

# **Earned Value Management Implementation Plan for CD-3a Scope**

**[dune-doc-555]**

**13 October 2015**

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## CHANGE LOG

This version of the document may not be the current or approved revision. The current revision is maintained in the former LBNF/DUNE's Document Management system (DocDB) where all internal Project document approvals are also managed. DocDB can be accessed through the web by authorized users ([docs.dunescience.org](http://docs.dunescience.org)) and this document can be identified by the document and version number as indicated in the Version Control Table below.

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Docdb #	Date	Version	Person Responsible	Change Description
			Robert O'Sullivan	

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## ABBREVIATIONS AND ACRONYMS

ANSI	American National Standards Institute
BCR	Baseline Change Request
CA	Control Account
CAM	Control Account Manager
CCB	Change Control Board
CF	Conventional Facilities
DUNE	Deep Underground Neutrino Experiment
EAC	Estimate At Completion
EFIG	Experiment-Facility Interface Group
ETC	Estimate To Complete
EVMS	Earned Value Management System
FRA	Fermi Research Alliance
PMP	Project Management Plan
OBS	Organizational Breakdown Structure
RAM	Responsibility Assignment Matrix
TPC	Total Project Cost
WBS	Work Breakdown Structure
WP	Work Package

## 1 INTRODUCTION

The LBNF/DUNE project is requesting a CD-3a approval from DOE for Initial Far Site Construction. The authorization amount being sought is approximately \$300M, whose scope includes portions of the conventional facilities (CF) to be designed and constructed on the surface, in the shafts, and underground at the Sanford Underground Research Facility (SURF) to support the LBNF cryostats and cryogenic systems and the Deep Underground Neutrino Experiment (DUNE) Far Detector. The CD-3a scope covers the initial construction work prior to baselining the LBNF/DUNE Project necessary to support installation of cryostats and cryogenic systems to be ready for installation of two DUNE detectors.

Construction approval essentially baselines the associated scope. The Project needs a means to track and measure progress and performance for the work scope included in the CD-3a request. This document describes the plan to implement the Fermi Research Alliance Earned Value Management System (EVMS) on the CD-3a scope, including the steps and timeline required.

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## 2 BACKGROUND

In January 2010, the Long-Baseline neutrino experiment (LBNE) received CD-0, Mission Need, approval followed by CD-1 approval in December 2012. In May 2014 the High Energy Physics Advisory Panel (HEPAP) Particle Physics Project Prioritization Panel (P5) issued a report noting that a more ambitious Long-Baseline neutrino facility has been recommended by the particle physics community study with expressions of interest from physicists in other regions. LBNE was recast as LBNF/DUNE, which required a reevaluation of the project by the DOE and was reviewed July 14-16, 2015.

As part of the transition from LBNE to LBNF/DUNE, the project has been reorganized to better align with the new project structure and facilitate more efficient management of the work. This reorganization required changes to the work breakdown structure, project schedules, change control processes, etc., which have been implemented for the CD-3a review. The LBNF/DUNE integrated master schedule consists of schedule components at the WBS L2 or L3 subproject level. The CD-3a scope resides in the Far Site Conventional Facilities subproject schedule component, which will be baselined and managed under the requirements of the certified Fermi Research Alliance Earned Value Management System (EVMS).

Many of the required practices of FRA's EVMS have been followed to date. These practices include but are not limited to:

1. Organization – establishment of the WBS, OBS and RAM
2. Planning – Estimating, Scheduling, Risk Management and establishment of Control Accounts
3. Authorization – Yearly budgeting, management of Base Cost and TPC
4. Execution – Schedule Updating, Reporting progress, Authorized scope only
5. Monitoring – Reporting of Cost, Schedule and Performance, Forecast of EAC, Update of Risk Registers
6. Control - Maintaining of Change Control Logs, Approval of out of scope work

However, further development is needed to implement EVM on the Far Site Conventional Facilities scope to comply with the certification requirements, including updating the controls systems and project management work practices prior to this specific baselining. This plan outlines the work required to implement EVM on the CD-3a scope of work and conclude within the necessary timeline for baselining.

