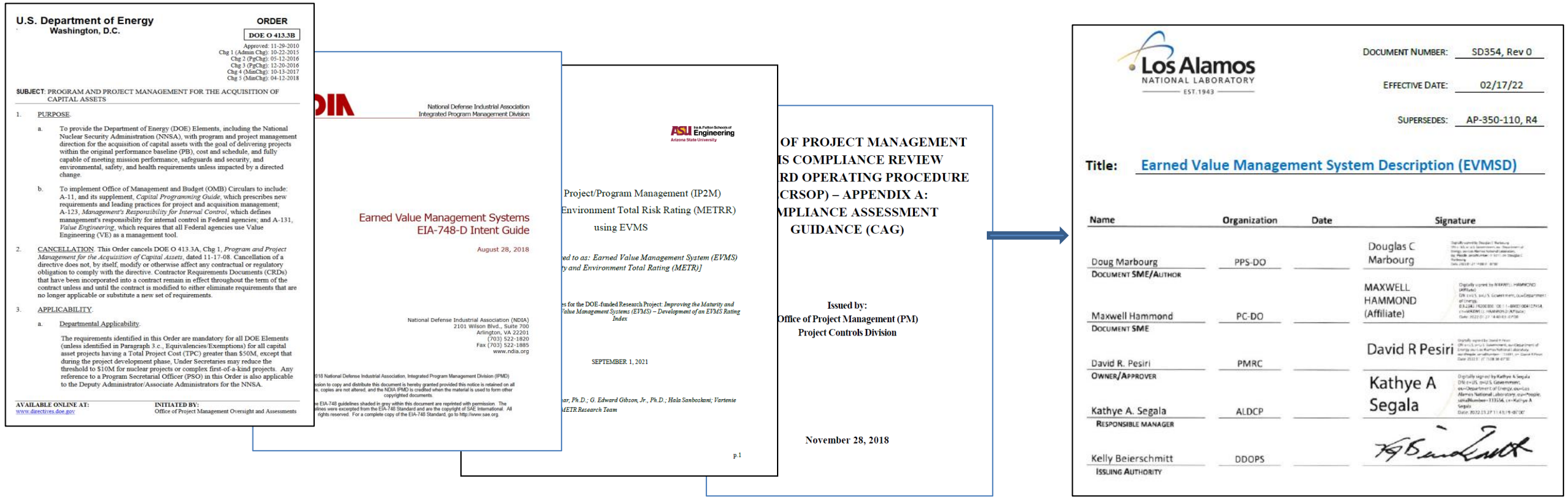
SUPERSEDES: N/A

Title: FY23 Internal Earned Value Management System (EVMS) Surveillance Plan

Name	Organization	Date	Signature
Doug Marbourg DOCUMENT SME/AUTHOR	ALDICP	11/17/2022	MOHAMMED ABOUSHOUSHA (Affiliate)
David Pesiri OWNER/APPROVER	ALDICP	11/22/2022	DAVID PESIRI (Affiliate)
David Teter ISSUING AUTHORITY	ALDICP	11/23/2022	David Teter

Requirements

- **Requirements: Underpinning of Self-Governance Processes**



Evaluation: Monthly “Passive”

- **PASSIVE: JSON and Flat File formatting of cost and schedule data means ‘hands-off’ monthly analysis of system health**

