

EVMS Training Snippet Library: Integrated Master Schedule (IMS) Initial Baseline Review



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

Contract Compliance



SOLICITATION, OFFER AND AWARD		1. THIS CONTRACT IS RATED ORDER UNDER DPAS (15 CFR 700)	<input type="checkbox"/>	RATING N/A	PAGE OF PAGES 1 561
2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (SBI)	5. DATE ISSUED	6. REQUISITION PURCHASE NO.	

Project:

Contract Number:

C.3.1 Project Management

The Contractor shall provide all management and technical information to:

- Meet the requirements of DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets* and DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets*;
- Support the budget formulation activities including but not limited to: items list; budget formulation input (including Integrated Plan update submission; budget scenario development; and budget public and regulatory briefings, etc.);
- Meet the data requirements of the DOE Integrated Planning Budgeting System;
- Ensure transparency in project performance and efficiency;
- Support audits, evaluations, and external technical reviews;
- Support other DOE performance assessments and

The Contractor shall ensure that all project management information Contract is accessible to DOE

C.3.1.1 Project Integration and Control and Earned Value Management

The Contractor shall prepare and submit for DOE approval (Deliverable C.3.1.1-1) consistent with the PEP requirements in DOE M 413.3-1. The PEP shall describe the approach for managing and necessary to execute this Contract and shall focus on Contractor approach to project integration of scope, schedule and cost information.

The Contractor shall provide, as an attachment to the PEP, a *Project Control System Description* that complies with the requirements of DOE O 413.3B *American National Standards Institute (ANSI)/Electronic Industries version Earned Value Management Systems (EVMS)*.

The *Project Control System Description* shall describe the management that shall be used to implement an EVMS, manage and control work requirements. The *Project Control System Description* shall include

Project:

Contract Number:

C.3.1.2.2 Performance Measurement Baseline Submittals

The Contractor shall develop and submit an initial TOC Project Performance Measurement Baseline (Deliverable C.3.1.2.2-1) to DOE- for approval. The PMB submittal shall include both hard copies and electronic files for the:

- WBS and WBS dictionary sheets at the level in which the costs are collected and cross referenced to the corresponding Contract CLIN number;
- Time-phased cost estimate at a WBS level to be determined post-award by DOE-
- Basis of estimate at a WBS level to be determined post-award by DOE-
- Time-phased resource-loaded schedule at a WBS level to be determined post-award by DOE

The Contractor shall provide the WBS, WBS dictionary data, and the basis of estimate data in either Microsoft Word® or Microsoft Access® format. Cost data shall be provided in Microsoft Access® or Excel® format and the schedule shall be provided using the current version of Primavera Svstems, Inc., Enterprise for Construction® software unless agreed to otherwise by DOE



- **Earned Value Management System Required**
 - Contractor's IMS does not meet DOE's requirements
 - Contractor's IMS does not meet ANSI/EIA-748 requirements
 - Contractor's IMS does not meet contract requirements

Contractor Documentation



DOCUMENT RELEASE FORM

(1) Document Number: _____

(4) Document Type: _____

(5) Release Type: _____

(6) Document Title: _____

(8) Change/Release Description: _____

Project Control System Des

(9) Change Justification: _____

(10) Associated Structure, System and Component (SSC) and Building Number: _____

(11) Impacted Documents: _____

(12) Approvals: _____

SCHEDULERS GUIDANCE
Manual
Document
Page
Issue
Date

[Ownership matrix](#) [Click for copy of Word \(native\) file](#)

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P6 ACTIVITY

PROJECTS Document
Page
Issue Date

SCHEDULERS GUIDANCE

ATTACHMENT B – REQUIRED CODING STRUCTURE

The following codes are required on all activities:

Global Activity Codes

Code Field	Description
GWBS	TOC Work Breakdown Structure
MSTYPE	Milestone Type (Only required for Start and Finish Milestones)
FOC	Functional Organization Code
RESP	Responsible Person
SCHDLR	Responsible Scheduler - Last Name, First and Middle Initials
SUBP	Subproject ID
SUMC	Summary Code = Activity ID in SLCS
FMLO	Used to show which farm work is taking place in
TKST	Used to show which tank, pit, or area work is taking place at
WKPH	Used to show work phase