### 3 FERMI RESEARCH ALLIANCE EARNED VALUE MANAGEMENT SYSTEM REQUIREMENTS

This section outlines the requirements for implementing EVMS on Fermilab managed projects. These include:

1. Plan all work scope for the project to completion;
2. Break down the project work scope into finite pieces that can be assigned to a responsible person or organization for control of the technical, schedule and cost objectives;
3. Integrate the project work scope, schedule and cost objectives into a performance measurement baseline against which accomplishments may be measured. Control changes to the baseline;
4. Use actual cost incurred and recorded in accomplishing the work performed;
5. Objectively assess accomplishments at the work performance level;
6. Analyze significant variances from the plans, forecast impacts and prepare an estimate at completion based on performance to date and work to be performed;
7. Use EVMS information in management processes.

The basic principle of the EVMS process is structured around the five ANSI guideline categories including, (1) Organization, (2) Planning, Scheduling and Budgeting, (3) Accounting Considerations, (4) Analysis and Management Reports, and (5) Revisions and Data Maintenance. Compliance. These principles are supported by FRA's [EVMS System description and 8 implementing procedures](#), which include the following:

1. Procedure 1 - Project WBS, OBS, RAM
2. Procedure 2 – Control Accounts, Work Packages and Planning Packages
3. Procedure 3 – Work Authorizations
4. Procedure 4 – Project Scheduling
5. Procedure 5 – Cost Estimating
6. Procedure 6 – Monthly Status Reporting
7. Procedure 7 – Change Control
8. Procedure 8 – EVMS Surveillance and Maintenance

Over the past several years, Fermilab has been successful in implementing EVMS on DOE 413.3b projects as evidenced in the December 2014 independent Surveillance Review conducted on the certified Fermi Research Alliance Earned Value Management System (EVMS). This review audited two projects, CMS Phase 1 Upgrade and Mu2e, for compliance with implementation of EVM concluding that FRA EVMS

continues to meet the requirements and intent of ANSI/EIA-748 Standard and that there continues to be a Lab-wide emphasis on project performance, in general, and EVMS in particular. LBNF-DUNE will leverage the experience of these two projects and other projects to ensure its implementation is successful.

## 4 PROCESS IMPLEMENTATION

This section outlines how the Project already complies with the EVM requirements, and the steps that will be taken to implement the elements not as mature. Each FRA EVMS procedural step will be compared to the existing practice, gaps identified, and the plan outlined.

### 4.1 Procedure 1 - Project WBS, OBS, RAM

Procedure: This procedure provides guidelines and format for the development of the project Work Breakdown Structure (WBS), WBS Dictionary, Organizational Breakdown Structure (OBS), and Responsibility Assignment Matrix (RAM).

Presently: DUNE currently complies with the requirements set forth in Procedure 1. This is evidenced through the established WBS, OBS and RAM. The WBS, WBS Dictionary, OBS and RAM are included as supporting documents provided for the CD-3a review.

### 4.2 Procedure 2 – Control Accounts, Work Packages and Planning Packages

Procedure: This procedure governs the development and use of control accounts and work packages. A control account (CA) is a management control point at which budgets (resource plans) and actual costs are accumulated and compared to earned value. Work packages (WP) are a subdivision of a control account and consist of a discrete or level-of-effort set of tasks that have been planned and budgeted in detail. Planning packages are created to describe work within a control account that will occur in the future.

Presently: The Control Accounts for the CD-3a scope have been identified and are shown below. The Control Accounts are also included in the Responsibility Assignment Matrix, with corresponding values for the budgeted cost of work scheduled.

Additional Implementation Steps: The project schedule includes a combination of work packages and planning packages, which require additional work for compliance with the procedural requirements prior to baselining. These include

- Converting planning packages to work packages prior to 1 month of the current reporting period, including limiting their duration to 1-2 reporting periods
- Ensure all activities necessary to complete the project's work scope are scheduled. Once all scope is scheduled, activities must be traceable to the source plan or schedule.
- Some scheduled activities such as subcontractor schedules (fixed price, time & material, etc.) may be outside of the project's P6 baseline schedule. However, this scope must have appropriate milestones or activities, in the project P6 baseline schedule, that reflect efforts and dependencies. These activities must reflect the plan for earning value and reflect actual or accrued costs as agreed per procurement contract. The external schedule is then maintained and updated at least monthly per the schedule owner and the associated project activities are updated to reflect progress of identified deliverables.

WBS Element #	WBS Element Name	WBS Element Responsible Person	Control Acct (Y or N)
131.01.02.02.04.01	FSCF Construction Management	J. Willhite	Y
131.01.02.02.04.02	Buildings & Site Infrastructure (BSI)	J. Willhite	Y
131.01.02.02.04.03	Cavern & Drift Excavation (EXC)	J. Willhite	Y

### 4.3 Procedure 3 – Work Authorization

Procedure: This procedure establishes the work authorization to ensure that a Control Account (CA) is sufficiently defined, organized, planned, and budgeted before its work scope is authorized and started.

