

FRA EVMS Training

December 03-4, 2008 ***“Earned Value Management Systems”***

- TRAIN database course # FN000429
- Documents used in training provided by consultant
- Attendees: Bakul Banerjee, Carl Bromberg, John Cooper, Paul Derwent, Steve Dixon, Ken Domann, Harry Ferguson, Bill Freeman, Peter Garbincius, Ken Heller, Cat James, Marc Kaducak, Jim Kerby, Dale Knapp, Ioanis Kourbanis, Pat Lukens, Mike Martens, Elaine McCluskey, Leon Mualem, Stuart Mufson, Gina Rameika, Ron Ray, Suzanne Saxer, Richard Talaga, Bob Zwaska

December 09, 2008 ***“Work Authorization & Change Control”***

- Documents used in training NOVA-doc-3676
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Carl Bromberg, Richard Talaga, Ken Heller, Leon Mualem, Pat Lukens and John Cooper

January 06, 2009 ***“Progress Reporting”***

- Documents used in training NOVA-doc-3555
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Carl Bromberg, Richard Talaga, Ken Heller, Leon Mualem, Pat Lukens and John Cooper

February 06, 2009 ***“Earned Value Management for Senior Management”***

- TRAIN database course # FN000431
- Documents used in training provided by consultant
- Attendees: Jeffery Appel, Greg Bock, Dave Carlson, Bruce Chrisman, Cindy Conger, Roger Dixon, Peter Garbincius, Bob Grant, Nancy Grossman, David Harding, Steve Holmes, Young-Kee Kim, Pier Oddone, Randy Ortgiesen, Ed Temple, Kay Van Vreede, Vicki White, Michael Lindgren

February 17, 2009 ***“Objective Measurement, BCWS Profile, Revised Variance Thresholds”***

- Documents used in training NOVA-doc-3627
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Carl Bromberg, Richard Talaga, Leon Mualem, Pat Lukens and John Cooper

March 03, 2008 ***“Control Account and Chargeable Task Codes”***

- Documents used in training NOVA-doc-3641
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Carl Bromberg, Richard Talaga, Ken Heller, Leon Mualem, Pat Lukens and John Cooper

March 17, 2008 ***“VAR Corrective Actions”***

- No particular document utilized
- Attendees: Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Richard Talaga, Leon Mualem, Pat Lukens and John Cooper

March 31, 2009 ***“Accruals”***

- Documents used in training NOVA-doc-3677
- Attendees: Paul Derwent, Ioanis Kourbanis, Robert Zwaska, Stuart Mufson, Carl Bromberg, Richard Talaga, Pat Lukens and John Cooper

April 14, 2009 ***“Finding your way around the CAM Notebook”***

- Documents used in training NOVA-doc-3696
- Attendees: Paul Derwent, Robert Zwaska, Steve Dixon, Carl Bromberg, Richard Talaga, Leon Mualem, Pat Lukens and John Cooper

April 21, 2009 ***“Control Accounts, Active Control Accounts, BCWS spread and Critical Path”***

- Documents used in training docdb 3703
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Carl Bromberg, Richard Talaga, Ken Heller, Leon Mualem, Pat Lukens and John Cooper

April 28, 2009 ***“EAC/ETC”***

- Documents used in training NOVA-doc-3761
- Attendees: Paul Derwent, Ioanis Kourbanis, Mike Martens, Robert Zwaska, Steve Dixon, Stuart Mufson, Carl Bromberg, Leon Mualem, Pat Lukens and John Cooper

Individual CAM Training and Review of CAM notebooks

April 14, 2009 ***“Review Accruals for CAs”***

- No Documents used in training
- CAM Attendees: Paul Derwent

April 24, 2009 ***“Understanding PMTs, Peg points on % complete BCWS spread on procurements and review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Rich Talaga, Leon Mualem and Mike Martens

April 24, 2009 ***“Understand how PMTs work when is stasured, where VARs are documented and review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Carl Bromberg

April 24, 2009 ***“Understand how to find CA values on RAM, differences between contingency/MR vs. updating EAC and review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Ken Heller

April 27, 2009 ***“Review CAM notebook, understand CPR1 reports and how to explain BCWS plan for commodity purchase”***

- Documents used in training - CAM Notebook
- CAM Attendees: Stuart Mufson

April 28, 2009 ***“Understand ETC, EAC and review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Steve Dixon

April 28, 2009 ***“Review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Bob Zwaska

April 30, 2009 ***“Understand how Peg points are used in statusing % complete PMTs, where that info is documented and Review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Ioanis Kourbanis

May 5, 2009 ***“Understand how much LOE PMT is in a CA, what EV reports are available, how EAC is updated, CAMs responsibility for correcting mischarges and review CAM notebook”***

- Documents used in training - CAM Notebook
- CAM Attendees: Pat Lukens

May 6, 2009 ***“General review of CAM notebook documentation”***

- Documents used in training - CAM Notebook
- CAM Attendees: Steve Dixon

CAM Topic Training

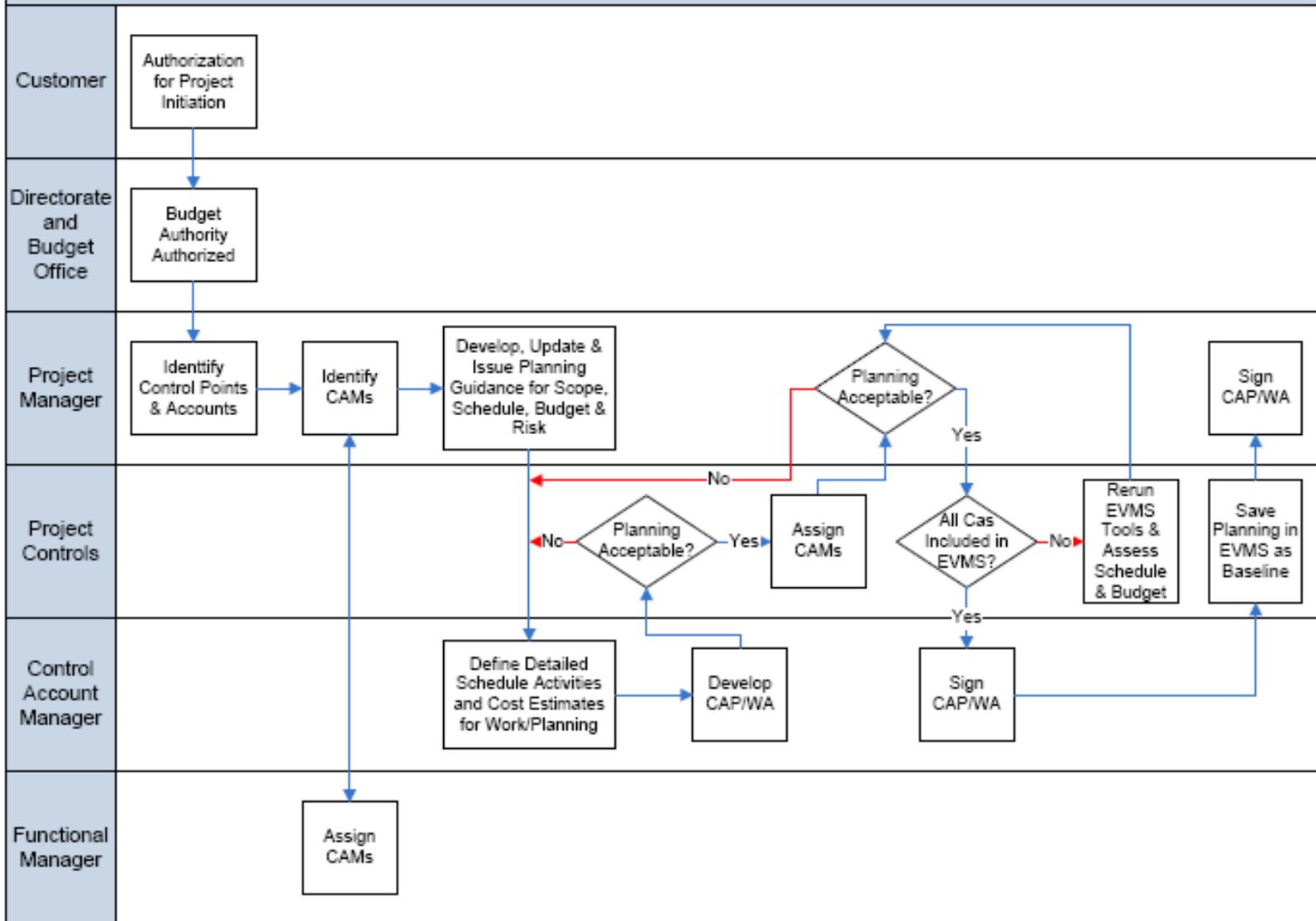
9 Dec 2009

Work Authorization
Change Control

Work Authorization Process

- Formalizes the agreement between the Project Manager and the CAM to accomplish the work scope defined in the WBS dictionary in the schedule timeframe noted, with the resources noted, and the budget time-phased noted
- Described in the FRA EVMS Procedure 12.PM-003

EVMS: Control Account, Planning, and Work Authorization



Work Authorization Document (WAD)

- Document that gets signed consists of
 - Control Account Plan/Work Authorization Form
 - Budget for control account phased by month
 - Schedule for control account by task
 - Resources required by task
 - WBS dictionary

Work Authorization Mechanics

- WADs are kept in NOVA docdb as files, one per control account
- WADs are linked to the CAM notebooks which are also individual files in NOVA docdb, one per control account
- WADs are signed by the Field Financial Officer, the Project Scheduler, the CAM, and then the PM, all under docdb signoffs

Work Authorization docdb file

NOVA Document 3307-v3
[\[NOVA DocDB Home\]](#)

Work Authorization Document for Control Account 1.3
(Document Status: Approved)

Document #:
NOVA-doc-3307-v3

Document type:
[Work Authorization](#)

Submitted by:
[Elaine McCluskey](#)

Updated by:
[Elaine McCluskey](#)

Document Created:
24 Oct 2008, 11:20

Contents Revised:
21 Nov 2008, 15:50

DB Info Revised:
02 Dec 2008, 16:23

Update Document

Update DB Info

Add Files

Watch Document

Abstract:
This document contains files or links to other files in NOVA-docdb that constitute this Work Authorization Document.

Files in Document:

- [NOVA Budgeted Cost by Month by CA 1.3.pdf](#) (29.5 kB)
- [NOVA WAD form CA 1.3.doc](#) (79.5 kB)
- [WBS Dictionary 1.3, 2.3.pdf](#) (7.7 kB)
- [WP Schedule for Control Account](#) (WAD Gantt CA_1.3.pdf, 54.9 kB)

Get all files as [tar.gz](#), [zip](#).

Topics:

- [Work Authorization](#)

Authors:

- [Carl Bromberg](#)

Keywords:
[control account](#)

Notes and Changes:
changing Carl's certificate

Referenced by:

- NOVA-doc-3384: [CAM Notebook for 1.3](#)

Signoffs:

- [Suzanne L. Saxer](#) (signature complete)
- [William S. Freeman](#) (signature complete)
 - [Carl Bromberg 75407](#) (signature complete)
 - [John W. Cooper 937155](#) (signature complete)

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- [nova-techboard](#)
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Other Versions:

- [NOVA-doc-3307-v2](#)
13 Nov 2008, 14:18
- [NOVA-doc-3307-v1](#)
27 Oct 2008, 09:30
- [NOVA-doc-3307-v0](#)
24 Oct 2008, 11:20

Work Authorization Form



CONTROL ACCOUNT PLAN/WORK AUTHORIZATION FORM NOVA Project

Control Account Title: WLS Fiber R&D

Control Account Number: 1.3

Work Breakdown Structure Element: WBS 1.3

Period of Performance: 01May07 to 09Oct09

Current Authorized Budget (in AYS with all burdening): \$298,604

This Work Authorization, including all attachments, represents the agreement between the Project Manager and Control Account Manager (CAM) to perform, or to have performed, efforts defined by the following:

- 1) A WBS Dictionary sheet that defines the scope of work for this WBS element/Control Account. If additional definition is warranted, or required for a particular WBS element, (e.g., QA reasons, Work Orders for third party services, etc) attach applicable documentation.
- 2) A detailed Control Account schedule showing all work packages and planning packages.
- 3) A detailed resource report by WBS and schedule activity.
- 4) Budgeted cost by month

This Work Authorization is for the lifecycle of the project. Funding will be authorized incrementally based on schedule status and funding availability, and communicated by other means to CAMs.

In addition to the CAMs approval of all third party commitments (i.e., Memorandums of Understanding (MOU) with other institutions, purchase orders, and subcontracts), the following is required:

- Commitments must be approved by the Project Manager for all R&D work > \$1000, and for construction work where commitments values are greater than \$10,000.
- To move funds to collaborating institutions, the CAM is to see that the following is in place before executing the purchase order:
 - MOU with the collaborating institution, signed by both parties, including the Project Manager.
 - Statement of Work, one for each fiscal year (FY), detailing the amounts expected to be funded during that FY. SOW signatures must include the CAM and the Project Manager.
 - This Work Authorization with all approvals.

Any change to this document will be implemented through the Change Control procedures.

Approvals will be done through the NOVA DocDB on the Work Authorization Document file.

Signature chain will be Scheduler, Financial Officer, Control Account Manager, and Project Manager.

Control account task codes may not be opened without a signed work authorization form.

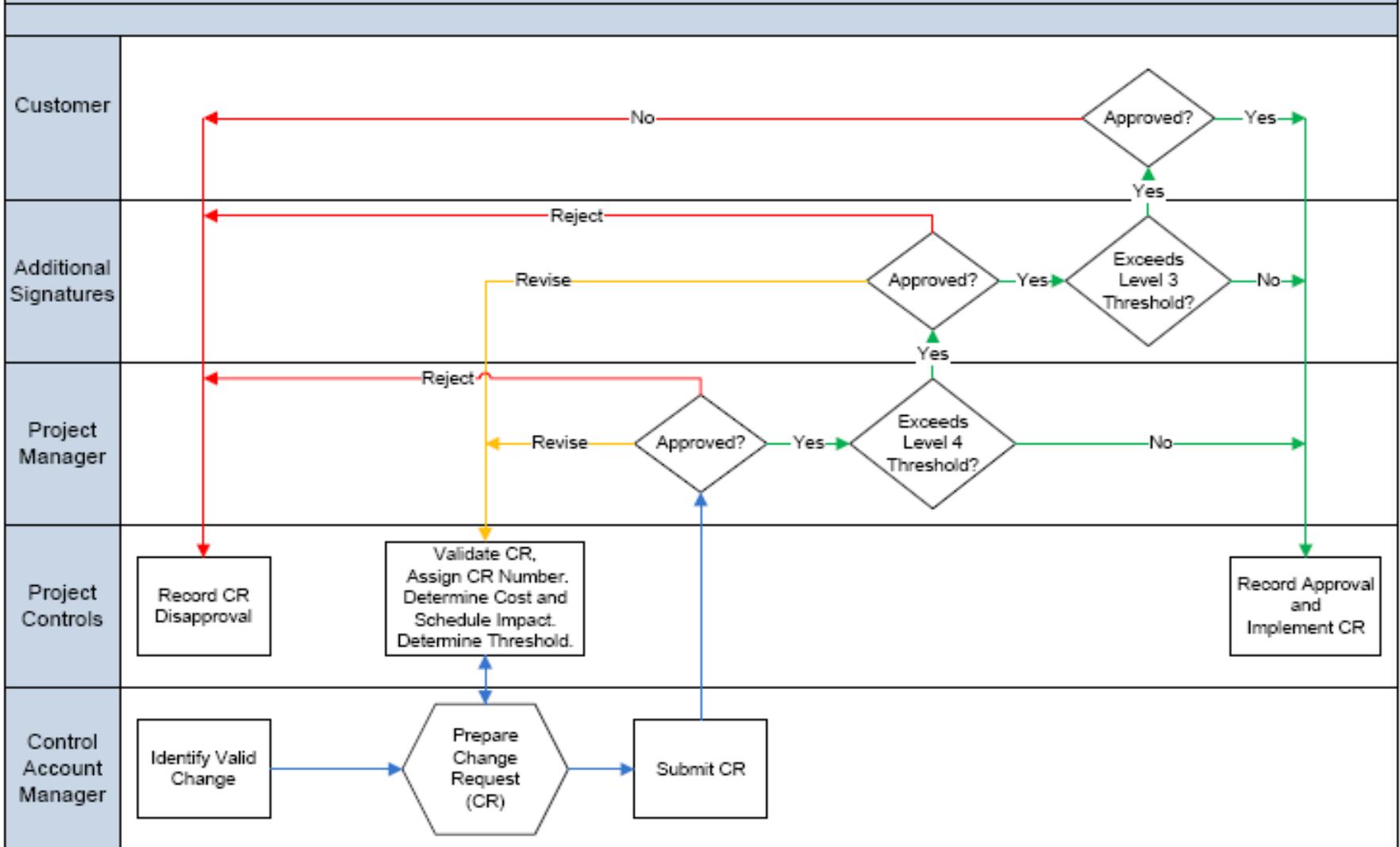
Work Authorization – when to update

- Updates happen when any of the items change that make up the WAD
- If there are changes, the WAD could be updated once the change request is approved
- EVMS documents allow for annual updates to include changes in that year, rather than updating with each CR
- Updates are done by the CAM and Project Controls working together
- Questions???

Change Control Process

- When changes are required to the project baseline, a standard change control process is followed
 - Some of this process is generally described in the EVMS procedure 12.PM-007
 - The particulars of the process NOVA uses are described in NOVA-doc-131, Configuration Management and Change Control Plan

EVMS: Change Control Flow Diagram



Change Control Mechanics

- CAM or someone else within project subsystem identifies need for a change
- CAM should try to talk with the Project Manager about any anticipated changes before submission
- Once decision is made to proceed, use CR email form from NOVA Project website to submit change information

Change Control Mechanics

- CR email goes to Elaine for processing
- Information is input into NOVA Change Database in MS Access
- CR # is assigned
- Paper form is submitted to Bill for preliminary assesement of cost and schedule impact of change
- John then either approves or disapproves preliminary impact
- If approved, CR proceeds to Suzanne for actual cost impact out of Cobra
- Final impact information is inputted into Change Database, form revised, and then final signatures acquired
- All documentation related to change is filed in NOVA docdb, one CR per document file.

CR submittal form from website

NOvA Project Office Home Page (certificate links) - Microsoft Internet Explorer

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Address http://www-nova.fnal.gov/nova_project.html Go

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NOvA Project Office Home Page

General

[NOvA Organization Chart](#)
[ANU Org Chart](#)
[NOvA ES&H/QA Information](#)
[ANU Subproject](#)
[CAM Notebooks](#) (as [grouped MS Excel](#))

NOvA Change Requests

[Configuration Management Program](#)
[Configuration Item Data List \(CIDL\)](#)
[Change Request Procedures](#)
[Change Control Form](#)

NOvA Review Schedule

- [DOE Mini-Review](#) April 30, 2008
- [Director's Mini-Review](#) April 17, 2008
- [Department of Energy CD2/3a](#) October 22-25, 2007
- [External Independent Review](#) November 26-30, 2007

NOvA Documents

- o [Document Database](#)
- o [CDR](#)
- o [Proposal](#)

Reference

- o [P5 report](#)
- o [NuSAG report](#)
- o [CD1](#)

Page Links

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Done, but with errors on page. Local intranet

CR submittal form from website

NOVA Change Request Form - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www-nova.fnal.gov/change_requests/cr_form.html

Links Fermilab at Work ORNL Review Project X NOVA DoDB NOVA at Fermilab Welcome Home projectb-docdb ANU weblink

 NOVA Project Office
CHANGE REQUEST FORM (CR)

Title

L2 Manager Originator Email

WBS Change Type:
 Technical Schedule Cost Other

Budget
M&S (base cost)

before change	after change
<input type="text"/>	<input type="text"/>

Resource Type & Labor hours

before change	after change
<input type="text"/>	<input type="text"/>

Start/End Dates & Duration :

Before Change		
Start Date	End Date	Duration (working days)
<input type="text"/>	<input type="text"/>	<input type="text"/>

After Change		
Start Date	End Date	Duration (working days)
<input type="text"/>	<input type="text"/>	<input type="text"/>

Short Description

This should very briefly, describe

- What is being requested
- Why it's necessary
- Impact on other costs (if none, so state)
- Impact on schedule and milestones (if none, so state)
- Impact to interfaces and other activities (if none, so state)
- Indicate any ES&H impact
- Other pertinent information, if necessary

If supporting documents have been uploaded to the NOvA Document database please enter the document number below.

DocDB Document Number: Date:

Submit request: Clear form:

Send suggestions or comments to - [The Pagemaster](#)

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Change Control Mechanics

- Approval path is
 - CAM, plus L2 if different from CAM
 - Bill
 - Suzanne
 - John
 - Peter Garbincius, if required by thresholds
 - Pepin Carolan, if required by thresholds

Change Control Thresholds

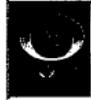
- Thresholds defined in NOVA Change Control Plan – agreed to on a project basis by FPD and PM

Table 1 Change control thresholds and responsibilities

	Secretarial Acquisition Executive (Level 0-A) Deputy Secretary	Acquisition Executive (Level 0-B) SC-1	Associate Director OHEP (Level 1)	DOE NOVA Federal Project Director (Level 2)	Fermilab Associate Director (Level 3)	NOVA Project Manager (Level 4)	Subproject Manager (Level 5)
Technical	A change in scope that affects the ability to meet a Key Performance Parameter (KPP) and the ability to satisfy the mission need.	A change in scope that affects the ability to meet a KPP and the ability to satisfy the mission need.	Any change in the KPPs as referenced in PEP section 3.2.	Any significant change to the technical scope (as described in PEP sect. 5) that affect ES&H requirements or meeting Project Closeout definitions in PEP Table 7.2.	Major technical changes that are significant departures from the technical baseline. Changes that affect ES&H or impact PoT projections by more than 10%. Out-of-scope changes to upgrade physics capabilities.	Related technical changes to multiple subprojects that do not diminish performance	Minor technical changes to a single subproject that does not diminish performance
Schedule	≥ 6 month (cumulative) delay in the CD-4 completion date.	a 3 to 6 month (cumulative) delay in the CD-4 project completion date.	Any change to a level 1 milestone > 3 months, or up to a 3 month delay in CD-4 project completion date .	Any change to a Level 2 milestone > 1 month or a Level 1 milestone < 3 months.	Any change that results in the delay of a Level 3 Director's milestone.	Any change that results in the delay of a Level 4 milestone by more than one month.	Any change that results in the delay of a Level 5 milestone by more than one month
Cost	Increase in excess of \$25M or 25% (cumulative) of the CD-2 Total Project Cost baseline.	Any increase in the CD-2 Total Project Cost baseline.	Any change in Total Estimated Cost or Total Project Cost.	Any cumulative use of contingency of > \$1M.	Increase in the cost of a single item by more than \$250k. Increase in the Project base cost exceeding \$500k during the previous 12 months.	Increase in the cost of a single item by more than \$100k.	Increase in the cost of a single item by more than \$25k.

NOTE: INFORMATION FOR LEVEL 0 – LEVEL 2 CHANGES IS COPIED FROM THE PROJECT EXECUTION PLAN

CR approval form example



NOVA Project Office

CHANGE REQUEST RECORD

NOVA-CR No.	44	PRELIMINARY		PM GO-AHEAD
Related NOVA-DCN No.		Cost Impact:	\$216,593.00	DATE
Date Initiated	8/8/2008	Schedule Impact:	none	
Date Revised:	10/14/2008	FINAL APPROVAL		
Date Closed		Final Cost Impact:	\$216,597.28	from Project Financial Officer
Level of Change	L4 (NOVA PM)	Final Schedule Impact:	none	from Project Scheduler
Status	In Process	<i>Cary Bromberg</i> 10/14/08 CONTROL ACCOUNT MANAGER (+ L2 MGR IF DIFFERENT) DATE		
Awaiting:	Bromberg	<i>[Signature]</i> 10/14/08 PROJECT MANAGER DATE		
		<i>[Signature]</i> 10/14/08 FINANCIAL OFFICER DATE		
		<i>[Signature]</i> 10/14/08 SCHEDULER DATE		
		ASSOCIATE DIRECTOR FOR RESEARCH (IF REQ'D) DATE		
		DOE FEDERAL PROJECT DIRECTOR (IF REQ'D) DATE		



NOVA Project Office

CHANGE REQUEST RECORD

Labor Resource Type: (one resource per line)	Hours Before Change:	Hours After Change:
new 2.3.1.6		
L.MSU.PD.TECH.MT_M	0	544
L.MSU.PD.ME_SR	0	544
1.3.4.6		
L.MSU.PD.SCI.PHY	18	38
L.MSU.PD.ENG.EE_SR	22.5	0
L.MSU.PD.TECH.MT_M	0	340
L.MSU.PD.ENG.ME_SR	45	680
1.3.5.2		
L.MSU.PD.TECH.MT_M	90	544
L.MSU.PD.ENG.ME_SR	90	544
1.3.5.3		
L.MSU.PD.TECH.MT_M	4	10

SCHEDULE INFORMATION

BEFORE CHANGE (from Open Plan)

Duration Before Change:	Start Date:	End Date:
1.3.4.6 - 27 days		
1.3.5.2 - 15		
1.3.5.3 - 5		
2.3.1.6 - 0		

AFTER CHANGE

Duration After Change:	Start Date:	End Date:
1.3.4.6 - 100 days		
1.3.5.2 - 80		
1.3.5.3 - 70		
2.3.1.6 - 80		

SUBMITTED INFORMATION

CR Title: Fiber QA Facility and QA of IPND Fiber

Change Type: Technical Cost Schedule Other

Initiator Name: C Bromberg Control Account Manager: Bromberg

Initiator Email: bromberg@pa.msu.edu

Affected WBS #'s: 1.3.4.6, 1.3.5.2, 1.3.5.3, new 2.3.1.6

Change Description:

- 1.3.4.6 - Labor to complete fiber QA facility at MSU. facility must be ready before IPND fiber arrives at MSU (cur. est Jan 09); change start to 8/1/08, dur to 100 days
- 1.3.5.2 - Additional labor to perform QA on fiber, 35 spools for IPND. IPND fiber must be studied in detail to establish construction purchase criteria
- 1.3.5.3 - Additional labor to for multiple shipments) increase duration due to need for multiple shipments (just-in-time, as fiber is tested) spread over longer time (70d) rather than one shipment at end of QA testing;
- 2.3.1.6 - (new task) - Design and construct fiber QC device for use by/at fiber vendor (Kuraray), similar to MSU device; needed for QC of construction fiber at the vendor; link to predecessor "FY10 funds available"; 80 d duration

 No impact on other costs or milestones, no ESH impact.

CR File found in NOVA-doc: 3189

BUDGET INFORMATION (\$FY07 unburdened)

MS Cost Before Change:	new 2.3.1.6 \$0
MS Cost After Change:	new 2.3.1.6 \$5000

CR docdb file example



NOVA (E929)

NuMI Off-Axis v_e Appearance Experiment

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NOVA Document 3189-v1

[\[NOVA DocDB Home\]](#)

CR044 - Fiber QA Facility and QA of IPND Fiber

Document #:
NOVA-doc-3189-v1

Document type:
[change request](#)

Submitted by:
[Elaine McCluskey](#)

Updated by:
[Elaine McCluskey](#)

Document Created:
08 Aug 2008, 08:34

Contents Revised:
16 Oct 2008, 10:36

DB Info Revised:
16 Oct 2008, 10:37

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Abstract:

Change to add design & construction of a version of the MSU QA fiber facility for Kuraray QC; additional labor to complete fiber QA facility for IPND before fiber arrives at MSU; additional labor to perform 1st QA on fiber to establish construction purchase criteria.

Files in Document:

- [CR044 form PM approved.pdf](#) (58.4 kB)
- [OBL After Update](#) (Budget and Contingency After Baseline Update CR044_Ke...pdf, 26.3 kB)
- [OBL Before Update](#) (Budget and Contingency Before Baseline Update CR044_Ke...pdf, 26.3 kB)
- [PMB After Update](#) (Budget and Contingency After Baseline Update CR044_Nov...pdf, 26.3 kB)
- [PMB Before Update](#) (Budget and Contingency Before Baseline Update CR044_No...pdf, 26.3 kB)

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Topics:

- [Change Control](#)
- [WLS Fiber](#)

Authors:

- [Carl Bromberg](#)

Keywords:

[change request](#)

Viewable by:

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Modifiable by:

- [nova-techboard](#)
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- [nova-proj-office](#)

Other Versions:

[NOVA-doc-3189-v0](#)
08 Aug 2008, 08:34

Notes and Changes:

add PM approved form; added "before" and "after" pdf snapshots

Referenced by:

- NOVA-doc-3411: [CAM Notebook for 2.3.1](#)
- NOVA-doc-3384: [CAM Notebook for 1.3](#)

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Change Control on NOVA

- Currently, John is approving all CRs, no lower cost or schedule threshold
- CR process time can be extended, depending on other demands on Project Controls staff time.
- Changes are not done to wipe out old sins, only for work in the future
- Questions???



PMCS Tutorial For Control Account Managers

Reporting Progress, EVMS Reports, and Analysis

Bill Freeman

Nova Project Office

January 6, 2009



Outline

- Review of Project Controls Tools
- OP Schedule Views for Progress Reporting
 - Turnaround Reports
 - Progress Gantts (activities, milestones)
- Review of EV-related Acronyms
- Toy EV example
- Sample EVMS reports
 - Contract Performance Reports (CPR1)
 - Curve plots
 - Bulls-eye plot
 - Variance analysis reports (CPR5)
- Monthly Reporting Timeline
- Summary



Review Of Tools

- Scheduling Tool – **OPEN PLAN**
- Budget/Earned Value Analysis Tool – **COBRA**
- They are integrated tools, but...
 - Some differences in terminology pop up
 - “Schedule-speak” vs. “εαρνεδ-παλυε σπεακ”
(earned-value speak)
- Must learn/retain the EV-speak, too.
 - Will indicate parallels in this training



Scheduling Tool – Open Plan

■ Key Activity Info

- Activity ID, Description, Duration, Type
 - Activity ID hierarchy reflects the WBS hierarchy
 - Types include: Subproject, Start/Finish Milestones, ASAP, ALAP
- Relationships (predecessors, successors, leads/lags, target dates)
- Resource assignments
 - Resource ID hierarchy encodes information
 - » L.*inst.dept.cat.type* L.*FNAL.PPD.ENG.EE*
 - » M.*inst.dept.cat* M.*UMNTC.PD.MANDSXMPT*
 - *Cat* includes categories such as: Engineers, Techs, Scientists, etc.
 - *Type* denotes specific functional area: e.g. electrical engineer (EE)
 - L - Labor - resource assignment levels in hrs
 - M - M&S - resource assignment levels in direct (i.e. unburdened) FY07 \$\$
 - OP resource rates (and therefore OP calculated costs) include burdening
- Bottom-up contingency estimates - % of budgeted labor and M&S \$\$
- Funding source (DOE R&D, Cooperative agreement, DOE equipment [MIE], etc.)
- Responsible institution
- WBS definitions (task notes); refs to detailed BOE (in docDB)
- Performance Measurement Technique, Control Account/Cost Account/Work Package assignments (for *Cobra/EV* use)



Scheduling Tool – Open Plan

■ Reminders

- “Time analysis” in Open Plan yields the planned sequence of activities (i.e. the schedule)
 - **Early/Late Dates** – early dates calculated from forward pass, late dates from backward pass of the time analysis.
 - Nova **P**erformance **M**easurement **B**aseline (PMB) is based on Early dates calculated at the time we created the baseline.
 - Current values for Early/Late dates are recalculated each month based on progress information, i.e. actual dates, remaining activity durations, and relationships as of the status date. Think of these recalculated dates as the current forecast of the schedule.
- Open Plan is the initial repository for baseline dates and resource assignments which are then transferred to Cobra.
- Open Plan is the initial repository for schedule progress information (actual start/finish dates, remaining durations, units completed, PPC, etc.) entered each month which is then transferred to Cobra.
- Open Plan cost analysis (with escalation) yields a (close) approximation to official budget numbers, but official burdened and escalated budget numbers and profiles are produced by **COBRA**, not **OPEN PLAN**.



Budget/Earned Value Analysis Tool-Cobra

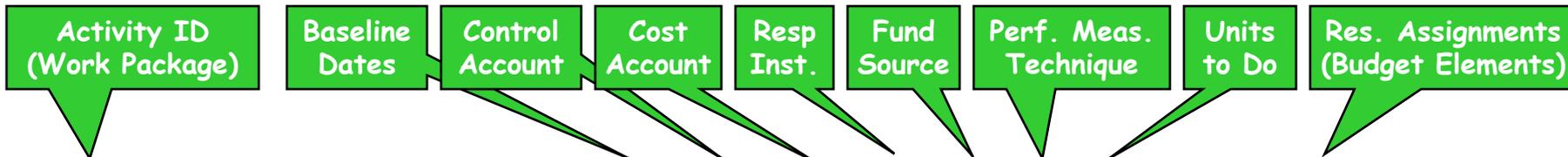
- COBRA – integrates with Open Plan
 - Each lowest-level activity in Open Plan (i.e. the level where resources are assigned) is associated with and referred to as a **work package** in Cobra. Each such activity in OP is assigned a **control account** number and a **cost account** number in Open Plan to map it into the appropriate place in COBRA.

Top-down structure in Cobra

- **Control Account** – a high-level grouping of related cost accounts; associated with a high-level WBS element/schedule activity
- **Cost Account** – a collection of work packages in Cobra; associated with an intermediate-level WBS element/schedule activity; each cost account rolls up to a single control account in Cobra
 - » Note: Actual costs (ACWP) are collected at the cost account level
- **Work Package** – associated with a lowest-level WBS element/activity; each WP resides under and rolls up to a single cost account and control account
 - » Progress information is collected/reported at the WP level
 - » Earned Value (BCWP) and Planned Work (BCWS) is computed at WP level.
- **Budget Elements** - assigned to work packages; correspond to the resource assignments and levels (labor hrs or M&S direct FY07 \$\$) from the corresponding activity in Open Plan.



