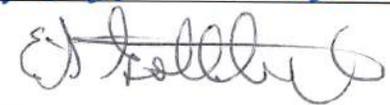


FRA EVMS CORRECTIVE ACTION PLAN

In response to the Surveillance Review Report of the Fermilab Research Alliance, LLC, Earned Value Management System (EVMS) dated August 19-20, 2013.

May 31, 2014

Updated October 27, 2014

Name/Title	Date	Signature
Marc Kaducak Head, Office of Project Support Services	30-OCT-2014	
Erik Gottschalk Head, Office of Integrated Planning and Performance Management	30-OCT-2014	
Mike Lindgren Chief Project Officer	30/10/2014	
Timothy Meyer Chief Operating Officer	30/10/2014	

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Summary

This Corrective Action Plan (CAP) identifies the FRA/FNAL management actions and responses to the independent surveillance review of the certified FRA EVMS conducted at Fermilab on August 19-20, 2013. The Surveillance Review Team performed an examination of the FRA EVMS system and procedures, as well as the application of the EVMS to the NOvA project.

Fermilab has initiated several activities to improve the Project Management culture, practices, training and documentation. These include:

- Establishing and filling the new position of Chief Project Officer
- Establishing a Project Management Planning Board
- Initiating a Project Management Improvement Initiative
- Hiring additional staff for the Office of Project Support Services
- Conducting a training program for project managers and CAMs
- Commissioning a follow up review by Bob Wunderlich

Responses to the principal findings of this review have been identified at both the project-specific level and at the FRA EVMS system level for all recommended Corrective Action Requests (CARs), Continuous Improvement Opportunities (CIOs) and Root and Contributing causes (RCCs) identified. In addition, this CAP addresses specific comments within the body of report noted by the review team.

Consistent with the guidance of the review team, the CAP focuses on actions that would have the greatest impact on recently initiated and future projects. CAP responses are entered into the Fermilab action tracking system (iTrack) and regularly monitored for completion by the Head, Office of Integrated Planning and Performance Management. While all CARs and CIO* items require tracking to closure under DOE EVMS guidance, Fermilab management has also chosen to track other CIO actions to closure through iTrack.

CARs, CIOs, RCCs, and Fermilab Responses

CAR-01: Need for improved quality (meaningful, quantitative, complete) of variance analysis reports (VARs) and records to provide effective analysis of issues and proposed corrective actions.

Additional text from review report: "VARs are inadequate for effective project management purposes; VARs were noted to be missing corrective actions and descriptions of variance impacts to budget, schedule milestones and/or critical path, explanations were generic or vague, and preparation was several months behind the occurrences. *This is a repeat issue from prior surveillances in March 2011 and March 2012.* The NOvA project is not in compliance with the Fermilab EVMS System Description and procedure."

Fermilab Responses to CAR-01 (from iTrack):

1.1 Institute a monthly review of remaining NOvA VARs to ensure that all active VARs meet laboratory-established quality attributes (prior to approval for new VARs.) The Head of OPSS will provide assistance as requested to ensure VARS meet quality standards.

Responsibility: ALD for Particle Physics (G. Bock)

Target completion date: July 1, 2014

Status as of 27-Oct-2014: Complete. NOvA achieved CD-4.

1.2 Provide a monthly progress report on all open NOvA Project-responsible EVMS Surveillance Audit CAR/CIO responses/actions to the NOvA PMG and Fermilab Project Management Planning Board.

Responsibility: ALD for Particle Physics (G. Bock)

Target completion date (initial report): July 1, 2014

Status as of 27-Oct-2014: Complete. NOvA achieved CD-4.

1.3 Define in simple matrix format the standard contents and quality attributes of a VAR, including the standards for timeliness in preparation and for complete and fully descriptive explanations, impacts and corrective actions. Incorporate this into relevant Fermilab EVMS procedures. Communicate expectations to Project management community.

Responsibility: PMII-SG (Elaine McCluskey)

Target completion date: July 1, 2014

Status as of 27-Oct-2014: Complete. Guidelines for VARs located at:

<http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-006/DT/VAR%20Preparation-20140728.pdf>

CAR-02: Coupling between risk management, Estimate-To-Complete (ETC), contingency, Management Reserve (MR) and Undistributed Budget (UB) accounts is not clearly defined and well understood across the NOvA CAMs. Some risks not quantified for cost and schedule impacts.