Typical Issues with Contractor Documentation



- **Contractor System Description does not meet the intent of the ANSI / EIA 748 Schedule Guidelines**
 - Fails to address the intent of Guideline 3
 - Integration of EVMS Subsystems
 - Fails to fully address Guideline 6
 - Description of schedule tiers
 - Description of consistent approach to defining start and completion milestones
 - Fails to define traceability requirements
 - Fails to address the mechanics of a realistic critical path
 - Fails to adequately address Guideline 7
 - Fails to define interim measurements of progress



Reviewing for Scope

B.2 ITEM(S) BEING ACQUIRED

(a) The Contractor shall, in accordance with the terms of this Contract (Contract refers solely to the sample building Contract), providing the personnel, equipment, material, and other things necessary for, or incidental to, the performance of all requirements of this contract.

(b) For purposes of cost collection and administration of the contract, the Contractor shall divide the contract activities divided among six (6) activities authorized in accordance with the *Authorization of Work*. The activities are listed in Section J Attachment entitled *Tables*.

WBS Number:		
WBS Title:	Revision:	
	Revision Date:	
	Last Affected Change:	
WBS Dictionary Sheet		
Completion Criteria:		
<ul style="list-style-type: none"> The life-cycle of this WBS element work scope will be closed out when all documentation and activities associated with implementation of interim and final corrective measures are completed. Completion of logging, samples, probe hole decommissioning, as appropriate, analysis, and reporting for each direct campaign. Final report, including data analysis, is provided for each location undergoing Surface Geophysical Exploration activities has been archived for future use. 		
New boreholes have been completed in compliance with applicable requirements, and final reports of sample analysis provided.		
Complete reports provided for any implemented interim measures. Test report provided for soil desiccation/Tc removal to, issued corrective measures study work plans, completion of pre-closure characterization, completion of a supplemental environmental impact statements (if required), establishment of a monitoring program that meets regulatory agency requirements, and completion of RCRA corrective action in accordance with approved plans.		

CONTROL ACCOUNT WORK AUTHORIZATION						PAGE	OF
CONTROL ACCT TITLE				WBS NO.	CONTROL ACCT NO.		
CONTROL ACCT MGR			OBS NO.	DATE			
PROGRAM NAME						REV. NO.	
PROGRAM NUMBER.			CONTRACT NO.		REV. DATE		
SCHEDULE	REFERENCE SCHEDULE	CA BASELINE SCHEDULE		WORK AUTHN STATUS			
NO.	DATED	START	COMPLETE				
		1 MAY 2013	30 SEP 2014				
Drill 15 Bore Holes and provide Report of soil analysis.							

Activity ID	Description
ENPHS1	Boring Report
ENPHS1BRNG	Boring in the Field
ENPHSCEST	Preliminary cost estimate
ENPH1DESN	Schematic Architect Design Analy
ENPHS1DRWG	Site Plan Draft

Typical Issues with Scope Traces



- **IMS does not reflect contracted work**
 - Missing or Ambiguous Scope
 - Scope is planned not within the contract
- **Work package activities do not describe work execution steps sufficiently**
 - Activities are at too high of a level
 - Common descriptions for unique work scope.
- **Planning package activities do not adequately describe scope content**
 - IMS activities are not broken down to a level that describes the work scope content
 - Activity descriptions are vague and not definitive