Presently: No work authorization documents exist for any control accounts.

Additional Implementation Steps: For each Control Account, the Work Authorization document and corresponding reports will be developed and executed for baselining. These documents and reports are shown in appendix A and include the following:

1. Work Authorization Document
2. Control Account Plan
3. Control Account Schedule

The forms and reports for the Work Authorization Documents are created using Fermilab project management/ project controls enterprise systems, Primavera (P6) and Cobra. They will be developed and signed once the schedule is baselined. As part of baseline change control which is explained in Procedure 7 below, the Work Authorization forms and reports are updated with each change to the control account.

### 4.4 Procedure 4 – Project Scheduling

Procedure: This procedure defines the scheduling approach and identifies the requirements and responsibilities for the development of plans and schedules for FRA projects where an Earned Value Management System (EVMS) is deemed appropriate.

Presently: The origins of the CD-3a schedule have been in existence in the Fermilab Enterprise system and used to manage the project since 2010. The schedule has been reviewed by committees on several occasions with positive results. The Far Site Conventional Facilities schedule has been integrated to the overall LBNF/DUNE project schedule, through the use of inter-project milestones.

Additional Implementation Steps: Although the schedule is stable, it needs additional work with respect to formatting and coding prior to baselining, such as additional refinement for work planned in FY16 and

assignment of performance measurement techniques codes. Additional reviews by internal project stakeholders will also be conducted as part of the baselining process.

## 4.5 Procedure 5 – Cost Estimating

**Procedure:** This procedure establishes the methods for developing cost estimates and implementing the cost estimating requirements as defined in the FRA Earned Value Management System Description document.

**Presently:** The scope of the CD-3a work has been estimated using the A/E's 100% preliminary design in accordance with the requirements of DOE's Cost Estimating Guide G-413.3-21. Also, in accordance with self-imposed LBNF processes, an independent estimate was completed on the 75% Preliminary Design scope by Hatch Mott and McDonald (HMM). The ARUP and HMM estimates were reviewed and reconciled during a 2-day workshop in August 2015. This reconciliation process is considered a best-practice in the private sector for civil-type construction project.

Upon receipt of the 100% cost estimate from ARUP, the Control Account Manager worked with a Project Controls Specialist to integrate the CD-3a plan into the Fermilab enterprise system and the schedule was integrated with all LBNF/DUNE schedules to time-phase the work across the life-cycle of the project. Internal indirect costs and estimate uncertainty contingency were applied to develop the Total Project Cost for the CD-3a scope of work.

**Additional Implementation Steps:** As the final design is completed, updated estimates in accordance with the estimating guidelines, for both base cost and contingency, will be completed for the CD-3a scope at distinct design milestones with changes incorporated into the project through change control.

## 4.6 Procedure 6 – Monthly Status Reporting

**Procedure:** This procedure describes the implementation of Earned Value Management for monthly status reporting and analysis, including variances in cost and schedule. The requirements include providing internal and external reports comparing actual costs and work accomplished to the planned value of the work, derived from baseline plans generated during the planning and budgeting phase. Forecasts of future costs and schedule dates will be made, and corrective actions initiated when problems are identified.

**Presently:** Monthly status reporting and reporting have been performed for several years with a "rolling" baseline.

**Additional Implementation Steps:** The monthly status and reporting process on a rolling baseline will continue for all subprojects, with the exception of the Far Site Conventional Facilities, where a baseline will be established and a forecast schedule updated monthly to compare actual vs. planned performance. In addition:

- The Fermilab enterprise systems are set-up for earned value status reporting, however the Project Controls Manager will need to work with other lab personnel to configure the reporting needs for LBNF/DUNE and to validate that the project data (EVMS inputs) is formatted properly to meet the reporting requirements (EVMS outputs).

- The project will establish work processes to create the monthly reports including the additional reporting requirements when variances thresholds are exceeded.
- Practicing all steps associated with a rigorous monthly reporting cycle, including the extra steps associated with completing a Variance Analysis Report and tracking the corresponding corrective action.

Examples of Monthly Status reports, forms and thresholds are provided in Appendix B.