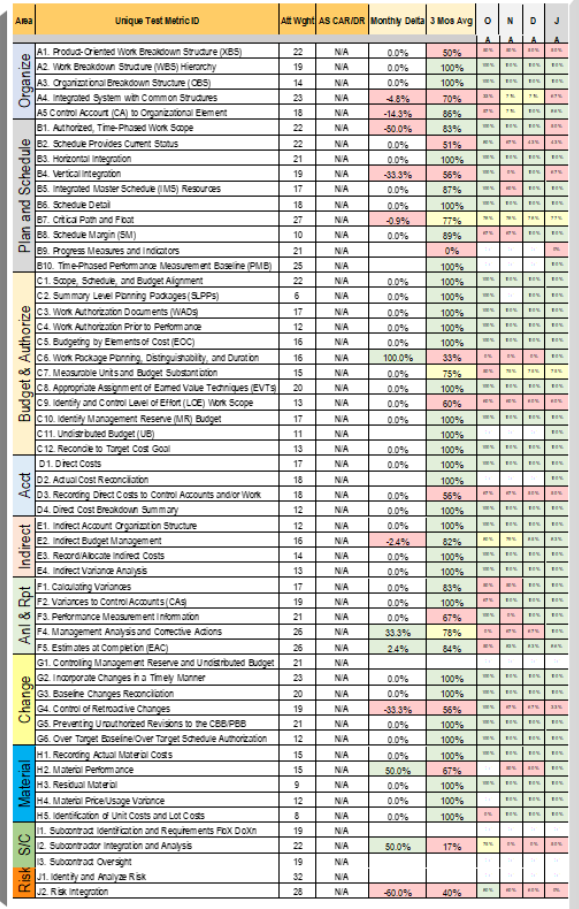
- **COMMON DENOMINATOR: Metrics based on understood customer (PM-30) test metrics within the Compliance Assessment Governance (CAG) document *and* LANL System Description**

EVMS Passive Evaluation: - *Behind the Scenes*

10 Process Areas/Administrative Procedures

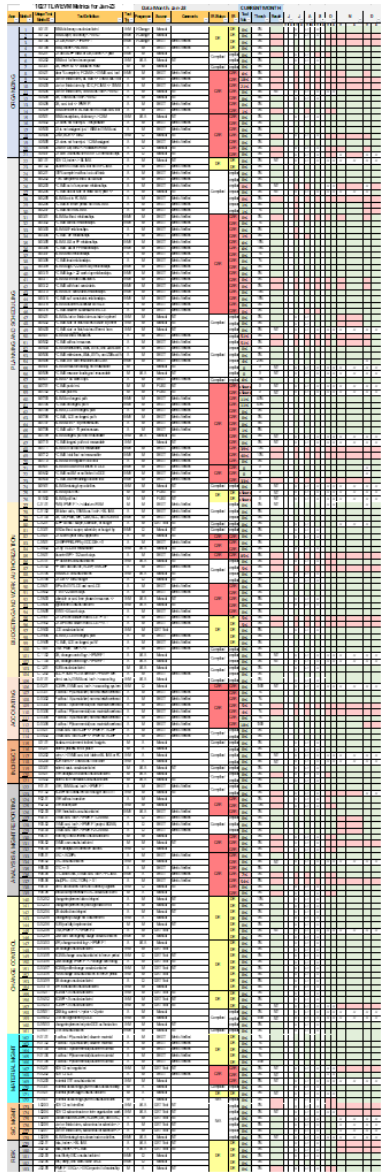
FOCUS AREA			2022				2023	
Area	Att Wght	Delta	S	O	N	D	J	F
Organize	96.0	0.00	54%	41%	66%	76%	76%	
Plan and Schedule	202.0	0.18	69%	56%	70%	56%	74%	
Budget & Authorize	178.0	0.08	58%	53%	71%	80%	89%	
Acct	65.0	0.00	75%	78%	54%	79%	79%	
Indirect	55.0	0.00		88%	88%	94%	94%	
Anl & Rpt	109.0	0.13	88%	43%	52%	65%	78%	
Change	116.0	0.00		78%	87%	87%	87%	
Material	59.0	-0.01	60%	64%	50%	81%	80%	
S/C	60.0	0.00		60%	67%	67%	67%	
Risk	60.0	-0.40	100%	40%	40%	80%	40%	

