CR- 1415

Fermi Research Alliance
Earned Value Management System (EVMS)
Corrective Action Plan (CAP)
Analysis Report

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SUBMITTED TO:
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CONTRACT NO.: GS-23F-0105K

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1: EXECUTIVE SUMMARY

Through Contract # GS-23F-0105K, the Department of Energy's (DOE) Office of Engineering and Construction Management (OECM) requested that Tecolote Research, Inc. (Tecolote) direct, lead and perform an Earned Value Management System (EVMS) compliance review of Fermi Research Alliance, LLC (FRA) EVMS and its application to the NUMI Off-axis electron neutrino (ν_e) Appearance (NOνA) Project, leading to certification of FRA's EVMS.

Tecolote was requested to review the subsequent Corrective Action Plan (CAP), provide comments on the CAP to the Office of Engineering and Construction Management and review, verify and validate the implementation of the CAP. Finally, after reviewing all of the above, Tecolote is required to issue an EVMS certification recommendation and review report to OECM. Following OECM's concurrence with Tecolote's recommendation to certify the contractor, OECM then sends the contractor a certification letter.

FRA submitted their CAP on May 29, 2009. After reviewing FRA's CAP for the 3 Corrective Action Requests (CARs), Tecolote recommends that OECM accept the plans. A detailed analysis of each CAP can be found in Section 4 of this report. Table 1 below provides a summary of our assessment.

Table 1: Summary of CAP Assessment

CAR #	Description	Assessment
1	Accounting for Scientist Labor (uncosted)	Appears to be Appropriate
2	No Process/Provision for US as Holding Account	Appears to be Appropriate
3	Direct Cost for Exempt Labor	Appears to be Appropriate

2: INTRODUCTION

As part of the implementation of OMB Circular A-11, Part 7, the DOE under Order 413.3, Program and Project Management for the Acquisition of Capital Assets, requires Earned Value Management application for its contracts/projects.

Through Contract # GS-23F-0105K DOE OECM requested that Tecolote direct, lead and perform an EVMS compliance review of FRA's EVMS and its application to the NO*v*A project, leading to certification of FRA's EVMS.

The purpose of the EVMS certification review was to determine if FRA's EVMS meets the requirements and intent of the 32 EVMS Guidelines embodied in the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA-748); Standard for Earned Value Management Systems by assessing:

a. The system, as described, is fully implemented on the selected programs
b. The implementation is successful and complies with the requirements of the system description/organization's EVMS procedures, and
c. The system implemented provides timely, accurate, and auditable management information for both the organization's project management and the customer.

The EVMS Certification Process is a clinical examination of the described system, its processes, and its outputs and is not intended to assess the health of the program/projects examined during the review. Those outputs (documents and artifacts produced on the programs/projects) are used solely as evidence to validate the EVM System's compliance with the ANSI/EIA-748 Standard for Earned Value Management Systems.

3: BACKGROUND

Fermi National Accelerator Laboratory (Fermilab) builds and operates the particle accelerators, detectors and other facilities that physicists need to carry out forefront research in high-energy physics (HEP). Fermilab, located 40 miles west of Chicago, IL, is owned by the U.S. DOE and managed and operated by FRA under the DOE Contract No. DE-AC02-07CH11359. FRA is a Universities Research Association/University of Chicago limited liability corporation created specifically to manage and operate Fermilab. The DOE Office of High Energy Physics (OHEP) within the DOE Office of Science (SC) operates the Fermilab complex of accelerators, which includes the Neutrinos at the Main Injector (NUMI) facility. The NUMI facility uses protons from a Main Injector accelerator complex to produce an intense beam of neutrinos for use in long-baseline neutrino experiments designed to observe the phenomena of neutrino oscillations and study the nature of neutrino mass. The NUMI Off-axis electron neutrino (νe) Appearance (NOνA) experiment is such an experiment, and is to be realized through the NOνA Project.

The purpose of the NOνA project is:

- to fabricate the NOνA near (on the Fermilab site) and far (on the Ash River, MN site) detectors in a state ready to take data.
- to provide a detector hall at the Ash River, MN site to house the far detector.
- to upgrade the Fermilab Main Injector and Recycler accelerator facilities and the NuMI beamline facility to support NOνA.

The DOE Office of Science Director Raymond L. Orbach approved Critical Decision-Zero (CD-0), Mission Need, in November 2005 and CD-1, Alternative Selection and Cost Range, in May 2007. The project completed DOE Independent and External Independent Reviews in fall of 2007, in support of CD-2 validation and approval of the project baseline. In December 2007 Congress passed the FY08 Omnibus budget, which reduced DOE Office of Science and High Energy Physics budgets, resulting in a zeroed FY08 funding allocation for some specific DOE Science project work, including NOνA.