COBRA-Related Open Plan Info



Activity ID	Activity Description	Baseline Dates	Control Account	Cost Account	Resp. Inst.	Fund Source	PMT Type	Units To Do	ResInfo
2	Construction Project	01May07						0	
2.9	Far Detector Assembly	0430							
2.9.4	Block Assembly and Installation	0426							
2.9.4.3	Block Assembly and Alignment	2728							
2.9.4.3.1	Operations review: Far detector assembly procedures	2703							
2.9.4.3.3	Assemble and mount block 1	0814							
2.9.4.3.4	Assemble and mount block 2	10Jan12 14Feb12	2.9.4	2.9.4.3	UMNTC	DE	C	0	L.UMNTC.FD.TECH.LDR,600.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.MT_W,2800.00;;L.UMNTC.FD.TECH.EO,600.00,
2.9.4.3.5	Assemble and mount block 3	21Feb12 26Mar12	2.9.4	2.9.4.3	UMNTC	DE	C	0	L.UMNTC.FD.TECH.EO,800.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.MT_W,3600.00;;L.UMNTC.FD.TECH.LDR,800.00,
2.9.4.3.6	Assemble and mount block 4	27Mar12 12Apr12	2.9.4	2.9.4.3	UMNTC	DE	E	0	L.UMNTC.FD.TECH.MT_W,1872.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.EO,416.00;;L.UMNTC.FD.TECH.LDR,416.00,
2.9.4.3.7	Assemble and mount block 5	13Apr12 01May12	2.9.4	2.9.4.3	UMNTC	DE	E	0	L.UMNTC.FD.TECH.EO,416.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.MT_W,1872.00;;L.UMNTC.FD.TECH.LDR,416.00,
2.9.4.3.9	Assemble and mount block 6	02May12 18May12	2.9.4	2.9.4.3	UMNTC	DE	E	0	L.UMNTC.FD.TECH.MT_W,1664.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.EO,416.00;;L.UMNTC.FD.TECH.LDR,312.00,
2.9.4.3.10	Assemble and mount block 7	21May12 07Jun12	2.9.4	2.9.4.3	UMNTC	DE	E	0	L.UMNTC.FD.TECH.EO,416.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.LDR,312.00;;L.UMNTC.FD.TECH.MT_W,1664.00,
2.9.4.3.11	Assemble and mount block 8	08Jun12 26Jun12	2.9.4	2.9.4.3	UMNTC	DE	E	0	L.UMNTC.FD.TECH.LDR,208.00;;M.UMNTC.FD.MANDSXMP,10300.00;;L.UMNTC.FD.TECH.MT_W,1352.00;;L.UMNTC.FD.TECH.EO,416.00,

OP Activity ID → COBRA Work Package ID
 OP PMT assigned → COBRA WP PMT
 A = Level of Effort (BCWP=BCWS → No SV)
 C = Specify Physical Percent Complete
 D = Specify Units Completed
 E = 50-50 (50% at start, 100% at finish)
 F = 0-100 (0% until completed)
 OP Resources assigned → Cobra Budget Elements assigned



CAM Monthly Progress Reporting

- Written procedure/guidelines found in Nova DocDb 1436
- Project Office posts monthly Turnaround Reports in Nova DocDb 1919 listing activities that potentially require progress updates from managers (nominal 6 month lookahead)
- Basic Requirements
 - Report progress, if any, for each lowest-level activity (and milestone) in the turnaround report
 - Did the activity start during the reporting period? If so, what was its actual start date?
 - Did the activity finish during the reporting period? If so, what was its actual finish date?
 - If the activity was in progress during the reporting period but not yet completed as of the end of the period, what is its remaining duration projected to be (in working days) as of the end of the period?
 - » What is its expected finish date? (optional)
 - What is the physical percent complete of the activity as of the end of the reporting period?
 - » What are the number of units completed as of the end of the period, if that PMT method is being used for the activity?

Wake up for this!



Turnaround Report Spreadsheet

Example of Return Copy - Updated with progress info for Current Month

ID	Description	Orig. Dur.	Early Start	Early Finish	Baseline Start	Baseline Finish	Progress Type	Progress Value	Actual Start	Actual Finish	Expected Finish	PPC	Units Completed	Total Units Needed	Activity Type	Comments
1.5	PVC Module R&D	1073d	10/3/2005	1/13/2010	5/1/2007	1/13/2010	Remaining Duration	320d	10/3/2005			35.7	0	0	Subproject	
1.5.2	End Seal R&D	955d	1/3/2006	10/16/2009	5/1/2007	11/12/2009	Remaining Duration	263d	1/3/2006			64.67	0	0	Subproject	
1.5.2.1	Fiber Manifold R&D	804d	1/3/2006	3/16/2009	5/1/2007	3/26/2009	Remaining Duration	112d	1/3/2006			94.6	0	0	Subproject	
1.5.2.1.1	Fiber Manifold Component R&D	804d	1/3/2006	3/16/2009	5/1/2007	3/26/2009	Remaining Duration	112d	1/3/2006			94.6	0	0	Subproject	
1.5.2.1.1.14	Preproduction prototype manifold design (for IPND) completed	0	3/16/2009	3/16/2009	3/26/2009	3/26/2009	Planned	0				0	0	0	Finish Milestone	not done
1.5.2.1.1.15	Finalize design of preproduction prototype (for IPND) - Part 2	39d	8/1/2008	3/16/2009	2/2/2009	3/26/2009	Remaining Duration	27d 34d	8/1/2008			30 20	0	0	ASAP	new progress
1.5.2.3	Joining Technology R&D	955d	1/3/2006	10/16/2009	5/1/2007	11/12/2009	Remaining Duration	263d	1/3/2006			64.67	0	0	Subproject	
1.5.2.3.9	Mechanical lifetime tests of tubing systems - Part 2	191d	9/2/2008	10/2/2009	2/2/2009	10/23/2009	Remaining Duration	153d 42d	9/2/2008			20 40	0	0	ASAP	new progress
1.5.2.3.10	Chemical lifetime tests of joining systems - Part 2	191d	9/2/2008	10/2/2009	2/2/2009	10/23/2009	Remaining Duration	153d 42d	9/2/2008			20 40	0	0	ASAP	new progress
1.5.4.2	IPND Manifold Components	110d	2/2/2009	7/7/2009	2/2/2009	7/7/2009	Planned	0				0	0	0	Subproject	
1.5.4.2.1	Manufacture snout	65d	2/2/2009	5/1/2009	2/2/2009	5/1/2009	Planned	0				0	0	0	Subproject	
1.5.4.2.1.2	Manufacture manifold covers	110d	2/2/2009	7/7/2009	2/2/2009	7/7/2009	Planned	0				0	0	0	Subproject	
1.5.5	Manufacture fill tubes	30d	2/2/2009	3/13/2009	2/2/2009	3/13/2009	Planned	0				0	0	0	Subproject	
1.5.5.4	Manufacture side s	2/2/2009	5/8/2009	Planned	2/2/2009	5/8/2009	Planned	0				0	0	0	Subproject	
1.5.5.10	Manufacture fiber	2/2/2009	5/22/2009	Planned	2/2/2009	5/22/2009	Planned	0				0	0	0	Subproject	
1.5.5.11	Manufacture fiber	2/2/2009	4/10/2009	Planned	2/2/2009	4/10/2009	Planned	0				0	0	0	Subproject	
1.5.5.12	Manufacture fill tub	2/2/2009	4/10/2009	Planned	2/2/2009	4/10/2009	Planned	0				0	0	0	Subproject	
1.5.5.13	Manufacture fiber	2/2/2009	4/10/2009	Planned	2/2/2009	4/10/2009	Planned	0				0	0	0	Subproject	
1.5.7	IPND End Plate Co	85d	8/9/2007	6/1/2009	8/9/2007	6/1/2009	Remaining Duration	85d	8/9/2007			0	0	0	Finish Milestone	not done
1.5.7.1	Manufacture IPND	2/2/2009	6/1/2009	Planned	2/2/2009	6/1/2009	Planned	0				0	0	0	Subproject	
1.5.7.1.4	Manufacture fiber	2/2/2009	3/27/2009	Planned	2/2/2009	3/27/2009	Planned	0				0	0	0	Subproject	
1.5.7.1.5	Manufacture side s	2/2/2009	3/2/2009	Planned	2/2/2009	3/2/2009	Planned	0				0	0	0	Subproject	
1.5.7.3	Integration of IPND manifold components	290d	8/9/2007	12/3/2008	8/9/2007	12/3/2008	Remaining Duration	290d	8/9/2007			0	0	0	Subproject	
1.5.7.3.1	IPND Manifold Components	110d	2/2/2009	7/7/2009	2/2/2009	7/7/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.1	Manufacture snout	65d	2/2/2009	5/1/2009	2/2/2009	5/1/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.2	Manufacture manifold covers	110d	2/2/2009	7/7/2009	2/2/2009	7/7/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.3	Manufacture fill tubes	30d	2/2/2009	3/13/2009	2/2/2009	3/13/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.4	Manufacture side s	2/2/2009	5/8/2009	Planned	2/2/2009	5/8/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.5	Manufacture fiber	2/2/2009	5/22/2009	Planned	2/2/2009	5/22/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.6	Manufacture fiber	2/2/2009	4/10/2009	Planned	2/2/2009	4/10/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.1.7	Manufacture fill tub	2/2/2009	4/10/2009	Planned	2/2/2009	4/10/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.3	IPND End Plate Co	85d	8/9/2007	6/1/2009	8/9/2007	6/1/2009	Remaining Duration	85d	8/9/2007			0	0	0	Subproject	
1.5.7.3.3.1	Manufacture IPND	2/2/2009	6/1/2009	Planned	2/2/2009	6/1/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.3.3	Manufacture fiber	2/2/2009	3/27/2009	Planned	2/2/2009	3/27/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.3.4	Manufacture side s	2/2/2009	3/2/2009	Planned	2/2/2009	3/2/2009	Planned	0				0	0	0	Subproject	
1.5.7.3.5	Manufacture prep	20d	8/27/2007	1/30/2008	8/27/2007	1/30/2008	Remaining Duration	20d	8/24/2007			0	0	0	Subproject	
1.5.10	Management - R	1d	5/1/2007	9/29/2008	5/1/2007	9/29/2008	Remaining Duration	1d	10/3/2005			100%	10/1/2007	9/30/2008	Subproject	
1.5.10.3	FY88	10/1/2007	9/29/2008	Complete	10/1/2007	9/29/2008	Complete	100%	10/1/2007			100%	10/1/2007	9/30/2008	Subproject	
1.5.10.5	Labor	100%	10/1/2007	9/29/2008	10/1/2007	9/29/2008	Complete	100%	10/1/2007			100%	10/1/2007	9/30/2008	Subproject	
1.5.10.5	Post CD-1 PVC Mo	1d	5/1/2007	9/28/2007	5/1/2007	9/28/2007	Remaining Duration	1d	5/1/2007			0	0	0	Subproject	
2.5	PVC Modules	1290d	10/1/2007	11/18/2013	10/1/2007	11/18/2013	Remaining Duration	1290d	10/1/2007			0	0	0	Subproject	
2.5.4	Management - C	1254d	10/1/2007	9/27/2013	10/1/2007	9/27/2013	Remaining Duration	1254d	10/1/2007			0	0	0	Subproject	
2.5.4.3	FY09	0	10/1/2008	9/29/2009	10/1/2008	9/29/2009	Planned	0				0	0	0	Subproject	
2.5.4.3.1	Labor	227d	10/1/2008	9/29/2009	10/1/2008	9/29/2009	Remaining Duration	227d	10/1/2008			0	0	0	Subproject	
2.5.4.3.2	Travel	227d	10/1/2008	9/29/2009	10/1/2008	9/29/2009	Remaining Duration	227d	10/1/2008			0	0	0	Subproject	
2.5.4.3.3	Equipment	227d	10/1/2008	9/29/2009	10/1/2008	9/29/2009	Remaining Duration	227d	10/1/2008			0	0	0	Subproject	
2.5.4.3.4	Materials and supplies	227d	10/1/2008	9/29/2009	10/1/2008	9/29/2009	Remaining Duration	227d	10/1/2008			0	0	0	Subproject	

Progress Type	Progress Value	Actual Start	Actual Finish	Expected Finish	PPC	Units Completed	Total Units Needed	Activity Type
Remaining Duration	320d	10/3/2005			35.7	0	0	Subproject
Remaining Duration	263d	1/3/2006			64.67	0	0	Subproject
Remaining Duration	112d	1/3/2006			94.6	0	0	Subproject
Remaining Duration	112d	1/3/2006			94.6	0	0	Subproject
Planned	0				0	0	0	Finish Milestone
Remaining Duration	27d 34d	8/1/2008			30 20	0	0	ASAP

Other Activity Progress Types / Values

- Planned / 0
- Elapsed Duration / e.g. 16d
- Percent Complete / e.g. 75%
- Complete / 100%

Example Comments

- Not Started
- No Progress- (i.e. Rem. Dur. unchanged)
- Not Done
- Not Met (milestone)
- Progress as scheduled
- New progress- PPC=45% ; rem. dur.=40d
- Units completed =60
- Actual finish: 12/23/08



OP Monthly Schedule Progress Reports

Posted in DocDB 2844 each month after progress info is updated

- ➔ a zip file containing pdfs of Gantt Charts for each L2 project compared to its performance measurement baseline (PMB) dates
- ➔ a zip file containing budget and contingency spreadsheets (FY07\$) for each L2 subproject, based on the current PMB
 - a pdf file containing the budget and contingency spreadsheet (FY07\$) rolled up to WBS L2
- ➔ a pdf Gantt chart for All WBS elements that includes schedule, budget and contingency information (big file, but John's favorite!)
- ➔ a pdf milestone Gantt chart that compares current forecast dates to the PMB dates (grouped by WBS L2)
 - a pdf milestone Gantt chart that compares current forecast dates to the prior month's forecast dates
- ➔ a pdf milestone Gantt chart that shows L0-L4 milestones in a one-yr window after the current status date.
- ➔ a pdf milestone Gantt chart for use in the monthly reports using a six-month window after the current status date.
 - a pdf milestone Gantt chart that shows all L1 and L2 milestones not yet met. (for Pepin, mainly)



WBS L2 Gantt Chart with Baseline and Progress Info

NOVA Project
 Nova_PVC_Modules
 Gantt Chart
 Time Now: 01Dec08
 Nov 2008 Status

All tasks for this L2 WBS

Legend:

- Baseline (Green bar)
- Activity (Blue bar)
- Progress (Red bar)
- Milestone Slippage (Yellow triangle)
- Milestone (Black triangle)
- Completed Milestone (Green triangle)
- Expected Finish (White triangle)

Progress (Phys. % complete)

Finish Variance

WBS	Activity Desc.	Computed Status	Activity Type	Duration	Early Dates	Baseline Dates	Predecessors	ResInfo	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
1.5.5.10	Develop methods for extrusion quality checkout - Part 2	In Progress	ASAP	74d	10Nov08 10Mar09	02Feb09 14May09	2.10.9.7[FS]; 1.5.5.1[FS]	L.UMNTC.PD.SCI.PHY.22.50.;M.UMNTC.PD.MANDSXMP.1800.00.;L.UMNTC.PD.TECH.UGRAD.45.00.;L.UMNTC.PD.TECH.LDR.45.00.			10%							
1.5.5.11	Develop methods for pressure testing - 2 - Part 2	In Progress	ASAP	41d	01Aug08 14Jan09	02Feb09 30Mar09	2.10.9.7[FS]; 1.5.5.3[FS]	L.UMNTC.PD.TECH.LDR.46.00.;L.UMNTC.PD.TECH.UGRAD.165.75.;L.UMNTC.PD.SCI.PHY.105.00.;M.UMNTC.PD.MANDSXMP.35000.00.			30%							
1.5.5.12	Develop methods for verifying fiber mapping and fiber continuity - Part 2	Planned						ANDSXMP.5000.00.;L.UMNTC.PD.82.80.;L.UMNTC.PD.SCI.PHY.49.00.;L.UMNTC.PD.TECH.LDR.16.20.										
1.5.5.13	Develop methods for assuring fiber-face tolerance - Part 2	Planned						ANDSXMP.1200.00.;L.UMNTC.PD.1.00.;L.UMNTC.PD.TECH.UGRAD.60.00.;L.UMNTC.PD.SCI.PHY.48.00.										
1.5.5.14	Develop QA tracking system procedures, software and training - Part 2	In Progress	ASAP	175d	01Apr08 09Apr09	02Feb09 07Oct09	2.10.9.7[FS]; 1.5.5.9[FS]	M.UMNTC.PD.MANDSXMP.2122.40.;L.UMNTC.PD.SCI.PHY.115.50.;L.UMNTC.PD.TECH.LDR.28.00.;L.UMNTC.PD.TECH.UGRAD.339.50.			49%							
1.5.6	Module Shipping and Storage R&D	Complete	ASAP	104d	01Aug07 28Dec07	01Aug07 28Dec07		L.FNAL.PPD.SCI.PHY.12.00.;L.UMNTC.PD.SCI.PHY.12.00.;L.UMNTC.PD.TECH.UGRAD.12.00.;L.UMNTC.PD.TECH.LDR.12.00.			100%							
1.5.7	Integration Prototype Detector (IPND) Modules	In Progress	Subproject	900d	08Mar06 02Oct09	30May07 03Dec09												
1.5.7.1	Factory Preparation for Integration Prototype Near Detector Production	In Progress	Subproject	722d	08Mar06 22Jan09	30May07 02Jun09												
1.5.7.1.1	Identify and acquire factory space	Complete	ASAP	45d	08Mar06 09May06		1.5.4.1.1[FS]	L.UMNTC.PD.ENG.ME.8.00.;L.UMNTC.PD.SCI.PHY.12.00.;L.UMNTC.PD.TECH.UGRAD.12.00.;L.UMNTC.PD.TECH.LDR.12.00.										
1.5.7.1.2	Acquire and install factory tools, fixtures, and other infrastructure	Complete	ASAP	120d	02Oct06 27Mar07		1.5.7.1.1[FS]+10	L.UMNTC.PD.ENG.ME.1600.00.;L.UMNTC.PD.SCI.PHY.48.00.;L.UMNTC.PD.MANDSXMP.60000.00.										
1.5.7.1.3	Install and setup additional infrastructure and factory machines	Complete	ASAP	144d	30May07 28Dec07	30May07 28Dec07	1.5.4.2.8[SS]; 1.5.4.2.11[SS]; 1.5.7.1.2[FS]; 1.5.4.2.7[FF]	L.UMNTC.PD.TECH.LDR.140.00.;M.UMNTC.PD.MANDSXMP.0.00.;L.UMNTC.PD.SCI.PHY.112.00.;L.UMNTC.PD.ENG.ME.14.00.;L.UMNTC.PD.TECH.UGRAD.420.00.			10%							
1.5.7.1.4	Develop initial versions of machine operating procedures	Planned	ASAP	10d	08Jan09 22Jan09	19May09 02Jun09	1.5.7.1.5[FF]	L.UMNTC.PD.TECH.LDR.40.00.;L.UMNTC.PD.SCI.PHY.40.00.										
1.5.7.1.5	Install and setup additional infrastructure and factory machines - Part 2	In Progress	ASAP	86d	01Aug08 22Jan09	02Feb09 02Jun09	1.5.4.2.7[FF]; 2.10.9.7[FS]; 1.5.7.1.3[FS]	L.UMNTC.PD.ENG.ME.6.00.;M.UMNTC.PD.MANDSXMP.5000.00.;L.UMNTC.PD.SCI.PHY.48.00.;L.UMNTC.PD.TECH.LDR.60.00.;L.UMNTC.PD.TECH.UGRAD.180.00.			60%							
1.5.7.3	Integration Prototype Near Detector (IPND) Module Manufacturing	In Progress	Subproject	541d	09Aug07 02Oct09	09Aug07 03Dec09												
1.5.7.3.1	IPND Manifold Components	In Progress	Subproject	106d	03Nov08 08Apr09	02Feb09 07Jul09												
1.5.7.3.1.1	Manufacture snout	Planned	ASAP	65d	01Dec08 06Mar09	02Feb09 01May09	2.10.9.7[FS]; 1.5.2.1.1.10.1[FS]+20d]	L.UMNTC.PD.SCI.PHY.8.00.;L.UMNTC.PD.TECH.LDR.4.00.;L.UMNTC.PD.ENG.ME.20.00.;M.UMNTC.PD.MANDSXMP.40670.00.										



WBS L2 Budget and Contingency (FY07\$)



Nova Project
Nova_PVC_Modules
 Budget and Contingency - Nov08 Status
 FY07 Dollars (Burdened)
 Time Now: 01Dec08

**All tasks for
this L2 WBS**

WBS	Activity Description	Activity Type	Early Dates	Funding Source	BAC Material	BAC Labor	BAC Total	M&S Cont. (\$)	M&S Cont. (%)	Labor Cont. (\$)	Labor Cont. (%)	Total Cont. (\$)	Total Cont. (%)	BAC + Cont. (\$)	BOE DOCDB No.
1.5.5.9	Develop QA tracking system procedures, software and training	ASAP	01May07 28Dec07	DR	\$3,942	\$12,859	\$16,800	\$394	10%	\$6,429	50%	\$6,823	41%	\$23,624	2366
1.5.5.10	Develop methods for extrusion quality checkout - Part 2	ASAP	10Nov08 10Mar09	DR	\$1,800	\$918	\$2,718	\$900	50%	\$459	50%	\$1,359	50%	\$4,077	0
1.5.5.11	Develop methods for pressure testing - 2 - Part 2	ASAP	01Aug08 14Jan09	DR	\$35,000	\$3,381	\$38,381	\$12,250	35%	\$1,691	50%	\$13,941	36%	\$52,322	0
1.5.5.12	Develop methods for verifying fiber mapping and fiber continuity - Part 2	ASAP	01Dec08 03Feb09	DR	\$5,000	\$1,689	\$6,689	\$2,000	40%	\$844	50%	\$2,844	43%	\$9,533	0
1.5.5.13	Develop methods for assuring fiber-face tolerance - Part 2	ASAP	01Dec08 22Apr09	DR	\$1,200	\$1,224	\$2,424	\$600	50%	\$612	50%	\$1,212	50%	\$3,636	0
1.5.5.14	Develop QA tracking system procedures, software and training - Part 2	ASAP	01Apr08 09Apr09	DR	\$2,122	\$6,924	\$9,046	\$212	10%	\$3,462	50%	\$3,674	41%	\$12,720	2366
1.5.6	Module Shipping and Storage R&D	ASAP	01Aug07 28Dec07	DR	\$0	\$245	\$245	\$0	0%	\$123	50%	\$123	50%	\$368	2515
1.5.7	Integration Prototype Detector (IPND) Modules	Subproject	08Mar06 02Oct09		\$637,956	\$137,638	\$775,594	\$126,586	20%	\$48,272	35%	\$174,858	23%	\$950,452	0
1.5.7.1	Factory Preparation for Integration Prototype Near Detector Production	Subproject	08Mar06 22Jan09		\$5,000	\$14,807	\$19,807	\$2,500	50%	\$7,404	50%	\$9,904	50%	\$29,711	0
1.5.7.1.1	Identify and acquire factory space	ASAP	08Mar06 09May06	DP	\$0	\$0	\$0	\$0	0%	\$0	0%	\$0	0%	\$0	2395
1.5.7.1.2	Acquire and install factory tools, fixtures, and other infrastructure	ASAP	02Oct06 27Mar07	DP	\$0	\$0	\$0	\$0	0%	\$0	0%	\$0	0%	\$0	2189
1.5.7.1.3	Install and setup additional infrastructure and factory machines	ASAP	30May07 28Dec07	DR	\$0	\$10,365	\$10,365	\$0	50%	\$5,182	50%	\$5,182	50%	\$15,547	2440
1.5.7.1.4	Develop initial versions of machine operating procedures	ASAP	08Jan09 22Jan09	DR	\$0	\$1	\$1	\$0	0%	\$0	50%	\$0	50%	\$1	2441
1.5.7.1.5	Install and setup additional infrastructure and factory machines - Part 2	ASAP	01Aug08 22Jan09	DR	\$5,000	\$4,442	\$9,442	\$2,500	50%	\$2,221	50%	\$4,721	50%	\$14,163	2440
1.5.7.3	Integration Prototype Near Detector (IPND) Module Manufacturing	Subproject	09Aug07 02Oct09		\$632,956	\$122,830	\$755,786	\$124,086	20%	\$40,868	33%	\$164,954	22%	\$920,741	0
1.5.7.3.1	IPND Manifold Components	Subproject	03Nov08 08Apr09		\$445,548	\$15,672	\$461,220	\$92,406	21%	\$3,918	25%	\$96,324	21%	\$557,543	2192
1.5.7.3.1.1	Manufacture snout	ASAP	01Dec08 06Mar09	DR	\$40,670	\$2,569	\$43,239	\$7,321	18%	\$642	25%	\$7,963	18%	\$51,202	0
1.5.7.3.1.2	Manufacture manifold covers	ASAP	03Nov08 08Apr09	DR	\$73,585	\$1,285	\$74,870	\$11,038	15%	\$321	25%	\$11,359	15%	\$86,229	0
1.5.7.3.1.3	Manufacture fill tubes	ASAP	01Dec08 15Jan09	DR	\$22,010	\$1,542	\$23,552	\$5,503	25%	\$385	25%	\$5,888	25%	\$29,439	0
1.5.7.3.1.4	Manufacture side and center seals	ASAP	01Dec08 13Mar09	DR	\$95,673	\$2,569	\$98,242	\$21,048	22%	\$642	25%	\$21,690	22%	\$119,932	0
1.5.7.3.1.5	Manufacture fiber raceways	ASAP	17Nov08 17Mar09	DR	\$147,640	\$5,138	\$152,778	\$31,004	21%	\$1,285	25%	\$32,289	21%	\$189,067	0
1.5.7.3.1.6	Manufacture fiber covers	ASAP	01Dec08 13Feb09	DR	\$55,300	\$1,028	\$56,328	\$13,825	25%	\$257	25%	\$14,082	25%	\$70,410	0
1.5.7.3.1.7	Manufacture fill tube manifolds	ASAP	01Dec08 13Feb09	DR	\$10,670	\$1,542	\$12,212	\$2,668	25%	\$385	25%	\$3,053	25%	\$15,264	0
1.5.7.3.2	Assemble and test IPND manifolds	ASAP	09Apr09 22Apr09	DR	\$2,000	\$2,917	\$4,917	\$600	30%	\$729	25%	\$1,329	27%	\$6,246	0
1.5.7.3.3	IPND End Plate Components	Subproject	09Aug07 03Apr09		\$109,660	\$7,194	\$116,854	\$19,110	17%	\$1,490	21%	\$20,600	18%	\$137,453	2203
1.5.7.3.3.1	Manufacture IPND end plates	ASAP	01Dec08 03Apr09	DR	\$24,325	\$2,055	\$26,380	\$2,433	10%	\$206	10%	\$2,638	10%	\$29,018	0
1.5.7.3.3.2	Manufacture side and center seals	ASAP	09Aug07 28Dec07	DR	\$19,600	\$1,285	\$20,885	\$4,116	21%	\$321	25%	\$4,437	21%	\$25,322	0
1.5.7.3.3.3	Manufacture fiber retaining rings	ASAP	01Dec08 30Jan09	DR	\$20,720	\$2,569	\$23,289	\$3,108	15%	\$642	25%	\$3,750	16%	\$27,039	0
1.5.7.3.3.4	Manufacture side and center seals - Part 2	ASAP	01Dec08 02Jan09	DR	\$45,015	\$1,285	\$46,300	\$9,453	21%	\$321	25%	\$9,774	21%	\$56,074	0
1.5.7.3.4	Assemble and test preproduction prototype (IPND) end plates and seals	ASAP	06Apr09 17Apr09	DR	\$2,000	\$2,917	\$4,917	\$500	25%	\$2,042	70%	\$2,542	52%	\$7,458	0



L0-L4 Milestone Gantt Chart

- One-year lookahead
- Sorted by baseline dates

Nova Project
Milestone Gantt Chart
L.0 - L.4 Milestones
Nov08 Status
TimeNow: 01Dec08

Legend:

- Baseline Date: ▼
- Completed Milestone: ☆
- Current Forecast Date: ▲
- Management Reporting Date: ◇

Activity Desc.	Baseline Date	Forecast/Actual Date	Management Reporting Date	Reporting Milestone Float	Baseline Variance	FY09					FY10				
						Q4	Q1	Q2	Q3	Q4	Q1	Q2			
L.0 -- DOE - Acquisition Executive Milestone						Time Now - 01Dec08									
CD-2	01Oct08	15Sep08	01Oct08	11d	11d	☆	◇								
L.1 -- DOE - OHEP Associate Director Milestone															
CD-3a	02Feb09	24Oct08	02Feb09	63d	63d	☆	◇								
CD-3b	01Oct09	01Oct09	01Oct09	0	0							◇			
L.2 -- DOE- NOVA Project Director Milestone															
DOE OECM - FRA EVMS Readiness Assessment	01Oct08	09Jan09	01Oct08	-67d	-67d	◇		▲							
DOE OECM - FRA EVMS Certification Review	01Dec08	16Mar09	01Dec08	-71d	-70d		◇		▲						
DOE OHEP CD-3a Mini-review	15Jan09	24Oct08	15Jan09	52d	52d	☆	◇								
Site preparation purchase order released	06Apr09	27Apr09	06Oct09	112d	-15d				▲	▲				◇	
Waveshifter PO issued	22May09	27Mar09	23Nov09	167d	40d				▲	▼					◇
DOE OECM - FRA EVMS Certified	01Jun09	09Sep09	01Jun09	-71d	-70d				◇			▲			
DOE OHEP CD-3b Review	01Jun09	01Jun09	01Jun09	-1d	0				◇						
Extrusion PO issued	01Oct09	01Oct09	01Apr10	122d	0								▲		
WLS fiber PO issued	02Nov09	02Nov09	03May10	123d	0									▲	
L.3 -- Fermilab Associate Director Milestone															
CD-3a Funds Available	02Feb09	24Oct08	01May09	127d	63d	☆		▼							
FY09 Funds Available	02Feb09	14Oct08	01May09	135d	71d	☆		▼							
2009 Shutdown Begun	06Apr09	15Jun09	06Jul09	14d	-49d				▼		▲			◇	
Director's CD-3b Review	01May09	01May09	03Aug09	64d	0						▲			◇	
CD-3b Funds Available	01Oct09	01Oct09	04Jan10	61d	0									◇	
FY10 Funds Available	02Nov09	02Nov09	02Feb10	59d	0									◇	
IPND module production completed	03Dec09	02Oct09	03Mar10	100d	42d									▲	▼
L.4 -- WBS L1 Manager's Milestone															
Wetland permit issued	05Mar08	09Apr09		0	-276d										
Prototype scintillator production completed	17Feb09	16Dec08		0	40d										



Milestone Gantt Chart – Monthly Reports

- Six-month lookahead
- Sorted by baseline dates

NOVA_PROJECT

Gantt Chart - 6-month look ahead

Monthly Report - Nov08

Time Now: 01Dec08

Baseline: NOVA_PMB

Baseline Date ▼

Completed Milestone ☆

Current Forecast Date ▲

Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level	FY09												
					A	S	O	N	D	J	F	M	A	M	J		
1.0 – ANU Planning, Engineering & Design					e Now - 01Dec08												
1.0.3.2.5.9	NuMI Hadron Monitor Initial Re-design Complete	30Jan09	06Mar09	L.5								▲25d	▼				
1.0.2.2.4.1	MI Cavity Pre-install Testing Complete	26Jan09	27Mar09	L.5								▲44d	▼				
1.0.3.1.5.2	NuMI Profile Monitor Conceptual Design Review Complete	09Mar09	01May09	L.5									▲39d	▼			
1.0.1.1.6.6	RR PDS Magnet Design Finalized	12Sep08	24Jun09	L.5	☆	195d											▼
1.0.1.1.6.5	RR Beamline Modifications Design Review Complete	01May09	08Jul09	L.5													▲46d
1.2 – Liquid Scintillator R&D																	
1.2.9.3.9	Mineral oil batch 2 for IPND delivered	14May08	02Feb09	L.5									▼				
1.2.9.3.12	Mineral oil batch 3 for IPND delivered	01Dec08	02Feb09	L.5				▲40d				▼					
1.2.9.6.11	Prototype scintillator production completed	16Dec08	17Feb09	L.4				▲40d				▼					
1.2.10.3	Liquid scintillator final specifications completed	18Feb09	20Feb09	L.5								▲2d					
1.3 – Wave-Length-Shifting Fiber R&D																	
1.3.3.7	Baseline (IPND) WLS fiber dye concentration chosen	03Feb09	31Mar09	L.5								▲40d	▼				



Key Earned Value Acronyms

Remember Trifold Cheat Sheet

- BCWS – Budgeted Cost of Work Scheduled (Planned Value)
- BCWP – Budgeted Cost of Work Performed (Earned Value)
- ACWP – Actual Cost of Work Performed

- CV – Cost Variance BCWP-ACWP
- SV – Schedule Variance BCWP-BCWS
 - greater than 0 = GOOD less than 0 = BAD

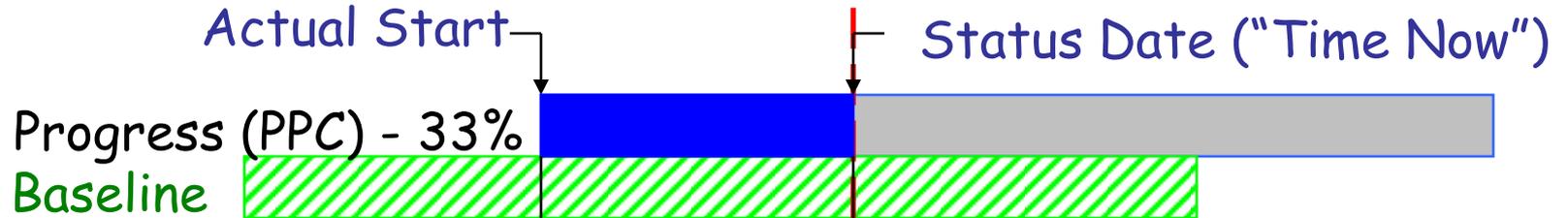
- CPI – Cost Performance Index BCWP/ACWP
- SPI – Sched. Performance Index BCWP/BCWS
 - greater than 1 = GOOD less than 1 = BAD

- BAC – Budget At Completion
- ETC – Estimate To Complete
- EAC – Estimate At Completion ACWP + ETC
- VAC – Variance At Completion BAC - EAC

- CPR – Contract Performance Report
- VAR – Variance Analysis Report



Simplified EV Example – Single Activity (WP)



MONTH	Jan	Feb	Mar
M.FNAL.PPD.MANDS (\$)	1000	1000	1000
L.FNAL.PPD.ENG.EE (Hrs)	160	160	160

M&S

EE

$$BCWS = \$2000 + 320 \text{ hrs} * \$50/\text{hr} = \$18,000$$

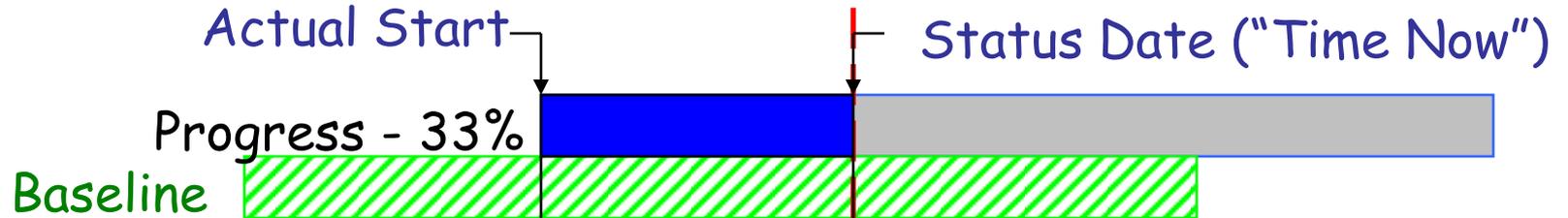
$$BCWP = \$1000 + 160 \text{ hrs} * \$50/\text{hr} = \$9,000 \leftarrow \text{Earned Value}$$

$$SV = 9,000 - 18,000 = -9,000$$

$$SPI = 9,000 / 18,000 = 0.50$$



Simplified EV Example – Single Activity (WP)



MONTH	Jan	Feb	Mar
M.FNAL.PPD.MANDS (\$)	1000	1000	1000
L.FNAL.PPD.EE (Hrs)	160	160	160

M&S

EE

$$BCWS = \$2000 + 320 \text{ hrs} * \$50/\text{hr} = \$18,000$$

$$BCWP = \$1000 + 160 \text{ hrs} * \$50/\text{hr} = \$9,000$$

$$ACWP = \$876 + 147 \text{ hrs} * \$48/\text{hr} = \$7,932 \leftarrow \text{Actuals}$$

$$SV = 9,000 - 18,000 = -9,000$$

$$SPI = 9,000 / 18,000 = 0.50$$

$$CV = 9,000 - 7,932 = +1,068$$

$$CPI = 9,000 / 7,932 = 1.13$$



COBRA Contract Performance Report (CPR1 by Control Account)

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REPORT STRUCTURE

1. CONTRACTOR
a. NAME
Fermi National Accelerator Lab

3. PROGRAM
a. NAME
NOvA Project

8. PERFORMANCE DATA

Control Acct[21]
BE.Expense cat
Results...