## 4.7 Procedure 7 – Change Control

**Procedure:** The baseline change management process includes the initiation of a Baseline Change Request (BCR) form, the approval process in accordance with the thresholds described in the *DOE Preliminary Project Execution Plan* [ref] and the *LBNF/DUNE Configuration Management Plan* [1], and incorporation of the change (if approved) into the PMB and all associated technical baseline documents. This procedure also applies to the change control process for new work as directed by the customer.

Any project participant may initiate a change request. Generally, the participant that is affected directly by the change is responsible for initiating the change request. In any case, the Control Account Manager (CAM) is responsible for reviewing and for ensuring appropriate documentation is prepared to substantiate the change, including documenting proposed alterations to the currently approved project baseline scope, schedule, and/or budget. Project Controls support the CAM by helping to determine the schedule and budget impact of as well as validating BCRs.

**Presently:** A change control process was implemented within the LBNE Project after CD-1 approval in December 2012 and executed for 2 years. With the evolution of the project into LBNF/DUNE, a new process was created with separate LBNF and DUNE Change Control Boards, which act upon change control items within each project's purview, however when it is identified that a change to one project may impact the other project, the changes is elevated to the project's Experiment-Facility Interface Group (EFIG) for review. The change control process along with thresholds and authorities are outlined in the *Configuration Management Plan* [1].

**Additional Implementation Steps:** A change control process specific to LBNF will be created, detailing the steps required for approval of change control items. Samples of the reports and forms are included in Appendix C.

## 4.8 Procedure 8 – Surveillance and Maintenance

This procedure provides for a periodic review of the EVMS is necessary to maintain the certification of the FRA EVMS. LBNF/DUNE will participate in the surveillances as requested after baselining the CD-3a scope.

## 5 IMPLEMENTATION TIMELINE

Although many of the principles of estimating and scheduling best practices have been in use on LBNE and then on LBNF/DUNE over the past several years, implementation of a formal EVMS will require training, as well as additional updating and reporting rigor to strictly comply with FRA procedures and practices. A first and important milestone for implementation of EVM includes the training of staff, including but not limited to the Project Manager, Sub/ Deputy Project Managers, Control Account Managers, Project Controls staff and financial controllers. Training will be completed on the following topics on this schedule:

- EVMS Introductory Training 29 Sep 2015
- Responsibilities & Fundamentals; PMB Review: Principles & Questions 12 Oct 2015
- Estimate Development; Monthly Statusing 6 Nov 2015
- Change Control Process; Accruals 18 Nov 2015

After the CD-3a review, the Control Account Managers and Project Controls Specialists will update the project schedule to conform to baseline requirements. This schedule will be reviewed by internal stakeholders prior to baselining.

The LBNF/DUNE schedule needs to be altered to produce the requisite EVMS reports from the FRA's project controls systems. This is a learning process that may require some iteration to ensure all necessary inputs are mapped from the schedule into the EVMS processing tool correctly to produce accurate and consistent output. The Project Controls Manager will work with support staff from the Office of Project Support Services to ensure the LBNF/DUNE schedule is built properly to integrate with FRA's project controls systems and functions as required by the Fermilab guidelines.

The specific steps, durations and responsibilities are outlined in Table below. Once the preliminary baseline is established in March 2016, it is expected that a six month trial period will follow with formal baselining occurring before the end of FY2016.

Activity Description		Responsibility	January	February	March
1	<b>Prepare Schedule for Baselineing</b> - Ensure Work Activities for near team are < 2 months in duration - All Work Packages must have PMT codes - Create Planning Packages, as necessary - Schedule review by Stakeholders (e.g. Procurement, SURF, etc.)	CAM (with PCS support)	[Bar spanning Jan 15 to Feb 15]		
2	<b>Develop Monthly Update Process and Reports conforming to Lab Standards</b> - Turnaround Reports - EAC/ETC method and process - Performance Measurement Reports - Mgmt Variance Analysis Reports	PCM	[Bar spanning Jan 15 to Feb 15]		
3	<b>Create Change Control Process and Reports conforming to Lab Standards</b> - Change Log and Approval Mechanism - Contingency and MR Tracking - Before and After reports	System Engineer	[Bar spanning Jan 15 to Feb 15]		
4	Develop VARs to align with Variance Thresholds	PCM	[Bar spanning Feb 15 to Feb 28]		
5	Update Schedule through February	CAM (with PCS support)		[Bar spanning Feb 15 to Feb 28]	
6	Separate Activities so activities do not cross the March 1st Timeline & Set S=P=A beyond Feb 28th	CAM (with PCS support)			[Bar spanning Mar 1 to Mar 5]
7	<b>Execute Work Authorization Documents for FSCF Control Accounts</b> - Develop forms and reports - Create Approval Mechanism	CAM (with PCS support)			[Bar spanning Mar 15 to Mar 22]