The CD-2 process was postponed, and the project adjusted the baseline plan within a subsequently revised funding profile and schedule to support project continuation in FY09. These revisions were subject to further DOE independent and external follow-up review. Under the revised plan, construction is planned to start in FY 2009 and Project Completion, CD-4, will be achieved in early FY 2015.

The DOE Office of Science is responsible for the NOvA Project, and its Office of High Energy Physics provides funding for the project via approved financial plans and, in part, through a DOE Cooperative Agreement (CA) with the University of Minnesota, that includes work at the Ash River, MN site. As Managing & Operating (M&O) contractor for Fermilab, FRA is responsible to DOE for carrying out the NOvA Project and providing for coordination as needed with the University of Minnesota. FRA and Fermilab, in coordination with the University of Minnesota, have responsibility for NOvA Project research and development, design, construction and transition to operations activities. The project team will coordinate project activities as needed with on-going Fermilab operations as well as other potential projects and efforts also located on the Fermilab site. FRA was awarded the $278 million DOE contract. The contract performance period is through November 2014.

4: ANALYSIS OF THE CORRECTIVE ACTION PLANS

Each of the three Corrective Action Requests (CARs) is addressed below. By item, the basis of the team's position is presented followed by the corrective action proposed by FRA. In the Analysis Section that follows Tecolote discusses the findings to include whether the CAP was responsive to the CAR and if provided, whether the artifacts were satisfactory to substantiate the proper implementation. Finally, a statement of the status of the CAR/CAP as a result of the review is provided.

Some of the text found in the CAR and CAP Sections are 'pictures' of the language found in the submittals so that the risk of misquoting or misinterpreting is minimized. Because these are a direct 'cut and paste' of the originals no changes have been made or can be made to grammar, spelling or acronyms.

CAR 1 – Accounting for Scientist Labor (uncosted)

OECM/Tecolote Observation/Finding:

The FRA EVMS is not tracking the labor of its scientists and science post-graduate students who support its NO*v*A project. This represents approximately 18 percent of the labor hours budgeted (163k/883k) for the project. In its execution, the NO*v*A project has budgeted scientists' labor hours in the schedule, but there are no labor rates related to the hours. Further, the actual hours worked by scientists are not being recorded and entered into the EVM system. As a result, cost variances cannot be determined for the work being performed. Further, where scientists' labor is included in work packages performed by others who record their hours and have associated labor rates, the cost and schedule variances for such work packages cannot be correctly calculated because costs do not include the scientists' labor costs.

Since scientists' hours are budgeted, schedule variances for this work could be determined using hours rather than dollars. However, the team did not find that this is currently being done. The EVMS standard allows cost and schedule performance to be measured using either dollars or hours. Therefore, planned, earned, and actual hours

could be used for determining schedule and cost variances. Because FRA does not capture actual hours worked by its scientists, this is not possible.

It is recognized that the unique nature of the support being provided by scientists at the various universities and that the science community culture at many places does not include accounting for their labor hours worked on projects. However, accurate project status and projections of project completion schedule and costs cannot be determined without accounting for scientists' labor.

FRA Corrective Action Plan

The FRA EVMS will track all budgeted labor on projects. Because labor requirements for projects are established in hours, tracking of labor "costs " can be done either in hours or in dollars. The FRA EVMS will track all costed labor in dollars and uncosted (scientist) labor, as applicable, in hours.

- FRA will perform EV in hours for uncosted Scientist effort budgeted on a project.
- A process will be established for the recording of scientist hours worked on a project where uncosted scientist effort is included in the hours budgeted.
- A process will be established for the collection of scientist hours worked on a project for comparison to budgeted hours.
- For non-FRA uncosted Scientist from other institutions, agreements will be made on the recording and reporting of hours worked on a project. These agreements will be documented in the Memorandum of Understanding (MOU) with each institution for new projects.
- The following documents will be revised to reflect the process for performing EV with hours
    - FRA Earned Value Management System Description
    - Procedure 12.PM-002 (Control Accounts, Work Packages, Planning Packages)
    - Procedure 12.PM-003 (Work Authorization)
    - Procedure 12.PM-005 (Cost Estimating)
    - Procedure 12.PM-006 (Monthly Status Reporting)
    - Procedure 12.PM-007 (Change Control)
- Training on these processes will be provided to CAMs, project office, senior management, and collaborating institutions.

- This corrective action will be implemented on the NOvA Project. Implementation will include modifying existing MOUs with collaborating institutions on agreement to record and report scientist effort.