CURRENT PERIOD

CUMULATIVE TO DATE

ITEM (1)	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE	
	WORK	WORK	WORK	SCHEDULE	COST	WORK	WORK	WORK	SCHEDULE	COST
	SCHEDULED	PERFORMED	PERFORMED	(5)	(6)	SCHEDULED	PERFORMED	PERFORMED	(10)	(11)
1.0.1 RR Upgrades										
MS Materials & Services										
FULLY_LOAD	1,205	4,532	10,240	3,326	-5,708	312,888	316,215	286,592	3,326	29,623
PC Personnel Costs										
FULLY_LOAD	11,592	55,287	2,779	43,694	52,508	532,656	708,215	712,890	175,559	-4,675
Control Acct[21]Totals:		9,818	13,018	47,021	46,800	845,544	1,024,430	999,482	178,885	24,948
1.0.2 MI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	542	285	542	258	2,957	4,042	471	1,085	3,571
PC Personnel Costs										
FULLY_LOAD	0	3,626	4,968	3,626	-1,342	62,553	69,390	116,913	6,837	-47,523
Control Acct[21]Totals:	0	4,169	5,253	4,169	-1,084	65,510	73,432	117,383	7,922	-43,952
1.0.3 NIMI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	3,715	0	3,715	3,715	8,746	32,966	12,750	24,220	20,216
PC Personnel Costs										
FULLY_LOAD	0	57,766	9,392	57,766	48,373	164,346	584,947	321,926	420,601	263,021
Control Acct[21]Totals:	0	61,481	9,392	61,481	52,089	173,092	617,914	334,677	444,821	283,237
1.0.4 ANU Beam Physics										
MS Materials & Services										
FULLY_LOAD	0	0	0	0	0	16,308	16,308	0	0	16,308
PC Personnel Costs										
FULLY_LOAD	0	0	0	0	0	13,065	14,287	0	1,223	14,287
Control Acct[21]Totals:	0	0	0	0	0	29,373	30,595	0	1,223	30,595

Report / Cal / Data / Sheet4 / Thresholds / Title /

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Grouped by/Rolled Up to Control Account

Totals



COBRA Contract Performance Report (CPR1 by Control Account)

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Monthly (pointing to column C)

Cumulative (pointing to column I)

CONTRACT PERFORMANCE FORMAT 1 - WORK BREAKDOWN STRUCTURE										
1. CONTRACTOR			2. CONTRACT			3. PROGRAM				
a. NAME			a. NAME			a. NAME				
Fermi National Accelerator Laboratory						NUvA Project				
8. PERFORMANCE DATA										
Control Acct[21]		CURRENT PERIOD				CUMULATIVE TO DATE				
BE.Expense cat		BUDGETED COST		ACTUAL COST		BUDGETED COST		ACTUAL COST		VARIANCE
Results...		WORK	WORK	WORK	VARIANCE		WORK	WORK	WORK	VARIANCE
ITEM	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.0.1 RR Upgrades										
MS Materials & Services										
FULLY_LOAD	1,205	4,532	10,240	3,326	-5,708	312,888	316,215	286,592	3,326	29,623
PC Personnel Costs										
FULLY_LOAD	11,592	55,287	2,779	43,694	52,508	532,656	708,215	712,890	175,559	-4,675
Control Acct[21]Totals:	12,797	59,818	13,018	47,021	46,800	845,544	1,024,430	999,482	178,885	24,948
1.0.2 MI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	542	285	542	258	2,957	4,042	471	1,085	3,571
PC Personnel Costs										
FULLY_LOAD	0	3,626	4,968	3,626	-1,342	62,553	69,390	116,913	6,837	-47,523
Control Acct[21]Totals:	0	4,169	5,253	4,169	-1,084	65,510	73,432	117,383	7,922	-43,952
1.0.3 NUvMI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	3,715	0	3,715	3,715	8,746	32,966	12,750	24,220	20,216
PC Personnel Costs										
FULLY_LOAD	0	57,766	9,392	57,766	48,373	164,346	584,947	321,926	420,601	263,021
Control Acct[21]Totals:	0	61,481	9,392	61,481	52,089	173,092	617,914	334,677	444,821	283,237
1.0.4 ANU Beam Physics										
MS Materials & Services										
FULLY_LOAD	0	0	0	0	0	16,308	16,308	0	0	16,308
PC Personnel Costs										
FULLY_LOAD	0	0	0	0	0	13,065	14,287	0	1,223	14,287
Control Acct[21]Totals:	0	0	0	0	0	29,373	30,595	0	1,223	30,595

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COBRA Contract Performance Report (CPR1 by Control Account)

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CONTRACT											
FORMAT 1 - WORK											
1. CONTRACT			2. CONTRACT				3. PROGRAM				
a. NAME			a. NAME				a. NAME				
Fermi National Ac							NOvA Project				
8. PERFORMANCE DATA											
Control Acct[21]		CURRENT PERIOD					CUMULATIVE TO DATE				
BE.Expense cat		BUDGETED COST		ACTUAL COST		VARIANCE		BUDGETED COST		ACTUAL COST	
Results...		WORK	WORK	WORK	SCHEDULE	COST	WORK	WORK	WORK	SCHEDULE	COST
ITEM	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1.0.1 RR Upgrades											
MS Materials & Services											
FULLY_LOAD	1,205	4,532	10,240	3,326	-5,708	312,888	316,215	286,592	3,326	29,623	
PC Personnel Costs											
FULLY_LOAD	11,592	55,287	2,779	43,694	52,508	532,656	708,215	712,890	175,559	-4,675	
Control Acct[21]Totals:	12,797	59,818	13,018	47,021	46,800	845,544	1,024,430	999,482	178,885	24,948	
1.0.2 MI Upgrades											
MS Materials & Services											
FULLY_LOAD	0	542	285	542	258	2,957	4,042	471	1,085	3,571	
PC Personnel Costs											
FULLY_LOAD	0	3,626	4,968	3,626	-1,342	62,553	69,390	116,913	6,837	-47,523	
Control Acct[21]Totals:	0	4,169	5,253	4,169	-1,084	65,510	73,432	117,383	7,922	-43,952	
1.0.3 NUMI Upgrades											
MS Materials & Services											
FULLY_LOAD	0	3,715	0	3,715	3,715	8,746	32,966	12,750	24,220	20,216	
PC Personnel Costs											
FULLY_LOAD	0	57,766	9,392	57,766	48,373	164,346	584,947	321,926	420,601	263,021	
Control Acct[21]Totals:	0	61,481	9,392	61,481	52,089	173,092	617,914	334,677	444,821	283,237	
1.0.4 ANU Beam Physics											
MS Materials & Services											
FULLY_LOAD	0	0	0	0	0	16,308	16,308	0	0	16,308	
PC Personnel Costs											
FULLY_LOAD	0	0	0	0	0	13,065	14,287	0	1,223	14,287	
Control Acct[21]Totals:	0	0	0	0	0	29,373	30,595	0	1,223	30,595	

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CONTRACT PERFORMANCE REPORT										
FORMAT 1 - WORK BREAKDOWN STRUCTURE										
1. CONTRACTOR	2. CONTRACT					3. PROGRAM				
a. NAME	b. NAME					a. NAME				
Fermi National Accelerator Laboratory						NOvA Project				
8. PERFORMANCE DATA										
Control Acct[21]	CURRENT PERIOD					CUMULATIVE TO DATE				
BE.Expense cat	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE	
Results...	WORK	WORK	WORK	SCHEDULE	COST	WORK	WORK	WORK	SCHEDULE	COST
ITEM	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.0.1 RR Upgrades										
MS Materials & Services										
FULLY_LOAD	1,205	4,532	10,240	3,326	-5,708	312,888	316,215	286,592	3,326	29,623
PC Personnel Costs										
FULLY_LOAD	11,592	55,287	2,779	43,694	52,508	532,656	708,215	712,890	175,559	-4,675
Control Acct[21]Totals:	12,797	59,818	13,018	47,021	46,800	845,544	1,024,430	999,482	178,885	24,948
1.0.2 MI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	542	285	542	258	2,957	4,042	471	1,085	3,571
PC Personnel Costs										
FULLY_LOAD	0	3,626	4,968	3,626	-1,342	62,553	69,390	116,913	6,837	-47,523
Control Acct[21]Totals:	0	4,169	5,253	4,169	-1,084	65,510	73,432	117,383	7,922	-43,952
1.0.3 NIMI Upgrades										
MS Materials & Services										
FULLY_LOAD	0	3,715	0	3,715	3,715	8,746	32,966	12,750	24,220	20,216
PC Personnel Costs										
FULLY_LOAD	0	57,766	9,392	57,766	48,373	164,346	584,947	321,926	420,601	263,021
Control Acct[21]Totals:	0	61,481	9,392	61,481	52,089	173,092	617,914	334,677	444,821	283,237
1.0.4 ANU Beam Physics										
MS Materials & Services										
FULLY_LOAD	0	0	0	0	0	16,308	16,308	0	0	16,308
PC Personnel Costs										
FULLY_LOAD	0	0	0	0	0	13,065	14,287	0	1,223	14,287
Control Acct[21]Totals:	0	0	0	0	0	29,373	30,595	0	1,223	30,595

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Ready NUM



COBRA Contract Performance Report (CPR1 by Control Account)

Microsoft Excel - CPR-by-control-acct-Nov2008-2

File Edit View Insert Format Tools Data Window Help Adobe PDF Type a question for help

V59

CONTRACT PERFORMANCE REPORT										
WORK BREAKDOWN STRUCTURE										
1. CONTRACTOR										
a. NAME										
Fermi National Accelerator Laboratory										
8. PERFORMANCE DATA										
Control Acct[21]										
BE.Expense cat										
Results...										
CURRENT PERIOD										
CUMULATIVE TO DATE										
BUDGETED COST ACTUAL COST VARIANCE BUDGETED COST ACTUAL COST VARIANCE										
WORK WORK WORK SCHEDULE COST WORK WORK WORK SCHEDULE COST										
ITEM SCHEDULED PERFORMED PERFORMED SCHEDULE COST SCHEDULED PERFORMED PERFORMED SCHEDULE COST										
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)										
1.0.1 RR Upgrades										
MS Materials & Services										
FULLY_LOAD 1,205 4,532 10,240 3,326 -5,708 312,888 316,215 286,592 3,326 29,623										
PC Personnel Costs										
FULLY_LOAD 11,592 55,287 2,779 43,694 52,508 532,656 708,215 712,890 175,559 -4,675										
Control Acct[21]Totals: 12,797 59,818 13,018 47,021 46,800 845,544 1,024,430 999,482 178,885 24,948										
1.0.2 MI Upgrades										
MS Materials & Services										
FULLY_LOAD 0 542 285 542 258 2,957 4,042 471 1,085 3,571										
PC Personnel Costs										
FULLY_LOAD 0 3,626 4,968 3,626 -1,342 62,553 69,390 116,913 6,837 -47,523										
Control Acct[21]Totals: 0 4,169 5,253 4,169 -1,084 65,510 73,432 117,383 7,922 -43,952										
1.0.3 NUMI Upgrades										
MS Materials & Services										
FULLY_LOAD 0 3,715 0 3,715 3,715 8,746 32,966 12,750 24,220 20,216										
PC Personnel Costs										
FULLY_LOAD 0 57,766 9,392 57,766 48,373 164,346 584,947 321,926 420,601 263,021										
Control Acct[21]Totals: 0 61,481 9,392 61,481 52,089 173,092 617,914 334,677 444,821 283,237										
1.0.4 ANU Beam Physics										
MS Materials & Services										
FULLY_LOAD 0 0 0 0 0 16,308 16,308 0 0 16,308										
PC Personnel Costs										
FULLY_LOAD 0 0 0 0 0 13,065 14,287 0 1,223 14,287										
Control Acct[21]Totals: 0 0 0 0 0 29,373 30,595 0 1,223 30,595										

Report Cal Data Sheet4 Thesholds Title

Ready NUM

SV, CV

SV, CV

VARIANCE

VARIANCE



COBRA Contract Performance Report (CPR1 by Control Account)

Microsoft Excel - CPR-by-control-acct-Nov2008-2

File Edit View Insert Format Tools Data Window Help Adobe PDF Type a question for help

100% 10 B

V59

		CUMULATIVE TO DATE					AT COMPLETION		
Control Acct[21]		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED	ESTIMATED	VARIANCE
BE.Expense cat		WORK	WORK	WORK	SCHEDULE	COST	(14)	(15)	(16)
Results...		SCHEDULED	PERFORMED	PERFORMED	(10)	(11)			
ITEM	(1)	(7)	(8)	(9)					
1. CONTRACTOR									
a. NAME									
Fermi National Accelerator Laboratory									
4. REPORT PERIOD									
a. FROM (YYYYMMDD)									
8. PERFORMANCE DATA									
At Completion									
FORM APPROVED									
OMB No. 0704-0188									
1.0.1 RR Upgrades									
MS Materials & Services									
FULLY_LOAD									
		312,888	316,215	286,592	3,326	29,623	1,465,534	1,435,350	30,184
PC Personnel Costs									
FULLY_LOAD									
		532,656	708,215	712,890	175,559	-4,675	3,715,433	3,700,011	15,422
Control Acct[21]Totals:									
		845,544	1,024,430	999,482	178,885	24,948	5,180,968	5,135,361	45,607
1.0.2 MI Upgrades									
MS Materials & Services									
FULLY_LOAD									
		2,957	4,042	471	1,085	3,571	130,775	129,721	1,054
PC Personnel Costs									
FULLY_LOAD									
		62,553	69,390	116,913	6,837	-47,523	906,528	953,303	-46,775
Control Acct[21]Totals:									
		65,510	73,432	117,383	7,922	-43,952	1,037,303	1,083,025	-45,722
1.0.3 ANUMI Upgrades									
MS Materials & Services									
FULLY_LOAD									
		8,746	32,966	12,750	24,220	20,216	232,435	211,519	20,915
PC Personnel Costs									
FULLY_LOAD									
		164,346	584,947	321,926	420,601	263,021	1,885,850	1,606,548	279,302
Control Acct[21]Totals:									
		173,092	617,914	334,677	444,821	283,237	2,118,285	1,818,067	300,218
1.0.4 ANU Beam Physics									
MS Materials & Services									
FULLY_LOAD									
		16,308	16,308	0	0	16,308	41,659	25,310	16,349
PC Personnel Costs									
FULLY_LOAD									
		13,065	14,287	0	1,223	14,287	40,433	26,521	13,912
Control Acct[21]Totals:									
		29,373	30,595	0	1,223	30,595	82,092	51,831	30,261

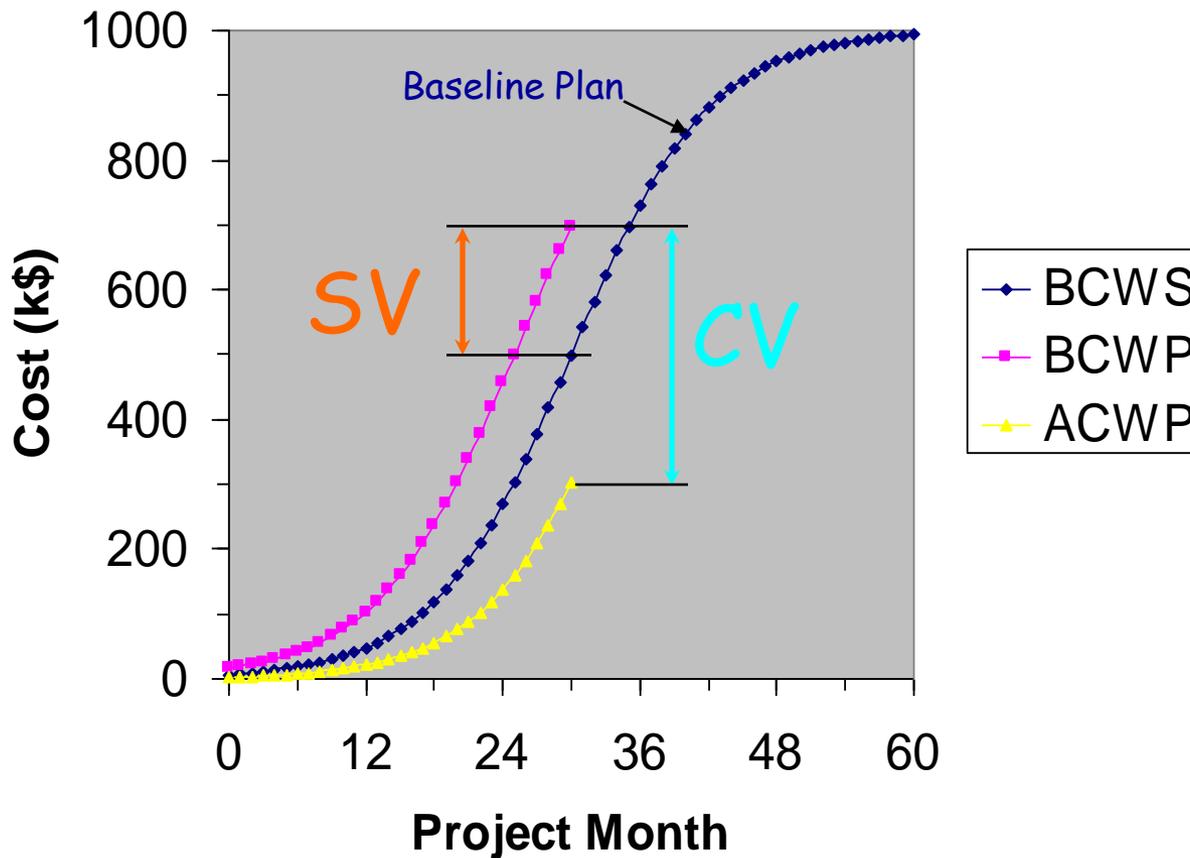
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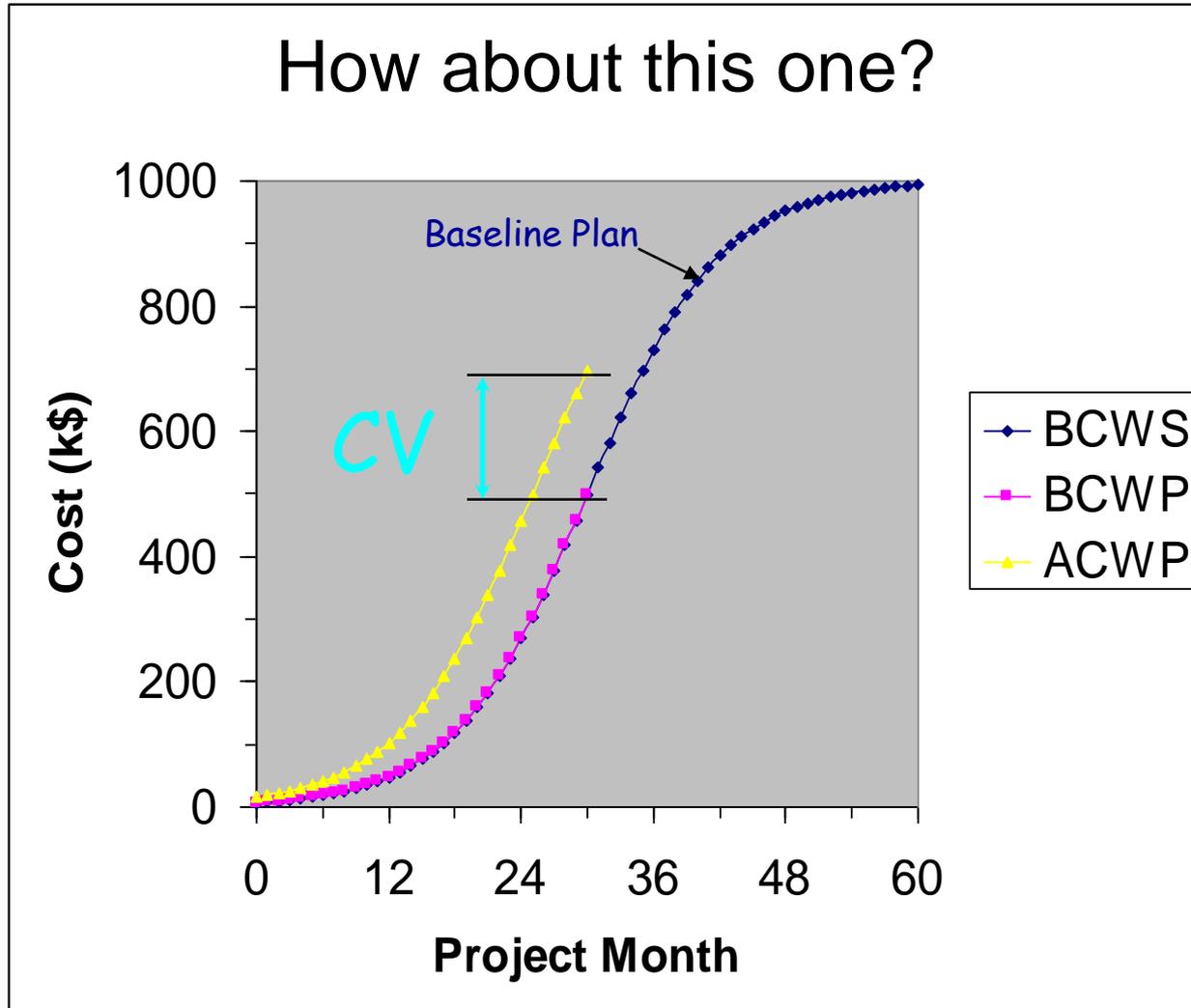
Assessing Project Performance

How is this generic project doing?



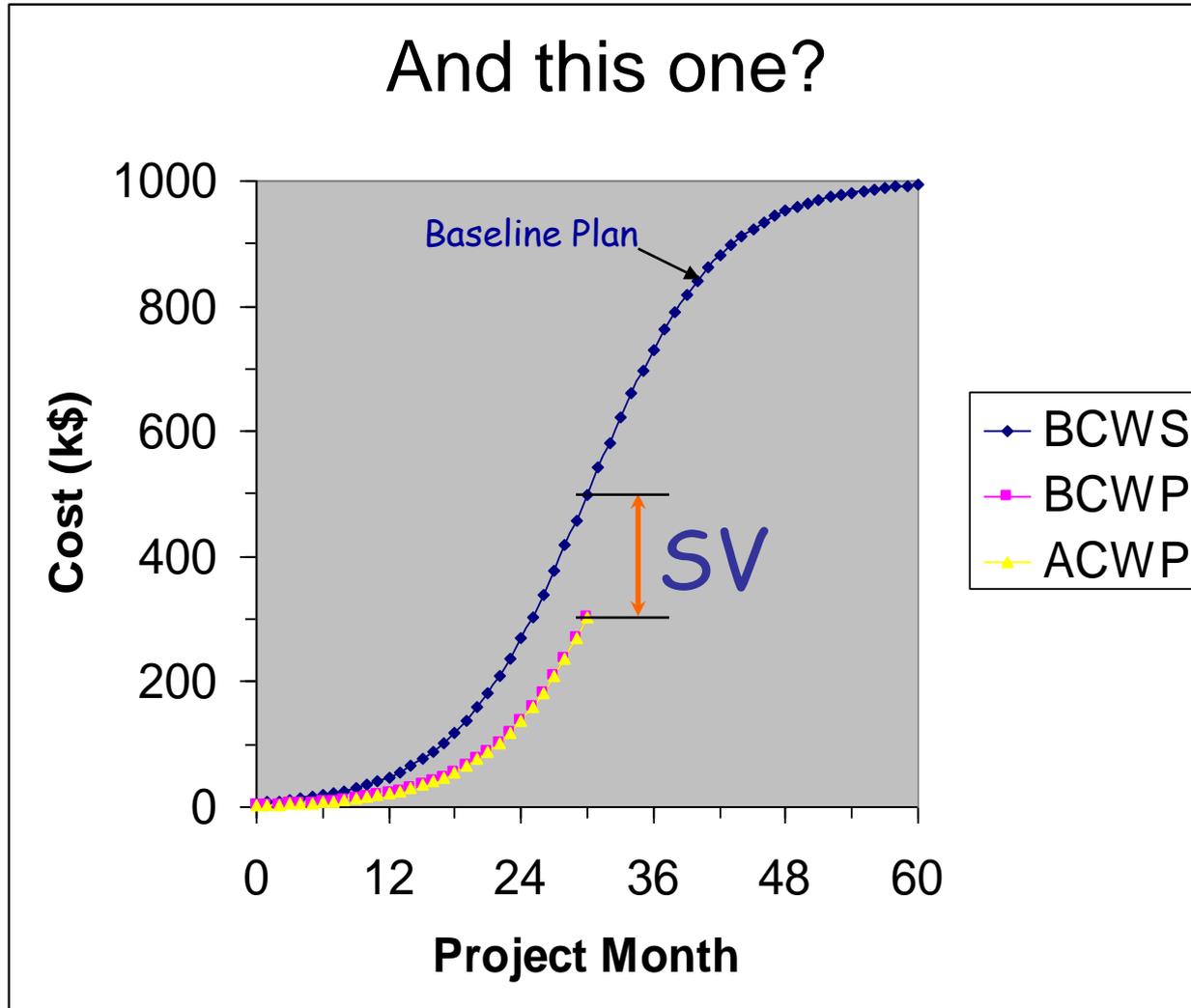


Assessing Project Performance





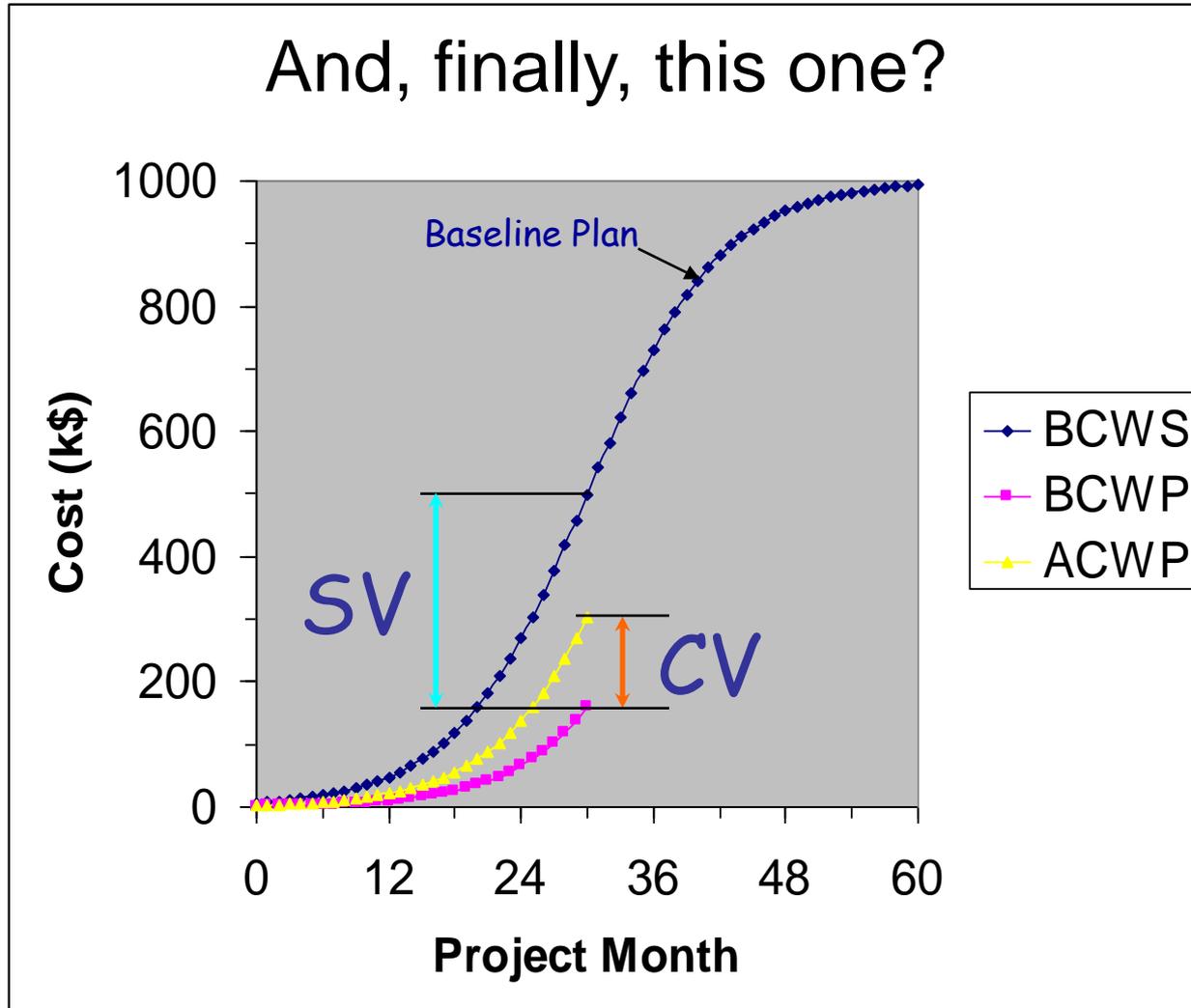
Assessing Project Performance





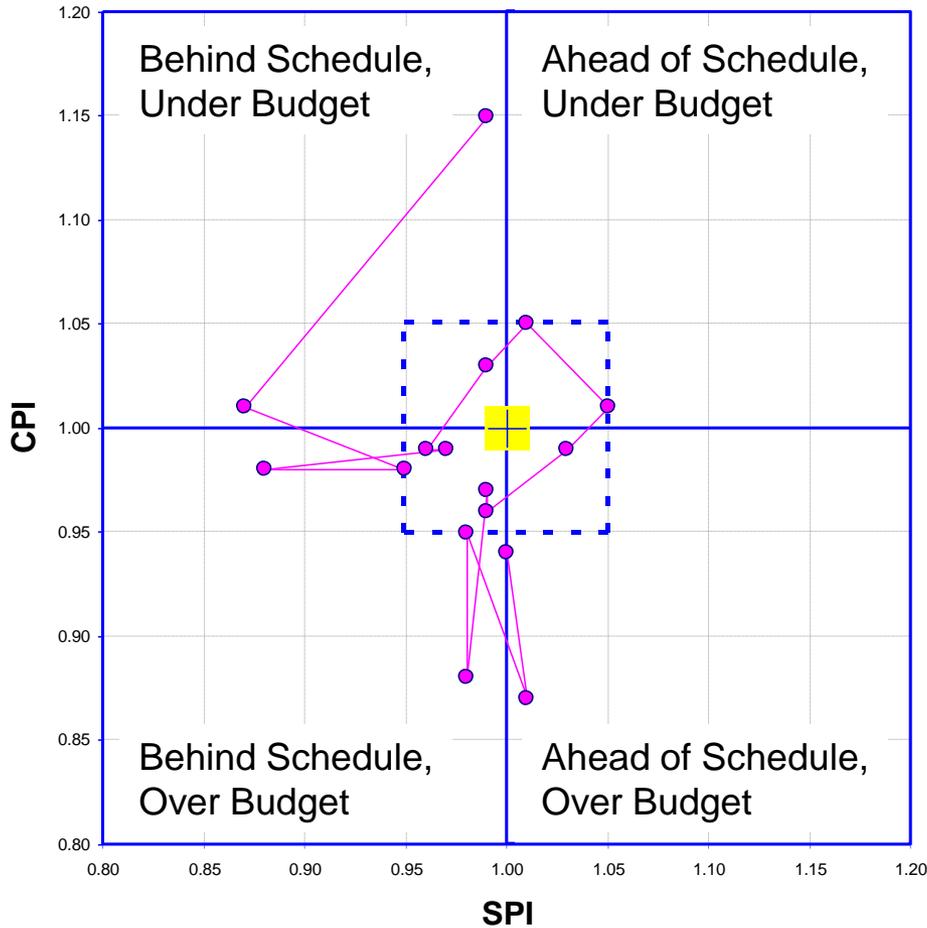
Assessing Project Performance

And, finally, this one?