56 Attributes

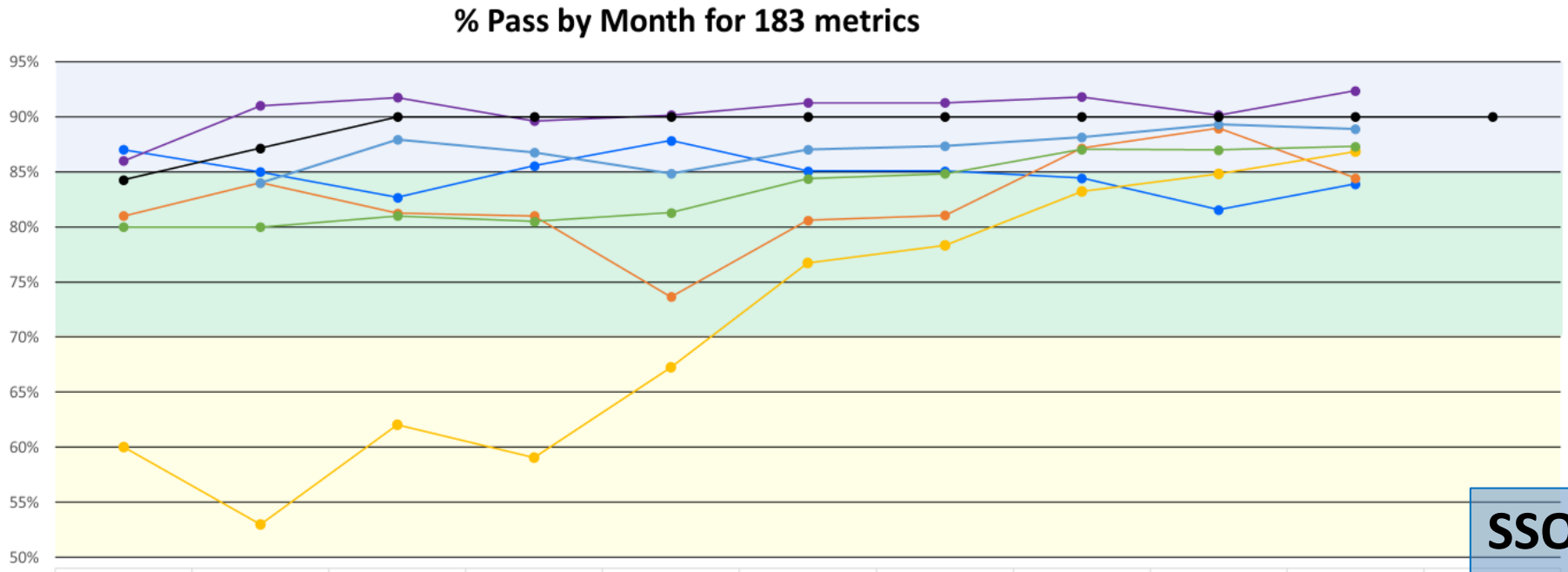


Area	Unique Test Metric ID	Att Wght	AS CAR/DR	Monthly Delta	3 Mos Avg	O	N	D	J
Organize	A1. Product-Oriented Work Breakdown Structure (XBS)	22	N/A	0.0%	50%				
	A2. Work Breakdown Structure (WBS) Hierarchy	19	N/A	0.0%	100%				
	A3. Organizational Breakdown Structure (OBS)	14	N/A	0.0%	100%				
	A4. Integrated System with Common Structures	23	N/A	-4.8%	70%				
	A5 Control Account (CA) to Organizational Element	18	N/A	-14.3%	86%				
Plan and Schedule	B1. Authorized, Time-Phased Work Scope	22	N/A	-50.0%	83%				
	B2. Schedule Provides Current Status	22	N/A	0.0%	51%				
	B3. Horizontal Integration	21	N/A	0.0%	100%				
	B4. Vertical Integration	19	N/A	-33.3%	56%				
	B5. Integrated Master Schedule (IMS) Resources	17	N/A	0.0%	87%				
	B6. Schedule Detail	18	N/A	0.0%	100%				
	B7. Critical Path and Float	27	N/A	-0.9%	77%				
	B8. Schedule Margin (SM)	10	N/A	0.0%	89%				
	B9. Progress Measures and Indicators	21	N/A		0%				
	B10. Time-Phased Performance Measurement Baseline (PMB)	25	N/A		100%				
Budget & Authorize	C1. Scope, Schedule, and Budget Alignment	22	N/A	0.0%	100%				
	C2. Summary Level Planning Packages (SLPPs)	6	N/A	0.0%	100%				
	C3. Work Authorization Documents (WADs)	17	N/A	0.0%	100%				
	C4. Work Authorization Prior to Performance	12	N/A	0.0%	100%				
	C5. Budgeting by Elements of Cost (EOC)	16	N/A	0.0%	100%				
	C6. Work Package Planning, Distinguishability, and Duration	16	N/A	100.0%	33%				
	C7. Measurable Units and Budget Substantiation	15	N/A	0.0%	75%				
	C8. Appropriate Assignment of Earned Value Techniques (EVTs)	20	N/A	0.0%	100%				
	C9. Identify and Control Level of Effort (LOE) Work Scope	13	N/A	0.0%	60%				
	C10. Identify Management Reserve (MR) Budget	17	N/A	0.0%	100%				
	C11. Undistributed Budget (UB)	11	N/A		100%				