Additional text from review report: "The identification of MR and UB on NOvA is not compliant with ANSI/EAI-748 or Fermilab EVM System description or procedure. The method and tools utilized to generate the ETC, EAC and evaluate available contingency created concerns with the accuracy of the ETC and the EAC reported to DOE, accuracy of the current MR and UB, and if remaining contingency is sufficient to cover remaining project risks. The EAC is not inclusive of all upcoming costs and so it is difficult to make an accurate assessment of remaining contingency, which prevents a full estimate of future conditions and likely sponsor future funding requirements. CAMs could not explain the methodology for evaluating ETC/EAC and were not confident that assessments of ETC for their Control Accounts were in the final project ETC/EAC."

Fermilab Responses to CAR-02 (from iTrack):

2.1 Ensure that the NOvA project ETC is complete and reflects the full cost of work remaining on the project, including clear and consistent incorporation of the ETC analysis log, "assigned contingency" and risk mitigation actions so that all draws on contingency are fully accounted for.

Responsibility: ALD for Particle Physics (G. Bock)

Target completion date: May 1, 2014

Status as of 27-Oct-2014: Complete for NOvA, which achieved CD-4. OPSS has developed ETC/EAC training materials (located on OPSS Sharepoint) as part of the EVMS training program and has scheduled an ETC/EAC course on 31-Oct-2014.

2.2 Develop a flow diagram and a process description that captures the contributing factors and roles/responsibilities for CAMs and other project staff that are included in Project Manager's determinations of the Estimate-to-Complete and Estimate-at-Completion. Update the monthly reporting

procedure to include this as clarification. Communicate the new information to Project Managers and direct them to ensure their CAMs understand these processes in order to ensure they take full ownership of their CA, ETC.

Responsibility: Project Controls Manger (R. Marcum)

Target completion date: July 31, 2014

Status as of 27-Oct-2014: Complete for NOvA, which achieved CD-4. OPSS has developed ETC/EAC training materials (located on OPSS Sharepoint) as part of the EVMS training program and has scheduled an ETC/EAC course on 31-Oct-2014.

2.3 Develop a lab-wide process for projects to track and manage UB and MR in Cobra. Incorporate into appropriate EVMS system documents and provide training to CAMs and Project Controls staff.

Responsibility: Project Controls Manager, Office of Project Support Services (R. Marcum +S. Saxer)

Target completion date: July. 31, 2014

Status as of 27-Oct-2014: Complete. OPSS has developed an EVMS training program that covers this topic. Definitions of UB, MR, and Contingency are described in EVMS Desktop Instruction "12.PM-007.DT-04 - Contingency MR & UB" located at:

http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-007/DT/Contingency_MR_and_UB.pdf

CAR-03: Need for additional CAM training in use of Fermilab EVMS policy so that system tools serve intended purpose. Training should include CAM roles, responsibilities and accountabilities.

Additional text from review report: "This training issue results in non-compliance with ANSI/EAI-748. Despite initial/refresher training of NOvA project CAMs, the FRA EVMS management process is not fully instituted as a culture. Some CAMs were not using EVMS to effectively manage their Control Accounts and some viewed EVMS as more of a reporting than management tool and some CAMs had developed secondary processes for performance determination. On several newer projects (LHC CMS, Muon g-2) there is evidence that earlier implementation in the planning cycle instills greater confidence in EVMS use as a valuable management process."

Fermilab Responses to CAR-03 (from iTrack):

3.1 Review/revise/develop/consolidate applicable laboratory guidance that comprehensively addresses the qualifications, training, assignment, system tools and R2A2s of CAMs for major projects at Fermilab. Brief/train clarified guidance to all Project Managers and affected project staff.

Responsibility: Acting Head, Office of Project Support Services (D. Hoffer)

Target completion date: Aug. 30, 2014

Status as of 27-Oct-2014: Complete. CAM responsibilities described in "12.PM-010.DT-01 - FRA EVMS Handbook" located at: <http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-010/DT/Earned%20Value%20Management%20Summary%20Guide.pdf>

3.2 In the Project Management Plan template, write the roles/responsibilities of CAMS as well as the oversight responsibilities for project managers for CAM training and guidance.