Figure 5-1 Timeline and Steps for CD-3a EVM Implementation

# APPENDIX A: WORK AUTHORIZATION DOCUMENTS & ACCOMPANYING REPORTS

## Work Authorization Document

Control Account Information	
Control Account Manager:	Wielgos, Randal J
Control Account Number:	600.02
Control Account Description:	High-Voltage Electrical Upgrade

Period of Performance			
Start:	2/10/2014	Finish:	11/3/2016

WAD Scope
High Voltage Electrical Includes all labor, materials, services, and equipment required to design and construct the H/V upgrades. The design will be completed by in-house resources and subcontracted A/E services. Construction will be completed using firm-fixed price subcontractors.
BCR# 008 BCR008 - EDIA Adjust, Objective KPPs, MSS Change Orders_Impact: Cost \$429 & Sched Days 0
BCR# 007 BCR007 - Construction Bids_Impact: Cost \$1,086 & Sched Days 0
BCR# 009 BCR009 - ICW CNST Cobra Activity Date Correction_Impact: Cost \$ & Sched Days 0
BCR# 006 BCR006 - MSS Planning Package Adjustment_Impact: Cost -\$36 & Sched Days 0
BCR# 005 BCR005 - OPC Budget & Schedule_Impact: Cost \$44 & Sched Days -33
BCR# 004 BCR004 Budget and Sched per Procurement and Commissioning Pos_Impact: Cost in k dollars \$162 & Sched Days 0

Budget	HOURS	DIRECT	BAC
Funding Type DOE.Non-HEP.SLI.CN	5,101.00	12,537,278.12	13,402,816.83
Labor	5,101.00	444,651.44	806,650.16
Material	0.00	12,092,626.68	12,596,166.67
Funding Type DOE.Non-HEP.SLI.PE	1,664.00	1,256,297.87	1,595,124.04
Labor	1,664.00	135,815.68	270,949.67
Material	0.00	1,120,482.19	1,324,174.37
<b>Total Budget:</b>	<b>6,765.00</b>	<b>13,793,575.98</b>	<b>14,997,940.87</b>

Authorization Signatures	
CAM:	Date:
Project Manager:	Date:

WORK AUTHORIZATION CONTROL ACCOUNT PLAN:

Control Account	CA Start	CA Finish	WP	2014										
				AQ-2		AQ-3		AQ-4						
				2/28/2015	3/31/2015	4/30/2015	5/31/2015	6/30/2015	7/31/2015	8/31/2015	9/30/2015			
= 600.03 Industrial Cooling Water Upgrade	= 2/10/2014	= 6/26/2017	= 600.03.01.01.1010	295.01									750.91	
			= 600.03.01.01.1020	89.81									104.53	
			= 600 CW01	481.03									481.03	
				825.85									1,336.07	
			= 600.03.01.02.1000		26.86	31.50	32.03	26.80	31.46	29.81			178.46	
			= 600.03.01.02.1040			255.46							255.46	
			= 600.03.01.02.1045				63.87						63.87	
			= 600.03.01.02.1075				17.74	19.51	19.51	7.10			63.82	
			= 600.03.01.02.3000				21.14						21.14	
				825.85	26.86	286.96	117.03	44.54	50.98	49.33	7.10		582.79	
	= 2/10/2014	= 6/26/2017	= 600.01.04.1110										1,918.86	
			= 600.03.01.03.1000								70.43	24.18	200.00	
			= 600.03.01.03.1020									79.06	94.62	
			= 600.03.01.03.1030									114.28	491.89	
			= 600.03.01.03.1040										472.10	
			= 600.03.01.03.1050										152.03	
			= 600.03.02.01.1000									632.54	218.47	
			= 600.03.02.01.3000										10,247.15	
			= 600.03.02.01.3010				0.73	0.86					25.16	
			= 600.03.02.01.3020									618.80	1.60	
			= 600.03.02.03.3030										518.88	
							0.73	0.86				70.43	222.50	
							0.73	0.86				70.43	1,508.86	
<b>Grand Total</b>				<b>825.85</b>	<b>26.86</b>	<b>286.96</b>	<b>117.77</b>	<b>45.40</b>	<b>50.98</b>	<b>49.33</b>	<b>7.10</b>	<b>70.43</b>	<b>1,508.86</b>	<b>14,663.13</b>