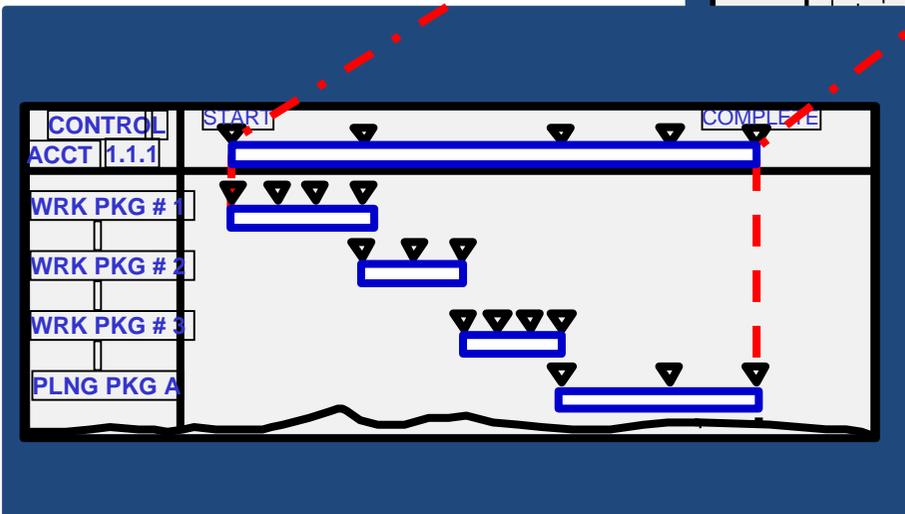
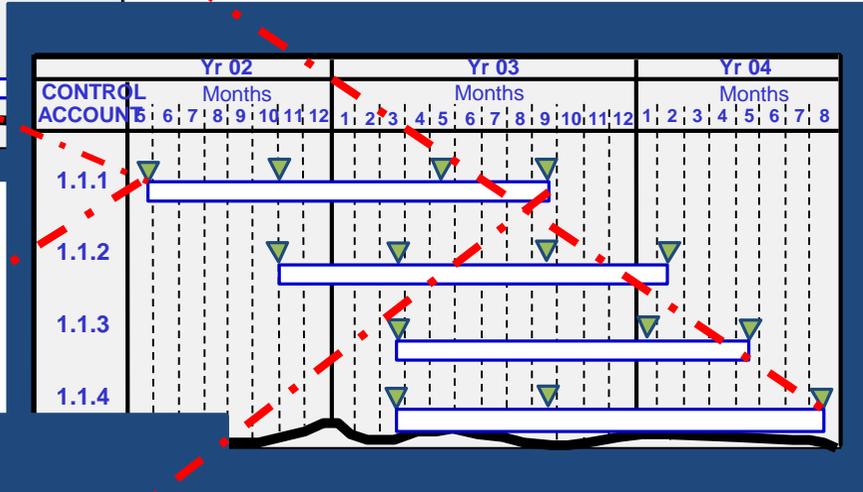
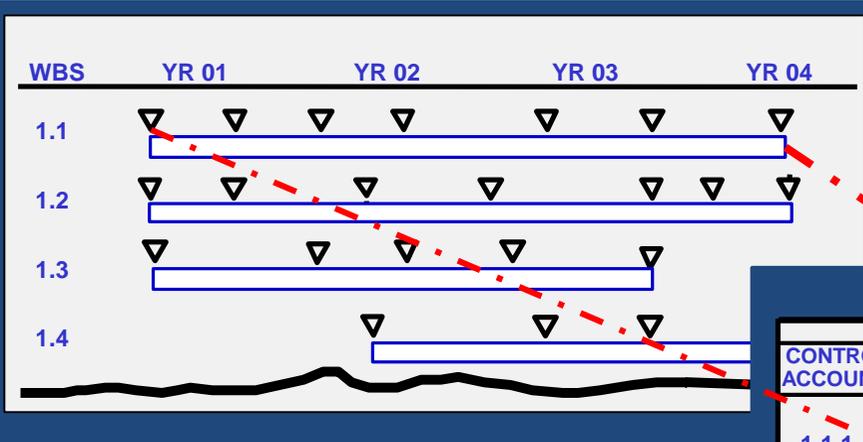
Typical Issues with Contract Deliverables



- **Missing deliverables**
 - Deliverables not found in the IMS
- **Dates not aligned**
 - IMS dates not on or Before Contract Deliverable Dates
- **Interim Milestones not identified**
 - Spans between project milestones



