



**FRA's  
Earned Value Management System  
Overview  
for  
Self Assessment Surveillance  
March 12-14, 2012**

Dean Hoffer

Head, Office of Project Management Oversight

# Outline

- EVMS History at the Lab
- FRA EVMS Documents
- FRA EVMS Process
- Non Costed Scientist Resources
- Training
- Responses to prior CARs/CIOs
- Summation

# Earned Value Management History

- A standard Cost Processing Tool (Cobra) was selected and used to support EVM on the NuMI Project starting in 1998.
- Each project had their own EVMS process and procedures but used Cobra as the cost processor.
- 1<sup>st</sup> Draft of Fermilab EVMS Description was generated in 2006, no implementing procedures at that time
- The FRA System Description and Implementing Procedures were first approved for use 17 October 2008
- NOvA is the first project to implement the FRA EVMS and represents a typical project at Fermilab. NOvA's implementation of the FRA System started in October 2008.



Department of Energy  
Washington, DC 20585

JAN 28 2010

Dr. Piermaria J. Oddone  
Director, Fermi Research Alliance, LLC  
P.O. Box 500, MS #105  
Batavia, IL 60510

Dear Dr. Oddone:

It is a pleasure to inform you that the Fermi Research Alliance, LLC (FRA) at the Department of Energy (DOE) Fermi National Accelerator Laboratory (Fermilab) site has successfully demonstrated compliance of its Earned Value Management System (EVMS) for non-information technology capital asset projects greater than \$20 million with the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748.

This certification is based on DOE's Office of Engineering & Construction Management (OECM) review of your EVM System Description (current as of January 10, 2010) and OECM's on-site review conducted May 11-15, 2009. Your team is to be commended for attaining this EVMS certification. This acceptance of the FRA EVMS requires application across all FRA acquisition projects requiring EVMS as executed under the guidance of DOE Order 413.3.

DOE expects FRA to maintain its EVMS Certification as evidenced through annual surveillance of this EVMS and submittal of a resulting report(s) directly to OECM. Recognizing that management systems are dynamic to meet changing business needs and to improve effectiveness, we further encourage continuous improvement of this EVMS as long as compliance within the ANSI/EIA-748-A is maintained. Should FRA make said improvements or changes to this Certified EVMS, FRA shall promptly notify OECM of said changes.

The Department of Energy congratulates FRA on this certification. FRA has achieved a significant milestone by demonstrating a performance measurement system that provides valid data and is effective in managing project performance.

Sincerely,

Paul Bosco  
Director, Office of Engineering &  
Construction Management

cc: Dan Lehman, SC-28  
Bruce Chrisman, FRA  
Dean Hoffer, FRA



Printed with soy ink on recycled paper

# EVMS Certification Letter

• Received Jan 28, 2010

# FRA EVMS Documents

- EVMS Documents
  - FRA Earned Value Management System Description
  - 12.PM-001 Project WBS, OBS, RAM
  - 12.PM-002 Control Accounts, Work Packages, Planning Packages
  - 12.PM-003 Work Authorization
  - 12.PM-004 Project Scheduling
  - 12.PM-005 Cost Estimating
  - 12.PM-006 Monthly Status Reporting
  - 12.PM-007 Change Control
  - 12.PM-008 EVMS Surveillance & Maintenance
- Ownership
  - Office of Project Management Oversight (OPMO) - responsible for maintaining the EVMS and maintaining interfaces with existing Fermilab business and management systems
  - Office of Quality and Best Practices (OQBP) - responsible for organizing the surveillance of the EVMS to ensure Lab adherence to the approved certified system

# Draft Updates of FRA EVMS Documents

- EVMS Documents under revision (first time since certification)
  - FRA Earned Value Management System Description
  - 12.PM-001 Project WBS, OBS, RAM
  - 12.PM-002 Control Accounts, Work Packages, Planning Packages
  - 12.PM-003 Work Authorization
  - 12.PM-004 Project Scheduling
  - 12.PM-005 Cost Estimating
  - 12.PM-006 Monthly Status Reporting
  - 12.PM-007 Change Control
  - 12.PM-008 EVMS Surveillance & Maintenance
- The draft updates are available on the OPMO review webpage  
<http://www.fnal.gov/directorate/OPMO/Projectsns/EVMS/InternalRev/FRAIntSurv/2012/EVMSdocsDraft/home.htm>
- The changes to the documents were to update the references to DOE O 413.3B, add clarification to what is timely, try to cleanup terminology with Management Reserve/Contingency, and miscellanies cleanup.
- Would like the review team to look at the changes and give us feedback as time allows.
- We will finalize these changes with any additional changes that result from this review as soon as fishable after any corrective actions are finalized.