Responsibility: PMII SG (Paul Mantsch or designee)

Target completion date (initial evaluation): October 30, 2014

Status as of 27-Oct-2014: Complete. A Project Management Plan template exists and will continue to be updated as best practices emerge.

CAR-04: Inconsistent identification and application of performance measurement techniques including Level-of-Effort (LOE.)

Additional text from review report: "Some NOvA Control Accounts contain higher LOE values than recommended for accuracy of EVM reporting and several Control Accounts contained significant percent of LOE mixed with discrete work; there appeared to be no ownership of performance measuring techniques by the NOvA CAMs interviewed."

Fermilab Response to CAR-04 (from iTrack):

4.1 Incorporating feedback from current Project Managers and CAMs, review and revise as appropriate the current Lab EVMS guidance documents to clarify and standardize consistent application of performance measurement techniques. Communicate changes in the FRA approach to project managers and project controls staff. Validate the approach is being applied through the CD-2 Director's Reviews for CMS, Muon g-2, and Mu2e Projects in 2014.

Responsibility: Project Controls Manager (R. Marcum)

Target completion date: August 31, 2014

Status as of 27-Oct-2014: Complete. Definitions and applications of performance measurement techniques described in EVMS desktop instruction "12.PM-002.DT-01 - Guidelines for PMT" located at:

<http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-002/DT/PMT%20guidance%20and%20clarification.pdf>

CAR-05: Potential for schedule integrity issues (critical path) resulting from lags, missing logic/relationships and constraints.

Additional text from review report: "The NOvA project is not in compliance with ANSI/EAI-748 or the FRA EVM System Description regarding scheduling and scheduling dependencies. *This is an unresolved repeat concern from prior surveillances in March 2011 and March 2012.*

The work scope on NOvA does not fully utilize logically sequenced activities and interdependencies required to meet project milestones and generate critical path schedules. The project schedule contains open relationships, constraints and lags (22% on in-progress work), which were not understood by CAMs; CAMs minimally used available scheduling data. There appears to be minimal interest in the project schedule at the CAM level."

Fermilab Response to CAR-05 (from iTrack):

5.1 Verify project schedule integrity in pre-CD milestone review preparation to reduce/eliminate open ends, lags and constraints; issues from prior schedule reviews/reports, scheduling system analysis reports and the disciplined approval and incorporation of schedule change requests should be part of this verification, among other factors.

Responsibility: Project Controls Manager (Richard Marcum)

Target completion date: August 1, 2014

Status as of 27-Oct-2014: Complete. Schedule integrity checklist in EVMS Desktop Instruction "12.PM-004.DT-05 - Guidelines for Schedule Review Checklist" located at:

<http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-004/DT/Schedule%20Review%20Checklist.pdf>

CAR-06: Ensure that baseline changes to the current performance period do not occur ("rubber baseline.")

Additional text from review report: "The NOvA project is not in compliance with ANSI/EAI-748 or the FRA EVM System Description regarding implementing of changes. Work packages have been added to the

baseline schedule with start date within the current performance period, a practice not in agreement with the standards noted.”

Fermilab Responses to CAR-06 (from iTrack):

6.1 Include in the Project Management Plan template guidance that compliance with the FRA EVMS procedures is the responsibility of the Project Manager and that all change requests must be reviewed and approved by the Project Controls Manager for compliance with the applicable procedures including those that govern the changing of the scheduled start date of work within the current performance period.

Responsibility: PMIISG (Paul Mantsch or designee) and Acting Head, Office of Project Support Services (D. Hoffer)

Target completion date: October 30, 2014

Status as of 27-Oct-2014: Complete. A Project Management Plan template exists and will continue to be updated as best practices emerge. EVMS procedure 12.PM-007 being revised to include updated Change Control language. EVMS procedure revisions will be presented at December 2014 EVMS Surveillance Review.

CIO*-01: Clarify level of integrated impact analysis in the change control process.