Generic Bulls-Eye Plot



No, this is not Brownian motion!

- SPI– Sched. Perf. Index- BCWP/BCWS
- CPI– Cost Perf. Index- BCWP/ACWP

< 1 = **BAD**

> 1 = **GOOD**

Formal variance analysis reporting is triggered at the control account level. Report required when cumulative or three-month rolling average CPI or SPI exceed **1.5** or drop below **0.85** for a control account.



COBRA Variance Analysis Report (CPR5, by Control Account)

Microsoft Excel - CPR5_AVG-NDvA-Nov2008

File Edit View Insert Format Tools Data Window Help Adobe PDF Type a question for help

A56 fx

CONTRACT PERFORMANCE REPORT								FORM APPROVED	
FORMAT 5 - EXPLANATIONS AND PROBLEM ANALYSES								OMB No. 0704-0188	
1. CONTRACTOR		2. CONTRACT		3. PROGRAM		4. REPORT PERIOD			
a. NAME						a. FROM (YYYYMMDD)			
Fermi National						2008/11/01			
b. LOCATION						b. TO (YYYYMMDD)			
Batavia, Illinois						2008/11/30			
		SHARE RATIO				YYMMDD			
				NO X YES					
1.0.1 RR Upgrades									
	BCWS	BCWP	ACWP	SV in \$	SV in %	CV in \$	CV %	SPI	CPI
Current:	12,797	59,818	13,018	47,021	367%	46,800	78%	4.87	4.59
3 Month Avg:	8,426	65,852	12,648	57,426	682%	53,204	81%	7.82	5.21
Cumulative:	845,544	1,024,430	999,482	178,885	21%	24,948	2%	1.21	1.02
	BAC	EAC	VAC in \$	VAC in %	CPI to BAC	CPI to EAC			
At Complete:	5,180,968	5,135,361	45,607	1%	0.99	1.00			
Thresholds Exceeded: Cumulative Schedule, Cumulative Cost									
Explanation of Variance/Description of Problem:									
56									
57 Impact									
58									
59									
60 Corrective Action:									
61									
62									
63 Monthly Summary (to include technical causes of VARs, Impacts) and Corrective Action(s):									
64									
65									
66 Prepared by:			Date:			Approved by:		Date:	
67									

Report Hi-Lighted Report Summary Report Cal Data Shee

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Control Account

Performance Indices

Index >1.5 or < 0.85 → RED
 Else
 Index >1.2 or < 0.88 → YELLOW
 Else
 0.88 ≤ Index ≤ 1.2 → GREEN

More detailed info from Cobra and/or accounting system is available to aid in VAR prep.

- drill downs to:
 - cost account level for ACWP
 - work pkg level for BCWP
- queries of accounting database

Variance Analysis Reporting Sections



COBRA Variance Analysis Summary (From CPR5s, by Control Account)

Microsoft Excel - CPR5_AVG-NDvA-Nov2008

File Edit View Insert Format Tools Data

Type a question for help

B1

Tables of Cumulative and 3-Month Rolling Avg.

0/0

N/A (div. by zero)

Report Period: Nov-08	Cumulative									
Control Account	BCWS (AY\$)	BCWP (AY\$)	ACWP (AY\$)	SV (AY\$)	SV (%)	CV (AY\$)	CV (%)	SPI	CPI	(AY\$)
1.0.0 ANU CDR COSTS	0	0	18,630	0	0%	-18,630	-100%	1.00	0.00	0
1.0.1 RR Upgrades	845,544	1,024,430	999,482	178,885	21%	24,948	2%	1.21	1.02	5,180,968
1.0.2 MI Upgrades	65,510	73,432	117,383	7,922	12%	-43,952	-60%	1.12	0.63	1,037,303
1.0.3 NUMI Upgrades	173,092	617,914	334,677	444,821	257%	283,237	46%	3.57	1.85	2,118,285
1.0.4 ANU Beam Physics	29,373	30,595	0	1,223	4%	30,595	100%	1.04	N/A	82,092
1.0.5 ANU Project Management	344,698	344,698	259,609	0	0%	85,089	25%	1.00	1.33	344,698
1.1 Site and Building R&D	2,167,846	2,258,518	1,227,543	90,672	4%	1,030,975	46%	1.04	1.84	2,274,519
1.2 Liquid Scintillator R&D	235,047	235,071	198,137	25	0%	36,934	16%	1.00	1.19	271,245
1.3 WLS Fiber R&D	134,270	132,041	131,032	-2,230	-2%	1,008	1%	0.98	1.01	298,604
1.4 PVC Extrusion R&D	925,639	925,639	936,212	0	0%	-10,573	-1%	1.00	0.99	1,348,394
1.5 PVC Module R&D	540,108	509,268	892,034	-30,839	-6%	-382,765	-75%	0.94	0.57	1,421,686
1.6 Electronics R&D	273,209	283,736	505,498	10,527	4%	-221,762	-78%	1.04	0.56	1,473,437
1.7 DAQ R&D	214,243	214,243	777,361	0	0%	-563,118	-263%	1.00	0.28	1,383,728
1.8 Detector Assembly R&D	869,053	844,540	1,547,469	-24,513	-3%	-702,928	-83%	0.97	0.55	2,850,906
1.9 Project Management R&D	9,184,127	9,184,127	9,359,813	0	0%	-175,686	-2%	1.00	0.98	9,184,127

Report Hi-Lighted Report Summary Report Cal Data Sheet4 Thesholds Title Na

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Index >1.5 or < 0.85 → RED

Else

Index >1.2 or < 0.88 → YELLOW

Else

0.88 ≤ Index ≤ 1.2 → GREEN



Monthly Reporting Timeline

T0 = end of the reporting month

<u>Action</u>	<u>Target (working days)</u>
-- Issue turnaround reports to L2 Managers/CAMS	T0 - 3 days
-- Change Request processing blackout period	T0 - 3 days to T0 + 11 days
-- Submit WBS Level 2 technical narratives to project office	T0 + 5 days
-- Submit completed turnaround reports to Project Office	T0 + 5 days
-- Validate progress information in turnaround reports	T0 + 7 days
-- Enter progress information into Open Plan	T0 + 8 days
-- Load status information into Cobra	T0 + 9 days
-- Validate information in Cobra	T0 + 10 days
-- Prepare and post Open Plan monthly reports	T0 + 10 days
-- Make Open Plan Backup file and Post in Doc DB	T0 + 10 days
-- Prepare and post Cobra monthly reports	T0 + 11 days
-- Process baseline changes in OP and Cobra	T0 + 12 days to T0 + 17 days
-- Submit completed variance analysis reports to Project Office	T0 + 14 days
-- PMG Meeting	T0 + ~15 days
-- Prepare change request status report	T0 + 17 days
-- Issue Monthly Report	T0 + 20 days



Control Account Manager's Monthly Reporting Activities - Summary

- Collect and enter progress information on the turnaround report for each activity scheduled to be ongoing during the reporting period, actually ongoing even if not scheduled to start, or actually ongoing even if omitted from the turnaround report.
 - Provide actual start and/or actual finish dates, remaining durations (and estimated finish dates, if appropriate), physical % completed, units completed (if required for the activity).
- Prepare WBS L2 technical narratives
- Review updated Open Plan snapshots posted in DocDB 2844 by the project office after entry of progress information and re-analysis of the schedule.
- Review updated CPRs (linked to CAM notebooks)
- Complete VARS if required. Address any significant schedule slippages and/or cost variances and explain how you intend to mitigate them.
- Prepare baseline change requests, if necessary
- Note any errors in reports. Consult with project office personnel, as needed. Prepare to address any errors that will require corrections in the next reporting period.



Summary of Relevant DocDB Documents

- 1436 – NOvA's Implementation of FRA's Earned Value Management System
 - Contains reporting procedure/guidelines for CAMS/L2 managers
- 1919 – Monthly Turnaround Reports
- 2844 – Monthly Schedule Snapshots with Progress Info
- 942 – Monthly Open Plan Backup File
- 3372 – Monthly CPRs from Cobra

NOvA Project
EVMS Special Topic Training

February 17, 2009

Dean Hoffer/Elaine McCluskey

Topics

- Objective % Complete Measurement
- Update BCWS Profile for Procurement Activities
- Revised Variance Thresholds

Objective % Complete Measurement

- **Issue** - Percent complete basis often unsupported (from Internal Readiness Assessment –Mock Review)
 - NOvA's schedule has about 150 work packages that have % Complete PMT assigned & duration > 2 mos without predefined Peg Points to add objectivity to statusing a % complete.
 - About 170 work packages with % Complete PMT & duration > 2 mos have identified these objective peg points that are documented in various notes fields in the schedule.

Objective % Complete Measurement

(continued)

- **New Duration Requirement:**
 - Work Packages with a duration greater than 2 months that have a % Complete PMT assigned are to have objective “peg points” identified and documented in the schedule file.
- **Action** - CAMs and Project Controls to develop objective Peg Points and document them in a notes field in the schedule, then use them when statusing.

Update BCWS Profile for Procurement Activities

- Issue - Linear BCWS tends to distort variances
- **Requirement:**
 - BCWS to be time phased based on when you expect to earn the value
 - For procurements the earned value (BCWP) is to be taken when material is received.
- **Action** - CAMs and Project Controls need to identify when material is to be received and modify the BCWS in the schedule – this is a baseline change

Variance Thresholds

Current Thresholds in EVMS Document

Green ≥ 0.88 to ≤ 1.2

Yellow ≥ 0.85 to < 0.88 , > 1.2 to < 1.5

Red < 0.85 , > 1.5

These are applied to SPI/CPI for current period and cumulative to date. If variance is red then a Variance Analysis Report (VAR) is required to be generated.

Revised Variance Thresholds

- **Issue** – Variance thresholds too loose
- Comments from Internal Readiness Assessment
 - In our opinion the VAR threshold are too forgiving [loose] and are applied for both internal and external reporting. Consider tighter threshold for internal reporting so that corrective actions will obviate significant variances at the customer reporting level.
 - Adding a dollar value expression to the thresholds will be beneficial.
- OECM/Tecolote commented that the range appeared to be loose

Revised Variance Thresholds

(continued)

New Requirement:

Yellow Thresholds		
Customer Reporting Thresholds		
Variance	Type	Threshold limit
Cost	Current Period	$\geq \pm 5\%$ to $< \pm 10\%$ and \$125K
	Cumulative	$\geq \pm 5\%$ to $< \pm 10\%$ and \$125K
Schedule	Current Period	$\geq \pm 5\%$ to $< \pm 10\%$ and \$125K
	Cumulative	$\geq \pm 5\%$ to $< \pm 10\%$ and \$125K
Control Account Variance Thresholds		
Variance	Type	Threshold limit
Cost	Current Period	$\pm 5\%$ and \$50K
	Cumulative	$\pm 5\%$ and \$50K
Schedule	Current Period	$\pm 5\%$ and \$50K
	Cumulative	$\pm 5\%$ and \$50K

Note: This is SV (schedule variance) or CV (cost variance) that is $\geq \pm 5\%$ to $< \pm 10\%$ of the BCWS and the SV or CV is \geq . (\$125K or \$50K) depending if at the Customer Reporting or Control Account level.

Revised Variance Thresholds

(continued)

Red Thresholds		
Customer Reporting Thresholds		
Variance	Type	Threshold limit
Cost	Current Period	$\geq \pm 10\%$ and $\geq \$250K$
	Cumulative	$\geq \pm 10\%$ and $\geq \$250K$
Schedule	Current Period	$\geq \pm 10\%$ and $\geq \$250K$
	Cumulative	$\geq \pm 10\%$ and $\geq \$250K$
Control Account Variance Thresholds		
Variance	Type	Threshold limit
Cost	Current Period	$\geq \pm 10\%$ and $\geq \$100K$
	Cumulative	$\geq \pm 10\%$ and $\geq \$100K$
Schedule	Current Period	$\geq \pm 10\%$ and $\geq \$100K$
	Cumulative	$\geq \pm 10\%$ and $\geq \$100K$

Note: This is SV (schedule variance) or CV (cost variance) that is $\geq \pm 10\%$ of the BCWS and the SV or CV is \geq (\$250K or \$100K) depending if at the Customer Reporting or Control Account level.

Revised Variance Thresholds

(continued)

- Changed
 - from variance thresholds triggering only off the SPI/CPI
 - to variance thresholds triggering off %SV and %CV plus exceed a \$ value of the SV or CV
- Should help reduce the number of VARs generated for small variances
- Variances are to be evaluated by CAMs but only the ones that trigger the Red Thresholds require VARs to be created
- The Yellow Threshold is indication to management that some attention should be given to those areas to ensure that the variance is not trending towards triggering the Red Thresholds
- **Action - New thresholds should be in effect for and used for January variance reporting**



Control Accounts & Chargeable Task Codes

3 March 2009

Tech Board Meeting

Suzanne Saxer and Elaine McCluskey



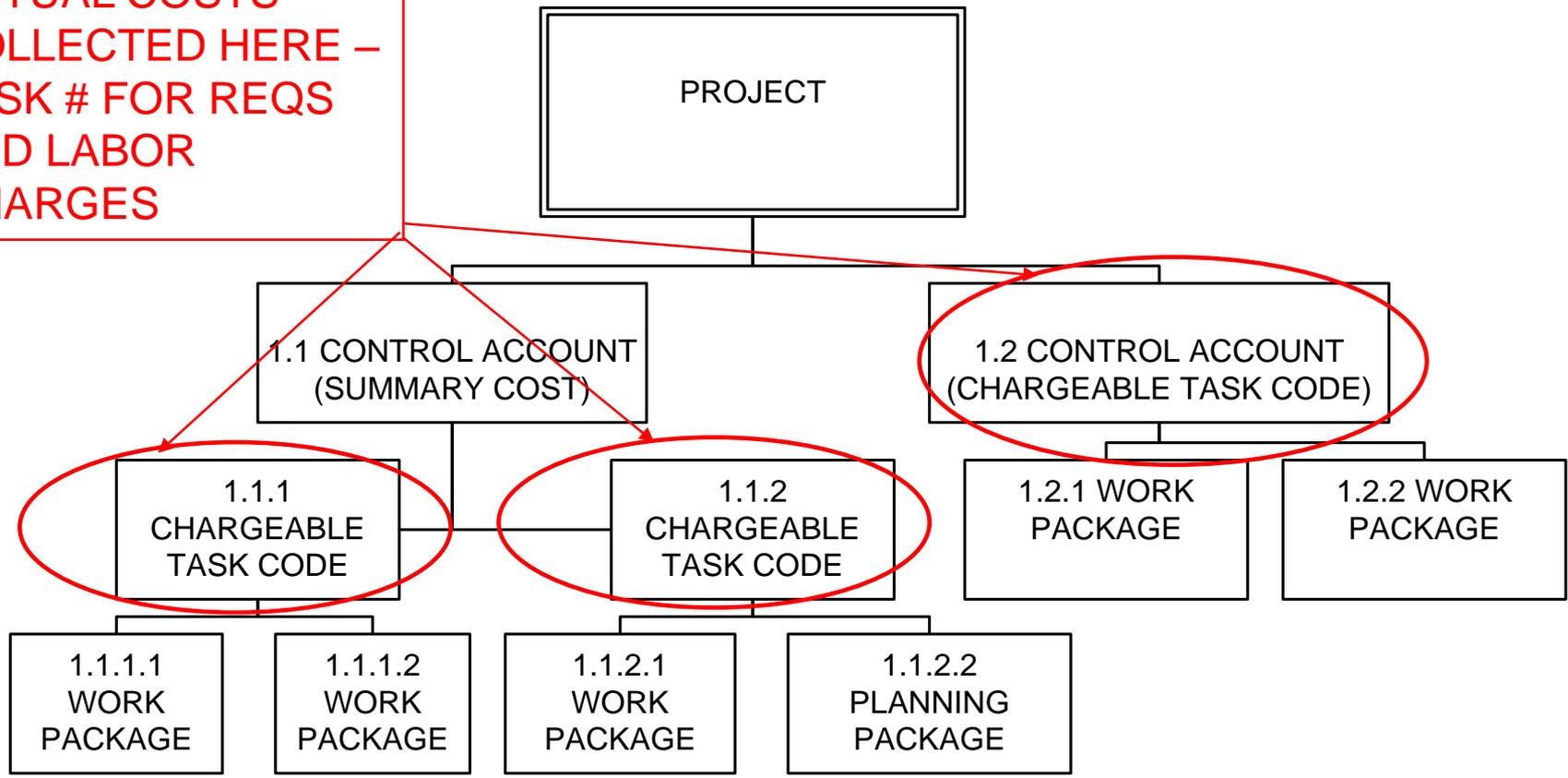
Cost Account → Chargeable Task Code

- Cost Account
 - Term we've been using for where actual costs are collected
 - This is the code number in the Fermilab accounting system against which reqs are written and labor charges made
 - For example: Project 425/Task 1.0.1.1
 - We have determined that projects will use the term **“Chargeable Task Code”** instead of Cost Account
 - Why change?
 - Cost Account is not a standard accounting term at Fermilab, so this isn't defined in the accounting system
 - This was formerly an EVMS term for what is now Control Account.
 - Need to have standard definitions for all projects for consistency.



Control Account Structure

ACTUAL COSTS COLLECTED HERE – TASK # FOR REQS AND LABOR CHARGES



When it's time to start work in a control account, the CAM needs to be sure that the proper chargeable task codes are opened first.



Opening Accounts & Codes

- Opening Chargeable Task Codes
 - Work Authorization form must be signed before Chargeable Task Codes can be opened
 - CAM needs to take initiative early, at least a week before the codes are needed for req writing and labor charges
 - CAM sends email to Suzanne requesting that a specific code(s) be opened. Give the actual number.
 - Find what are the chargeable task codes by looking in at the RAM in NOVA-doc-3447 (file called: \$RAM with Control Accounts & Chargeable Task Codes) – **look in the CTC? column (see next slide for example)**
 - **Chargeable Task Code # is the same as the WBS #**
 - Remember, a control account may be a chargeable task code, or it may be a summary level element with chargeable task codes below it.
 - Suzanne works with the Finance Section to open the codes
 - Suzanne sends an email back to CAM saying the codes are open



Opening Accounts & Codes

These are the numbers to give to Suzanne

Control Account Manager Budget

Value of Control Account Budgets as LOE

WBS	Activity Description	Account Level	CTC?
2.4.6	Management - PVC Extrusions - Construction	Control account	CTC
2.5	PVC Modules	Nova Reporting Level	
2.5.1	End Seals	Control account	
2.5.1.1	Fiber Manifold Production	Chargeable Task Code	CTC
2.5.1.2	End Plate and Seal Production	Chargeable Task Code	CTC
2.5.2	Optical Connector Production	Control account	CTC
2.5.3	Module Production	Control account	
2.5.3.1	Factory Machines, Tooling, & Fixtures - PVC Modules	Chargeable Task Code	CTC
2.5.3.2	Factory Setup and Operation	Nova Reporting Level	
2.5.3.2.1	Factory Lease - PVC Modules	Chargeable Task Code	CTC
2.5.3.2.3	Additional Factory HVAC - PVC Modules	Chargeable Task Code	CTC
2.5.3.2.4	Additional Factory Utilities and Preparation - PVC Modules	Chargeable Task Code	CTC
2.5.3.2.5	Factory Space Operation - PVC Modules	Chargeable Task Code	CTC
2.5.3.2.6	Module Assembly Infrastructure Setup	Chargeable Task Code	CTC
2.5.3.2.7	Review factory setup and operation for full production readiness - PVC Modules	Chargeable Task Code	CTC
2.5.3.2.8	Closeout factory space - PVC Modules	Chargeable Task Code	CTC
2.5.3.3	Module Assembly	Chargeable Task Code	CTC
2.5.4	Management - PVC Modules - Construction	Control account	CTC
2.6	Electronics	Nova Reporting Level	
2.6.1	APD Module Production	Control account	
2.6.1.1	APD Housing	Chargeable Task Code	CTC
2.6.1.2	APD Arrays	Chargeable Task Code	CTC
2.6.1.3	APD Module Testing	Chargeable Task Code	CTC
2.6.1.4	APD Module Shipping	Chargeable Task Code	CTC
2.6.2	Readout - FEB	Control account	
2.6.2.1	Procurements	Nova Reporting Level	
2.6.2.1.1	Far Detector ASIC Production	Chargeable Task Code	CTC
2.6.2.1.3	ADCs	Chargeable Task Code	CTC
2.6.2.1.4	Commercial off-the-shelf items (COTs) - FEBs	Chargeable Task Code	CTC

Control Account that is also a CTC

CTC at a lower level – WBS L4 and L5



Closing Accounts & Codes

- Closing Chargeable Task Codes
 - When all work packages are complete in a chargeable task code, CAM requests Suzanne to close the code
 - Stops reqs from being written on the code
 - Stops labor charges
 - Still allows invoices on a purchase order to be charged against it
 - When all Chargeable Task Codes on a Control Account are closed, the Control Account can be considered “closed”
 - At this point, variance reports will no longer need to be written for variances already explained
 - Project Controls will keep track of which Control Accounts are closed so that CPR5s are not put into the CAM notebooks and so that the stoplight table doesn't show these colored.



Accruals

Suzanne Saxer

Fermilab

NOvA

March 31, 2009



What are Accruals?

Wikipedia:

Accrual, in [accounting](#), describes the [accounting method](#) known as [accrual basis](#), whereby revenues and expenses are recognized when they are accrued, i.e. accumulated (earned or incurred), regardless when the actual cash is received or paid out.



Why accrue for NOvA?

Method for recording costs for “goods” received but not invoiced

- Matches costs to the period where the item or service is received
- Critical for earned value reporting
 - Minimizes artificial variances (BCWP without ACWP)
- NOvA plans to have many large purchases, most of which will be shipped to locations offsite
 - Very substantial costs
- University & Argonne expenses are also handled through Fermilab purchase orders and invoicing requires some lag time
 - Also significant costs, though not as much as the commodities
- Statusing in Open Plan needs to be based on when things are actually completed or received, regardless of when invoicing occurs



Monthly Process

Invoicing often lags behind the receipt of goods/services

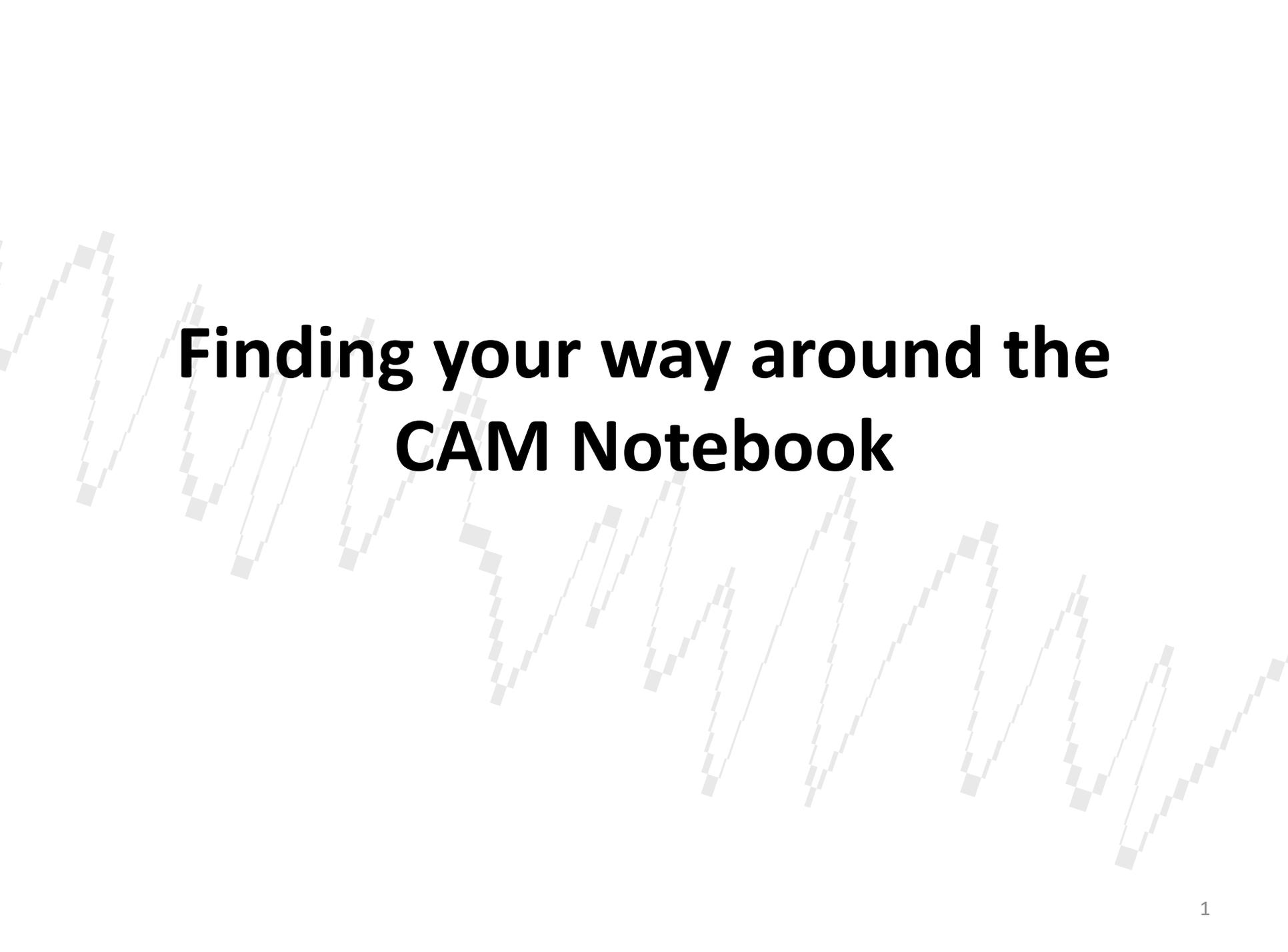
- The Oracle Material Management System automatically accrues costs for items that have been “received” at Fermilab but not yet invoiced
 - Costs are approximate based on the purchase order item cost
 - Does not include extras such as freight bills or differences in price
- MMS will also accrue for goods received offsite
 - We have to let Fermilab receiving know when items are received
 - They will enter a receipt for the item
 - MMS then automatically accrues the costs
- Accounting has developed “Service Receipt Accruals”
 - Record ‘receipts’ for services & items not physically received at the lab
 - Submitted to accounting via Service Receipt Accrual spreadsheet every month (example on next slide)



Service Receipt Accrual Spreadsheet

Division/Section: PPD
 Period: MAR-07
 Submitted By: Suzanne Pasek

Vendor Name	PO#	Line #	Ship #	Dist#	Current Period Receipts to be Entered (A)	Quantity Ordered (B)	Quantity Billed (C)	Prior Period Qty Delivered to Date (D)	Accounting Use (Formula Driven)		Last Name (for ref only)	Item Description (for ref only)	Project# (for ref only)	Task# (for ref only)
									Current Period Qty Delivered to Date (E)	PO Open Amt * After Current Period Receipt (B) - (E)				
ARGONNE NAT'L LAB	563811	29	1	1	41,567.30	150,392.00	142,834.03	108,824.70	150,392.00	-	Pasek	NOVA WBS	480	1.8.9.4
ARGONNE NAT'L LAB	563811	30	1	1	23,554.70	41,940.00	9,954.70	-	23,554.70	18,385.30	Pasek	WBS 1.4 PV	480	1.4.6.5
ARGONNE NAT'L LAB	563811	31	1	1	4,800.00	4,800.00	4,726.97	-	4,800.00	-	Pasek	WBS 1.5 PV	480	1.5.10.5
ARGONNE NAT'L LAB	563811	32	1	1	41,253.54	73,336.00	1,253.54	-	41,253.54	32,082.46	Pasek	WBS 1.8 AS	480	1.8.9.5
ARGONNE NAT'L LAB	563811	33	1	1	10,000.00	22,058.00	-	-	10,000.00	12,058.00	Pasek	NOVA R & D	480	1.8.9.5
UCLA	569659	1	1	10	8,576.00	44,500.00	36,137.92	35,924.00	44,500.00	-	Pasek	R & D ACTIV	480	1.3.7.4
SEH	570728	2	1	1	12,000.00	12,000.00	9,244.20	-	12,000.00	-	Pasek	TASK, INCR	480	1.1.4.6
BURNS & MCDONNELL	571506	1	1	1	194,992.75	260,000.00	223,078.25	65,007.25	260,000.00	-	Pasek	CREATE A N	480	1.1.4.4
INDIANA UNIVERSITY	564432	3	1	1	24,493.50	53,628.00	29,296.11	29,134.50	53,628.00	-	Pasek	WBS 1.6 AP	480	1.6.4.4
INDIANA UNIVERSITY	564432	5	1	1	7,807.86	17,426.00	-	9,618.14	17,426.00	-	Pasek	WBS 1.2 SC	480	1.2.10.4
SEH	564502	2	1	3	862.15	862.15	533.32	-	862.15	-	Pasek	EC-01: Incre	480	1.1.4.4
SEH	564502	3	1	2	1,136.52	1,136.52	-	-	1,136.52	-	Pasek	EC-02: Incre	480	1.1.4.4
SEH	564502	4	1	1	6,234.00	6,234.00	-	-	6,234.00	-	Pasek	EC-03: Incre	480	1.1.4.4
SEH	564502	5	1	1	13,000.00	28,000.00	-	15,000.00	28,000.00	-	Pasek	TASK, INCR	480	1.1.4.4
CONSTRUCTION TECHNOLO	572914	1	1	1	2,840.00	2,840.00	-	-	2,840.00	-	Pasek	NOVA CONC	480	1.1.4.6
BURNS & MCDONNELL	572707	1	1	1	385,194.00	486,000.00	126,477.25	-	385,194.00	100,806.00	Pasek	TASK, A NEV	480	1.1.4.6
SOUTHERN METHODIST UNIV	570891	1	1	1	13,549.00	13,549.00	13,498.99	-	13,549.00	-	Pasek	NOVA R & D	480	1.2.10.4
MICHIGAN STATE UNIVERSIT	565010	2	1	1	25,871.00	25,871.00	17,150.87	-	25,871.00	-	Pasek	ENGINEERII	480	1.3.7.4
MICHIGAN STATE UNIVERSIT	565010	3	1	1	18,608.00	18,608.00	8,576.77	-	18,608.00	-	Pasek	TECHNICIAN	480	1.3.7.4
MICHIGAN STATE UNIVERSIT	565010	4	1	1	1,015.04	7,560.00	6,544.96	6,544.96	7,560.00	-	Pasek	UNDERGRA	480	1.3.7.4
MICHIGAN STATE UNIVERSIT	565010	5	1	1	1,292.28	5,040.00	3,400.60	3,747.72	5,040.00	-	Pasek	MATERIALS	480	1.3.7.4
UNIVERSITY OF TEXAS AT DA	569738	1	1	1	5,000.00	25,000.00	24,534.49	20,000.00	25,000.00	-	Pasek	WBS 1.3 R&	480	1.3.7.4
EXTRUTECH PLASTICS INC	566578	2	1	1	118.00	118.00	-	-	118.00	-	Pasek	RIGID PVC 1	480	1.4.6.4
EXTRUTECH PLASTICS INC	566578	3	1	1	30.00	30.00	-	-	30.00	-	Pasek	RIGID PVC 1	480	1.4.6.4
EXTRUTECH PLASTICS INC	566578	4	1	1	120.00	120.00	-	-	120.00	-	Pasek	RIGID PVC 1	480	1.4.6.4
EXTRUTECH PLASTICS INC	566578	5	1	1	465.00	465.00	-	-	465.00	-	Pasek	RIGID PVC 1	480	1.4.6.4
EXTRUTECH PLASTICS INC	566578	6	1	1	335.00	335.00	-	-	335.00	-	Pasek	RIGID PVC 1	480	1.4.6.4
EXTRUTECH PLASTICS INC	566578	7	1	1	1.00	1.00	0.50	-	1.00	-	Pasek	C. O. TO PO	480	1.4.6.4
AURORA PLASTICS INC	573547	1	1	1	35,000.00	35,000.00	-	-	35,000.00	-	Pasek	NOVA-24 PE	480	1.4.6.5
ASHBY CROSS CO	573410	1	1	1	1.00	1.00	-	-	1.00	-	Pasek	SYSTEM, GF	480	1.8.9.5



Finding your way around the CAM Notebook

Where

- **Control Account Manager Page**

- This URL http://www-nova.fnal.gov/evms/cam_notebook_list.html

*****Note when opening CAM notebooks the document list sometimes get forced to the very bottom of page due to screen width*****

Ken Heller	WAD		Leon Mualem	WAD	
1.5	3308		1.6	3309	
2.5.1	3341		2.6.1	3345	
2.5.2	3342		2.6.2	3346	
2.5.3	3343		2.6.3	3347	
2.5.4	3344		2.6.4	3348	

- **There is a CAM notebook and WAD for each Control Account**

- Leon Mualem for 1.6 and 2.6 has a total
 - 5 Cam notebook for NOvA
 - 1.6 Electronics
 - 1 Cam notebook for NOvA R&D
 - 2.6 Electronics
 - 4 CAM Notebooks for NOvA Construction 2.6.1-2.6.4

What is In a CAM Notebook

- [Variance Analysis Report](#)
- [Work Authorization Document for Control Account](#)
- [Monthly Cost Performance Reports](#)
- [Monthly Schedule Snapshots with Progress Information - Feb09](#)
- [Nova WBS Level 2 Milestone Gantt charts By Control Account](#)
- [NOvA Dollarized RAM](#)
- [WBS Level 3 Managers](#)
- [NOvA WBS Dictionary](#)
- [Change Request](#)

Variance Analysis Report 1.6

- Files in Document:
 - [February Variance Analysis Report](#)
 - VAR-Feb09 for 1.6 Electronics R&D