Vertical Traceability

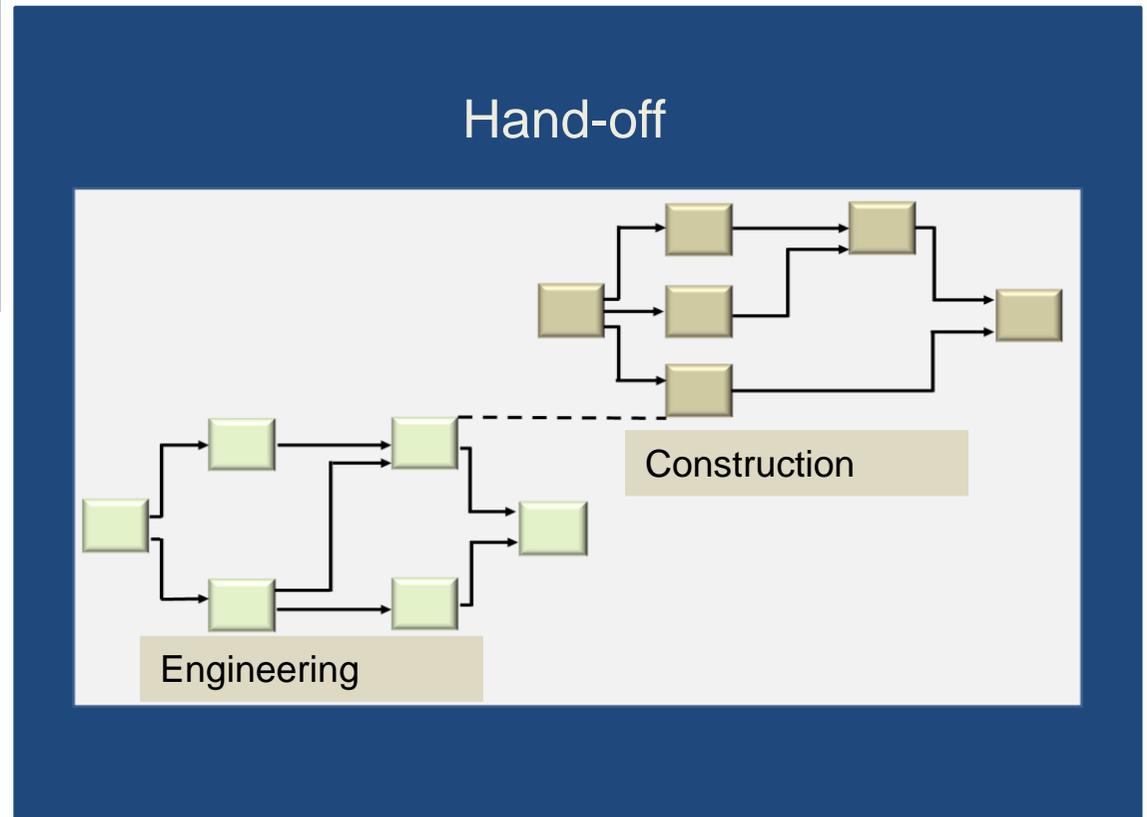
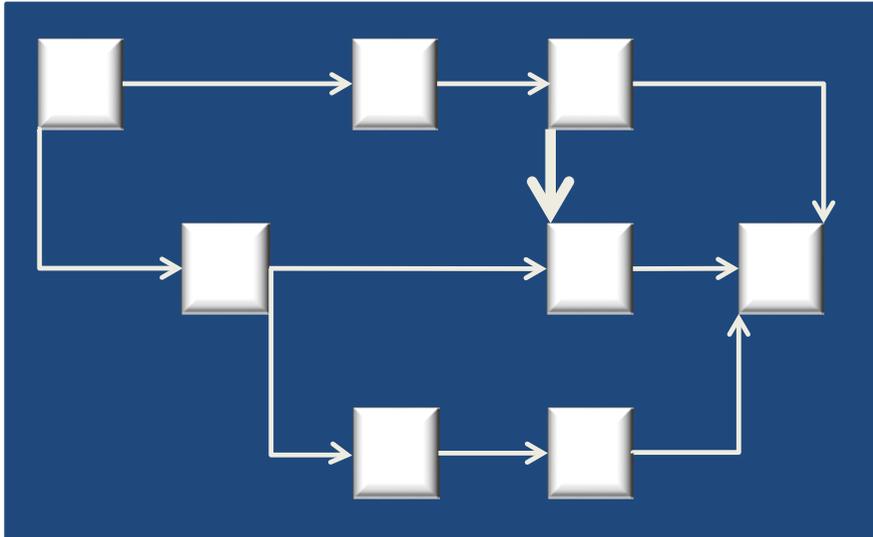