# Primary Project Management Tools

- Accounting
  - Oracle's e-Business Suite - Project Costing Module - aka Project Accounting (PA)
- Scheduling
  - Primavera P6 (new standard), Deltek Open Plan (NOvA)
- EV Cost Processor
  - Deltek Cobra

# FRA EVMS

- Consistent with ANSI/EIA-748B Standard for Earned Value Management Systems
  - Organization
  - Planning, scheduling and budgeting
  - Accounting considerations
  - Analysis and management reports
  - Revisions and data maintenance
- Crosswalk between ANSI/EIA748B and the System Description / Implementing Procedures is in Appendix A of System Description

# Organization

- Work Breakdown Structure developed with a product-oriented focus
- WBS Dictionary defines the scope of each WBS element
- Organizational Breakdown Structure is established to ensure the project's scope of work can be efficiently managed
- Organization is likely to include collaborating institutions (universities and/or laboratories) within and outside of the USA
- Responsibility Assignment Matrix establishes the key control points and the managers of the entire project scope

# Planning, Scheduling and Budgeting

- A key part of baseline planning is establishing the project assumptions
- Schedule development is an iterative process among the CAM, Functional Managers, Project Controls and the Project Manager
- Work Packages and Planning Packages
  - We have not utilized Planning Packages in the past. The FRA System allows for both. New projects are utilizing Planning Packages while developing project schedules.
- Risk Management is an integral part of the planning process and is key driver in establishing cost and schedule contingency

# Planning, Scheduling and Budgeting

(continued)

- A consistent approach is used in developing and documenting cost estimates
- Work Authorization
  - External Work Authorization - DOE to FRA
    - Difference between Line Item and Major Item of Equipment (MIE) Projects
      - Line items authorized by directives
      - MIE authorized by Financial Plan Guidance and achieving Critical Decisions
    - NOvA is an MIE Project
  - Internal Work Authorization -Project Manager to CAMs

# Accounting Considerations

- Fermilab's Oracle eBS (electronic Business Suite) used for actual costs
- Accruals done in Oracle eBS, except for the Cooperative Agreement for Building for NOvA
- Effort Reporting & Payroll used for Fermilab labor
  - Labor at other institutions appears as M&S to us, but is “labor” in the schedules
- Indirects are applied in Oracle eBS
  - Rates set at least annually by CFO, adjusted at fiscal year end to reflect actual indirect costs at Fermilab, may be adjusted at interim dates
  - opportunities for pass-through rates
  - cap on indirects for large purchase orders at \$500K (if criteria is met)
- Actual Costs are extracted from eBS and loaded into Cobra monthly
  - Cobra and eBS totals are reconciled