February Variance Analysis Report

CLASSIFICATION (When Filled In)									
CONTRACT PERFORMANCE REPORT FORMAT 5 - EXPLANATIONS AND PROBLEM ANALYSES								FORM APPROVED OMB No. 0704-0188	
1. CONTRACTOR		2. CONTRACT		3. PROGRAM		4. REPORT PERIOD			
a. NAME Fermi National Accelerator		a. NAME		a. NAME NOvA Project		a. FROM (YYYYMMDD) 2009/02/01			
b. LOCATION (Address) Batavia, Illinois		b. NUMBER		b. PHASE		b. TO (YYYYMMDD) 2009/02/28			
		c. TYPE	d. SHARE RATIO	c. EVMS ACCEPTANCE (YYYYMMDD) NO X YES					
1.6 Electronics R&D									
	BCWS	BCWP	ACWP	SV in \$	SV in %	CV in \$	CV %	SPI	CPI
Current:	155,840	19,443	14,471	-136,397	-88%	4,972	26%	0.12	1.34
Cumulative	429,049	313,030	549,846	-116,019	-27%	-236,816	-76%	0.73	0.57
	BAC	EAC	VAC in \$	VAC in %	CPI to BAC	CPI to EAC			
At Complete	1,473,437	1,717,981	-244,544	-17%	1.26	0.99			
Thresholds Exceeded: Current Period Schedule, Current Period Cost, Cumulative Schedule, Cumulative Cost									
Explanation of Variance/Description of Problem: The schedule variance in the current period is real schedule slippage due to delays in return or personnel to the project and delays in getting funding agreements in place so that work could resume. The sign of the slow startup is looking at the last several VARs. Each month the BCWP increased significantly, nearly a factor of 2 each month. A large fraction of this schedule slippage is due to a single procurement of APDs, which will create a \$60k per period schedule variance each month until deliveries start. This is due to two causes. The first is an actual delay that has caused this procurement to drag out as the vendor specifications were completed. The second is the application of linear spread of the budget over the entire procurement period. In addition, the vendor has decided to extend the delivery over a longer period than was originally scheduled, but this is only about a 15% effect. The cumulative schedule variance made a big jump this period also, since we had just barely gotten ahead of schedule (7%) and then ran into the planned startup that dropped us to a 27% schedule deficit. This trend will continue, but is expected to be less steep, as the workers ramp up in their tasks. The cumulative cost variance showed a slight decrease as the progress is beginning to show and some of the initial startup is waning. The primary sources of cumulative variance are: Unscheduled ASIC design cost \$232k ACWP with 78k BCWP for (\$154k) variance. (unchanged) Additional effort in FEB design \$114k ACWP with 61k BCWP for (\$53k) variance. (5k better) APD tests increased from \$125k ACWP with \$63k BCWP for a (\$62k) variance. (10k better) Additional effort for power distribution design \$42k ACWP with \$29k BCWP for a (\$13k) variance. (no change) Costs for vertical slice tests \$40k ACWP for \$83k BCWP for a +\$43k variance. (15k worse)									
Impact: The schedule variance will delay the completion of this section of R&D. It is not expected to impact other WBS sections									
Corrective Action: There is no corrective action for this period									
Monthly Summary (to include technical causes of VARs, Impacts) and Corrective Action(s): This control account has suffered a month of schedule slippage due to difficulties of restarting the effort and getting the funding in place for all the parties. This must be monitored to ensure that the situation improves to the point that we are progressing as expected. There will be some difficulty in understanding when this is the case due to the way the BCWS is spread over some large procurement tasks. This variance will have to be taken out and analyzed separately from the labor oriented schedule variance.									
Prepared by: Leon Mualem				Date: 3/20/2009		Approved by:		Date:	

Work Authorization Document for Control Account 2.6.1

- Files in Document:
 - [CAP-CA-1.6](#)
 - Control Account Plan showing BCWS for various Work packages
 - [NOvA WAD form CA 1.6](#)
 - Work Authorization Form for a specific control Account
 - [WBS Dictionary 1.6, 2.6](#)
 - Contains WBS Definitions
 - [WP Schedule by Control Account](#) (WAD Spreadsheet CA)
 - Control Account/Chargeable Task Code/Work Package Summary/PMT's/
Peg-point descriptions/resources

Work Authorization Document for Control Account 1.6

CAP - CA-1.6 Control Account Plan

Program:NOVA

Batch Report:CAP-RAM Filter:NOVA-CA-1.6

Program:	Description:																
NOVA	NOVA Project																
Run Date:	Status Date:																
3/4/2009	2/28/2009																
Control ACT/WP		MAY07	JUN07	JUL07	AUG07	SEP07	OCT07	NOV07	DEC07	JAN08	FEB08	MAR08	APR08	MAY08	JUN08	JUL08	
1.6 Electronics R&D																	
1.6.4.5 Electronics R&D																	
1.6.1.1.3.3	Fabricate second housing	BCWS	15,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.1.3.4	Assemble housing	BCWS	270	1,079	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.1.3.5	Assemble prototype	BCWS	0	1,058	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.1.3.6	Test second prototype	BCWS	0	849	1,868	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.1.3.8	APD module value engineering - prototype 2	BCWS	0	0	101	580	479	608	528	476	0	0	0	0	0	0	0
1.6.1.1.3.9	APD module value engineering - prototype 2 - Part 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.10.1	Design	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.10.2	Build	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.11.1	Design APD QE test procedure	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.11.2	Test prototype APDs	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.11.3	Document QE test results	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.3	Design - 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.4	Manufacture	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.5	Program	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.6	Qualify	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.2.7	Document	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.3.1	Model water flow	BCWS	3,278	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.3.2	Design test for model	BCWS	1,453	722	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.3.3	Procure manifolds	BCWS	0	2,101	2,521	89	0	0	0	0	0	0	0	0	0	0	0
1.6.1.3.4	Procure other components	BCWS	0	127	148	162	134	166	144	130	0	0	0	0	0	0	0
1.6.1.3.5	Assemble and test hardware	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.3.6	Water cooling value engineering	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.4.1	Develop preliminary design	BCWS	1,209	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.5.2	Design electronics box - 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.5.3	Prototype electronics box	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.5.4	Qualify electronics box for production	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.2	APD engineering run	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.3.1	Design housing manufacturing and test stand	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.3.2	Prototype mold	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.3.3	Pilot fabrication run	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.4	Manufacture housing parts	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.5	Assemble	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.6	Test	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.1.8	Review	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.2.1	Procure manifolds	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.2.2	Procure other components	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.1.6.2.3	Assemble and test hardware	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.1.2.2	Fabricate	BCWS	0	0	0	0	0	0	44,462	49,391	0	0	0	0	0	0	0
1.6.2.1.2.3	Test	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.1.2.4	Documentation	BCWS	0	0	0	0	0	0	591	0	0	0	0	0	0	0	0
1.6.2.1.2.5	Administration	BCWS	0	0	0	0	0	0	153	0	0	0	0	0	0	0	0
1.6.2.1.2.6	Documentation - Part 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.1.2.7	Administration - Part 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.1.4.1	Fabricate	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.1.4.2	Test	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.4.1	Design	BCWS	0	0	0	0	0	0	1,643	2,957	0	0	0	0	0	0	0
1.6.2.4.11	Review FEB prototype III	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.4.13	Design - Part 2	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.6.2.4.2	Fabricate PCB	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

cap-ram-noa-ca-1.6.xls

Work Package

Chargeable Task Code

Control Account

Work Authorization Document for Control Account 2.6.1

WAD Form



WORK AUTHORIZATION FORM NOVA Project

Control Account Title: Electronics R&D

Control Account Number: 1.6

Work Breakdown Structure Element: WBS 1.6

Period of Performance: 01May07 to 03Aug10

Current Authorized Budget (in AYS with all burdening): \$1,473,437

This Work Authorization, including all attachments, represents the agreement between the Project Manager and Control Account Manager (CAM) to perform, or to have performed, efforts defined by the following:

- 1) A WBS Dictionary sheet that defines the scope of work for this WBS element/Control Account. If additional definition is warranted, or required for a particular WBS element, (e.g., QA reasons, Work Orders for third party services, etc) attach applicable documentation.
- 2) A detailed Control Account schedule showing all work packages and planning packages.
- 3) A detailed resource report by WBS and schedule activity.
- 4) Budgeted cost by month

This Work Authorization is for the lifecycle of the project. Funding will be authorized incrementally based on schedule status and funding availability, and communicated by other means to CAMs.

In addition to the CAMs approval of all third party commitments (i.e., Memorandums of Understanding (MOU) with other institutions, purchase orders, and subcontracts), the following is required:

- Commitments must be approved by the Project Manager for all R&D work > \$1000, and for construction work where commitments values are greater than \$10,000.
- To move funds to collaborating institutions, the CAM is to see that the following is in place before executing the purchase order:
 - MOU with the collaborating institution, signed by both parties, including the Project Manager.
 - Statement of Work, one for each fiscal year (FY), detailing the amounts expected to be funded during that FY. SOW signatures must include the CAM and the Project Manager.
 - This Work Authorization with all approvals.

Any change to this document will be implemented through the Change Control procedures.

Approvals will be done through the NOVA DocDB on the Work Authorization Document file.

Signature chain will be Scheduler, Financial Officer, Control Account Manager, and Project Manager.

Chargeable task codes will not be opened without a signed work authorization form.

Work Authorization Document for Control Account 1.6

WBS Dictionary

NOVA PROJECT
WBS DICTIONARY

WBS	Activity Description	WBS Definition
1.6	Electronics R&D	This level 2 summary element includes the design, development, and testing of the front end electronics and infrastructure.
1.6.1	APD Modules	Development and procurement of prototype APD chips, APD carrier boards, TE coolers, optical connectors and the associated hardware that comprise the APD modules. Development of specifications for fiber alignment, power consumption, cooling, and QA are also included. APD modules for the Integration Prototype Near Detector are included here.
1.6.2	FEB	Design the front-end boards as well develop the testing and installation procedures. Front-end boards for the Integration Prototype Near Detector are included here.
1.6.3	Power Distribution	Design and specify the low voltage, high voltage, cooling, and power distribution for the NOVA electronics. Power distribution for the Integration Prototype Near Detector is included here.
1.6.4	Management - R&D Phase	Management tasks and budget for Electronics subproject during the R&D phase.
1.6.5	Vertical Slice Tests	Create small-scale test facility for evaluating various configurations of prototype PVC extrusions, liquid scintillator, and WLS fiber using cosmic ray muons, APDs, and prototype versions of the front-end board.
2.6	Electronics Production	This level 2 summary element includes procurement of the Avalanche Photo Diode (APD) optical sensors, the thermo-electric (TE) coolers for cooling the APDs, the custom ASIC that amplifies and multiplexes the APD signals, the ADC that digitizes the signals, and the FPGAs that zero suppress and time-stamps the data. The low-voltage system for the TE coolers and the front-end electronics, the high voltage system for the APDs, and a cooling system to remove the heat from the TE coolers are included, as well as system design, board layout, and assembly and component testing.
2.6.1	APD Module Production	Procurement and QA of the APD chips, the APD carrier boards, the TE coolers, and the APD housing hardware. This task includes managing the flow of components for assembly and development and execution of the QA plan.
2.6.2	Readout - FEB	Delivery of the specified system to receive signals from the APD modules, digitize them, and deliver them to the DAQ system. This task includes managing the flow of components for assembly and development and execution of the QA plan.
2.6.3	Readout Infrastructure	Design, production, and installation of the infrastructure required to deliver power and cooling to operate the FEBs and APDs.
2.6.4	Management - Construction Phase	This WBS element includes the tasks required to support and manage WBS 2.6 activities including quality assurance, value management, risk management, monitoring of performance and schedule, preparation of reports and other related activities.

Work Authorization Document for Control Account 1.6

WAD Spreadsheet

Nova Project										
Control Account/Chargeable Task Code/Work Package Summary										
Control Account: C25 = '1.6' and TPC_Filter = [BOOL.T]										
WBS	Activity Description	Status	Original Duration	Early Start	Early Finish	Baseline Start	Baseline Finish	Performance Measurement Technique	Ground Rules & Assumptions	Resource Assignments (Labor hrs, M&S FY07)
Control Account: 1.6 -- Electronics R&D				01May07	27Aug10	01May07	03Aug10			
Task Code: 1.6.4.5 -- Electronics R&D				01May07	27Aug10	01May07	03Aug10			
1.6.1.1.3.3	Fabricate second housing	Complete	20d	01May07	04Jun07	01May07	29May07	E -- 50-50		M.I.U.PD.MANDSXMPT,15000.00,
1.6.1.1.3.4	Assemble housing	Complete	10d	04Jun07	14Jun07	30May07	12Jun07	F -- 0-100		L.I.U.PD.TECH.MT_W,40.00,
1.6.1.1.3.5	Assemble prototype	Complete	5d	14Jun07	20Jun07	13Jun07	19Jun07	F -- 0-100		L.CT.PD.TECH.MT_W,24.00,
1.6.1.1.3.6	Test second prototype	Complete	25d	14Jun07	28Jun07	20Jun07	25Jul07	C -- % COMPLETE		L.CT.PD.TECH.UGRAD,40.00.;L.CT.PD.TECH.MT_W,8.00.;L.I.U.PD.TECH.MT_W,40.00,
1.6.1.1.3.8	APD module valve engineering - prototype 2	Complete	20d	26Jul07	28Dec07	26Jul07	28Dec07	C -- % COMPLETE		L.I.U.PD.TECH.MT_W,80.00,
1.6.1.1.3.9	APD module valve engineering - prototype 2 - Part 2	Complete	20d	01Oct08	31Oct08	02Feb09	27Feb09	C -- % COMPLETE		L.I.U.PD.TECH.MT_W,80.00,
1.6.1.2.3	Design - 2	Planned	19d	02Mar09	26Mar09	02Feb09	26Feb09	E -- 50-50		L.UMNTPC.PD.TECH.ET_M,68.00.;L.UMNTPC.PD.SCI.PHY,4.00,
1.6.1.2.4	Manufacture	Planned	25d	27Mar09	30Apr09	27Feb09	02Apr09	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,34501.00.;L.UMNTPC.PD.TECH.ET_M,100.00,
1.6.1.2.5	Program	Planned	50d	01May09	13Jul09	03Apr09	12Jun09	C -- % COMPLETE	30% Single channel test complete, 70% multi-channel tests complete, 100% test results entered in database	L.UMNTPC.PD.TECH.ET_M,200.00,
1.6.1.2.6	Qualify	Planned	25d	14Jul09	17Aug09	15Jun09	20Jul09	C -- % COMPLETE		L.UMNTPC.PD.TECH.ET_M,75.00,
1.6.1.2.7	Document	Planned	25d	14Jul09	17Aug09	15Jun09	20Jul09	C -- % COMPLETE		L.UMNTPC.PD.TECH.ET_M,25.00,
1.6.1.2.10.1	Design	Planned	40d	02Mar09	24Apr09	02Feb09	27Mar09	C -- % COMPLETE		L.UMNTPC.PD.SCI.PHY,16.00.;L.UMNTPC.PD.TECH.ET_M,160.00,
1.6.1.2.10.2	Build	Planned	40d	27Apr09	22Jun09	30Mar09	22May09	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,4218.00.;L.UMNTPC.PD.TECH.ET_M,160.00,
1.6.1.2.11.1	Design APD QE test procedure	Complete	20d	01Oct08	20Nov08	02Feb09	27Feb09	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,1000.00.;L.UMNTPC.PD.TECH.ET_M,20.00,
1.6.1.2.11.2	Test prototype APDs	Complete	20d	01Dec08	30Dec08	02Mar09	27Mar09	C -- % COMPLETE		L.UMNTPC.PD.TECH.UGRAD,40.00.;L.UMNTPC.PD.SCI.PD,20.00.;L.UMNTPC.PD.TECH.ET_M,20.00,
1.6.1.2.11.3	Document QE test results	In Progress	20d	15Jan09	17Mar09	30Mar09	24Apr09	C -- % COMPLETE		L.UMNTPC.PD.SCI.PD,20.00,
1.6.1.3.1	Model water flow	Complete	15d	01Jun07	14Dec07	01May07	21May07	E -- 50-50		L.UMNTPC.PD.TECH.ET_M,60.00,
1.6.1.3.2	Design test for model	Complete	10d	01Dec07	21Dec07	22May07	05Jun07	F -- 0-100		L.UMNTPC.PD.TECH.ET_M,40.00,
1.6.1.3.3	Procure manifolds	Complete	40d	11Jun07	13Jul07	06Jun07	01Aug07	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,4711.00,
1.6.1.3.4	Procure other components	Complete	40d	06Jun07	28Dec07	06Jun07	28Dec07	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,1000.00,
1.6.1.3.5	Assemble and test hardware	Complete	40d	01May08	19Feb09	02Feb09	27Mar09	C -- % COMPLETE		L.UMNTPC.PD.TECH.ET_W,160.00,
1.6.1.3.6	Water cooling valve engineering	In Progress	50d	06Jan09	17Mar09	02Mar09	08May09	C -- % COMPLETE		M.UMNTPC.PD.MANDSXMPT,1000.00.;L.UMNTPC.PD.TECH.UGRAD,160.00.;L.UMNTPC.PD.SCI.PD,40.00.;L.UMNTPC.PD.TECH.ET_M,120.00,
1.6.1.4.1	Develop preliminary design	Complete	40d	01May07	26Jun07	01May07	26Jun07	C -- % COMPLETE	Following completion of preliminary design work, further effort on this option was suspended.	L.FNAL.PPD.ENG.ME,20.00,
1.6.1.5.2	Design electronics box - 2	Complete	9d	01Oct08	31Oct08	02Feb09	12Feb09	F -- 0-100		L.I.U.PD.ENG.ME,20.00,
1.6.1.5.3	Prototype electronics box	Planned	20d	02Mar09	27Mar09	13Feb09	12Mar09	E -- 50-50		M.I.U.PD.MANDSXMPT,500.00.;L.I.U.PD.TECH.ET_W,80.00,
1.6.1.5.4	Qualify electronics box for production	Planned	1d	30Mar09	30Mar09	13Mar09	13Mar09	F -- 0-100		L.I.U.PD.SCI.PHY,8.00.;L.UMNTPC.PD.ENG.ME_SR,8.00.;L.CT.PD.SCI.PHY,8.00.;L.I.U.PD.ENG.ME,8.00,

Monthly Cost Performance Reports

- Files in Document:
 - [CPR by Chargeable Task Code](#)
 - Contract Performance Report by Chargeable Task Code
 - [CPR by Control Account](#)
 - Contract Performance Report by Control Account
 - [CPR by Fund Source](#)
 - Contract Performance Report by Fund Source
 - [CPR by Fund Source and WBS L2](#)
 - Contract Performance Report by WBS Level 2
 - [CPR5 for all control accounts](#)
 - Contract Performance Report -5 for all Control Accounts

Monthly Cost Performance Reports

CPR by Chargeable Task Code

Program:NOVA

Report:NOVA-CPV

CONTRACT PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
1. CONTRACTOR				2. CONTRACT				3. PROGRAM			4. REPORT PERIOD		
a. NAME Fermi National Accelerator Laboratory				a. NAME				a. NAME NOvA Project			FROM 01-Feb-2009 TO 28-Feb-2009		
8. PERFORMANCE DATA													
Chargeable Task Code BE.Expense cat Results... ITEM (1)	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED (14)	ESTIMATED (15)	VARIANCE (16)
	WORK SCHEDULED (2)	WORK PERFORMED (3)	WORK PERFORMED (4)	SCHEDULE (5)	COST (6)	WORK SCHEDULED (7)	WORK PERFORMED (8)	WORK PERFORMED (9)	SCHEDULE (10)	COST (11)			
<i>1.6.4.5 Electronics R&D Cost Account</i>													
MS Materials & Services													
Fully burdened AY\$	149,968	18,239	14,471	(131,730)	3,767	420,078	304,059	408,954	(116,019)	(104,895)	1,435,447	1,547,555	(112,108)
PC Personnel Costs													
Fully burdened AY\$	5,871	1,204	0	(4,667)	1,204	8,971	8,971	140,892	0	(131,922)	37,990	170,426	(132,436)
Chargeable Task CodeTotals:	155,840	19,443	14,471	(136,397)	4,972	429,049	313,030	549,846	(116,019)	(236,816)	1,473,437	1,717,981	(244,544)
Undist. Budget											0	0	0
Sub Total	#####	946,569	608,595	#####	337,974	#####	#####	#####	(187,669)	(605,764)	208,799,539	#####	(693,159)
Management Resrv.											69,200,461		
Total	#####	946,569	608,595	#####	337,974	#####	#####	#####	(187,669)	(605,764)	278,000,000		

Monthly Cost Performance Reports

CPR by Control Account

Program:NOVA

Report:NOVA-CPR

CONTRACT PERFORMANCE REPORT													
FORMAT 1 - WORK BREAKDOWN STRUCTURE													
1. CONTRACTOR				2. CONTRACT				3. PROGRAM				4. REPORT PERIOD	
a. NAME Fermi National Accelerator Laboratory				a. NAME				a. NAME NOVA Project				FROM 01-Feb-2009 TO 28-Feb-2009	
8. PERFORMANCE DATA													
Control Acct[21] BE.Expense cat Results... ITEM (1)	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED	ESTIMATED	VARIANCE
	WORK SCHEDULED (2)	WORK PERFORMED (3)	WORK PERFORMED (4)	SCHEDULE (5)	COST (6)	WORK SCHEDULED (7)	WORK PERFORMED (8)	WORK PERFORMED (9)	SCHEDULE (10)	COST (11)	(14)	(15)	(16)
<i>1.6 Electronics R&D</i>													
MS Materials & Services													
Fully burdened AY\$	149,968	18,239	14,471	(131,730)	3,767	420,078	304,059	408,954	(116,019)	(104,895)	1,435,447	1,547,555	(112,108)
PC Personnel Costs													
Fully burdened AY\$	5,871	1,204	0	(4,667)	1,204	8,971	8,971	140,892	0	(131,922)	37,990	170,426	(132,436)
Control Acct[21]Totals:	155,840	19,443	14,471	(136,397)	4,972	429,049	313,030	549,846	(116,019)	(236,816)	1,473,437	1,717,981	(244,544)
Control Acct[21]Totals:	8,492	8,492	0	0	8,492	42,887	42,887	0	0	42,887	967,339	913,816	53,524
Undist. Budget											0	0	0
Sub Total	#####	946,569	608,595	#####	337,974	#####	#####	#####	(187,669)	(605,764)	#####	#####	(693,159)
Management Resrv.											69,200,461		
Total	#####	946,569	608,595	#####	337,974	#####	#####	#####	(187,669)	(605,764)	#####		

Monthly Cost Performance Reports

CRP by Fund Source

Program:NOVA

Report:NOVA-CP0

COST PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
CONTRACTOR				CONTRACT				PROGRAM				4. REPORT PERIOD	
NAME Fermi National Accelerator Laboratory				NAME				NAME NOVA Project				FROM 01-Feb-2009 TO 28-Feb-2009	
PERFORMANCE DATA													
Fund Source Results... ITEM (1)	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED	LATEST REVISED ESTIMATE	VARIANCE
	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST			
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
DA DOE-ACEL MIE													
Fully Burdened AY\$k	386	98	57	(288)	41	593	322	283	(271)	39	29,946	29,943	2
Fund SourceTotals:	386	98	57	(288)	41	593	322	283	(271)	39	29,946	29,943	2
DC DOE-CA													
Fully Burdened AY\$k	55	376	46	321	330	351	1,278	958	927	320	46,239	46,075	164
Fund SourceTotals:	55	376	46	321	330	351	1,278	958	927	320	46,239	46,075	164
DD DOE-ACEL R&D													
Fully Burdened AY\$k	598	146	144	(451)	2	1,998	2,222	2,033	224	189	7,604	7,406	198
Fund SourceTotals:	598	146	144	(451)	2	1,998	2,222	2,033	224	189	7,604	7,406	198
DE DOE-DET MIE													
Fully Burdened AY\$k	367	156	102	(211)	54	1,207	1,058	640	(150)	418	103,067	102,547	521
Fund SourceTotals:	367	156	102	(211)	54	1,207	1,058	640	(150)	418	103,067	102,547	521
DO DOE-ACEL OPS													
Fully Burdened AY\$k	149	19	28	(130)	(9)	229	233	57	5	177	1,227	1,047	180
Fund SourceTotals:	149	19	28	(130)	(9)	229	233	57	5	177	1,227	1,047	180
DR DOE-POST CD-1 DET R&D													
Fully Burdened AY\$k	946	151	232	(795)	(81)	6,969	6,046	7,795	(923)	(1,748)	11,916	13,674	(1,758)
Fund SourceTotals:	946	151	232	(795)	(81)	6,969	6,046	7,795	(923)	(1,748)	11,916	13,674	(1,758)
DY DOE CD-0 TO CD-1 R&D													
Fully Burdened AY\$k	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Fund SourceTotals:	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Cost of Money	0	0	0	0	0	0	0	0	0	0	0	0	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0	0
Sub Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	208,800	209,493	(693)
Management Resrv.											69,200		
Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	278,000		
G&A included in totals above	558	139	147	(419)	(8)	2,189	2,086	2,322	(103)	(236)	19,859	20,070	(211)
Total Project													
CPI			1.555					0.971					
SPI		0.378					0.991						

Monthly Cost Performance Reports

CPR by Fund Source and WBS L2

Program:NOVA

Report:NOVA-CP1

COST PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
CONTRACTOR						CONTRACT			PROGRAM		4. REPORT PERIOD		
NAME Fermi National Accelerator Laboratory						NAME			NAME NOVA Project		FROM 01-Feb-2009 TO 28-Feb-2009		
PERFORMANCE DATA													
Fund Source WBS[2] Results... ITEM	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED	LATEST REVISED ESTIMATE	VARIANCE
	WORK	WORK	WORK	SCHEDULE	COST	WORK	WORK	WORK	SCHEDULE	COST			
	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	SCHEDULED	PERFORMED	PERFORMED	SCHEDULE	COST	BUDGETED	REVISED ESTIMATE	VARIANCE
DR DOE-POST CD-1 DET R&D													
1.1 Site and Building R&D													
Fully Burdened AY\$k	0	0	40	0	(40)	2,275	2,275	1,666	0	608	2,275	1,666	608
1.2 Liquid Scintillator R&D													
Fully Burdened AY\$k	12	4	2	(8)	2	264	256	211	(8)	45	271	226	45
1.3 WLS Fiber R&D													
Fully Burdened AY\$k	25	87	101	62	(14)	172	234	261	62	(27)	341	368	(27)
1.4 PVC Extrusion R&D													
Fully Burdened AY\$k	81	0	20	(81)	(20)	1,007	938	975	(69)	(37)	1,348	1,389	(41)
1.5 PVC Module R&D													
Fully Burdened AY\$k	287	25	0	(262)	25	829	550	1,041	(279)	(491)	1,590	2,086	(496)
1.6 Electronics R&D													
Fully Burdened AY\$k	156	19	14	(136)	5	429	313	550	(116)	(237)	1,473	1,718	(245)
1.7 DAQ R&D													
Fully Burdened AY\$k	125	2	18	(123)	(16)	339	218	798	(121)	(580)	1,384	1,954	(570)
1.8 Detector Assembly R&D													
Fully Burdened AY\$k	260	13	36	(247)	(23)	1,271	879	1,733	(392)	(854)	2,851	3,708	(857)
1.9 Project Management R&D													
Fully Burdened AY\$k	0	0	0	0	0	383	383	559	0	(176)	383	559	(176)
Fund SourceTotals:	946	151	232	(795)	(81)	6,969	6,046	7,795	(923)	(1,748)	11,916	13,674	(1,758)
DY DOE CD-0 TO CD-1 R&D													
1.9 Project Management R&D													
Fully Burdened AY\$k	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Fund SourceTotals:	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Undist. Budget											0	0	0
Sub Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	208,800	209,493	(693)
Management Resrv.											69,200		
Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	278,000		

Monthly Cost Performance Reports

CPR5 for all Control Accounts

Report Period: Feb-09					
Control Account	Cur. Period BCWS (AY\$)	BCWP (AY\$)	ACWP (AY\$)	SV (AY\$)	SV (%)
R&D					
1.0.0 ANU CDR COSTS	0	0	0	0	0%
1.0.1 RR Upgrades	457,056	100,207	121,072	-356,849	-78%
1.0.2 MI Upgrades	44,062	36,493	20,431	7,569	-17%
1.0.3 NUMI Upgrades	238,849	20,992	31,614	-217,857	-91%
1.0.4 ANU Beam Physics	6,792	7,469	0	677	10%
1.0.5 ANU Project Management	0	0	-1,373	0	0%
1.1 Site and Building R&D	0	0	40,234	0	0%
1.2 Liquid Scintillator R&D	11,940	4,221	2,246	-7,719	-65%
1.3 WLS Fiber R&D	25,303	87,109	100,942	61,807	244%
1.4 PVC Extrusion R&D	81,085	0	19,829	-81,085	-100%
1.5 PVC Module R&D	286,736	25,200	0	-261,535	-91%
1.6 Electronics R&D	155,840	19,443	14,471	-136,397	-88%
1.7 DAQ R&D	125,175	1,747	17,983	-123,429	-99%
1.8 Detector Assembly R&D	260,125	13,117	36,482	-247,007	-95%
1.9 Project Management R&D	0	0	0	0	0%
Construction					
R&D SubTotal (WBS 1.0-1.9)	1,692,963	315,999	403,930	-1,376,964	-81%
Construction SubTotal (WBS 2.0-2.10)	807,954	630,570	204,665	-177,384	-22%
Project Total	2,500,917	946,569	608,595	-1,554,348	-62%

SPI	CPI	Cumulative BCWS (AY\$)	BCWP (AY\$)	ACWP (AY\$)	SV (AY\$)	SV (%)	CV (AY\$)	CV (%)	SPI	CPI	BAC (AY\$)
1.00	1.00	0	0	18,630	0	0%	-18,630	-100%	1.00	0.00	0
0.22	0.83	1,324,028	1,154,549	1,233,813	-169,479	-13%	-79,264	-7%	0.87	0.94	5,248,666
0.83	1.79	109,572	142,650	151,884	33,078	30%	-9,233	-6%	1.30	0.94	1,037,303
0.09	0.66	411,941	771,482	426,192	359,540	87%	345,290	45%	1.87	1.81	2,118,285
1.10	N/A	36,165	41,578	0	5,413	15%	41,578	100%	1.15	N/A	82,092
1.00	0.00	344,698	344,698	258,692	0	0%	86,006	25%	1.00	1.33	344,698
1.00	0.00	2,274,519	2,274,519	1,666,483	0	0%	608,036	27%	1.00	1.36	2,274,519
0.35	1.88	263,858	256,164	211,138	-7,694	-3%	45,026	18%	0.97	1.21	271,245
3.44	0.86	172,208	234,014	260,922	61,807	36%	-26,907	-11%	1.36	0.90	340,909
0.00	0.00	1,006,723	938,211	974,916	-68,512	-7%	-36,705	-4%	0.93	0.96	1,348,394
0.09	N/A	829,196	550,292	1,041,055	-278,904	-34%	-490,763	-89%	0.66	0.53	1,589,549
0.12	1.34	429,049	313,030	549,846	-116,019	-27%	-236,816	-76%	0.73	0.57	1,473,437
0.01	0.10	339,419	218,044	798,136	-121,375	-36%	-580,092	-266%	0.64	0.27	1,383,728
0.05	0.36	1,270,768	878,966	1,733,144	-391,802	-31%	-854,178	-97%	0.69	0.51	2,850,906
1.00	1.00	9,184,127	9,184,127	9,359,785	0	0%	-175,658	-2%	1.00	0.98	9,184,127
0.19	0.78	17,996,272	17,302,324	18,684,636	-693,947	-4%	-1,382,312	-8%	0.96	0.93	29,547,858
0.78	3.08	2,150,797	2,657,075	1,880,528	506,278	24%	776,548	29%	1.24	1.41	179,251,681
0.38	1.56	20,147,069	19,959,400	20,565,164	-187,669	-1%	-605,764	-3%	0.99	0.97	208,799,539

Monthly Schedule Snapshots with Progress Information - Mar09

- Files in Document:
 - [L0-L4 Milestones \(1 yr window\)](#)
 - L0-L4_MilestoneGantt_Mar09
 - [L1-L2 Milestone Gantt for Federal Project Director](#)
 - L1-L2_MilestoneGantt_Mar09
 - [pdf - Gantt for all WBS with Budget and Schedule Info](#)
 - Gantt_AllWBS_WithBudgetInfo_PMB_Mar09
 - [pdf of L2 rollup - Budget and Contingency Spreadsheet](#)
 - BudgetAndContingency_L2_Rollup_Mar09
 - [pdf of milestone Gantt chart - Performance Measurement Baseline Comparison](#)
 - Gantt_Milestones_PMB_Mar09
 - [pdf of milestone Gantt chart - Prior Month Comparison](#)
 - Gantt_Milestones_LastMonth_Mar09
 - [pdf of milestone Gantt chart - incomplete milestones with baseline dates before Time Now](#)
 - Gantt_Milestones_Missed_PMB_Mar09
 - [pdf of milestone Gantt chart for Monthly Report \(6 month lookahead\)](#)
 - MilestonesForMonthlyReport-Mar09 - Six-month_Window

Monthly Schedule Snapshots with Progress Information - Feb09

- Files in Document:
 - [zip file of WBS L2 Budget and Contingency Sheets](#)
 - BudgetandContingency_L2_Details_Mar09
 - [zip file of WBS L2 Gantt Charts](#)
 - Gantt_L2_Details_Mar09.