	C12. Reconcile to Target Cost Goal	13	N/A	0.0%	100%				
Acct	D1. Direct Costs	17	N/A	0.0%	100%				
	D2. Actual Cost Reconciliation	18	N/A		100%				
	D3. Recording Direct Costs to Control Accounts and/or Work	18	N/A	0.0%	56%				
	D4. Direct Cost Breakdown Summary	12	N/A	0.0%	100%				
Indirect	E1. Indirect Account Organization Structure	12	N/A	0.0%	100%				
	E2. Indirect Budget Management	16	N/A	-2.4%	82%				
	E3. Record/Allocate Indirect Costs	14	N/A	0.0%	100%				
	E4. Indirect Variance Analysis	13	N/A	0.0%	100%				
Anl & Rpt	F1. Calculating Variances	17	N/A	0.0%	83%				
	F2. Variances to Control Accounts (CAs)	19	N/A	0.0%	100%				
	F3. Performance Measurement Information	21	N/A	0.0%	67%				
	F4. Management Analysis and Corrective Actions	26	N/A	33.3%	78%				
	F5. Estimates at Completion (EAC)	26	N/A	2.4%	84%				
Change	G1. Controlling Management Reserve and Undistributed Budget	21	N/A						
	G2. Incorporate Changes in a Timely Manner	23	N/A	0.0%	100%				
	G3. Baseline Changes Reconciliation	20	N/A	0.0%	100%				
	G4. Control of Retroactive Changes	19	N/A	-33.3%	56%				
	G5. Preventing Unauthorized Revisions to the CBB/PBB	21	N/A	0.0%	100%				
	G6. Over Target Baseline/Over Target Schedule Authorization	12	N/A	0.0%	100%				
Material	H1. Recording Actual Material Costs	15	N/A	0.0%	100%				
	H2. Material Performance	15	N/A	50.0%	67%				
	H3. Residual Material	9	N/A	0.0%	100%				
	H4. Material Price/Usage Variance	12	N/A	0.0%	100%				
	H5. Identification of Unit Costs and Lot Costs	8	N/A	0.0%	100%				
S/C	I1. Subcontract Identification and Requirements Flow Down	19	N/A						
	I2. Subcontractor Integration and Analysis	22	N/A	50.0%	17%				
	I3. Subcontract Oversight	19	N/A						
Risk	J1. Identify and Analyze Risk	32	N/A						
	J2. Risk Integration	28	N/A	-50.0%	40%				