Typical issues with Vertical Traceability



- **Required levels of schedule not producible**
 - Omission or errors in the WBS and or OBS
- **Lower Level Activities do not support project milestones**
 - Activities that contribute to completion of milestones fall outside the milestone date
- **WBS / OBS hierarchy not supported**
 - Non–hierarchical (flat) codes used

Horizontal Traceability



Typical issues with Horizontal Traceability



- **Statistical Analysis**
 - Logic is not found
 - Use of excessive lags and leads
 - Use of excessive constraints
- **Sequence of activities do not flow to a rationale conclusion**
 - Logic ties do not meeting the intent of the milestones
 - Predecessors are not logically linked to the successors
- **Activities do not support completion of project milestones**
 - Completion criteria for milestones not supported
- **Hand-off Milestones between organizations not documented**
 - Interface are not identified and monitored
- **Excessive and systemic float indicate that the schedule has no horizontal traceability**

Typical issues with Historical Traceability



- **In-process activities**

- Remaining work scope not adequately described
- Remaining work scope over or under stated
- Analysis does not meet contract delivery requirements

- **Future activities**

- Work scope changes without baseline change control
- Period of Performance changes without baseline change control

IMS Integration with EVMS Subsystem (WBS,OBS,CA,WP)



CONTROL ACCOUNT WORK AUTHORIZATION		PAGE 1	OF 1
CONTROL ACCT TITLE SYSTEM TEST PLAN / PROCEDURES		WBS NO. 1.1.1	CONTROL ACCT NO. 1.1.1.2
CONTROL ACCT MGR		ORGN NO. 4000	DATE 10 APR 2012
PROGRAM NAME		REV. NO. 0	
PROGRAM NUMBER	CONTRACT NO.	TYPE CPIF	REV. DATE
REFERENCE SCHEDULE		CA BASELINE SCHEDULE	
SCHEDULE NO.	DATED 02 FEB Yr02	START 1 Mar 2013	COMPLETE 30 SEP 2015
BUDGET(EXCLUDES OVERHEAD AND G&A)			

SYSTEMS INTEGRATION MAP
COMMON DATA ELEMENTS
Typical elements used to integrate data across multiple systems and tools

COST & SCHEDULE	WBS ID	OBS ID	Control Account ID	Plannin g Package ID	Work Package ID	EV Technique ID
SOW						
WBS						
IMP						
IMS						
Subcontractor IMS						
MRP Schedule						
Cost Data						

WBS: 1.1.1 CONTROL ACCOUNT PLAN Revision #
Control Account: Revision Date:
CAM: Organization # Baseline Start: 01 Mar Baseline Finish: 30

Workpackage NcEV	2013												2014											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.1.1.2.1 BCWS			XX	XX	XX	XX	XX																	
1.1.1.2.2 BCWS					XX	XX	XX	XX	XX	XX														
1.1.1.2.2 BCWS										XX	XX	XX												