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## CORRECTIVE ACTION LOG

Item # (date-CA-#)	Control Account #	Date Posted	Date Approved by PM	Responsible Person (CAM)	Corrective Action	Status (Open/Closed)	Status Details	Status Detail Date	Completion Date
03.31.15-02-001	600.02	31-Mar-15	31-Mar-15	Wielgos, Randal	Correct the issuance of future Purchase Orders to account for Exempt and Non-exempt line items ensuring indirect costs are applied proportionally to the direct invoice line items. This applies to the first 500k of costs in the Purchase Order.	Closed	All future Purchase Orders have been issued with two line items for Standard and Exempt to account for this issue.	31-Mar-15	31-Mar-15
04.30.15-02-002	600.02	30-Apr-15	30-Apr-15	Wielgos, Randal	Monthly review meetings to be held to address planned Accruals, Invoices, and Earned value to minimize the affect of unexpected costs.	Closed	Monthly meetings have been arranged close to month end with all relevant parties to discuss future planned budgets and actuals.	30-Apr-15	30-Apr-15

## VARIANCE ANALYSIS THRESHOLDS

Variance Analysis Thresholds for Control Accounts		
<b>Green Thresholds – Cost and Schedule Performance falling outside of yellow or red thresholds</b>		
<b>Yellow Thresholds</b>		
<b>Cost Variance</b>	<b>Type</b>	<b>Threshold limit</b>
<b>Schedule Variance</b>		
<b>Dollars</b>	Current Period	$\geq \pm 5\%$ to $< \pm 10\%$ and $\geq \$50K$
	Cumulative	$\geq \pm 5\%$ to $< \pm 10\%$ and $\geq \$100K$
<b>Hours</b>	Current Period	$\geq \pm 5\%$ to $< \pm 10\%$ and $\geq 350$ hrs
	Cumulative	$\geq \pm 5\%$ to $< \pm 10\%$ and $\geq 700$ hrs
<b>Red Thresholds</b>		
<b>Cost Variance</b>	<b>Type</b>	<b>Threshold limit</b>
<b>Schedule Variance</b>		
<b>Dollars</b>	Current Period	$\geq \pm 10\%$ and $\geq \$100K$
	Cumulative	$\geq \pm 10\%$ and $\geq \$200K$
<b>Hours</b>	Current Period	$\geq \pm 10\%$ and $\geq 700$ hrs
	Cumulative	$\geq \pm 10\%$ and $\geq 1400$ hrs

## APPENDIX C: CHANGE CONTROL REPORTS

### BASELINE CHANGE SUMMARY LOG

	BCWS	Contingency	TCP
Original Baseline	\$ 30,075,695	\$ 5,924,305	\$ 36,000,000
Current Net Approved Adjusted Baseline	\$ 32,886,954	\$ 3,113,046	\$ 36,000,000

Project Log of Baseline Change Requests

BCR #	Description of change	Date Submitted	Level	BCWS Impact	MR Impact	Contingency Impact	TPC Impact	Schedule Impact (Days)	Approval Status	Date of Last Status	Month-Year of BCR Implementation	Reference Document
001	Pre CD-2/3a Transition to Post CD-2/3a Establish Initial	1/22/2015	3	\$ 296	\$ -	\$ (296)	\$ -	126	approved		February-15	
002	Set Baseline and Align Budgets	2/11/2015	3	\$ 395	\$ -	\$ (395)	\$ -	0	approved		February-15	
003	Baseline Modifications due to Vendor Acceptance	2/27/2015	3	\$ 31	\$ -	\$ (31)	\$ -	0	approved		February-15	
004	Budget and Sched per POs	4/3/2015	3	\$ 173	\$ -	\$ (173)	\$ -	0	approved		April-15	
005	OPC Budget Allocation & Schedule Adjustments	4/28/2015	3	\$ 401	\$ -	\$ (401)	\$ -	0	approved		May-15	
006	MSS Planning Package Adjustment	5/27/2015	3	\$ (36)	\$ -	\$ 36	\$ -	0	approved		June-15	
009	ICW CNST Cobra Activity Date Correction	9/9/2015	3	\$ 94	\$ -	\$ (94)	\$ -	0	approved		September-15	
007	Construction Bids	7/29/2015	1	\$ 1,457	\$ -	\$ (1,457)	\$ -	0	approved		September-15	
008	EDIA Adjust, Objective KPPs, MSS Change Orders	9/28/2015	3	\$ (224)	\$ -	\$ 224	\$ -	0	Submitted		September-15	
Approved Net Impact				\$ 2,811	\$ -	\$ (2,811)	\$ -					
Pending Net Impact				\$ -	\$ -	\$ -	\$ -					
Total Net Impact				\$ 2,587	\$ -	\$ (2,587)	\$ -					