183 Test Metrics

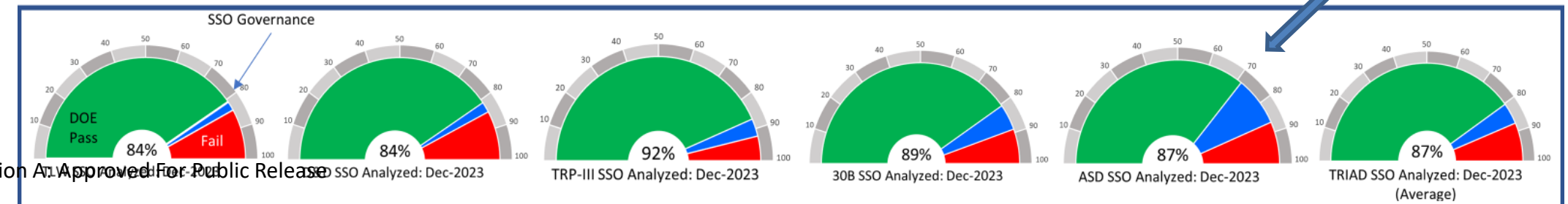


EVALUATION: Positive results = TRUST IN DATA



	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24
TLW	87%	85%	83%	86%	88%	85%	85%	84%	82%	84%	
D&D	81%	84%	81%	81%	74%	81%	81%	87%	89%	84%	
TRP-III	86%	91%	92%	90%	90%	91%	91%	92%	90%	92%	
ASD	60%	53%	62%	59%	67%	77%	78%	83%	85%	87%	
30B		84%	88%	87%	85%	87%	87%	88%	89%	89%	
TRIAD (Avg)	80%	80%	81%	80%	81%	84%	85%	87%	87%	87%	
TRIAD Control	84%	87%	90%	90%	90%	90%	90%	90%	90%	90%	90%

SSO Governance
- Flag to Pass
- Pass to Flag



Resolution

- **Factual accuracy evaluation by project team and compliance officer.**
  - –Root cause/Causal evaluation
  - –Corrective action identified: Action/Actionee/Date Due
- **Effectiveness evaluation**
- **Formal EVMS MRB acceptance/closure**

EVMS Self-Governance/The Secret Sauce - Questions/Discussion

- Are you striving for 100% compliance?
- Self-governance sounds expensive. What is the value added?

What Is Base Work Construct (BWC)?

- **Base Work Construct is a tool for visual comparison**
  - **Categorize by Elements of Cost (EOC) (labor, material, subcontract, other direct costs)**
  - **BWC elements – EPCC (engineering, procurement, construction, commissioning)**
  - **Time phasing, compare against critical decision points**

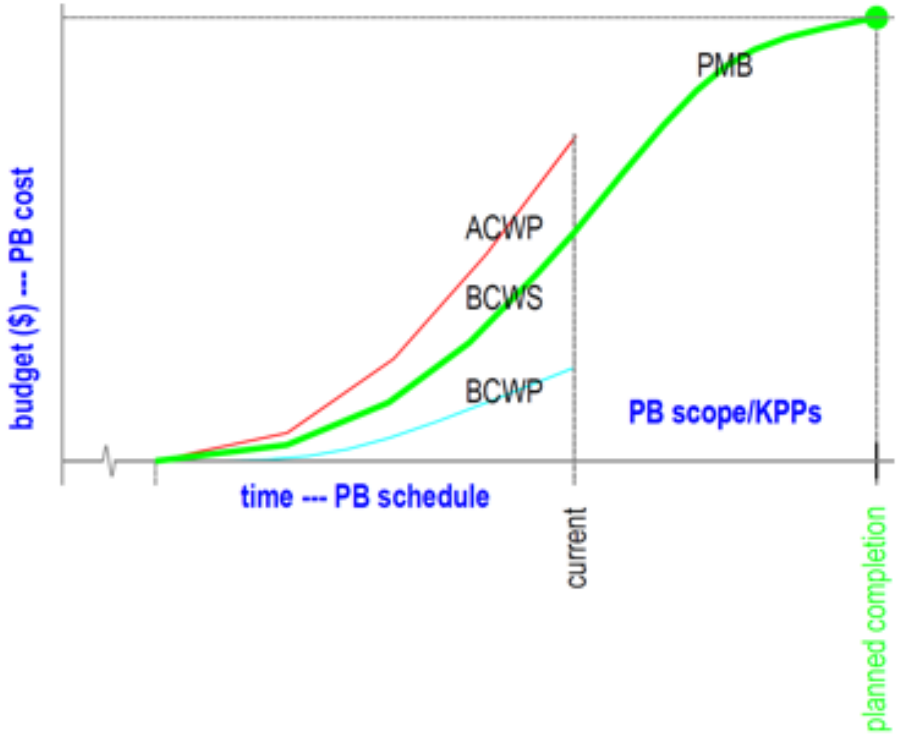
Why Use BWC?