Monthly Schedule Snapshots with Progress Information - Mar09

L0-L4 Milestones (1 yr window)

Activity Desc.	Baseline Date	Forecast/Actual Date	Management Reporting Date	Reporting Milestone Float	Baseline Variance	FY09			FY10		
						Q2	Q3	Q4	Q1	Q2	Q3
2009 Shutdown Completed	12Jun09	21Aug09		0	-49d		▼	▲			
IPND WLS fiber production completed	09Jul09	10Jun09		0	20d		▲	▼			
DAQ software ready for IPND	15Jul09	14Sep09		0	-42d			▼	▲		
Full-scale block assembly prototype testing completed	23Jul09	13Oct09		0	-57d			▼	▲		
IPND modules for first 8-plane segment completed	04Aug09	27Aug09		0	-17d			▼	▲		
IPND data concentrators ready for installation	21Aug09	20Oct09		0	-41d			▼	▲		
IPND module production 50% complete	18Sep09	13Oct09		0	-17d			▼	▲		
APD modules for IPND completed	23Oct09	14Dec09		0	-34d				▼	▲	
Release production database servers for use	11Nov09	11Nov09		0	0				▲	▼	
Notice to proceed - DE/AA concrete	17Nov09	02Dec09		0	-9d				▼	▲	
NuMI Target, Baffle & Carrier Initial Design Review Complete	21Dec09	15Jun09		0	131d		▲			▼	
Pre-production PCBs and components received for control and timing system	22Jan10	12Feb10		0	-15d					▼	▲
Adhesive dispenser completed	18Feb10	17Mar10		0	-19d					▼	▲

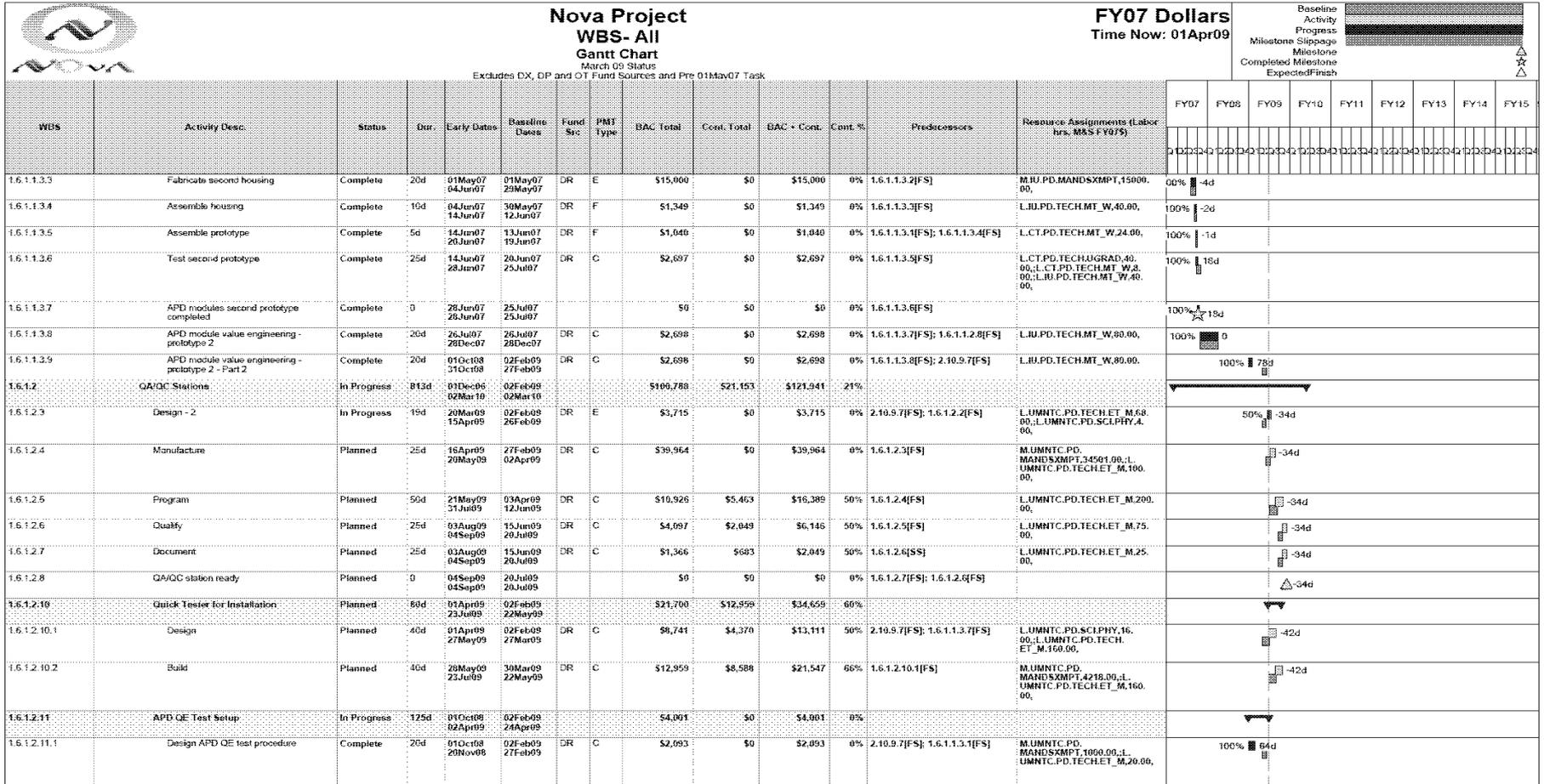
Monthly Schedule Snapshots with Progress Information - Mar09

Gantt for all WBS with Budget and Schedule info

Nova Project WBS- All Gantt Chart March 09 Status Excludes DX, DP and OT Fund Sources and Pre 01May07 Task													FY07 Dollars Time Now: 01Apr09		Baseline Activity Progress Milestone Slippage Milestone Completed Milestone Expected/Finish							
WBS	Activity Desc.	Status	Dur.	Early Dates	Baseline Dates	Fund Src	PMT Type	BAC Total	Cost. Total	BAC + Cost.	Cont. %	Predecessors	Resource Assignments (Labor hrs. RMS FY07\$)	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15
1.5.10	Management - R&D Phase	In Progress	877d	03Oct05 01Apr09	01May07 29Sep08			\$196,782	\$0	\$196,782	0%											
1.5.10.2	FY07	Complete	259d	02Oct05 28Sep07	01May07 28Sep07			\$68,154	\$0	\$68,154	0%											
1.5.10.2.8	2HFY07	Complete	106d	01May07 28Sep07	01May07 28Sep07			\$68,154	\$0	\$68,154	0%											
1.5.10.2.8.1	Labor	Complete	106d	01May07 28Sep07	01May07 28Sep07	DR	A	\$50,234	\$0	\$50,234	0%	1.5.10.2.6.1[FS]	L.LUMNTC.PD.SCLPHY.84.00.;L.LUMNTC.PD.MNG.FM.137.00.	00%								
1.5.10.2.8.2	Travel	Complete	106d	01May07 28Sep07	01May07 28Sep07	DR	A	\$17,920	\$0	\$17,920	0%	1.5.10.2.6.2[FS]	M.LUMNTC.PD.MANDSXMP.3000.00.;M.FNAL.PPD.MANDS.12000.00.;M.ANL.PD.MANDSXMP.1000.00.	00%								
1.5.10.2.8.3	Equipment	Complete	106d	01May07 28Sep07	01May07 28Sep07	DR	A	\$0	\$0	\$0	0%	1.5.10.2.6.3[FS]		00%								
1.5.10.2.8.4	Materials and supplies	Complete	106d	01May07 28Sep07	01May07 28Sep07	DR	A	\$0	\$0	\$0	0%	1.5.10.2.6.4[FS]		00%								
1.5.10.3	FY08	Complete	252d	01Oct07 30Sep08	01Oct07 29Sep08			\$128,628	\$0	\$128,628	0%											
1.5.10.3.1	Labor	Complete	251d	01Oct07 30Sep08	01Oct07 29Sep08	DR	A	\$123,718	\$0	\$123,718	0%	1.5.10.2.8.1[FS]	L.LUMNTC.PD.ENG.ME.25.00.;L.LUMNTC.PD.MNG.FM.1768.00.;L.LUMNTC.PD.SCLPHY.50.00.	100%								
1.5.10.3.2	Travel	Complete	61d	01Oct07 28Dec07	01Oct07 28Dec07	DR	A	\$4,910	\$0	\$4,910	0%	1.5.10.2.8.2[FS]	M.FNAL.PPD.MANDS.1000.00.;M.LUMNTC.PD.MANDSXMP.1,3250.00.;M.ANL.PD.MANDSXMP.500.00.	100%								
1.5.10.3.3	Equipment	Complete	61d	01Oct07 28Dec07	01Oct07 28Dec07	DR	A	\$0	\$0	\$0	0%	1.5.10.2.8.3[FS]		100%								
1.5.10.3.4	Materials and supplies	Complete	61d	01Oct07 28Dec07	01Oct07 28Dec07	DR	A	\$0	\$0	\$0	0%	1.5.10.2.8.4[FS]		100%								
1.5.10.5	Post CD-1 PVC Module R&D Cost Account	In Progress	106d	01May07 01Apr09	01May07 01Apr09	DR	A	\$0	\$0	\$0	0%			99%								
1.5.11	Module Shipping and Storage R&D - Part 2	In Progress	136d	12May09 30Dec09	21May09 03Dec09	DR	C	\$2,410	\$1,205	\$3,614	50%	1.5.7.3.9[FF]; 1.5.8[FS]; 2.10.5.7[FS]	L.LUMNTC.PD.SCLPHY.118.00.;L.FNAL.PPD.SCLPHY.118.00.;L.LUMNTC.PD.TECH.LDR.118.00.;L.LUMNTC.PD.TECH.UGRAD.118.00.		20%							
1.6	Electronics R&D	In Progress	1232d	03Oct05 27Aug10	01May07 03Mar10			\$1,556,036	\$179,806	\$1,735,842	12%											
1.6.1	APD Modules	In Progress	1106d	03Oct05 02Mar10	01May07 02Mar10			\$655,103	\$113,192	\$768,295	17%											
1.6.1.1	Prototypes	Complete	776d	03Oct05 31Oct09	01May07 27Feb09			\$25,481	\$0	\$25,481	0%											
1.6.1.1.3	Second Prototype	Complete	429d	07May07 31Oct08	01May07 27Feb09			\$25,481	\$0	\$25,481	0%											

Monthly Schedule Snapshots with Progress Information - Mar09

Gantt for all WBS with Budget and Schedule info



Project: NOVA PROJECT
 View: NOVA_BASLINE_Simple_77
 Filter: Cobra_baseline_NOVA
 Sort:

Baseline: Nova_PMB

Monthly Schedule Snapshots with Progress Information - Mar09

L2 Rollup-Budget and Contingency Spreadsheet

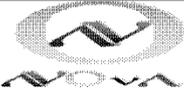


Nova Project
WBS L2 Rollup
Budget and Contingency - Mar09 Status
 FY07 Dollars (Burdened)
 Time Now: 01Apr09

WBS	Activity Description	Activity Type	Early Dates	Funding Source	BAC Material	BAC Labor	BAC Total	M&S Cont. (\$)	M&S Cont. (%)	Labor Cont. (\$)	Labor Cont. (%)	Total Cont. (\$)	Total Cont. (%)	BAC + Cont. (\$)	BOE DOCID No.
1	Research and Development	Subproject	03Oct05 - 23Aug12		\$7,811,826	\$11,830,943	\$19,642,769	\$1,183,228	15%	\$2,828,333	24%	\$4,011,560	20%	\$22,654,330	0
1.0	AMU Planning, Engineering & Design	Subproject	01Dec06 - 23Aug12		\$1,688,600	\$6,370,671	\$8,059,271	\$477,869	28%	\$2,268,198	36%	\$2,746,067	34%	\$10,805,338	0
1.1	Site and Building	Subproject	03Oct05 - 01Apr09		\$1,952,213	\$286,915	\$2,239,128	\$353,766	18%	\$38,831	21%	\$412,597	18%	\$2,651,725	0
1.2	Liquid Scintillator R&D	Subproject	03Oct05 - 26Jul09		\$192,631	\$74,063	\$266,694	\$0	0%	\$0	0%	\$0	0%	\$266,694	0
1.3	Wave-Length-Shifting Fiber R&D	Subproject	03Oct05 - 09Jul09		\$87,722	\$231,559	\$319,281	\$21,616	25%	\$46,076	20%	\$67,692	21%	\$386,973	0
1.4	PVC Extrusion R&D	Subproject	03Oct05 - 03Mar10		\$946,960	\$390,163	\$1,337,143	\$0	0%	\$0	0%	\$0	0%	\$1,337,143	0
1.5	PVC Module R&D	Subproject	03Oct05 - 08Feb10		\$951,835	\$586,973	\$1,538,808	\$163,250	18%	\$140,180	25%	\$309,440	20%	\$1,848,249	0
1.6	Electronics R&D	Subproject	03Oct05 - 27Aug10		\$964,493	\$591,632	\$1,556,036	\$106,220	11%	\$73,666	12%	\$179,886	12%	\$1,735,921	0
1.7	DAQ System R&D	Subproject	03Oct05 - 02Aug11		\$173,617	\$1,095,626	\$1,269,443	\$27,774	16%	\$857	0%	\$28,631	2%	\$1,298,074	0
1.8	Detector Assembly R&D	Subproject	02Oct05 - 14Feb12		\$781,075	\$1,886,611	\$2,667,686	\$26,733	3%	\$249,515	13%	\$276,248	10%	\$2,934,934	0
1.9	Project Management - R&D	Subproject	02Oct05 - 30Sep06		\$72,549	\$236,729	\$409,278	\$0	0%	\$0	0%	\$0	0%	\$409,278	2275
2	Construction Project	Subproject	01Dec06 - 26Nov14		\$122,108,019	\$26,990,961	\$158,098,980	\$36,568,294	39%	\$12,792,069	36%	\$49,360,363	31%	\$207,399,343	0
2.0	AMU Construction	Subproject	01Dec06 - 31Jan14		\$9,772,476	\$16,301,637	\$26,074,113	\$1,379,225	35%	\$5,397,425	33%	\$6,776,649	34%	\$32,850,762	0
2.1	Site and Building	Subproject	01Nov07 - 09Jun11		\$40,199,091	\$2,007,520	\$42,206,611	\$8,826,220	22%	\$499,225	25%	\$9,325,444	22%	\$51,532,056	2105
2.2	Liquid Scintillator	Subproject	01Oct07 - 07Feb14		\$16,177,268	\$421,487	\$16,598,754	\$4,410,396	27%	\$171,964	41%	\$4,582,360	28%	\$21,181,114	0
2.3	Wave Length-Shifting Fiber	Subproject	01Oct07 - 08Jul13		\$8,292,367	\$809,779	\$9,102,146	\$2,319,296	28%	\$84,475	10%	\$2,403,771	26%	\$11,505,917	0
2.4	PVC Extrusions	Subproject	01Oct07 - 27Dec13		\$21,371,820	\$1,329,433	\$22,701,253	\$5,825,675	27%	\$473,236	35%	\$6,298,911	28%	\$29,000,265	0
2.5	PVC Modules	Subproject	01Oct07 - 13Dec13		\$5,801,505	\$3,154,976	\$8,956,483	\$1,352,148	23%	\$1,038,024	33%	\$2,396,172	27%	\$11,346,655	0
2.6	Electronics Production	Subproject	01Oct07 - 06Feb14		\$9,991,522	\$871,529	\$10,863,051	\$3,340,219	33%	\$295,157	34%	\$3,635,376	33%	\$14,498,426	0
2.7	Data Acquisition System	Subproject	01Oct07 - 13Dec13		\$1,812,121	\$1,552,550	\$3,364,671	\$450,422	28%	\$495,068	29%	\$965,490	29%	\$4,070,161	0
2.8	Near Detector Assembly	Subproject	01Oct07 - 27Sep13		\$3,371,650	\$443,210	\$3,814,860	\$3,180,259	94%	\$246,717	56%	\$3,426,976	90%	\$7,241,836	0
2.9	Far Detector Assembly	Subproject	04Sep07 - 30Sep14		\$5,034,235	\$4,611,942	\$9,646,177	\$3,303,488	56%	\$3,011,565	68%	\$6,315,024	65%	\$15,961,201	0
2.10	Project Management - Construction	Subproject	01May07 - 26Nov14	DE	\$483,865	\$4,476,897	\$4,960,762	\$129,966	25%	\$1,119,224	25%	\$1,249,190	25%	\$6,209,952	2276

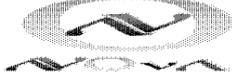
Monthly Schedule Snapshots with Progress Information - Mar09

Milestone Gantt chart-Prior month Comparison

 NoVA Project Milestone Gantt Chart Progress Reporting - thru March 09 Time Now: 01Apr09 Baseline: Last Month					Baseline Milestone  Completed Milestone  Milestone 																															
Activity ID	Milestone Description	Early/Actual Date	Baseline Date	Milestone Level	FY08				FY09				FY10				FY11				FY12				FY13				FY14				FY15			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.6 -- Electronics R&D																																				
1.6.1.1.3.7	APD modules second prototype completed	28Jun07	28Jun07	L.5																																
1.6.1.6.1.1	APD module production for IPND started	01Apr09	02Mar09	L.5																																
1.6.2.4.12	FEB prototype III released to DAQ	25Jun09	29May09	L.5																																
1.6.2.5.1	FEB modules for IPND started	24Jul09	24Jul09	L.5																																
1.6.1.2.8	QA/QC station ready	04Sep09	17Aug09	L.5																																
1.6.1.6.1.7	APD modules for 8-plane segment completed	14Sep09	24Aug09	L.5																																
1.6.1.6.1.9	APD modules for IPND completed	14Dec09	20Nov09	L.4																																
1.6.3.5.8	IPND power distribution system online	07Jan10	17Dec09	L.5																																
1.6.2.5.13	FEB modules for IPND completed	02Mar10	02Mar10	L.5																																
1.6.2.6.11	FEB prototype V for near detector released to DAQ	27Aug10	27Aug10	L.5																																

Monthly Schedule Snapshots with Progress Information - Mar09

Milestone Gantt chart-for Monthly Report

 NOVA_PROJECT Milestone Gantt Chart - 6-month look ahead Monthly Report - Mar09 Time Now: 01Apr09 Baseline: NOVA_PMB					Baseline Date ▼ Completed Milestone ☆ Current Forecast Date ▲											
Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level	FY09											
					D	J	F	M	A	M	J	J	A	S	O	
1.0 -- ANU Planning, Engineering & Design					Time Now - 01Apr09											
1.0.3.2.5.9	NuMI Hadron Monitor Initial Re-design Complete	22Jun09	06Mar09	L.5				▼				▲-75d				
1.0.2.2.4.1	MI Cavity Pre-install Testing Complete	08May09	27Mar09	L.5				▼		▲-30d						
1.0.3.1.5.2	NuMI Profile Monitor Conceptual Design Review Complete	08May09	01May09	L.5						▼-5d						
1.0.1.1.6.6	RR PDS Magnet Design Finalized	12Sep08	24Jun09	L.5								▼				
1.0.1.1.6.5	RR Beamline Modifications Design Review Complete	12Aug09	08Jul09	L.5								▼		▲-25d		
1.0.1.1.6.3	RR 53 Mhz RF Design Review Complete	03Aug09	11Aug09	L.5										▲5d		
1.0.3.1.5.3	NuMI Profile Monitor Technical Design Review Complete	25Aug09	18Aug09	L.5										▼-5d		
1.0.3.2.5.1	NuMI Target, Baffle & Carrier Initial Design Review Complete	15Jun09	21Dec09	L.4								▲131d				
1.0.3.3.5.3	NuMI Target Chase Cooling Design Complete	20Aug09	13Apr10	L.5										▲160d		
1.2 -- Liquid Scintillator R&D																
1.2.9.3.9	Mineral oil batch 2 for IPND delivered	14May08	02Feb09	L.5												
1.2.9.3.12	Mineral oil batch 3 for IPND delivered	01Apr09	02Feb09	L.5			▼		▲-42d							
1.2.9.6.11	Prototype scintillator production completed	16Apr09	17Feb09	L.4			▼		▲-42d							
1.2.10.3	Liquid scintillator final specifications completed	13Mar09	20Feb09	L.5			▼									
1.3 -- Wave-Length-Shifting Fiber R&D																
1.3.3.7	Baseline (IPND) WLS fiber dye concentration chosen	02Jan09	31Mar09	L.5										☆61d		
1.3.5.5	IPND WLS fiber production completed	10Jun09	09Jul09	L.4								▲20d	▼			
1.3.6.5	Production WLS fiber diameter confirmed	17Jun09	16Jul09	L.5								▲20d	▼			
1.3.6.6	Production WLS fiber composition confirmed	17Jun09	16Jul09	L.5								▲20d	▼			
1.4 -- PVC Extrusion R&D																
1.4.2.5.2	PO for raw PVC resin for 16-cell horizontal extrusions released	15Apr09	16Feb09	L.5								▲-42d				
1.4.2.6.2	PO for raw PVC resin for 16-cell vertical extrusions released	18Jun09	20Apr09	L.4								▼		▲-42d		
1.5 -- PVC Module R&D																
1.5.4.2.12	Prototype gluing machine for IPND ready to operate	04Jun09	01May08	L.5										▲-274d		
1.5.2.1.1.14	Preproduction prototype manifold design (for IPND) completed	27Apr09	26Mar09	L.5								▲-22d				
1.5.5.4	Pressure-testing hardware for IPND production ready to operate	27May09	30Mar09	L.5								▲-41d				
1.5.5.7	Fiber mapping and continuity hardware for IPND production ready to operate	18Aug09	18Jun09	L.5									▼		▲-42d	
1.5.7.3.7	IPND modules for first 8-plane segment completed	27Aug09	04Aug09	L.4										▼	▲-17d	
1.5.7.3.8	IPND module production 50% complete	13Oct09	18Sep09	L.4											▼	▲-17d
1.6 -- Electronics R&D																
1.6.1.6.1.1	APD module production for IPND started	01Apr09	02Feb09	L.5								▲-42d				27
1.6.2.4.12	FEB prototype III released to DAQ	25Jun09	16Jun09	L.5									▼	▲-7d		

Nova WBS Level 2 Milestone Gantt charts By Control Account

- Files in Document:
 - [ANU Milestones \(x.0\)](#)
 - CAM Notebook Milestone Gantt WBSx.0
 - [DAQ Milestones \(x.7\)](#)
 - CAM Notebook Milestone Gantt WBSx.7
 - [Detector Assembly Milestones \(x.8, 2.9\)](#)
 - CAM Notebook Milestone Gantt WBSx.8_and_2.9
 - **[Electronics Milestones \(x.6\)](#)**
 - **CAM Notebook Milestone Gantt WBSx.6**
 - [Liquid Scintillator Milestones \(x.2\)](#)
 - CAM Notebook Milestone Gantt WBSx.2
 - [PVC Extrusion Milestones \(x.4\)](#)
 - CAM Notebook Milestone Gantt WBSx.4

Nova WBS Level 2 Milestone Gantt charts By Control Account Cont.

- [PVC Extrusion Milestones \(x.4\)](#)
 - CAM Notebook Milestone Gantt WBSx.4
- [PVC Modules Milestones \(x.5\)](#)
 - CAM Notebook Milestone Gantt WBSx.5
- [Project Management Milestones \(1.9, 2.10\)](#)
 - CAM Notebook Milestone Gantt WBS1.9_and_2.10
- [Site and Building Milestones \(x.1\)](#)
 - CAM Notebook Milestone Gantt WBSx.1
- [WLS Fiber Milestones \(x.3\)](#)
 - CAM Notebook Milestone Gantt WBSx.3

NOvA Dollarized RAM

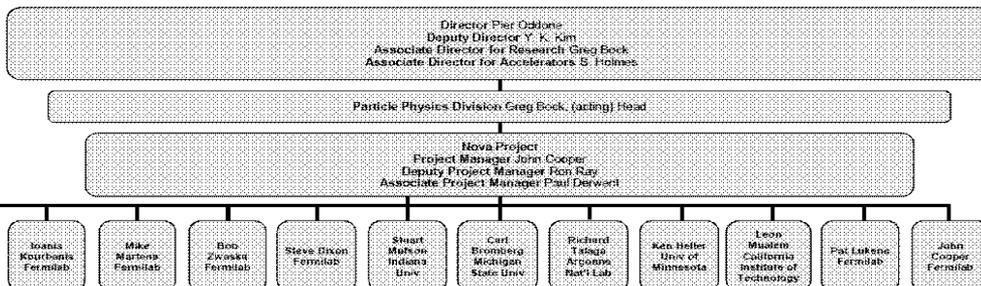
- Files in Document:
 - [\\$RAM with Control Accounts](#)
 - NOVA_\$RAM_Control Accounts
 - [\\$RAM with Control Accounts and Chargeable Task Codes](#)
 - NOVA_\$RAM_Control Accounts_&_Chargeable_Task_Codes
 - [Microsoft Excel File](#)
 - \$RAM_v17_with_LOE
 - [NOVA \\$RAM Control Accounts with LOE](#)
 - NOVA_\$RAM_v17_with_LOE

NOvA Dollarized RAM with Control Accounts

Fermi National Accelerator Laboratory



NOvA Dollarized RAM



WBS	Activity Description	Control Account Manager	Budget	Paul Darwent	Dennis Kourbanis	Mike Martens	Bob Ziwan	Steve Dixon	Stuart Mathon	Carl Eronberg	Richard T. Stone	Ken Heller	Leon Muehlen	Pat Lukens	John Cooper
		Account Level		\$28,002,097	\$2,843,726	\$7,846,903	\$42,982	\$48,466,278	\$10,787,264	\$16,424,694	\$28,024,304	\$11,966,198	\$18,217,164	\$48,588,246	\$16,766,932
1	Nova R&D	Nova Reporting Level													
1.0	ANU R&D	Nova Reporting Level													
1.0.1	RF Upgrades	Control account	\$5,248,666		\$1,037,303										
1.0.2	MI Upgrades	Control account													
1.0.3	NuMI Upgrades	Control account				\$2,118,255									
1.0.4	ANU Beam Physics	Control account					\$82,082								
1.0.5	ANU Project Management	Control account	\$344,699												
1.1	Site and Building R&D	Control account						\$2,274,519							
1.2	Liquid Scintillator R&D	Control account							\$271,245						
1.3	WLS Fiber R&D	Control account								\$340,908					
1.4	PVC Extrusion R&D	Control account									\$1,348,394				
1.5	PVC Module R&D	Control account										\$1,589,549			
1.6	Electronics R&D	Control account											\$1,473,437		
1.7	DAQ R&D	Control account											\$1,383,728		
1.8	Detector Assembly R&D	Control account												\$2,860,906	
1.9	Project Management R&D	Control account													\$9,184,127
2	Nova Construction	Nova Reporting Level													
2.0	ANU Construction	Nova Reporting Level													
2.0.1.1	Recycler Ring Modifications	Control account	\$7,916,804												
2.0.1.2	Recycler Kicker System	Control account	\$7,910,714												
2.0.1.3	Recycler Instrumentation	Control account	\$1,421,492												
2.0.2.1	MI Modifications	Control account			\$373,302										
2.0.2.2	MI RF Cavities	Control account		\$1,433,082											
2.0.3.1	NuMI Primary Proton Beam	Control account				\$1,450,655									
2.0.3.2	NuMI Target Hal Technical Components	Control account				\$1,634,201									
2.0.3.3	NuMI Target Hal Infrastructure	Control account				\$1,716,959									
2.0.3.4	NuMI Decay Pipes/Hadron Absorber/Utilities	Control account				\$928,793									
2.0.4	Project Management - ANU - Construction	Control account	\$5,159,684												
2.1	Site and Building	Nova Reporting Level													
2.1.1	Site Preparation Package	Control account						\$11,530,402							
2.1.2	Far Detector Building	Control account						\$36,637,247							
2.1.3	Site and Building Security	Control account						\$195,804							
2.1.4	Management - Site and Building - Construction	Control account						\$171,593							
2.2	Liquid Scintillator	Nova Reporting Level													
2.2.1	Mineral Oil	Control account						\$12,687,277							
2.2.2	Pseudocumene	Control account						\$1,289,109							
2.2.3	Waveshifters and Stads 425	Control account						\$2,242,996							
2.2.4	Blending	Control account						\$747,442							
2.2.5	Transport - Liquid Scintillator	Control account						\$1,455,419							
2.2.6	Management - Liquid Scintillator - Construction	Control account						\$93,772							

NOvA Dollarized RAM with Control Accounts and Chargeable Task Codes

Fermi National Accelerator Laboratory				Director Peter Diddone Deputy Director Y. K. Kim Associate Director for Research Greg Back, Associate Director for Accelerators S. Holmes												
NOvA Dollarized RAM				Particle Physics Division Greg Back, (acting) Head												
				Nova Project Project Manager John Cooper Deputy Project Manager Ron Ray Associate Project Manager Paul Dowdell												
				Paul Dorsett Fermilab	Joseph Kopelke Fermilab	Mark Marino Fermilab	Ryszard Zwolski Fermilab	Steve Drozdz Fermilab	Shawn Merson Indiana Univ.	Carl Brenberg Michigan State Univ.	Richard Fisher Argonne NACL Lab	Ken Holtz Univ of Minnesota	Lynn Mason California Institute of Technology	Pat Lisheva Fermilab	John Cooper Fermilab	
Control Account Manager Budget				\$5,492,227	\$5,214,728	\$5,254,473	\$1,002,222	\$5,693,570	\$1,755,219	\$56,771	\$1,821,552	\$1,505,100	\$2,222,599	\$1,026,210	\$1,845,345	\$14,746,685
Value of Control Account Budgets as LOE				\$5,846,614	\$5	\$5	\$68,016	\$7,214,582	\$7,755,219	\$56,771	\$1,821,552	\$2,491,317	\$513,488	\$1,845,345	\$14,746,685	
WBS	Activity Description	Account Level	CTC?	% of acct as LOE												
2.4	Management - PVC Extrusions - Construction	Control account														
2.5	PVC Modules	Nova Reporting Level	GTC	100.00%								\$781,816				
2.5.1	End Seals	Control account		0.00%									\$1,798,372			
2.5.1.1	Fiber Manifold Production	Chargeable Task Code	GTC										1,332,754			
2.5.1.2	End Plate and Seal Production	Chargeable Task Code	GTC										465,618			
2.5.2	Optical Connector Production	Control account	GTC	0.00%									\$119,077			
2.5.3	Module Production	Control account		19.76%									\$7,603,656			
2.5.3.1	Factory Machines, Tooling, & Fixtures - PVC Modules	Chargeable Task Code	GTC										1,644,209			
2.5.3.2	Factory Setup and Operation	Nova Reporting Level														
2.5.3.2.1	Factory Lease - PVC Modules	Chargeable Task Code	GTC										1,143,830			
2.5.3.2.2	Additional Factory HVAC - PVC Modules	Chargeable Task Code	GTC										610,757			
2.5.3.2.4	Additional Factory Utilities and Preparation - PVC Modules	Chargeable Task Code	GTC										245,318			
2.5.3.2.5	Factory Space Operation - PVC Modules	Chargeable Task Code	GTC										418,400			
2.5.3.2.6	Module Assembly Infrastructure Setup	Chargeable Task Code	GTC										50,959			
2.5.3.2.7	Review factory setup and operation for full production readiness - PVC Modules	Chargeable Task Code	GTC										3,718			
2.5.3.2.8	Cleanout factory space - PVC Modules	Chargeable Task Code	GTC										8,460			
2.5.3.3	Module Assembly	Chargeable Task Code	GTC										9,177,086			
2.5.4	Management - PVC Modules - Construction	Control account	GTC	100.00%									\$785,631			
2.6	Electronics	Nova Reporting Level														
2.6.1	APD Module Production	Control account		0.00%												\$6,289,258
2.6.1.1	APD Housing	Chargeable Task Code	GTC													669,450
2.6.1.2	APD Arrays	Chargeable Task Code	GTC													5,577,626
2.6.1.3	APD Module Testing	Chargeable Task Code	GTC													136,548
2.6.1.4	APD Module Shipping	Chargeable Task Code	GTC													4,572
2.6.2	Readout - FEBS	Control account		0.64%												\$2,610,747
2.6.2.1	Procurements	Nova Reporting Level														
2.6.2.1.1	Far Detector ASIC Production	Chargeable Task Code	GTC													479,959
2.6.2.1.3	ADCs	Chargeable Task Code	GTC													121,792
2.6.2.1.4	Commercial off-the-shelf items (COTS) - FEBS	Chargeable Task Code	GTC													644,371
2.6.2.1.5	PC boards	Chargeable Task Code	GTC													165,249
2.6.2.1.6	Procure electronics box	Chargeable Task Code	GTC													198,852
2.6.2.1.7	TEC Controller Modules	Chargeable Task Code	GTC													588,220
2.6.2.2	Far Detector FEB Fabrication and Assembly	Chargeable Task Code	GTC													248,426
2.6.2.3	Near Detector Fabrication and Assembly - FEBS	Chargeable Task Code	GTC													44,375
2.6.2.4	Firmware manufacture - FEBS	Chargeable Task Code	GTC													26,599
2.6.2.5	QA/QC - FEBS	Chargeable Task Code	GTC													82,449
2.6.2.6	FEBS production oversight	Chargeable Task Code	GTC													18,340
2.6.2.7	FEBS Shipping	Chargeable Task Code	GTC													11,223
2.6.3	Readout Infrastructure	Control account		0.00%												\$2,905,067
2.6.3.1	Low Voltage Power Supplies	Chargeable Task Code	GTC													597,030
2.6.3.2	High Voltage Power Supplies	Chargeable Task Code	GTC													114,020
2.6.3.3	Power Cables - Readout Infrastructure	Chargeable Task Code	GTC													282,696
2.6.3.4	Power Distribution Boxes	Chargeable Task Code	GTC													489,552
2.6.3.5	Cooling - Readout Infrastructure	Chargeable Task Code	GTC													1,353,747
2.6.3.6	Power Distribution System Shipping	Chargeable Task Code	GTC													28,717
2.6.4	Management - Electronics - Construction	Control account	GTC	100.00%												\$33,179
2.7	DAQ	Nova Reporting Level														
2.7.1	DAQ Software	Control account	GTC	0.60%												\$774,268
2.7.2	DAQ Hardware	Control account		0.00%												\$2,100,306
2.7.2.1	Data Concentrator	Chargeable Task Code	GTC													772,356
2.7.2.2	Control and Timing System	Chargeable Task Code	GTC													268,278
2.7.2.3	Network	Chargeable Task Code	GTC													140,253
2.7.2.4	Control Room Equipment and Infrastructure - DAQ	Chargeable Task Code	GTC													107,226
2.7.2.5	Buffer Farm	Chargeable Task Code	GTC													553,528
2.7.2.6	Data Storage	Chargeable Task Code	GTC													63,650
2.7.2.7	Archiving - DAQ	Chargeable Task Code	GTC													156,731
2.7.2.8	Databases	Chargeable Task Code	GTC													8,404
2.7.3	Integration - DAQ	Control account	GTC	58.01%												\$441,042