# Accounting Considerations (Actual Costs)

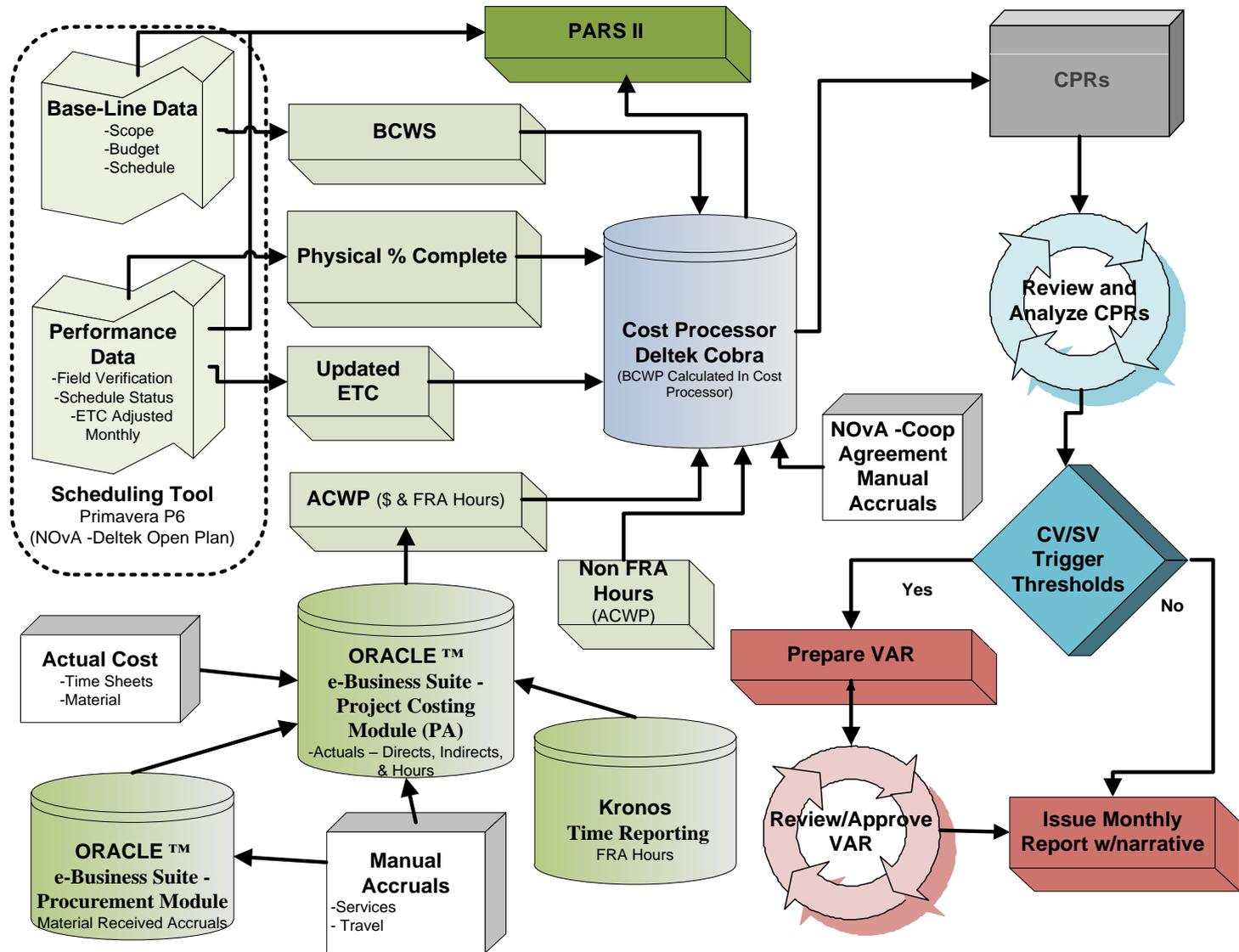
## **Labor**

- Effort reporting and Payroll data combine to generate labor costs
- Labor burdens (fringe, paid time off) applied in eBS

## **Materials & Services**

- Invoicing often lags behind the receipt of goods/services
- The Oracle eBS Material Management System automatically accrues costs for items that have been “received” at Fermilab but not yet invoiced
- Service Accruals
  - Ability to record ‘receipts’ for services
- Minimizes artificial variances where earned value not offset by invoiced costs

# Monthly Analysis and Management Reporting



# Estimate to Complete/Estimate at Completion

- CAMs can update ETC when update monthly turnaround report (gives 6 month window) by updating work to go
- CAMs review ETC/EAC at control account level during monthly status cycle
- If felt to be inaccurate, CAMs propose ETC change to the Project Manager
- Project Manager assesses; if approved, information forwarded to Project Controls for input into forecast baseline and updating in Cobra.

# Variance Thresholds (with hours)

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

Note: This applies to SV% (Schedule Variance in %) or CV% (Cost Variance in %) and the SV or CV in \$ or hours.

# VAR Threshold Determination

- VAR Thresholds in procedure 12-PM-006 are default thresholds for all projects, but can be modified based on specific project requirements.
- Modified VAR Thresholds will be presented to the PMG for approval and then added to the project's PMP that is approved.
- NOvA is using default Thresholds

# Analysis and Management Reports

(continued)

- FRA management monitors project performance including EV data from:
  - Project monthly reports
  - Monthly Project Management Group (PMG) meeting chaired by an Associate Director
  - FRA Director's Reviews prior to DOE's Office of Project Assessment review and Critical Decisions

# Project Management Group Meetings

- Monthly meetings to discuss project progress, pending work, and current/ potential issues
- Institutionalized practice for all projects covered by DOE O 413.3B
- Members
  - Project Office
  - Divisions supplying project resources
  - Supporting Sections (i.e. ES&H, Procurement, etc.)
  - Directorate (i.e. Associate Directors, OPMO, Budget Office, etc.)
  - DOE (Federal Project Director, Program Manager)
  - Collaboration Spokesperson(s)
- Members have direct control over resources, so can take action if issues arise
- PMG normally functions as project change control board