- Benchmark for use in reviews, management decisions
  - –BWC does not replace the WBS – BWC feeds and aligns with the WBS
  - –Project Realism - Will project realistically achieve on schedule and budget?
  - –Reasonability of EOC/BWC

BWC Categories/Time Phasing

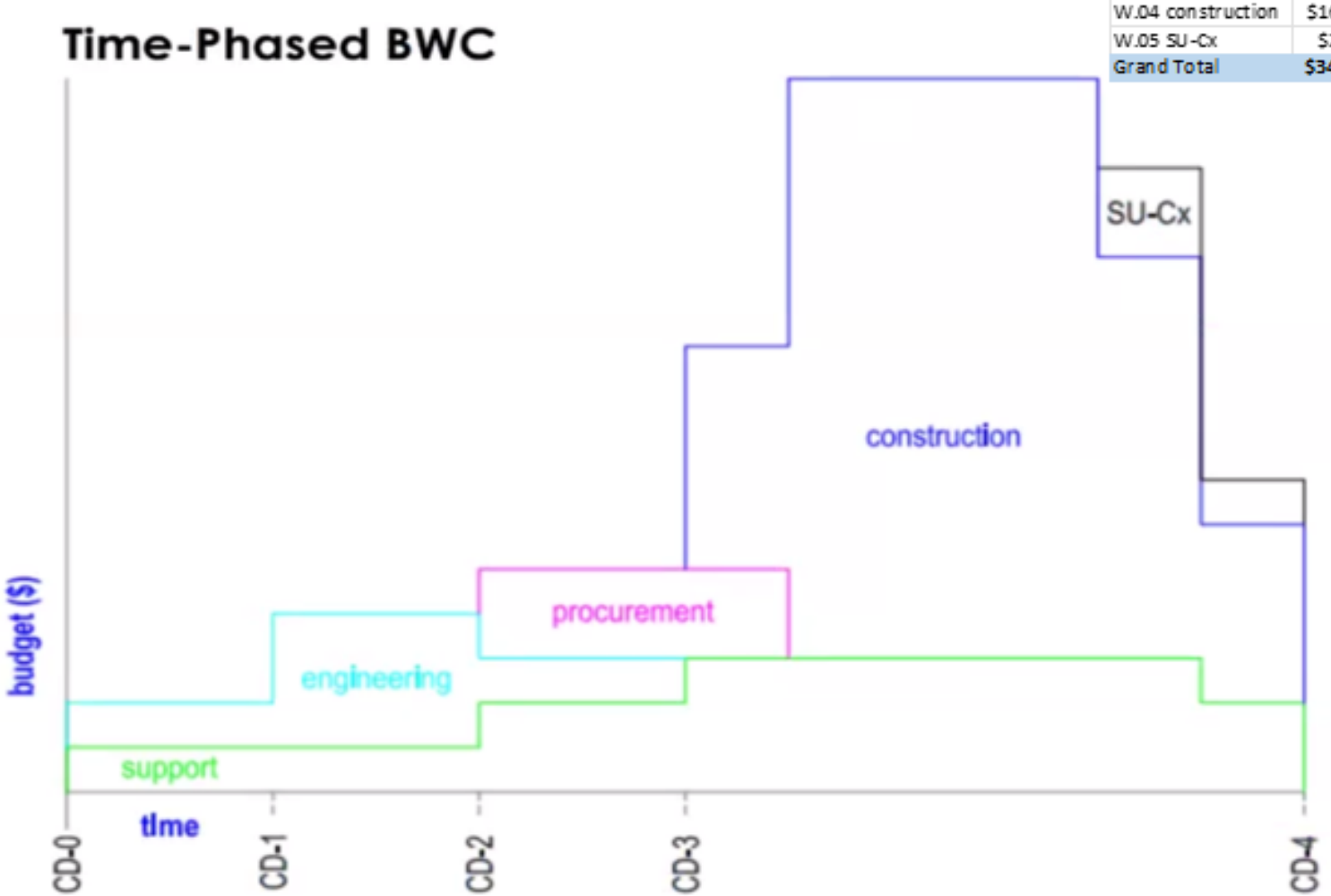
	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design	209,868	187,921	166,962
Design - Contingency	999	1,717	9,696
Total, Design (TEC)	**210,867**	**189,638**	**176,658**
Equipment	503,727	478,809	465,180
Other Construction	17,000	17,000	17,000
Construction - Contingency	64,906	111,053	137,662
Total, Construction (TEC)	**585,633**	**606,862**	**619,842**
Total, TEC	**796,500**	**796,500**	**796,500**
Contingency, TEC	*65,905*	*112,770*	*147,358*
Other Project Cost (OPC)			
Conceptual Planning	1,000	1,000	1,000
Conceptual Design	7,500	7,500	7,500
Start-up	8,662	7,570	7,100
OPC - Contingency	1,338	2,430	2,900
Total, Except D&D (OPC)	**18,500**	**18,500**	**18,500**
Total, OPC	**18,500**	**18,500**	**18,500**
Contingency, OPC	*1,338*	*2,430*	*2,900*
Total, TPC	**815,000**	**815,000**	**815,000**
Total, Contingency (TEC+OPC)	***67,243***	***115,200***	***150,258***