Integrated Master Schedule

Activity	WBS	CA	CAM	ORG	WP	Baseline Start	Baseline Finish	2013											
								J	F	M	A	M	J	J	A	S	O	N	D
A001	1.1.1	1.1.1.2		4000	1.1.1.2.1	1-Mar-13	31-Jul-13	[Gantt bar from Mar to Jul]											
A002	1.1.1	1.1.1.2		4000	1.1.1.2.1	1-Mar-13	30-Apr-13	[Gantt bar from Mar to Apr]											
A003	1.1.1	1.1.1.2		4000	1.1.1.2.1	15-Apr-13	15-Jun-13	[Gantt bar from Apr to Jun]											
A004	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-May-13	31-Jul-13	[Gantt bar from May to Jul]											
A005	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Apr-13	30-Sep-13	[Gantt bar from Apr to Sep]											
A006	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Apr-13	30-Jun-13	[Gantt bar from Apr to Jun]											
A007	1.1.1	1.1.1.2		4000	1.1.1.2.2	1-Jul-13	30-Sep-13	[Gantt bar from Jul to Sep]											
A008	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Aug-13	30-Sep-13	[Gantt bar from Aug to Sep]											

Typical Integration issues with other EVMS Subsystems (WBS, OBS, CA, WP)



- **Code Identifiers are missing or incorrect**
 - WBS
 - OBS
 - CAM
 - Control Account
 - Work Package
 - Statement of Work paragraph
 - Integrated Master Plan (IMP) if contractually required

IMS Integration with EVMS Subsystems

(Period of Performance)



[Redacted]			0
Program Number:	Contract Number:	Contract Type:	Revision Date
[Redacted]		CPIF	-
Reference Schedule:		Baseline Dates	
Schedule Number	Dated	Start Date	Completion Date
	2-Feb-13	1-Mar-13	30-Sep-15

Activity ID	WBS	CA	CAM	ORG	WP	Baseline Start	Baseline Finish	2013												2014											
								J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	1.1.1	1.1.1.2		4000		1-Mar-13	30-Sep-15	[Gantt bar spanning from Mar 2013 to Sep 2015]																							
A001	1.1.1	1.1.1.2		4000	1.1.1.2.1	1-Mar-13	30-Apr-13	[Gantt bar from Mar to Apr 2013]																							
A002	1.1.1	1.1.1.2		4000	1.1.1.2.1	15-Apr-13	15-Jun-13	[Gantt bar from Apr to Jun 2013]																							
A003	1.1.1	1.1.1.2		4000	1.1.1.2.1	15-May-13	31-Jul-13	[Gantt bar from May to Jul 2013]																							
A004	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Apr-13	30-Jun-13	[Gantt bar from Apr to Jun 2013]																							
A005	1.1.1	1.1.1.2		4000	1.1.1.2.2	1-Jul-13	30-Sep-13	[Gantt bar from Jul to Sep 2013]																							

WBS: 1.1.1		CONTROL ACCOUNT PLAN		Revision #	
Control Account:				Revision Date:	
Orginazation #		Baseline Start:		Baseline Finish:	
4000		01 Mar 2013		30 Sept 2015	

Work Package No.	EVT	2013												2014											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.1.1.2.1	BCWS	[Gantt bar from Mar to Sep 2013]																							
	BCWP	[Gantt bar from Mar to Sep 2013]																							
	ACWP	[Gantt bar from Mar to Sep 2013]																							
	ETC	[Gantt bar from Mar to Sep 2013]																							
1.1.1.2.2	BCWS	[Gantt bar from Apr to Sep 2013]																							
	BCWP	[Gantt bar from Apr to Sep 2013]																							
	ACWP	[Gantt bar from Apr to Sep 2013]																							
	ETC	[Gantt bar from Apr to Sep 2013]																							

Typical Integration issues with EVMS Subsystems (Period of Performance)



- **Period of Performance does meet contract objectives**
 - Work scope not within project phase
 - Work scope not within contract period of performance
- **Period of Performance not Authorized**
 - IMS baseline start and finish dates outside of Work Authorization dates
- **Period of Performance not supported by the PMB**
 - Period of performance baseline start and finish dates in the IMS do not match
 - Control Account Level
 - Work Package Level
- **Period of performance not aligned with procurement schedules**
 - Procurements need dates are not aligned with IMS required dates

IMS Integration with EVMS Subsystems

(Resources)