NOvA Dollarized RAM with LOE

Fermi National Accelerator Laboratory				Director Pier Oddone Deputy Director Y. K. Kim Associate Director for Research Greg Bock Associate Director for Accelerators S. Holmes											
NOvA Dollarized RAM				Particle Physics Division Greg Bock, (acting) Head											
				Nova Project Project Manager John Cooper Deputy Project Manager Ron Ray Associate Project Manager Paul Derwent											
				Paul Derwent Fermilab	Ioanis Kourbanis Fermilab	Mike Martens Fermilab	Bob Zwaska Fermilab	Steve Dixon Fermilab	Stuart Mufson Indiana Univ	Carl Bromberg Michigan State Univ	Richard Talaga Argonne Nat'l Lab	Ken Heller Univ of Minnesota	Leon Muelam California Institute of Technology	Pat Lukens Fermilab	John Cooper Fermilab
Control Account Manager Budget				\$28,002,057	\$2,843,728	\$7,845,893	\$82,092	\$50,809,070	\$16,787,261	\$10,421,694	\$26,624,394	\$11,695,165	\$18,232,364	\$18,506,246	\$14,746,055
Value of Control Account Budgets as LOE				\$5,646,014	\$0	\$0	\$66,019	\$7,214,382	\$1,756,219	\$50,771	\$1,623,332	\$2,491,317	\$513,488	\$1,848,345	\$14,746,055
WBS	Activity Description	Account Level	CTC?	% of acct as LOE											
1	Nova R&D	Nova Reporting Level													
1.0	ANU R&D	Nova Reporting Level													
1.0.1	RR Upgrades	Control account		0.00%	\$5,248,666	\$1,037,303									
1.0.2	MI Upgrades	Control account		0.00%											
1.0.3	NUMI Upgrades	Control account		0.00%			\$2,118,285								
1.0.4	ANU Beam Physics	Control account	CTC	80.42%				\$82,092							
1.0.5	ANU Project Management	Control account	CTC	100.00%	\$344,698										
1.1	Site and Building R&D	Control account	CTC	0.00%				\$2,274,519		\$271,245					
1.2	Liquid Scintillator R&D	Control account		56.79%											
1.3	WLS Fiber R&D	Control account		3.85%						\$340,909					
1.4	PVC Extrusion R&D	Control account		18.51%							\$1,348,394				
1.5	PVC Module R&D	Control account		12.79%								\$1,589,549			
1.6	Electronics R&D	Control account		4.95%									\$1,473,437		
1.7	DAQ R&D	Control account		8.77%										\$1,383,728	
1.8	Detector Assembly R&D	Control account		5.23%											\$2,850,906
1.9	Project Management R&D	Control account		100.00%											
2	Nova Construction	Nova Reporting Level													\$9,184,127

Change Request



NOVA Project Office

CHANGE REQUEST RECORD

NOVA-CR No. <u>1</u> Related NOVA-DCN No. _____ Date Initiated <u>12/17/2007</u> Date Revised: <u>3/10/2008</u> Date Closed _____ Level of Change <u>L4 (NOVA PM)</u> Status <u>Prelim Approval</u> Awaiting: <u>Cooper</u>	<table border="1"> <tr> <td>PRELIMINARY</td> <td>PM GO-AHEAD</td> </tr> <tr> <td>Cost Impact: <u>(\$50,572.00)</u></td> <td><u>1/4/08</u> DATE</td> </tr> <tr> <td>Schedule Impact: _____</td> <td>_____ DATE</td> </tr> </table>	PRELIMINARY	PM GO-AHEAD	Cost Impact: <u>(\$50,572.00)</u>	<u>1/4/08</u> DATE	Schedule Impact: _____	_____ DATE																										
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	<table border="1"> <tr> <td colspan="2">FINAL APPROVAL</td> </tr> <tr> <td>Final Cost Impact: <u>(\$51,849.94)</u></td> <td>from Project Financial Officer</td> </tr> <tr> <td>Final Schedule Impact: <u>none</u></td> <td>from Project Scheduler</td> </tr> <tr> <td><u>OK per email</u></td> <td><u>3-18-08</u></td> </tr> <tr> <td>L2 MANAGER</td> <td>DATE</td> </tr> <tr> <td><u>[Signature]</u></td> <td><u>3/10/08</u></td> </tr> <tr> <td>PROJECT MANAGER</td> <td>DATE</td> </tr> <tr> <td><u>[Signature]</u></td> <td><u>3/10/08</u></td> </tr> <tr> <td>FINANCIAL OFFICER</td> <td>DATE</td> </tr> <tr> <td><u>[Signature]</u></td> <td><u>3/10/08</u></td> </tr> <tr> <td>SCHEDULER</td> <td>DATE</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>ASSOCIATE DIRECTOR FOR RESEARCH (IF REQ'D)</td> <td>DATE</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>DOE FEDERAL PROJECT DIRECTOR (IF REQ'D)</td> <td>DATE</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	FINAL APPROVAL		Final Cost Impact: <u>(\$51,849.94)</u>	from Project Financial Officer	Final Schedule Impact: <u>none</u>	from Project Scheduler	<u>OK per email</u>	<u>3-18-08</u>	L2 MANAGER	DATE	<u>[Signature]</u>	<u>3/10/08</u>	PROJECT MANAGER	DATE	<u>[Signature]</u>	<u>3/10/08</u>	FINANCIAL OFFICER	DATE	<u>[Signature]</u>	<u>3/10/08</u>	SCHEDULER	DATE	_____	_____	ASSOCIATE DIRECTOR FOR RESEARCH (IF REQ'D)	DATE	_____	_____	DOE FEDERAL PROJECT DIRECTOR (IF REQ'D)	DATE	_____	_____
FINAL APPROVAL																																	
Final Cost Impact: <u>(\$51,849.94)</u>	from Project Financial Officer																																
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DOE FEDERAL PROJECT DIRECTOR (IF REQ'D)	DATE																																
_____	_____																																

SUBMITTED INFORMATION

CR Title Near Detector Prototype ASIC

Change Type Technical Cost Schedule Other

Initiator Name Leon Mualem

Initiator Email mualem@hep.caltech.edu

Affected WBS #'s: 1.6.2.1.3

Change Description This item is no longer needed due to a design change in the far detector ASIC, there is no difference. This change removes all resources and duration for WBS 1.6.2.1.3. This plan will not affect the schedule. There is no impact to interfaces or other activities, or ES&H impact.
Revise all task names to "OBSOLETE"

CR File found in NOVA-doc- 2971

BUDGET INFORMATION (\$FY07 unburdened)

MS Cost Before Change: _____ 1.6.2.1.3.2 \$31500

MS Cost After Change: _____ 1.6.2.1.3.2 \$0

Labor Resource Type: (one resource per line) _____ **Hours Before Change:** _____ **Hours After Change:** _____

Change Request

Page 1 of 1

Elaine McCluskey

From: Leon Mualem [mualem@hep.caltech.edu]
Sent: Tuesday, March 18, 2008 4:50 PM
To: Elaine McCluskey
Cc: 'Cooper, John'; 'Robert Bernstein'
Subject: Re: NOVA change request approval - CRs 1,2,3,4,7,8,12,13

Hi Elaine,
I believe these are all consistent with our recent discussions.
I therefore approve these CR's 1,2,3,4,7,8,12,13.
Leon

Elaine McCluskey wrote:

Leon
We're at the final point of approving the bulk of the change requests that have been in process since last fall. Since we've discarded the docdb approval system, we need to know that you concur with the final versions of the change requests that you've submitted. I've attached them for your perusal. If you concur, please just respond to this email with such a comment, and it will become part of the docdb file, and I'll note it as such on the change request form manually. Thanks for your patience with this.

Elaine McCluskey
Fermi National Accelerator Laboratory
Accelerator Division/Projects
(630) 840-2193
mcccluskey@fnal.gov



please consider the environment before printing this email

--
Leon Mualem
Lauritsen Lab MC 356-48
California Institute of Technology
1200 E. California Blvd
Pasadena, CA 91125
Office: 626-395-3459
LAB: 626-395-6580
Cell: 612-669-9688
Home: 626-507-8506
FAX: 626-584-9304

WBS Level 3 Managers

NOVA Organization Chart

Activity	Description	Manager	Co-Manager	Deputy/Contact
1.0	ANU Planning, Engineering & Design	Nancy Grossman		Elaine McCluskey
1.0.1	Recycler Upgrades	Paul Derwent		
1.0.2	Main Injector Upgrades	Iounis Kourbenis		
1.0.3	NuMI Upgrades	Michael Martins		
1.0.4	Beam Physics	Robert Zwaska		
1.0.5	Project Management	Nancy Grossman		
1.1	Site and Building	Steve Dixon		Merle Olson
1.1.1	Site Conditions Investigation	Steve Dixon		
1.1.2	Title 1 Preparation	Steve Dixon		
1.1.4	Management - R&D Phase	Steve Dixon		
1.2	Liquid Scintillator R&D	S. Mufson		Chuck Bower
1.2.1	Requirements	S. Mufson		
1.2.2	Scintillator Composition Studies	Chuck Bower		
1.2.3	Accelerated Aging Studies	Chuck Bower		
1.2.4	Scintillator Production Method Studies	S. Mufson		
1.2.5	Development of QC Methods	Tom Coan		
1.2.6	Scintillator Transportation Studies	TBA		
1.2.7	Blending Investigations	Dave Puska		
1.2.8	Component Acquisition Investigations	S. Mufson		
1.2.9	Integration Prototype Detector Scintillator Production	S. Mufson		
1.2.10	Production Scintillator Specifications	S. Mufson		
1.2.11	Management - R&D Phase	S. Mufson		
1.3	Wave-Length-Shifting Fiber R&D	Carl Bromberg		Jocely Hinson
1.3.1	Requirements	Ron Richards		
1.3.2	Vendor Investigations	Ron Richards		
1.3.3	WLS Fiber Optimization Studies	Ron Richards		
1.3.4	Development of QA Methods	Ron Richards		
1.3.5	Integration Prototype Detector Fiber Production	Ron Richards		
1.3.6	Production WLS Fiber Specifications	Ron Richards		
1.3.7	Management - R&D Phase	Carl Bromberg		
1.4	PVC Extrusion R&D	Richard Talaga		Ama Pils-Dalman
1.4.1	Physical Properties Determination and Test Method	Jim Grudzinski		
1.4.2	Raw Materials	Jim Grudzinski		
1.4.3	Extrusions	Chuck Grovis		
1.4.4	Shipping & Handling	Karen Kephart		
1.4.5	Quality Assurance Hardware	Jim Grudzinski		
1.4.6	Management - R&D Phase	Richard Talaga		
1.5	PVC Module R&D	Ken Heller		Dan Cronin-Hennessy
1.5.1	Requirements	Ken Heller		
1.5.2	End Seal R&D	Tom Chase		
1.5.3	Photo Detector Interface R&D	Jon Urheim		
1.5.4	Module Factory R&D	Ron Poing		
1.5.5	Quality Assurance and Quality Control Methods	Dan Cronin-Hennessy		
1.5.6	Module Shipping and Storage R&D	Ken Heller		
1.5.7	Integration Prototype Detector (IPND) Modules	Ken Heller		
1.5.8	Initial Production Module Specifications	Ken Heller		
1.5.9	Initial Factory Tooling Specifications	Tom Chase		
1.5.10	Management - R&D Phase	Ken Heller		
1.6	Electronics R&D	Leon Muenlem		John Oliver
1.6.1	APD Modules	Roger Rusack		
1.6.2	FEB	John Oliver		
1.6.3	Power Distribution	Craig Dulak		
1.6.4	Management - R&D Phase	Leon Muenlem		
1.6.5	Vertical Slice Tests	Leon Muenlem		
1.7	DAQ System R&D	Leon Muenlem		Jerry Guglielmo
1.7.1	DAQ Software	Jerry Guglielmo		
1.7.2	DAQ Hardware	Vince Pawlick		
1.7.3	Integration	Margaret Wolava		
1.7.4	Detector Control System	Andrew Norman		
1.7.5	Management - R&D Phase	Leon Muenlem		

NOvA WBS Dictionary

1.6	Electronics R&D	This level 2 summary element includes the design, development, and testing of the front end electronics and infrastructure.
1.6.1	APD Modules	Development and procurement of prototype APD chips, APD carrier boards, TE coolers, optical connectors and the associated hardware that comprise the APD modules. Development of specifications for fiber alignment, power consumption, cooling, and QA are also included. APD modules for the Integration Prototype Near Detector are included here.
1.6.2	FEB	Design the front-end boards as well develop the testing and installation procedures. Front-end boards for the Integration Prototype Near Detector are included here.
1.6.3	Power Distribution	Design and specify the low voltage, high voltage, cooling, and power distribution for the NOvA electronics. Power distribution for the Integration Prototype Near Detector is included here.
1.6.4	Management - R&D Phase	Management tasks and budget for Electronics subproject during the R&D phase.
1.6.5	Vertical Slice Tests	Create small-scale test facility for evaluating various configurations of prototype PVC extrusions, liquid scintillator, and WLS fiber using cosmic ray muons, APDs, and prototype versions of the front-end board.

Documents available in Paper form for CAMS

- [Variance Analysis Report](#)
- [Work Authorization Document for Control Account](#)
- [Monthly Cost Performance Reports](#)
- [Monthly Schedule Snapshots with Progress Information - Feb09](#)
- [Nova WBS Level 2 Milestone Gantt charts By Control Account](#)
- [NOvA Dollarized RAM](#)

CAM Training

21 April 2009

How many and \$ value of Control Accounts

- \$ value can be seen in several places
 - Use the RAM (Responsibility Assignment Matrix) to see the number of your control accounts and their \$ value in summary.
 - \$ value is shown on the WAD form
 - \$ value is summarized at bottom of CAP report, also included in the WAD
- For the interview, know how many you have, and then know where to see the \$ value – ok to have RAM with you – it will be in the paper CAM notebook
- \$ value of control account changes when cost CRs are approved

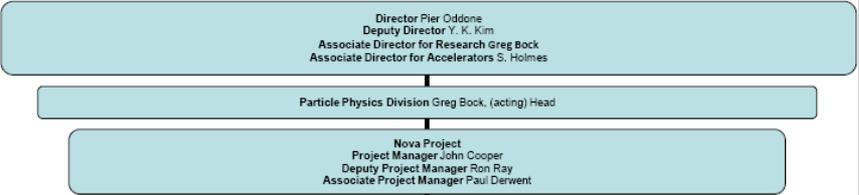
On the RAM

Fermi National Accelerator Laboratory



NOVA Dollarized RAM

For CA 1.0.1



Control Account Manager Budget				\$28,902,957	\$2,843,728	\$7,848,853	\$82,092	\$50,805,570	\$18,787,261	\$10,421,654	\$26,624,354	\$11,935,185	\$18,232,364	\$16,505,246	\$14,746,055
Value of Control Account Budgets as LOE				\$5,646,014	\$0	\$0	\$66,015	\$7,214,382	\$1,755,219	\$50,771	\$1,623,332	\$2,491,317	\$613,488	\$1,848,345	\$14,746,055
WBS	Activity Description	Account Level	CTC?	% of total LOE											
1	Nova R&D	Nova Reporting Level													
1.0	ANU R&D	Nova Reporting Level													
1.0.1	RR Upgrades	Control account		0.00%	\$5,248,656										
1.0.2	MI Upgrades	Control account		0.00%		\$1,037,303									
1.0.3	NUMI Upgrades	Control account		0.00%			\$2,118,285								
1.0.4	ANU Beam Physics	Control account	CTC	80.42%				\$82,092							
1.0.5	ANU Project Management	Control account	CTC	100.00%	\$344,698										
1.1	Site and Building R&D	Control account	CTC	0.00%				\$2,274,519							
1.2	Liquid Scintillator R&D	Control account		56.79%					\$271,245						
1.3	WLS Fiber R&D	Control account		3.85%						\$340,909					
1.4	PVC Extrusion R&D	Control account		18.51%							\$1,348,394				
1.5	PVC Module R&D	Control account		12.79%								\$1,589,549			
1.6	Electronics R&D	Control account		4.95%									\$1,473,437		
1.7	DAQ R&D	Control account		8.77%									\$1,383,728		
1.8	Detector Assembly R&D	Control account		5.23%										\$2,850,906	
1.9	Project Management R&D	Control account		100.00%											\$9,184,127
2	Nova Construction	Nova Reporting Level													
2.0	ANU Construction	Nova Reporting Level													
2.0.11	Recycler Ring Modifications	Control account		0.86%	\$7,916,804										
2.0.12	Recycler Kicker System	Control account		0.87%	\$7,910,714										
2.0.13	Recycler Instrumentation	Control account		0.00%	\$1,421,492										
2.0.21	MI Modifications	Control account		0.00%		\$373,332									
2.0.22	MI RF Cavities	Control account		0.00%		\$1,433,092									
2.0.31	NuMI Primary Proton Beam	Control account		0.00%			\$1,450,655								
2.0.32	NuMI Target Hall Technical Components	Control account		0.00%			\$1,634,201								
2.0.33	NuMI Target Hall Infrastructure	Control account		0.00%			\$1,716,959								
2.0.34	NuMI Decay Pipe/Hadron Absorber/Utilities	Control account		0.00%			\$928,793								
2.0.4	Project Management - ANU - Construction	Control account	CTC	100.00%	\$5,159,684										
2.1	Site and Building	Nova Reporting Level													
2.1.1	Site Preparation Package	Control account		12.46%				\$11,530,402							
2.1.2	Far Detector Building	Control account		15.77%				\$36,637,247							
2.1.3	Site and Building Security	Control account	CTC	0.00%				\$195,804							
2.1.4	Management - Site and Building - Construction	Control account		0.00%				\$171,699							
2.2	Liquid Scintillator	Nova Reporting Level													
2.2.1	Mineral Oil	Control account	CTC	9.66%				\$12,687,277							
2.2.2	Pseudocumene	Control account	CTC	12.88%				\$1,289,109							
2.2.3	Waveshifters and Stadis 425	Control account	CTC	0.00%				\$2,242,996							
2.2.4	Blending	Control account	CTC	15.49%				\$747,442							
2.2.5	Transport - Liquid Scintillator	Control account	CTC	0.00%				\$1,455,419							
2.2.6	Management - Liquid Scintillator - Construction	Control account	CTC	100.00%				\$93,772							
2.3	WLS Fiber	Nova Reporting Level													
2.3.1	Procurement - WLS Fiber	Control account	CTC	0.00%				\$84,360							
2.3.2	Production - WLS Fiber	Control account	CTC	0.00%				\$9,958,779							
2.3.3	Management - WLS Fiber - Construction	Control account	CTC	100.00%				\$37,646							
2.4	PVC Extrusions	Nova Reporting Level													
2.4.1	Procurement - PVC Extrusions	Control account	CTC	0.00%							\$177,691				
2.4.2	Extrusion Pre-Production	Control account	CTC	0.00%							\$1,172,758				
2.4.3	Extrusion Production	Control account	CTC	0.00%							\$21,776,474				
2.4.4	Production Quality Assurance and Extrusion Evaluation	Control account	CTC	72.45%							\$605,199				
2.4.5	Shipping & Handling - PVC Extrusions	Control account	CTC	22.18%							\$782,062				
2.4.6	Management - PVC Extrusions - Construction	Control account	CTC	100.00%							\$761,816				
2.5	PVC Modules	Nova Reporting Level													
2.5.1	End Seals	Control account		0.00%								\$1,798,372			
2.5.2	Optical Connector Production	Control account	CTC	0.00%								\$118,077			
2.5.3	Module Production	Control account		19.76%								\$7,603,656			
2.5.4	Management - PVC Modules - Construction	Control account	CTC	100.00%								\$785,531			
2.6	Electronics	Nova Reporting Level													
2.6.1	APD Module Production	Control account		0.00%									\$6,288,235		

RAM page 2

Fermi National Accelerator Laboratory

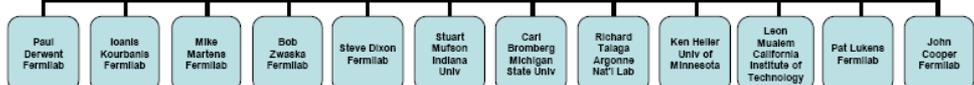


NOVA Dollarized RAM

Director Pier Oddone
Deputy Director Y. K. Kim
Associate Director for Research Greg Bock
Associate Director for Accelerators S. Holmes

Particle Physics Division Greg Bock, (acting) Head

Nova Project
Project Manager John Cooper
Deputy Project Manager Ron Ray
Associate Project Manager Paul Derwent



Control Account Manager Budget				Paul Derwent	Ioanis Kourbanis	Mike Martens	Bob Zwaska	Steve Dixon	Stuart Mufson	Carl Bromberg	Richard Talaga	Ken Heller	Leon Mualem	Pat Lukens	John Cooper
Value of Control Account Budgets as LOE				\$5,646,014	\$0	\$0	\$66,019	\$7,214,382	\$1,755,219	\$50,771	\$1,623,332	\$2,491,317	\$513,488	\$1,848,345	\$14,746,055
WBS	Activity Description	Account Level	CTC?	% of acct as LOE											
2.6.2	Readout - FEB	Control account		0.84%									\$2,610,747		
2.6.3	Readout Infrastructure	Control account		0.00%									\$2,905,067		
2.6.4	Management - Electronics - Construction	Control account	CTC	100.00%									\$39,179		
2.7	DAQ	Nova Reporting Level													
2.7.1	DAQ Software	Control account	CTC	0.00%									\$778,265		
2.7.2	DAQ Hardware	Control account		0.00%									\$2,100,306		
2.7.3	Integration - DAQ	Control account	CTC	58.01%									\$441,042		
2.7.4	Detector Control System - DAQ	Control account	CTC	0.00%									\$204,894		
2.7.5	Management - DAQ - Construction	Control account	CTC	100.00%									\$7,464		
2.8	Near Detector Assembly	Nova Reporting Level													
2.8.1	Near Detector Site Preparation	Control account	CTC	0.40%										\$3,578,374	
2.8.2	Mechanical Construction and Installation - Near Detector	Control account	CTC	0.00%										\$492,873	
2.8.3	Liquid Scintillator Filling Equipment - Near Detector	Control account	CTC	0.00%										\$54,128	
2.8.4	Installation Coordination - Near Detector	Control account	CTC	0.00%										\$32,051	
2.8.5	Management - Near Detector Assembly - Construction	Control account	CTC	100.00%										\$91,930	
2.9	Far Detector Assembly	Nova Reporting Level													
2.9.1	Mechanical Systems - Far Detector Assembly	Control account		0.00%										\$1,790,369	
2.9.2	Detector Infrastructure - Far Detector Assembly	Control account		0.00%										\$475,003	
2.9.3	Scintillator Filling Equipment - Far Detector Assembly	Control account		0.00%										\$468,394	
2.9.4	Block Assembly and Installation - Far Detector Assembly	Control account		8.12%										\$7,705,179	
2.9.5	Management - Far Detector Assembly - Construction	Control account	CTC	100.00%										\$967,339	
2.10	Project Management - Nova Project - Construction	Control account	CTC	100.00%											\$5,561,928

On WAD form



WORK AUTHORIZATION FORM NOVA Project

Control Account Title: RR Upgrades

Control Account Number: 1.0.1

Work Breakdown Structure Element: WBS 1.0.1

Period of Performance: 30 Apr07 to 01May12

Current Authorized Budget (in AYS with all burdening): \$5,248,666

This Work Authorization, including all attachments, represents the agreement between the Project Manager and Control Account Manager (CAM) to perform, or to have performed, efforts defined by the following:

- 1.) A WBS Dictionary sheet that defines the scope of work for this WBS element/Control Account. If additional definition is warranted, or required for a particular WBS element, (e.g., QA reasons, Work Orders for third party services, etc) attach applicable documentation.
- 2.) A detailed Control Account schedule showing all work packages and planning packages.
- 3.) A detailed resource report by WBS and schedule activity.
- 4.) Budgeted cost by month

This Work Authorization is for the lifecycle of the project. Funding will be authorized incrementally based on schedule status and funding availability, and communicated by other means to CAMs.

In addition to the CAMs approval of all third party commitments (i.e., Memorandums of Understanding (MOU) with other institutions, purchase orders, and subcontracts), the following is required:

- Commitments must be approved by the Project Manager for all R&D work > \$1000, and for construction work where commitments values are greater than \$10,000.
- To move funds to collaborating institutions, the CAM is to see that the following is in place before executing the purchase order:
 - MOU with the collaborating institution, signed by both parties, including the Project Manager.
 - Statement of Work, one for each fiscal year (FY), detailing the amounts expected to be funded during that FY. SOW signatures must include the CAM and the Project Manager.
 - This Work Authorization with all approvals.

Any change to this document will be implemented through the Change Control procedures.

Approvals will be done through the NOVA DocDB on the Work Authorization Document file.

Signature chain will be Scheduler, Financial Officer, Control Account Manager, and Project Manager.

Chargeable task codes will not be opened without a signed work authorization form.

For CA 1.0.1

On the CAP report

Program:NOVA

Batch Report:CAP-RAM Filter:NOVA-CA-

Program:	Description:														
NOVA	NOVA Project														
Run Date:	Status Date:														
3/4/2009	2/28/2009														
Control Acct	CTG	WP	DEC10	JAN11	FEB11	MAR11	APR11	MAY11	JUN11	JUL11	AUG11	SEP11	OCT11	Cumulative	
	1.0.1.1.1.4.3	R32 Remove Instrumentation/Trim & Mirror Magnets	BCWS	0	0	0	0	0	0	0	47,284	11,821	0	59,105	
	1.0.1.1.2.2.3.1	IL Stakeout Beamline	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.2	EL Stakeout Beamline	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.3	RR30 Stakeout Beamline	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.5	IL Installation Stakeout	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.6	EL Installation Stakeout	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.7	RR-30 SS Installation Stakeout	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.3.8	BA Mods Installation Stakeout	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.5.1	Final IL Alignment	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.5.2	Final EL Alignment	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.5.3	RR30 Final Alignment	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.5.4	BA Mods Final Alignment	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.1.2.2.6.1	Ensure Availability of Tooling	BCWS	0	0	0	0	0	0	0	0	0	0	1,947	
	1.0.1.1.2.2.6.2	Verify Design Compatibility-1	BCWS	0	0	0	0	0	0	0	0	0	0	8,660	
	1.0.1.1.2.2.6.3	Verify Design Compatibility-2	BCWS	0	0	0	0	0	0	0	0	0	0	2,282	
	1.0.1.1.3.2.1	Procure S&C Disconnect	BCWS	0	0	0	0	0	0	0	0	0	0	28,988	
	1.0.1.1.3.2.2	Assembly of MI60 Anode Supply Room	BCWS	0	0	0	0	0	0	0	0	0	0	68,169	
	1.0.1.1.3.2.3	Test 53 Mhz RF System	BCWS	0	0	0	8,652	25,957	25,957	27,193	14,832	0	0	102,591	
	1.0.1.4.1	Recycler Radiation Shielding Study-1	BCWS	0	0	0	0	0	0	0	0	0	0	11,627	
	1.0.1.4.2	Recycler - Review & Revise Shielding Assessment	BCWS	0	0	0	0	0	0	0	0	0	0	0	
	1.0.1.4.4	Recycler Radiation Shielding Study-2	BCWS	0	0	0	0	0	0	0	0	0	0	8,109	
	CTC[2] Totals:		BCWS	0	0	0	8,652	25,957	25,957	27,193	14,832	194,617	83,495	37,164	547,649
	Control Acct[10] Totals:		BCWS	0	45,808	2,474	8,652	25,957	25,957	27,193	14,832	256,907	112,445	40,471	5,248,666
	Grand Totals:		BCWS	0	45,808	2,474	8,652	25,957	25,957	27,193	14,832	256,907	112,445	40,471	5,248,666

For CA 1.0.1

Active Control Accounts

- Active control account = actual start on any work packages in the CA, unless all WPs have actual finish dates
- Project controls will provide list of which CAs fall into this category prior to the review

BCWS spread in Control Accounts

- Found on the CAP report
- May have bolded lines to indicate a break in the sequence of dates (example to follow)
- Pages go across, then down – if there are too many work packages to fit on one page, the sheets with of the dates for the first page of WPs will be first, then the next set of WPs – all of the dates, and so on...

BCWS spread in Control Accounts

- If the dates covered by the CAP are different than the dates on the schedule details, then you probably have a task(s) with zero cost physicist labor – the CAP only covers the months with costed labor resources
- Make sure you know if this applies to your CA's – they will ask you & won't be impressed if you don't know the answer

Program:	Description:														
NOVA	NOVA Project														
Run Date:	Status Date:														
3/4/2009	2/28/2009														
Control A CTQ WP		APR09	MAY09	JUN09	JUL09	AUG09	SEP09	OCT09	NOV09	DEC09	JAN10	FEB10	MAR10	APR10	MAY10
2.0.1.3 Recycler Instrumentation															
2.0.1.3.1 BPMs															
2.0.1.3.1.1 Procure BPM Cables/Connectors	BCWS	0	0	0	0	37,678	78,123	84,689	73,140	76,999	30,796	0	0	0	0
2.0.1.3.1.2 Procure BPM Transition Boards	BCWS	0	0	0	0	12,825	26,932	28,834	24,902	26,213	24,902	26,213	30,144	28,834	26,213
2.0.1.3.1.3 Test BPM Transition Boards	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.1.4 Recycler Instrumentation - Install Cables & Boards	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTC[21] Totals	BCWS	0	0	0	0	50,502	106,055	113,522	98,042	103,202	55,698	26,213	30,144	28,834	26,213
2.0.1.3.2 DCCT/Toroids															
2.0.1.3.2.1 Procure DCCT, Cables & Connectors	BCWS	11,112	10,102	11,112	11,112	10,607	8,586	0	0	0	0	0	0	0	0
2.0.1.3.2.2 Recycler Instrumentation - Install & Test DCCT	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.2.2 Recycler Instrumentation - Relocate Toroids to Injection L	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.2.3 Recycler Instrumentation - Relocate Toroids to Extraction	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTC[21] Totals	BCWS	11,112	10,102	11,112	11,112	10,607	8,586	0	0	0	0	0	0	0	0
2.0.1.3.3 Dampers															
2.0.1.3.3.1 Procure Longitudinal Dampers	BCWS	0	0	0	0	1,914	4,619	4,328	3,738	3,936	3,738	3,148	0	0	0
2.0.1.3.3.2 Test Longitudinal Dampers	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.3.3 Recycler Instrumentation - Install Longitudinal Dampers	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.3.2.1 Procure Transverse Dampers (incl Move 240V outlet)	BCWS	0	0	0	0	17,440	36,623	39,201	33,856	35,638	33,856	35,638	1,782	0	0
2.0.1.3.3.2.2 Test Transverse Dampers	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0.1.3.3.2.3 Recycler Instrumentation - Install Transverse Dampers	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTC[21] Totals	BCWS	0	0	0	0	19,354	40,642	43,530	37,594	39,872	37,594	38,785	1,782	0	0
Control Acc[10] Totals	BCWS	11,112	10,102	11,112	11,112	80,402	155,283	157,052	135,636	142,775	93,292	64,998	39,297	28,834	26,213
Grand Totals	BCWS	11,112	10,102	11,112	11,112	80,402	155,283	157,052	135,636	142,775	93,292	64,998	39,297	28,834	26,213

Program:NOVA

Program:	Description:										
NOVA	NOVA Project										
Run Date:	Status Date:										
3/4/2009	2/28/2009										
Control A CTQ WP		JUN10	JUL10	AUG10	AUG11	SEP11	FEB12	MAR12	Cumulative		
2.0.1.3 Recycler Instrumentation											
2.0.1.3.1 BPMs											
2.0.1.3.1.1 Procure BPM Cables/Connectors	BCWS	0	0	0	0	0	0	0	382,415		
2.0.1.3.1.2 Procure BPM Transition Boards	BCWS	1,311	0	0	0	0	0	0	257,320		
2.0.1.3.1.3 Test BPM Transition Boards	BCWS	27,563	27,563	26,251	0	0	0	0	81,377		
2.0.1.3.1.4 Recycler Instrumentation - Install Cables & Boards	BCWS	0	0	0	292,049	55,628	0	0	347,678		
CTC[21] Totals	BCWS	28,874	27,563	26,251	292,049	55,628	0	0	1,068,789		
2.0.1.3.2 DCCT/Toroids											
2.0.1.3.2.1 Procure DCCT, Cables & Connectors	BCWS	0	0	0	0	0	0	0	62,630		
2.0.1.3.2.2 Recycler Instrumentation - Install & Test DCCT	BCWS	0	0	0	5,507	0	0	0	5,507		
2.0.1.3.2.2 Recycler Instrumentation - Relocate Toroids to Injection L	BCWS	0	0	0	0	0	0	0	5,404		
2.0.1.3.2.3 Recycler Instrumentation - Relocate Toroids to Extraction	BCWS	0	0	0	0	0	4,503	901	5,404		
CTC[21] Totals	BCWS	0	0	0	5,507	0	4,503	6,304	78,944		
2.0.1.3.3 Dampers											
2.0.1.3.3.1 Procure Longitudinal Dampers	BCWS	0	0	0	0	0	0	0	24,820		
2.0.1.3.3.2 Test Longitudinal Dampers	BCWS	0	0	0	0	0	0	0	0		
2.0.1.3.3.3 Recycler Instrumentation - Install Longitudinal Dampers	BCWS	0	0	0	5,127	0	0	0	5,127		
2.0.1.3.3.2.1 Procure Transverse Dampers (incl Move 240V outlet)	BCWS	0	0	0	0	0	0	0	234,033		
2.0.1.3.3.2.2 Test Transverse Dampers	BCWS	0	0	0	0	0	0	0	7,370		
2.0.1.3.3.2.3 Recycler Instrumentation - Install Transverse Dampers	BCWS	0	0	0	2,407	0	0	0	2,407		
CTC[21] Totals	BCWS	0	0	0	7,535	0	0	0	273,758		
Control Acc[10] Totals	BCWS	28,874	27,563	26,251	305,091	55,628	4,503	6,304	1,421,492		
Grand Totals	BCWS	28,874	27,563	26,251	305,091	55,628	4,503	6,304	1,421,492		

On the Critical Path

- Bill will prepare subsystem schedule snapshots/descriptions that describe where each subsystem is with respect to critical path
- A few general reminders
 - CD-4 is “fixed” at 26Nov14; was originally set by agreement with DOE ~10 months later than nominal baseline technical completion date (defined by ANU project complete and beam neutrino event seen in superblock 6 (14 kt)
 - We monitor float between the projected technical finish date (based on progress input each month) and the fixed CD-4 date. Current driver is detector, not ANU; float slightly reduced now to 197d working days.
 - Path currently flows thru:
IPND modules → prod. module parts (manifolds/opt. connect.)
→ module assembly → block assembly → fill → outfit;
Bldg benef. occup. → infrastructure setup is close.
(still analyzing, so details may change.)