Fiscal Year	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2018	4/22/10	9/18/15	2/4/16	1Q FY 2019	2Q FY 2020	4Q FY 2019	N/A	1Q FY 2026
FY 2019	4/22/10	9/18/15	2/4/16	2Q FY 2019	4Q FY 2021	1Q FY 2020	N/A	2Q FY 2026
FY 2020	4/22/10	9/18/15	2/4/16	12/9/18	1Q FY 2022	1Q FY 2020	N/A	2Q FY 2026
FY 2021	4/22/10	9/18/15	2/4/16	12/9/18	1Q FY 2022	7/25/19	N/A	2Q FY 2026
FY 2022	4/22/10	9/18/15	2/4/16	12/9/18	1Q FY 2022	7/25/19	N/A	2Q FY 2026
FY 2023	4/22/10	9/18/15	2/4/16	12/9/18	4Q FY 2022	7/25/19	N/A	2Q FY 2026



BWC Example

	labor	material	subcontract	overhead	ODC	total
W.01 support	$85,000,000	$400,000	$3,000,000	$4,000,000	$60,000	$92,460,000
W.02 engineering	$70,000,000	$0	$15,000,000	$12,000,000	$467,000	$97,467,000
W.03 procurement	$0	$77,000,000	$34,000,000	$12,000,000	$124,000	$123,124,000
W.04 construction	$160,000,000	$0	$290,000,000	$30,000,000	$3,967,000	$483,967,000
W.05 SU-Cx	$27,000,000	$2,000,000	$2,500,000	$8,000,000	$160,000	$39,660,000
Grand Total	**$342,000,000**	**$79,400,000**	**$344,500,000**	**$66,000,000**	**$4,778,000**	**$836,678,000**



	Code	Description
⊟	W.01	Support
	W.01.01	Project
	W.01.02	Closeout
	W.01.03	Operations
⊟	W.02	Engineering
	W.02.01	R&D
	W.02.02	Conceptual
	W.02.03	Preliminary
	W.02.04	Final
	W.02.05	General
⊟	W.03	Procurement
	W.03.01	General
⊟	W.04	Construction
	W.04.01	Engineering Support
	W.04.02	Demolition
	W.04.03	Site Preparation
	W.04.04	Construction
⊟	W.05	SU-Cx
	W.05.01	Preps
	W.05.02	SU
	W.05.03	Cold Cx
	W.05.04	Hot Cx

BWC - Questions/Discussion

- How is the BWC used to evaluate project realism?
- How is the BWC used to monitor project performance?

Wrap Up

- Continue to develop tools and methods to advance the state of EVMS
- Provide Current, Accurate, Complete, Repeatable, Auditable, and Compliant (CACRAC) Data
- Position *Contractors* and *Project Offices* for project success

Questions