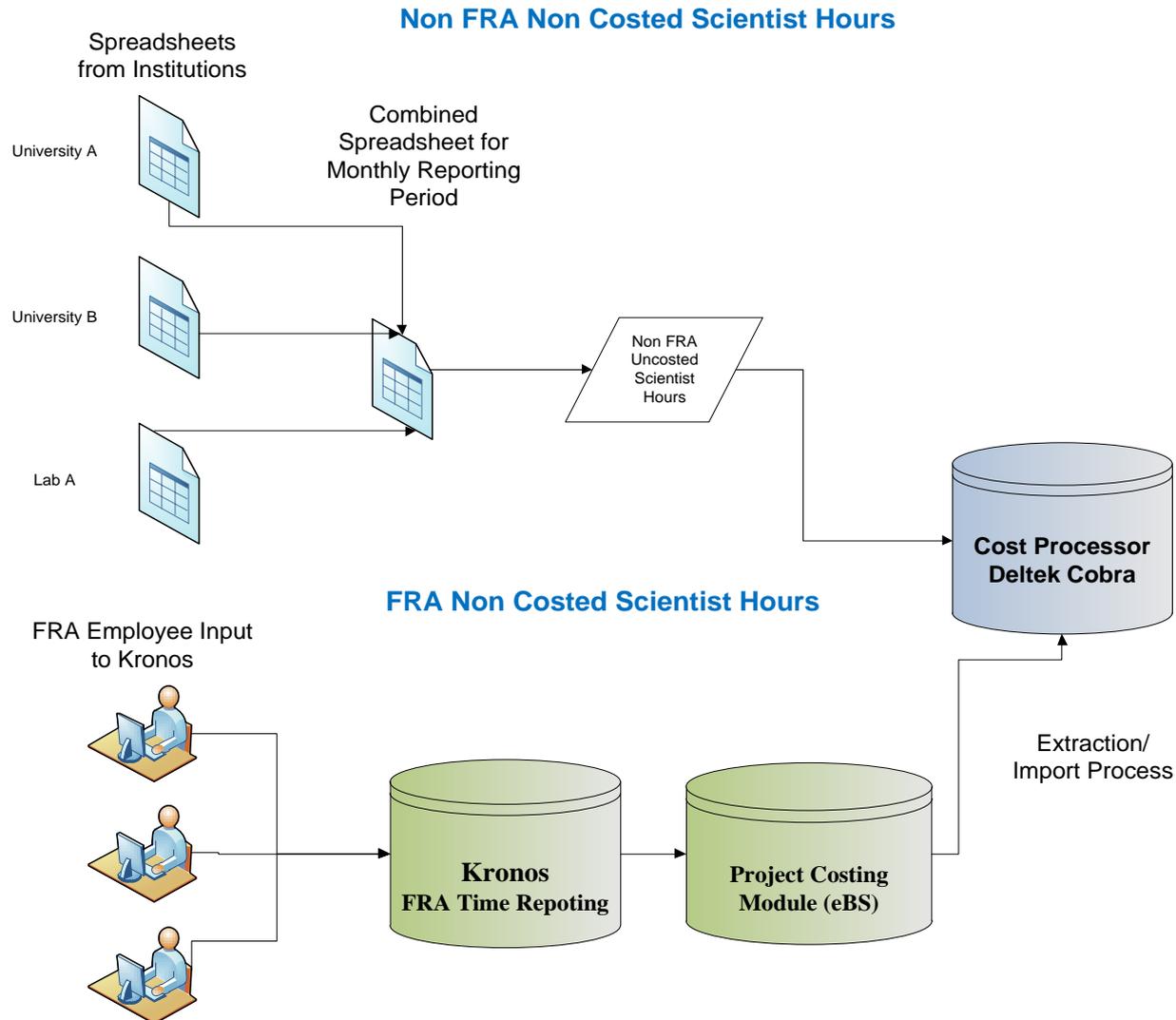
# Revisions and Data Maintenance (Change Control Process)

- Change Control Thresholds are project specific and agreed on with DOE.
- High level thresholds (DOE's) are identified in the Project Execution Plan (PEP).
- Lower level thresholds (FRA's) are identified in the Project Management Plan (PMP)