Analysis

FRA has included the hours for scientists and graduate students contributing the the NO*v*A Project. These hours are without cost to FRA and are not recorded in the FRA accounting system. In its Corrective Action Plan FRA plans to budget, claim earned value on, and record and report such resources using hours rather than dollars. The NDIA PMSC EVMS Intent Guide, Guideline 9, states the following; "Budgets may be stated either in dollars, hours, or other measurable units." FRA plans to modify its EVMS description document, appropriate policies and procedures, and its MOAs with external educational institutions who provide these science resources to incorporate changes regarding how scientist and science graduate student labor is to be budgeted, reported, and measured. This appears to be an appropriate and acceptable approach to gaining visibility of resources budgeted and used in the measuring and reporting performance for the related work. Pending review of the documented procedural changes yet to be made by FRA, Tecolote finds this to be a workable, reasonable, and compliant approach to budgeting and measuring performance related to these uncosted resources and recommends acceptance of these corrective actions.

CAR 2 – No Process/Provision for UB as Holding Account

OECM/Tecolote Observation/Finding:

FRA's EVMS description does not address provisions for undistributed budget or processes/procedures for managing such. Para 3.5.2 of the FRA EVM system description states "At the present time, Fermilab projects do not employ undistributed budget as described in the NDIA Intent Guide. The team could find no process that addresses the tracking, use, distribution, and accounting for undistributed budget. While there is an Undistributed Budget (UB) Log that shows funds in a UB status, that status is instantaneous, as it is negated in the next line by a debit or credit to management reserve.

The FAR has provisions for contract letters of authorization to proceed which authorize additions/deletions of scope and budget. Should DOE issue a letter of authorization to proceed pending the preparation, review, and approval of a Baseline Change Proposal (BCP), the FRA projects currently have no process for managing such budget until the BCP is approved. Contract authorizations to proceed could direct additional scope and budget or the removal of scope and budget. Without a provision for UB, the projects have no process for segregation and management of such budget into a temporary holding account. The EVMS description should have a provision for UB and a process for the managing a UB holding account.

FRA Corrective Action Plan

FRA will revise the FRA Earned Value Management System Description to provide for the possibility of utilizing undistributed budget, as well as a description of processes for tracking, use, distribution, and accounting of such budget.

Analysis

FRA does not currently have an undistributed budget. However, if DOE would provide a directed change to the contract or if the project would identify scope that that should not be accomplished, FRA would need an acceptable holding account for the related budget. FRA's proposed change to their system description and related processes for managing this budget should satisfy the intent of Guideline 14 of the ANSI/EIA EVMS standard.

CAR 3 – Direct Cost for Exempt Labor

OECM/Tecolote Observation/Finding:

FRA is not in compliance with ANSI Guideline #16 because there is not an auditable trail beyond submitted employee time records that would validate whether

salaried exempt employees' efforts are allocated to multiple projects proportionate to their actual effort. Hours recorded may or may not represent total hours actually worked. Through review of FRA policy and procedures documentation and interviews with both accounting department and project personnel it has been determined that the FRA timekeeping system/process does not capture total hours worked. Also, there are no detailed procedures regarding recording of time worked and there is no adequate guidance to support consistent/accurate recording of time when charging to more than one project/task. Timekeeping is accomplished using two different methods; 1) manual timekeeping records (paper based) and 2) electronic timekeeping through the Fermi Time and Labor System (FTL).

The timekeeping systems/processes (for exempt employees working more than one project or charges time to more than one task within a project) as defined creates an internal control weakness allowing for unnecessary inaccuracies in how exempt employees record their time in relation to work assignments.

FRA Corrective Action Plan

All hours worked for exempt FRA employees will be recorded on a weekly basis.

The FRA Fermilab Time and Labor system will be fully implemented for exempt employees for this purpose.

Standard FRA policy and procedures have been developed. A revised Labor Capture and Distribution Policy, with specific guidance for employees regarding tracking and recording of effort, was posted on the Finance Section website on May 26, 2009. A memo was distributed from the Fermilab Director, Dr. Pier Oddone, directing employees using the FTL system to read and adhere to the new policy, which will be implemented as of June 15, 2009.

Analysis

The proposed corrective actions appear to be appropriate**.** FRA has changed its time keeping policy effective June 15, 2009, as stated in their signed policy document,

subject "Labor Capture and Distribution Policy and Procedure". It is expected that this change will be reflected in their Cost Accounting Standards disclosure statement as well. Tecolote recommends that accounting records related to this change in policy be reviewed to verify that this change has been successfully implemented across projects in which FRA's EVMS system is applicable prior to certification of the EVMS.

5: CONCLUSION

Based on the findings above, Tecolote recommends that OECM accept FRA's Corrective Action Plans. Table 2 below recaps our assessment for each of the CARs.

Table 2: Recap of CAP Assessment

CAR #	Description	Assessment
1	Accounting for Scientist Labor (uncosted)	Appears to be Appropriate
2	No Process/Provision for UB as Holding Account	Appears to be Appropriate
3	Direct Cost for Exempt Labor	Appears to be Appropriate