Additional text from review report: “NOvA change requests are evaluated within the management line of the CAM, but a fully cross-functional analysis of project change requests that includes affected division and project management, ESH&Q, facilities engineering and other key areas of the project can reduce the risk of unidentified impacts. The existing PMG membership may contain the expertise to perform such a role.”

Fermilab Response to CIO*-01 (from iTrack):

7.1 Work with the project managers to review/revise applicable laboratory procedure on project change control to include responsibilities (including communicating at the appropriate levels) and factors to consider when performing an integrated impact analysis of a proposed change request. Add this information to the template/requirements for Project Management Plans.

Responsibility: PMIISG (Paul Mantsch or designee)

Target completion date: October 30, 2014

Status as of 27-Oct-2014: Complete. EVMS procedure 12.PM-007 has been revised to include updated Change Control language and PMP template has been generated. EVMS Procedure revisions will be presented at December 2014 EVMS Surveillance Review.

CIO-01: Unclear accounting for spares and associated distribution of scope/budgets/costs.

Additional text from review report: “Several NOvA Control Accounts (CAs) included budgets to purchase spares, costs that were later transferred/sold to Laboratory inventory accounts. The anticipated credit for the transfer/sale was made to a separate CA, which inflates the actual project cost in the original CAs. In addition, CAMs could not explain and did not have a clear understanding of these spares transactions affecting their CAs.”

Fermilab Responses to CIO-01 (from iTrack):

8.1 Consider moving the budget for the sales of the NOvA spare parts to inventory into the appropriate CA.

Responsibility: ALD for Particle Physics (G. Bock.)

Target completion date: May 1, 2014

Status as of 27-Oct-2014: Complete. NOvA achieved CD-4.

8.2 Provide clarification and guidance in appropriate procedures to ensure that the budgeting for the purchase and accounting for sale of spares is maintained in the same CA. Ensure that the PMs communicate the project spares policy to the CAMs. Ensure that this guidance is included in PM/CAM training.

Responsibility: Project Controls Manager (R. Marcum)

Target completion date: August 30, 2014

Status as of 27-Oct-2014: Complete. Sale of spares described in EVMS desktop instruction "12.PM-002.DT-02 - Sale of Special Process Spares" located at:

http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-002/DT/Sale_of_Special_Process_Spares.pdf

CIO-02: Limited level of detail in NOvA WBS Dictionary (total scope, limited quantification.)

Additional text from review report: "Detailed work scope was not flowed down to the Control Account level of the WBS dictionary. Several NOvA CAMs were unsure of content specified in their responsible portion of the WBS Dictionary. Several WBSL2 lacked specific work scope with quantifiable equipment/device numbers. The NOvA WBS Dictionary, and the WBS Dictionaries of two new projects—CMS and Muon g-2-- do not provide the complete information required by the FRA EVMS procedure."

Fermilab Responses to CIO-02 (from iTrack):

9.1 Advise Project Managers to review/revise the WBS Dictionaries to ensure that all information required by EVMS procedure is present at least the CA level.

Responsibility: Acting Head, Office of Project Support Services (D. Hoffer)

Target completion date: July 31, 2014

Status as of 27-Oct-2014: Complete.

CIO-03: Reduced indirect rates for special procurements are assessed at the beginning of the contract as opposed to over the life of the contract.

Additional text from review report: "Much of the early procurement work may take place before the contract is awarded, the work benefits the project over the contract life. On-going indirect support costs are not assessed once the \$500K cap is realized, which shifts the costs of these indirect activities to other unrelated projects."

Fermilab Response to CIO-03 (from iTrack):

10.1 On all project procurements that qualify for the special rate, consider modifying the application of indirect expense to assess the overhead as the benefit is received (over the contract life) though: (1) estimating the indirect benefit at the start of the contract and then apply it over the contract life; or (2) restart the \$500K procurement cap at the beginning of the fiscal year to recognize that certain procurement and financial support activities are required throughout the life of the award

Responsibility: CFO (C. Conger)

Target completion date: June 30, 2014

Status as of 27-Oct-2014: Complete. From the CFO: "Management agrees that the current method of allocating indirect costs to purchased goods/services may result in a mismatch of effort and cost allocation in any particular fiscal year. While we believe this effect is immaterial with respect to the lab's overall indirect allocation methodology, it is most pronounced in the case of large complex procurements most commonly encountered by projects, where the procurement effort begins much before costs are incurred

and where the duration of the contract is generally lengthy. The laboratory is working on an alternative methodology for charging indirects on large complex procurements that will better align procurement effort with the associated indirect cost to the project. The new methodology is targeted for FY15 implementation, subject to DOE approval of the change to FRA's Cost Accounting Disclosure Statement."