### BASELINE CONTROL ACCOUNT LOG

BCR #	BCR Description	Control Account	CAM	Prior Start	Revised Start	Start Impact (Days)	Prior Finish	Revised Finish	Finish Impact (Days)	Values		
										BAC Before	BAC After	Cost Impact Increase/(Decrease)
003										30,798.27	30,798.27	(0.00)
004										30,798.27	30,970.84	172.57
005										30,970.84	31,371.97	401.13
006										31,371.97	31,335.72	(36.26)
007										31,429.71	32,886.95	1,457.24
008	BCR008 - EDIA Adjust, Obj	600.01	Alber, Russell J	2/10/2014	2/10/2014	0	7/31/2017	7/13/2017	18	2,737.95	1,901.71	(836.24)
		600.02	Wielgos, Randal J	2/10/2014	2/10/2014	0	11/3/2016	11/3/2016	0	14,568.63	14,997.94	429.31
		600.03	Federowicz, Charles A	2/10/2014	2/10/2014	0	3/17/2017	6/26/2017	-99	14,480.37	14,663.13	182.75
		600.04	Alber, Russell J	10/1/2013	10/1/2013	0	3/17/2017	3/17/2017	0	1,100.00	1,100.00	0.00
008 Total										32,886.95	32,662.78	(224.18)

## HISTORY UNCHANGED VALIDATION

Pivot From Prior Data (in K Dollars)			Pivot From BCR Data (in K Dollars)			Prior Data - BCR Data (in K Dollars)	
Fund Type	(All)		Fund Type	(All)			
Results	F-BDN-AY\$		Results	F-BDN-AY\$			
Sum of Value	Cost Set		Sum of Value	Cost Set			
Date	Budget	ETC	Date	Budget	ETC	Date	Budget
10/31/2013	197		10/31/2013	197		10/31/2013	0
11/30/2013	163		11/30/2013	163		11/30/2013	0
12/31/2013	163		12/31/2013	163		12/31/2013	0
1/31/2014	180		1/31/2014	180		1/31/2014	0
2/28/2014	131		2/28/2014	131		2/28/2014	0
3/31/2014	134		3/31/2014	134		3/31/2014	0
4/30/2014	142		4/30/2014	142		4/30/2014	0
5/31/2014	135		5/31/2014	135		5/31/2014	0
6/30/2014	136		6/30/2014	136		6/30/2014	0
7/31/2014	140		7/31/2014	140		7/31/2014	0
8/31/2014	104		8/31/2014	104		8/31/2014	0
9/30/2014	84		9/30/2014	84		9/30/2014	0
10/31/2014	443		10/31/2014	443		10/31/2014	0
11/30/2014	314		11/30/2014	314		11/30/2014	0
12/31/2014	348		12/31/2014	348		12/31/2014	0
1/31/2015	538		1/31/2015	538		1/31/2015	0
2/28/2015	181		2/28/2015	181		2/28/2015	0
3/31/2015	458		3/31/2015	458		3/31/2015	0
4/30/2015	545		4/30/2015	545		4/30/2015	0
5/31/2015	788		5/31/2015	788		5/31/2015	0
6/30/2015	740		6/30/2015	740		6/30/2015	0
7/31/2015	1,320		7/31/2015	1,320		7/31/2015	0
8/31/2015	1,012		8/31/2015	1,012		8/31/2015	0
9/30/2015	1,180	777	9/30/2015	1,180	777	9/30/2015	0
10/31/2015	1,050	2,683	10/31/2015	710	2,683	10/31/2015	-340
11/30/2015	1,012	2,763	11/30/2015	1,005	2,763	11/30/2015	-7



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## REFERENCES

[1] LBNF/DUNE Project, "Configuration Management Plan (dune-doc-82)," 2015.