EAC/ETC Discussion

Bill Freeman

NOvA Tech Board Meeting

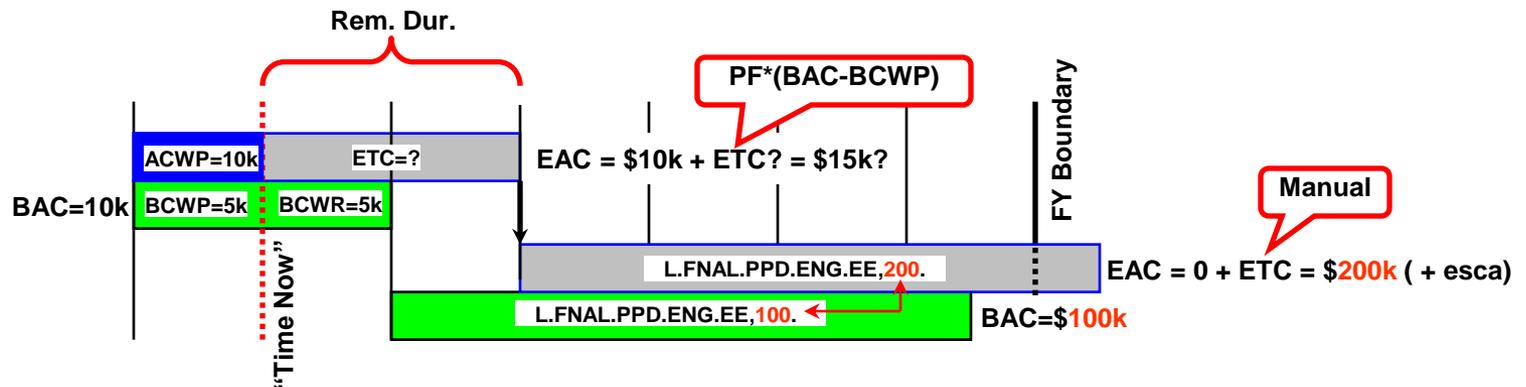
Definition of EAC

Estimate **A**t **C**ompletion (EAC) =
Actual **C**ost of **W**ork **P**erformed (ACWP) + Estimate-**T**o-**C**omplete (ETC)

ACWP is in the past → can't change it

ETC is in the future → forecast

Relative to what? The current status date ("Time Now")



EAC is NOT the Budget At Completion (BAC),
which is obtained from the Performance Measurement Baseline.
The PMB does not change unless we process a baseline Change Request.

General Guidelines

DocDB 3758

Updating the Estimate to Complete (ETC)/Estimate at Completion (EAC) on a project can provide information to project management about the remaining contingency on the project, and if the projected completed cost of the project will exceed or underrun the available budget. The NOvA Project follows the general procedure outlined in the [FRA procedure 12.PM-006 Monthly Status Reporting](#) for EAC/ETC updating. More specifically, this is what the project will do:

- If the **CAM believes** that the current ETC for their control account is not realistic, they will **discuss this with the Project Manager**, either in person, by phone, or via email.
- If the Project Manager believes the case for a revised ETC is sufficiently real, he will ask the **CAM to document the ETC by email to the Project Manager**, giving all the information necessary to make the changes in the schedule.
- The **Project Manager will forward the email to the Project Scheduler**, indicating approval to update the ETC for this part of the project.
- The Project Manager will **retain the pertinent information** for each approved ETC update **in an Excel spreadsheet log (docdb 3759)**.
- The Project Scheduler will follow the already established Open Plan process for **inputting this information into the project schedule**, and subsequent **transfer to Cobra** for processing and ultimately updating of the EAC.

Candidates for ETC Changes

- Substantial changes in anticipated labor hours for future work, based on past performance of similar work (e.g. EAC001)
- Improved knowledge of future M&S costs that differ substantially from budgeted costs
- Substantive future rate changes (direct and/or indirect/overhead).
- For simplicity, our preference is to adjust ETC on unstarted tasks/work packages, not in-progress ones; so please be proactive on identifying candidates.
- Some ETC changes may eventually lead to/be incorporated as baseline changes.
- Not generally applied to scope changes. Those require baseline changes.
- Changes to bottoms-up contingency percentage estimates, while not affecting the EAC/ETC directly, can impact the project thru the year-by-year comparison to the funding profile, so we would like to track such changes through this EAC/ETC process as well. (e.g. EAC002)

ETC Log

DocDB 3759

NOVA Log of Estimate to Complete Changes					27-Apr-09	
ETC#	Item	WBS items	CAM	estimated amount	approved?	date of email approval
1	Labor reductions on 1.0.3	1.0.3.2, 1.0.3.3	Martens	< \$100K decrease in base estimate	yes	15-Apr-09
2	Near Cavern updated estimate following Conceptual design by Harza, checked by Wightman	2.8.1.4.5, 2.8.1.4.6	Lukens	only \$20K increase in base estimate, but a change in contingency estimate from 100% to 50%	yes	15-Apr-09

DocDB (Sub)Topics

List of Topics

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Physics

- [Beam Nue](#)
- [CP Violation](#)
- [Charged Current](#)
- [Cross-sections](#)
- [Mass Hierarchy](#)
- [Neutral Current](#)
- [Nue Appearance](#)
- [Numu Disappearance](#)
- [Proton Decay](#)
- [Short Baseline Oscillations](#)
- [Supernova](#)
- [Theta 13](#)
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Presentations

- [Conference Writeups](#)
- [LOI](#)
- [Official Plots & Figures](#)
- [PAC & Fermilab](#)
- [Proposals](#)

Project Management

- [ANU Configuration Management](#)
- [ANU Project Management](#)
- [ANU Reviews](#)
- [ANU Status Report](#)
- [ANU watch list](#)
- [BOEs](#)
 - [BOEs WBS X.0.2 \(MD\)](#)
 - [BOEs WBS X.0.4 \(BP\)](#)
 - [BOEs WBS 1.9 & 2.10](#)
 - [BOEs WBS X.0.1 \(RR\)](#)
 - [BOEs WBS X.0.3 \(NuMI\)](#)
 - [BOEs WBS X.1](#)
 - [BOEs WBS X.2](#)
 - [BOEs WBS X.3](#)
 - [BOEs WBS X.4](#)
 - [BOEs WBS X.5](#)
 - [BOEs WBS X.6](#)
 - [BOEs WBS X.7](#)
 - [BOEs WBS X.8 & 2.9](#)
- [BOEs ETC FY09](#)
 - [ETC FY09 WBS X.0.3 \(NuMI\)](#)
 - [ETC FY09 WBS X.8 & 2.9](#)

Document List by Topic

[NOvA DocDB Home]

These documents or [ETC FY09 WBS X.0.3 \(NuMI\)](#) (subtopic of [BOEs ETC FY09](#)) are available:

NOVA-doc-#	Title	Author(s)	Topic(s)	Last Updated
3763-v1	ETC 001 chnage to WBS 1.0.3.1 and 1.0.3.4	John W. Cooper <i>et al.</i>	ETC FY09 WBS X.0.3 (NuMI)	28 Apr 2009

NOVA Document 3763-v1

[NOvA DocDB Home]

ETC 001 chnage to WBS 1.0.3.1 and 1.0.3.4

Abstract:

need reference to initial BOE

Files in Document:

- [pdf ETC request by CAM](#) (ETC 001 WBS 1.0.3. details from martens.pdf, 21.8 kB)
- [pdf approval by Project Manager](#) (ETC 001 approval.pdf, 53.8 kB)
- [pdf final number from Bill Freeman](#) (Freeman final numbers on ETC 001.pdf, 25.6 kB)
- [pdf from Freeman, after](#) (EAC 001 - After.pdf, 30.0 kB)
- [pdf from Freeman, before](#) (EAC 001 - Before.pdf, 40.5 kB)

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Topics:

- [Project Management:BOEs ETC FY09:ETC FY09 WBS X.0.3 \(NuMI\)](#)

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Modifiable by:

- [nova-techboard](#)
- [nova-proj-office](#)

Sample ETC Change Request

From: John Cooper [jcooper@fnal.gov] Sent: Wed 4/15/2009 2:04 PM
To: Mike Martens
Cc: Freeman, Bill; Suzanne Saxer; Cooper, John
Subject: FW: Updated resources for 1.0.3 ETC estimate
Attachments: ETC_1_0_3_martens.xls (57 KB); ETC_1_0_3_martens mod by Cooper.xls (59 KB)

EAC001

Mike,
My understanding is that the work under 1.0.3.1 and 1.0.3.4 were estimated by different people than the two WBSs you propose to re-estimate.

When I did a quick addition of hours in the changes, I get about 650 hours – so this might amount to \$100K at most. See my attached update of your spreadsheet. That puts it on the edge of things we might do for ETC in the future, but I believe it is worth it just to get the experience with Open Plan and Cobra. Yours is an example of an SWF change.

So I am officially approving this ETC and handing it off to Bill and Suzanne to implement for the March 2009 reports.

Thanks,
John

Approval by JC

From: Mike Martens [mailto:martens@fnal.gov]
Sent: Wednesday, April 15, 2009 11:49 AM
To: 'John Cooper'
Cc: 'Mike Martens'
Subject: Updated resources for 1.0.3 ETC estimate

Hi John,

Attached is an excel spreadsheet with my estimate for the resources needed to complete the work in control account 1.0.3. My estimate is based on the fact that the engineering and design efforts for the work in 1.0.3.2 and 1.0.3.3 have been consistently over-estimated by ~30%. Therefore I have looked at future tasks under 1.0.3.2 and 1.0.3.3 and reduced the engineering and design resources by approximately 70% using my judgment in each case. Not enough work has been performed under 1.0.3.1 and 1.0.3.4 for me to make any estimates of future performance on tasks under these WBS levels.

This spreadsheet represents my best estimate of the ETC for Control Account 1.0.3 and does not include any possible change requests which may result of a change in scope.

Mike Martens

Request to JC from MM

Attached Spreadsheet from MM

No tasks started

EAC001

Resource Assignments (Before)

Resource Assignments (After)

	A	B	C	D	E	F	G	H	I	J
	WBS	Activity Desc.	Computed Status	Activity Type	Duration	Early Dates	Baseline Dates	Predecessors	ResInfo	Updated Resource Info
27	1.0.3.2.1.1.3	Assess IHEP ME Target Design Study 2	Planned	ASAP	48d	01Apr09 08Jun09	06Oct09 14Dec09	1.0.3.2.1.1.2[FS]	L.FNAL.AD.SCI.PHY,138.00;L.FNAL.AD.ENG.ME_SR,10.00;L.FNAL.AD.ENG.ME,86.00,	L.FNAL.AD.SCI.PHY,130.00;L.FNAL.AD.ENG.ME_SR,5.00;L.FNAL.AD.ENG.ME,56.00,
29	1.0.3.2.1.1.5	Integrate mechanical drawings from IHEP	Planned	ASAP	22d	04Jan10 03Feb10	09Jul10 09Aug10	1.0.3.2.1.1.4[FS]	L.FNAL.AD.ENG.DES,176.00;L.FNAL.AD.ENG.ME_SR,9.00;L.FNAL.AD.ENG.ME,79.00,	L.FNAL.AD.ENG.DES,130.00;L.FNAL.AD.ENG.ME_SR,7.00;L.FNAL.AD.ENG.ME,55.00,
31	1.0.3.2.1.2.1	Analysis of Carrier for 700kW Beam Power	Planned	ASAP	48d	01Apr09 08Jun09	30Mar09 04Jun09	2.10.9.7[FS+40d]; 2.0.4.3.1.2[FS]	L.FNAL.AD.ENG.ME,173.00;L.FNAL.AD.ENG.DES,384.00;L.FNAL.AD.ENG.ME_SR,19.00,	L.FNAL.AD.ENG.ME,140.00;L.FNAL.AD.ENG.DES,300.00;L.FNAL.AD.ENG.ME_SR,12.00,
32	1.0.3.2.1.2.2	Design of new carrier	Planned	ASAP	60d	16Jun09 09Sep09	22Dec09 22Mar10	1.0.3.2.5.1[FS]; 1.0.3.3.5.1[FS]	L.FNAL.AD.ENG.DES,480.00;L.FNAL.AD.ENG.ME_SR,24.00;L.FNAL.AD.ENG.ME,216.00,	L.FNAL.AD.ENG.DES,3600.00;L.FNAL.AD.ENG.ME_SR,18.00;L.FNAL.AD.ENG.ME,130.00,
38	1.0.3.2.2.1	Analyze Current Hadron Monitor Design for Higher Beam Power.	Planned	ASAP	53d	01Apr09 15Jun09	02Feb09 27Feb09	2.10.9.7[FS]	L.FNAL.AD.ENG.ME,144.00;L.FNAL.AD.ENG.ME_SR,16.00;L.FNAL.AD.SCI.PHY,160.00;L.FNAL.AD.ENG.DES,80.00,	L.FNAL.AD.ENG.ME,100.00;L.FNAL.AD.ENG.ME_SR,10.00;L.FNAL.AD.SCI.PHY,100.00;L.FNAL.AD.ENG.DES,80.00,
39	1.0.3.2.3	Design Hadron Monitor Beam Abort	Planned	ASAP	15d	01Nov10 19Nov10	01Nov10 19Nov10	2.10.9.9[FS]; 2.0.3.2.2.1[FS]	L.FNAL.AD.SCI.PHY,30.00;L.FNAL.AD.ENG.EE_SR,12.00;L.FNAL.AD.ENG.EE,108.00;L.FNAL.AD.CP.SD,120.00,	L.FNAL.AD.SCI.PHY,20.00;L.FNAL.AD.ENG.EE_SR,10.00;L.FNAL.AD.ENG.EE,80.00;L.FNAL.AD.CP.SD,90.00,
41	1.0.3.2.4.1	Target, Baffle & Carrier Initial Design Review	Planned	ASAP	5d	09Jun09 15Jun09	15Dec09 21Dec09	1.0.3.2.1.3.1[FS]; 1.0.3.2.1.2.1[FS]; 1.0.3.2.1.1.3[FS]	L.FNAL.AD.ENG.ME,36.00;L.FNAL.AD.SCI.PHY,40.00;L.FNAL.AD.ENG.DES,10.00;L.FNAL.AD.ENG.ME_SR,4.00,	L.FNAL.AD.ENG.ME,24.00;L.FNAL.AD.SCI.PHY,30.00;L.FNAL.AD.ENG.DES,7.00;L.FNAL.AD.ENG.ME_SR,3.00,
42	1.0.3.2.4.2	Target, Baffle & Carrier Design Review	Planned	ASAP	15d	01Apr10 21Apr10	06Oct10 26Oct10	2.0.3.2.1.2.1[FS]; 2.0.3.2.1.3.1[FS]; 2.0.3.2.1.1.1[FS]; 1.0.3.2.5.3[FS]	L.FNAL.AD.ENG.ME,108.00;L.FNAL.AD.SCI.PHY,120.00;L.FNAL.AD.ENG.DES,30.00;L.FNAL.AD.ENG.ME_SR,12.00,	L.FNAL.AD.ENG.ME,86.00;L.FNAL.AD.SCI.PHY,90.00;L.FNAL.AD.ENG.DES,24.00;L.FNAL.AD.ENG.ME_SR,9.00,
77	1.0.3.3.3.2.3	Design Forced Air Cooling for Horn 1 Chase Stripline	Planned	ASAP	45d	25Jun09 27Aug09	17Feb10 20Apr10	1.0.3.3.4.4[FS]	L.FNAL.AD.ENG.DES,180.00;L.FNAL.AD.ENG.ME_SR,18.00;L.FNAL.AD.SCI.PHY,36.00;L.FNAL.AD.ENG.ME,162.00,	L.FNAL.AD.ENG.DES,120.00;L.FNAL.AD.ENG.ME_SR,12.00;L.FNAL.AD.SCI.PHY,36.00;L.FNAL.AD.ENG.ME,140.00,
81	1.0.3.3.3.4	NuMI - Review & Revise Shielding Assessment	Planned	ASAP	105d	02Nov09 06Apr10	02Nov09 06Apr10	2.10.9.8[FS]	L.FNAL.AD.MNG.ESH,294.00;L.FNAL.AD.SCI.PHY,420.00,	L.FNAL.AD.MNG.ESH,220.00;L.FNAL.AD.SCI.PHY,360.00,
84	1.0.3.3.4.4	Target Hall Chase Cooling Initial Design Review	Planned	ASAP	10d	11Jun09 24Jun09	03Feb10 16Feb10	1.0.3.3.5.1[FS]; 1.0.3.3.3.1.4[FS]; 1.0.3.2.1.2.1[FS]; 1.0.3.3.3.2.1[FS]; 1.0.3.3.3.1.3[FS]; 1.0.3.3.3.2.2[FS]	L.FNAL.AD.SCI.PHY,80.00;L.FNAL.AD.ENG.ME_SR,8.00;L.FNAL.AD.ENG.DES,20.00;L.FNAL.AD.ENG.ME,72.00,	L.FNAL.AD.SCI.PHY,60.00;L.FNAL.AD.ENG.ME_SR,6.00;L.FNAL.AD.ENG.DES,16.00;L.FNAL.AD.ENG.ME,60.00,
85	1.0.3.3.4.5	Final Target Hall Chase Cooling Design Review	Planned	ASAP	15d	26Oct09 13Nov09	17Jun10 08Jul10	2.0.3.3.3.2.1[FS]; 1.0.3.3.5.3[FS]	L.FNAL.AD.ENG.DES,30.00;L.FNAL.AD.ENG.ME_SR,12.00;L.FNAL.AD.ENG.ME,108.00;L.FNAL.AD.SCI.PHY,120.00,	L.FNAL.AD.ENG.DES,22.00;L.FNAL.AD.ENG.ME_SR,9.00;L.FNAL.AD.ENG.ME,80.00;L.FNAL.AD.SCI.PHY,100.00,
86	1.0.3.3.4.6	Target Hall Space Planning & Horn 2 Reconfiguration & Equip Design Rev	Planned	ASAP	15d	04Oct10 22Oct10	09Jul10 29Jul10	2.0.4.4.2.39[FS]; 2.0.3.3.2.2.1[FS]; 1.0.3.4.1.3.1[FS]; 1.0.3.3.1.1.1[FS]; 1.0.3.3.4.5[FS]	L.FNAL.AD.SCI.PHY,120.00;L.FNAL.AD.ENG.ME_SR,12.00;L.FNAL.AD.ENG.ME,108.00;L.FNAL.AD.ENG.DES,30.00,	L.FNAL.AD.SCI.PHY,100.00;L.FNAL.AD.ENG.ME_SR,9.00;L.FNAL.AD.ENG.ME,86.00;L.FNAL.AD.ENG.DES,26.00,

Example - Before

No tasks started yet



Nova Project
WBS 1.0.3
 Subsection by Control Account and Chargeable Task Code
 EAC Change [EAC001]
 Before EAC Update

AY Dollars
Baseline:Nova_PMB

Activity ID	Activity Description	Change Request Numbers	Computed Status	Orig. Dur.	Early Dates	Baseline Dates	Resp. Inst.	PMT Type	Fund Source	Units To Do	BAC Material	BAC Labor	BACcum	M&S Cont. %	M&S Cont. \$	Labor Cont. %	Labor Cont. \$	EAC	VAC	Resinfo
1.0.3 -- NUMI Upgrades																				
0 \$0 \$370,994 \$370,994 0% \$0 590% \$216,175 \$363,742 \$7,252																				
1.0.3.1 -- ANU NUMI Upgrades R&D																				
1.0.3.2.1.3	Assess IHEP ME Target Design Study 2	[CR035];[EAC001]	Planned	48d	01Apr09 06Jun09	06Oct09 14Dec09	FNAL	C	DD	0	\$0	\$12,326	\$12,326	0%	\$0	35%	\$3,748	\$11,762	\$564	L.FNAL.AD.SCI.PHY.138.00.;L.FNAL.AD.ENG.ME.SR.10.00.;L.FNAL.AD.ENG.ME.86.00.
1.0.3.2.1.5	Integrate mechanical drawings from IHEP	[CR035];[EAC001]	Planned	22d	04Jan10 03Feb10	05Jul10 09Aug10	FNAL	C	DD	0	\$0	\$30,870	\$30,870	0%	\$0	35%	\$9,367	\$30,870	\$0	L.FNAL.AD.ENG.DES.176.00.;L.FNAL.AD.ENG.ME.SR.9.00.;L.FNAL.AD.ENG.ME.79.00.
1.0.3.2.1.2.1	Analysis of Carrier for 700kW Beam Power	[CR035];[EAC001]	Planned	49d	01Apr09 08Jun09	30Mar09 04Jun09	FNAL	C	DD	0	\$0	\$64,229	\$64,229	0%	\$0	100%	\$68,450	\$64,229	\$0	L.FNAL.AD.ENG.ME.173.00.;L.FNAL.AD.ENG.DES.384.00.;L.FNAL.AD.ENG.ME.SR.19.00.
1.0.3.2.1.2.2	Design of new carrier	[CR035];[EAC001]	Planned	60d	16Jun09 09Sep09	22Dec09 22Mar10	FNAL	C	DD	0	\$0	\$84,157	\$84,157	0%	\$0	100%	\$73,114	\$80,301	\$3,856	L.FNAL.AD.ENG.DES.480.00.;L.FNAL.AD.ENG.ME.SR.24.00.;L.FNAL.AD.ENG.ME.216.00.
1.0.3.2.2.1	Analyze Current Hadron Monitor Design for Higher Beam Power.	[CR035];[EAC001]	Planned	53d	01Apr09 15Jun09	02Feb09 27Feb09	FNAL	C	DD	0	\$0	\$28,055	\$28,055	0%	\$0	40%	\$10,218	\$28,055	\$0	L.FNAL.AD.ENG.ME.144.00.;L.FNAL.AD.ENG.ME.SR.16.00.;L.FNAL.AD.SCI.PHY.160.00.;L.FNAL.AD.ENG.DES.80.00.
1.0.3.2.3	Design Hadron Monitor Beam Abort	[CR035];[EAC001]	Planned	15d	01Nov10 19Nov10	01Nov10 19Nov10	FNAL	C	DD	0	\$0	\$32,512	\$32,512	0%	\$0	40%	\$10,781	\$32,512	\$0	L.FNAL.AD.SCI.PHY.30.00.;L.FNAL.AD.ENG.EE.SR.12.00.;L.FNAL.AD.ENG.EE.108.00.;L.FNAL.AD.ENG.DES.108.00.
1.0.3.2.4.1	Target, Baffle & Carrier Initial Design Review	[CR035];[EAC001]	Planned	5d	09Jun09 15Jun09	15Dec09 21Dec09	FNAL	F	DD	0	\$0	\$6,238	\$6,238	0%	\$0	20%	\$1,084	\$5,952	\$286	L.FNAL.AD.ENG.ME.36.00.;L.FNAL.AD.SCI.PHY.40.00.;L.FNAL.AD.ENG.DES.10.00.;L.FNAL.AD.ENG.ME.SR.4.00.
1.0.3.2.4.2	Target, Baffle & Carrier Design Review	[CR035];[EAC001]	Planned	15d	01Apr10 21Apr10	06Oct10 26Oct10	FNAL	F	DD	0	\$0	\$19,612	\$19,612	0%	\$0	20%	\$3,262	\$18,714	\$898	L.FNAL.AD.ENG.ME.108.00.;L.FNAL.AD.SCI.PHY.120.00.;L.FNAL.AD.ENG.DES.30.00.;L.FNAL.AD.ENG.ME.SR.12.00.
1.0.3.3.3.3	Design Forced Air Cooling for Horn 1 Chase Stripline	[CR035];[EAC001]	Planned	45d	25Jun09 27Aug09	17Feb10 20Apr10	FNAL	C	DD	0	\$0	\$43,091	\$43,091	0%	\$0	100%	\$37,437	\$41,117	\$1,974	L.FNAL.AD.ENG.DES.180.00.;L.FNAL.AD.ENG.ME.SR.18.00.;L.FNAL.AD.SCI.PHY.36.00.;L.FNAL.AD.ENG.ME.162.00.
1.0.3.3.4.4	Target Hall Chase Cooling Initial Design Review	[CR035];[EAC001]	Planned	10d	11Jun09 24Jun09	03Feb10 16Feb10	FNAL	F	DD	0	\$0	\$12,476	\$12,476	0%	\$0	20%	\$2,168	\$11,904	\$571	L.FNAL.AD.SCI.PHY.80.00.;L.FNAL.AD.ENG.ME.SR.8.00.;L.FNAL.AD.ENG.DES.20.00.;L.FNAL.AD.ENG.ME.72.00.
1.0.3.3.4.5	Final Target Hall Chase Cooling Design Review	[CR035];[EAC001]	Planned	15d	26Oct09 13Nov09	17Jun10 08Jul10	FNAL	F	DD	0	\$0	\$18,714	\$18,714	0%	\$0	20%	\$3,262	\$18,714	\$0	L.FNAL.AD.ENG.DES.30.00.;L.FNAL.AD.ENG.ME.SR.12.00.;L.FNAL.AD.ENG.ME.108.00.;L.FNAL.AD.SCI.PHY.120.00.
1.0.3.3.4.6	Target Hall Space Planning & Horn 2 Reconfiguration & Equip Design Rev	[CR035];[EAC001]	Planned	15d	04Oct10 22Oct10	09Jul10 29Jul10	FNAL	F	DD	0	\$0	\$18,714	\$18,714	0%	\$0	20%	\$3,262	\$19,612	(\$898)	L.FNAL.AD.SCI.PHY.120.00.;L.FNAL.AD.ENG.ME.SR.12.00.;L.FNAL.AD.ENG.ME.108.00.;L.FNAL.AD.ENG.DES.30.00.
1.0.3.2 -- ANU NUMI Upgrades Op																				
1.0.3.3.3.4	NuMI - Review & Revise Shielding Assessment	[CR035];[EAC001]	Planned	105d	02Nov09 06Apr10	02Nov09 06Apr10	FNAL	C	DO	0	\$0	\$0	\$0	0%	\$0	40%	\$3	\$0	\$0	L.FNAL.AD.MNG.ESH.294.00.;L.FNAL.AD.SCI.PHY.420.00.
0 \$0 \$370,994 \$370,994 0% \$0 590% \$216,175 \$363,742 \$7,252																				

Note: Small variance present before ETC update due to being ahead of schedule (escalation effects)

VAC_{before} = \$7,252

Example - After



Nova Project
WBS 1.0.3
 Subsection by Control Account and Chargeable Task Code
 EAC Change [EAC001]
 After EAC Update

AY Dollars
Baseline:Nova_PMB

Activity ID	Activity Description	Change Request Numbers	Computed Status	Orig. Dur.	Early Dates	Baseline Dates	Resp. Inst.	PMT Type	Fund Source	Units To Do	BAC Material	BAC Labor	BACcum	M&S Cont. %	M&S Cont. \$	Labor Cont. %	Labor Cont. \$	EAC	VAC	Resinfo	
1.0.3 – NUMI Upgrades																					
0																					
1.0.3.1 – ANU NUMI Upgrades R&D																					
1.0.3.2.1.1.3	Assess IHEP ME Target Design Study 2	[CR035];[EAC001]	Planned	48d	01Apr09 08Jun09	06Oct09 14Dec09	FNAL	C	DD	0	\$0	\$12,326	\$12,326	0%	\$0	35%	\$4,314	\$7,392	\$4,934	L.FNAL.AD.SCI.PHY.130.00.;L.FNAL.AD.ENG.ME.SR.5.00.;L.FNAL.AD.ENG.ME.56.00.	
1.0.3.2.1.1.5	Integrate mechanical drawings from IHEP	[CR035];[EAC001]	Planned	22d	04Jan10 03Feb10	09Jul10 09Aug10	FNAL	C	DD	0	\$0	\$30,870	\$30,870	0%	\$0	35%	\$10,805	\$22,458	\$8,412	L.FNAL.AD.ENG.DES.130.00.;L.FNAL.AD.ENG.ME.SR.7.00.;L.FNAL.AD.ENG.ME.55.00.	
1.0.3.2.1.2.1	Analysis of Carrier for 700kW Beam Power	[CR035];[EAC001]	Planned	48d	01Apr09 06Jun09	30Mar09 04Jun09	FNAL	C	DD	0	\$0	\$64,229	\$64,229	0%	\$0	100%	\$64,229	\$50,241	\$13,988	L.FNAL.AD.ENG.ME.140.00.;L.FNAL.AD.ENG.DES.300.00.;L.FNAL.AD.ENG.ME.SR.12.00.	
1.0.3.2.1.2.2	Design of new carrier	[CR035];[EAC001]	Planned	60d	16Jun09 09Sep09	22Dec09 22Mar10	FNAL	C	DD	0	\$0	\$84,157	\$84,157	0%	\$0	100%	\$84,157	\$56,505	\$27,652	L.FNAL.AD.ENG.DES.360.00.;L.FNAL.AD.ENG.ME.18.00.;L.FNAL.AD.ENG.ME.130.00.	
1.0.3.2.2.1	Analyze Current Hadron Monitor Design for Higher Beam Power.	[CR035];[EAC001]	Planned	53d	01Apr09 15Jun09	02Feb09 27Feb09	FNAL	C	DD	0	\$0	\$28,055	\$28,055	0%	\$0	40%	\$11,222	\$19,759	\$8,296	L.FNAL.AD.ENG.ME.100.00.;L.FNAL.AD.ENG.ME.SR.10.00.;L.FNAL.AD.SCI.PHY.100.00.;L.FNAL.AD.ENG.DES.60.00.	
1.0.3.2.3	Design Hadron Monitor Beam Abort	[CR035];[EAC001]	Planned	15d	01Nov10 19Nov10	01Nov10 19Nov10	FNAL	C	DD	0	\$0	\$32,512	\$32,512	0%	\$0	40%	\$13,005	\$24,450	\$8,062	L.FNAL.AD.SCI.PHY.20.00.;L.FNAL.AD.ENG.EE.SR.10.00.;L.FNAL.AD.ENG.EE.80.00.;L.FNAL.AD.CP.SD.90.00.	
1.0.3.2.4.1	Target, Baffle & Carrier Initial Design Review	[CR035];[EAC001]	Planned	5d	08Jun09 15Jun09	15Dec09 21Dec09	FNAL	F	DD	0	\$0	\$6,238	\$6,238	0%	\$0	20%	\$1,248	\$4,062	\$2,176	L.FNAL.AD.ENG.ME.24.00.;L.FNAL.AD.SCI.PHY.30.00.;L.FNAL.AD.ENG.DES.7.00.;L.FNAL.AD.ENG.ME.SR.3.00.	
1.0.3.2.4.2	Target, Baffle & Carrier Design Review	[CR035];[EAC001]	Planned	15d	01Apr10 21Apr10	06Oct10 26Oct10	FNAL	F	DD	0	\$0	\$19,612	\$19,612	0%	\$0	20%	\$3,922	\$14,812	\$4,801	L.FNAL.AD.ENG.ME.86.00.;L.FNAL.AD.SCI.PHY.90.00.;L.FNAL.AD.ENG.DES.24.00.;L.FNAL.AD.ENG.ME.SR.5.00.	
1.0.3.3.3.2.3	Design Forced Air Cooling for Horn 1 Chase Sipline	[CR035];[EAC001]	Planned	45d	25Jun09 27Aug09	17Feb10 20Apr10	FNAL	C	DD	0	\$0	\$43,091	\$43,091	0%	\$0	100%	\$43,091	\$31,132	\$11,959	L.FNAL.AD.ENG.DES.120.00.;L.FNAL.AD.ENG.ME.SR.12.00.;L.FNAL.AD.SCI.PHY.36.00.;L.FNAL.AD.ENG.ME.140.00.	
1.0.3.3.4.4	Target Hall Chase Cooling Initial Design Review	[CR035];[EAC001]	Planned	10d	11Jun09 24Jun09	03Feb10 16Feb10	FNAL	F	DD	0	\$0	\$12,476	\$12,476	0%	\$0	20%	\$2,465	\$9,732	\$2,744	L.FNAL.AD.SCI.PHY.60.00.;L.FNAL.AD.ENG.ME.SR.6.00.;L.FNAL.AD.ENG.DES.16.00.;L.FNAL.AD.ENG.ME.60.00.	
1.0.3.3.4.5	Final Target Hall Chase Cooling Design Review	[CR035];[EAC001]	Planned	15d	26Oct09 13Nov09	17Jun10 08Jul10	FNAL	F	DD	0	\$0	\$18,714	\$18,714	0%	\$0	20%	\$3,743	\$13,858	\$4,856	L.FNAL.AD.ENG.DES.22.00.;L.FNAL.AD.ENG.ME.SR.9.00.;L.FNAL.AD.ENG.ME.80.00.;L.FNAL.AD.SCI.PHY.100.00.	
1.0.3.3.4.6	Target Hall Space Planning & Horn 2 Reconfiguration & Equip Design Rev	[CR035];[EAC001]	Planned	15d	04Oct10 22Oct10	08Jul10 28Jul10	FNAL	F	DD	0	\$0	\$18,714	\$18,714	0%	\$0	20%	\$3,743	\$15,756	\$2,958	L.FNAL.AD.SCI.PHY.100.00.;L.FNAL.AD.ENG.ME.SR.9.00.;L.FNAL.AD.ENG.ME.86.00.;L.FNAL.AD.ENG.DES.26.00.	
1.0.3.2 – ANU NUMI Upgrades Op																					
1.0.3.3.4	NUMI - Review & Revise Shielding Assessment	[CR035];[EAC001]	Planned	105d	02Nov09 06Apr10	02Nov09 06Apr10	FNAL	C	DO	0	\$0	\$0	\$0	0%	\$0	40%	\$0	\$0	\$0	\$0	L.FNAL.AD.MNG.ESH.220.00.;L.FNAL.AD.SCI.PHY.360.00.
0																					
\$0																					
\$370,994																					
\$370,994																					
0%																					
\$0																					
600%																					
\$245,073																					
\$270,157																					
\$100,838																					

Net reduction in EAC = \$93,586

Note: No changes to BAC

VAC_{after} = \$100,838

Summary

- EAC/ETC changes are not changes to the Baseline. They are changes to the Forecast.
- As CAMS, you are evaluating your estimates-to-complete on a regular basis and discussing them with the Project Manager and others, as needed.
 - Venues may include: e-mail exchanges, one-on-one discussions, group meetings, tech board meetings, PMGs, etc.
- When substantive changes to the ETC appear on the horizon, and after discussions with the PM, you submit the necessary ETC changes to the PM for approval and for incorporation into Open Plan and Cobra by Project Office personnel.