# Non Costed Scientist Resources

- Implementing Procedure 12.PM-005 Cost Estimating
  - For scientific labor on DOE projects, the labor rate will be set to comply with “OHEP Guidance to Ensure Compliance with DOE O413.3B.”
- Per OHEP guidance, scientist labor is included in the project cost under certain circumstances
- The scientist hours are loaded into the schedule and the cost processor
- Scientist work is tracked by schedule task and milestone progress
- In general, work packages with non costed scientist labor also have costed labor, which allows EV to be measured on that work
- FRA is working with OHEP and others to address this in a consistent manner across labs

# Processes for Collecting Uncosted Scientist Hours Worked



# EVMS Training

- **Refresher Training**
  - **January 6, 2012 Refresher Session (15)**
  - **March 7, 2012 Refresher Session (1)**
  - **1 CAM still to receive refresher training**
- **Current system is manual. Working on having automated reminder as part of Lab TRAIN system and Web based alternate refresher training**

# Follow-up to 2011 Surveillance

#	Description	Addressed By
CAR-01	EAC is Not Utilized Correctly on the Project	Cooper
CAR-02	Change Requests to Eliminate Variances, Timing of CR Implementation	Hoffer/ Cooper
CAR-03	Variance Analysis – Not Timely, Not Consistently Used by Project	Hoffer / Cooper
CAR-04	Variance Corrective Action Tracking	Cooper
CAR-06	Uncosted Scientific Labor Charging Inaccurately	Cooper
CAR-07	CAM Refresher Training Not Performed	Hoffer
CAR-10	Risk Assessment Not Formalized & Conducted Regularly	Hoffer / Cooper
CAR-12	Objective Measurement of EV	Cooper
CIO-05	Actual Cost Reconciliation	Hoffer / Cooper
CIO-08	Contingency / Management Reserve – Not Consistently Handled by Project	Hoffer / Cooper
CIO-09	Use and Integrity of Scheduling Data	Cooper
CIO-11	Documentation Inconsistencies	Cooper
CIO-13	EVM Implementation	Hoffer

# 2011 CARs/CIOs

## CAR-02: Change Requests to Eliminate Variances, Timing of CR Implementation

- Draft changes to EVMS System Description and 12.PM-007 (Change Control) to address when changes can be made and timeliness of processing/approval.

## CAR-03: Variance Analysis – Not Timely, Not Consistently Used by Project

- Draft changes to EVMS System Description and 12.PM-006 (Monthly Status Reporting) to define what timely processing/approval is. Each project will specify the timeframes and that will be included in the project PMP that will be concurred with by OPMO by signing the PMP.

# 2011 CARs/CIOs (continued)

## CAR-07:CAM Refresher Training Not Performed

- Refresher EVMS training has been conducted for all but one CAM on NOvA (conflict with availability). Presently manual process to trigger when a CAM/PMO personnel require refresher training. Working on automated within the Fermilab TRAIN process.

## CAR-10: Risk Assessment Not Formalized & Conducted Regularly

- Draft changes to the EVMS System Description document to define what timely/regular is. Each project will specify the frequency/process for ongoing risk assessment and that will be included in the project PMP that will be concurred with by OPMO by signing the PMP.

# 2011 CARs/CIOs (continued)

## CIO-05: Actual Cost Reconciliation

- On new projects the project controls personnel (load actuals into Cobra) and project financial personnel are the ones that extract the actuals from the Fermilab Financial System. The project's financial personnel will validate the actuals before giving the file to the PC to upload into Cobra, and then the output from Cobra will be validate.

## CIO-08: Contingency / Management Reserve – Not Consistently Handled by Project

- If future contracts have budget as part of the contract for future field changes, that future work will be put into a Planning Package until the work is specified and agreed to. Then converted to a Work Package.

# 2011 CARs/CIOs (continued)

## CIO-13

- Project Controls staff will continue to be both centralized and distributed over Divisions, Sections, Centers and Projects. Coordination, training, and logistical support for project controls are provided by the centralized Office of Project Management Oversight.

# Summation

- Documentation has been provided for you on the review website ahead of time
- Interviews have been arranged
- FRA is ready to support the Surveillance Team in the evaluation of our EVMS to
  - Verify the FRA EVMS is in compliance with ANSI/EIA-748B
  - Verify NOvA's is in compliance with the FRA Certified EVMS
- Now John Cooper will give the overview of the NOvA Project and it's implementation of the FRA EVMS