Workpackage No.	EVT	WBS: 1.1.1		CONTROL ACCOUNT PLAN												Revision #									
		Control Account: 1.1.1.2														Revision Dat									
		CAM		Orginazation # 4000			Baseline Start: 01 Mar			Baseline Finis															
		2013												2014											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.1.1.2.1	Resource																								
	ENG 1			160	80	80	80	40																	
	ENG 2			40	40	40	40	40																	
	Staff 2			320	320	320	320	160																	
Total Hrs				520	440	440	440	240																	
1.1.1.2.2	Resource																								
	Trades X				320	640	640	320	160	80															
	Trades Y				180	320	320	320	180	120															
Total Hrs					500	960	960	640	340	200															
1.1.1.2.2	Resource																								
	Insp 1								160	160	160	160	160	160											

Integrated Master Schedule																							
Activit y	WBS	CA	CAM	ORG	WP	Baseline Start	Baseline Finish	2013															
								J	F	M	A	M	J	J	A	S	O						
	1.1.1	1.1.1.2		4000	1.1.1.2.1	1-Mar-13	31-Jul-13																
A001	1.1.1	1.1.1.2		4000	1.1.1.2.1	1-Mar-13	30-Apr-13																
A002	1.1.1	1.1.1.2		4000	1.1.1.2.1	15-Apr-13	15-Jun-13																
A003	1.1.1	1.1.1.2		4000	1.1.1.2.1	15-May-13	31-Jul-13																
	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Apr-13	30-Sep-13																
A004	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Apr-13	30-Jun-13																
A005	1.1.1	1.1.1.2		4000	1.1.1.2.2	1-Jul-13	30-Sep-13																
A006	1.1.1	1.1.1.2		4000	1.1.1.2.2	15-Aug-13	30-Sep-13																
Work package																							
1.1.1.2.1																							
Resource																							
ENG 1										160	80	80	80	40									
ENG 2										40	40	40	40	40									
Staff 2										320	320	320	320	160									
Total Hours										520	440	440	440	240	0	0	0						

IMS Integration with EVMS Subsystems (Resources)



- **PMB time phasing of resources not aligned with IMS resources**
 - Hours / dollars per month
- **Missing or inconsistent resource identified**
 - Resources not applied
 - Resources not traceable to resources used in the PMB
- **Element of Cost Type do not match**
 - Labor hours planned for direct dollars
- **Resource quantities in the schedule do not reconcile to PMB**
 - Total resources / costs at WBS levels do not reconcile



- **Subcontract integration not documented**
 - System documentation does not define the requirements for subcontractor IMS submission
 - System document does not define methodology for incorporating subcontractor IMS submissions
- **Subcontract Period of Performance not contained in the IMS**
 - Subcontractor work scope is not identified in the IMS for the contracted period of performance
- **Reconciliation of Subcontract reported dates and IMS not demonstrated**
 - IMS does not reflect the same dates as the Subcontractor submission.
- **Subcontract not adequately integrated into project level critical path**
 - A single line for a significant subcontractor is inadequate.
 - Not every task from the subcontractor is required; however, an intermediate level to adequately drive the critical path is required



- **Material integration not documented**
 - Thresholds for type not defined
 - Point(s) for earning performance not defined by type
- **Materials not identified as resources**
 - Resource for material types not found in the IMS
- **Material planning not reconciled to the Procurement System**
 - Material need dates in procurement system not found in the IMS



- **Poor schedule quality**
 - Statistical assessment
- **Use of constraints**
 - Constraints used to “hold” milestones in place
- **Use of non-sequential logic**
 - Logic does not support the work flow
- **Baseline schedule contains negative float; forecast schedule has repeated negative float without corrective action**
 - Negative float indicates a constrained milestone will not meet the required date
 - It is eliminated in the forecast by moving commitment date

Additional Schedule Information



- **Snippet 3.1B – Integrated Master Schedule Monthly Review**
- **Snippet 3.2 – Schedule Health Metrics**
- **Snippet 3.3 – Schedule Guidance and Resources**
- **Snippet 5.3 – PARS II Analysis: Schedule Health Assessment Reports**

DOE OAPM EVM Home Page



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EARNED VALUE MANAGEMENT

- Aviation 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>

Career Development Program

Real Estate

History