CIO-04: Consider consequences of routine accounting adjustments (e.g., rate adjustments) and involve CAMs directly on impact analysis.

Additional text from review report: "Change requests to make adjustments (credits) to some NOvA CAs resulted in erroneous Level-of-Effort percentages (i.e., >100%) and increased variances, consequences of which were not recognized or understood by the responsible CAMs. CAMs were not involved in the Change Request."

Fermilab Response to CIO-04 (from iTrack):

11.1 Communicate the importance of routine accounting adjustments to project managers who will then work with their project controls staff and CAMs to understand possible impacts on EVMS reporting.

Responsibility: Project Controls Manager (R. Marcum)

Target completion date: July 31, 2014

Status as of 27-Oct-2014: Complete. Effects of rate adjustments described in EVMS Desktop Instruction "12.PM-007.DT-03 - Guidelines for Rate Changes" located at:

http://www.fnal.gov/directorate/OPMO/PolProc/12.PM-007/DT/Rate_Changes_Guidance_07.10.14.pdf

RCC-01: CAM Roles, Responsibilities, Authorities and Accountabilities.

Additional text from review report: "At least four (CAR-01, CAR-02, CAR-03, CAR-04) of the six recommended corrective actions involve the need for Fermilab management to establish clear expectations for the CAMs, provide the necessary training, and developing a process which regularly evaluates CAM performance to ensure that project-wide implementation is occurring. Fermilab management action is needed to ensure that the CAM functions are being met, including screening and/or mentoring of staff in CAM assignments. During interviews, NOvA CAMs could not consistently articulate their roles and responsibilities and did not make full use of the FRA EVMS management and reporting capabilities. CAMs did not "own" the baseline. Corrective actions concerning CAM effectiveness were identified in previous surveillances. There is a need for increased focus on CAMs working with the Project Managers to develop these roles. Pro-active support from senior lab and project leadership will encourage a culture where the full EVMS process can be an effective management tool."

Fermilab Response to RCC-01: The corrective actions to the noted CARs and CIO*-01 provide extensive attention to CAM selection, training and identification of methods for senior lab and project management to take steps to improve the culture of effective management within the EVMS system. OPSS has supplemented EVMS documentation to include guidelines in "Desktop Instructions" and has implemented an EVMS training program for CAMs, comprised of 1 hour modules with topics such as Responsibilities and Fundamentals, Performance Measurement Baseline, Schedule Development, Monthly Statusing, ETC/EAC, and Variance Reporting.

RCC-02: Repeat Issues.

Additional text from review report: "Several corrective actions were previously identified in prior surveillances, including poor schedule quality and management-approved corrective actions that were

ineffective in implementation. Most of the issues identified in the March 2012 Surveillance review remain unresolved. Confirmation/validation reviews associated with corrective action closeout need to be more rigorous. Fermilab management needs to ensure that formal closeout of corrective actions will provide for the effective implementation of the FRA EVMS as well as ensure that results are sustainable. The Corrective Action Plan should identify responsible leads in the Fermi management structure that have a continuing responsibility and accountability to ensure corrective actions are sustainable.”

Fermilab Response to RCC-02: Repeat issues were confined to a specific project (NOvA) and are not indicative of endemic issues in other projects. Actions have been identified within this CAP to improve EVMS procedures, training and oversight. The actions in this Corrective Action plan will be tracked to closure. Roles and responsibilities in the Project Management System assign responsibility for the EVMS system to OPSS and for CAM training and adherence to processes to Project Managers.

RCC-03: Timely implementation of the EVMS.

Additional text from review report: “Fermilab projects under development were noted to be implementing the FRA EVMS early in the development process. While the completion of the NOvA project relies on the collection, analysis and reporting of the detailed detector manufacturing data, the early implementation of EVMS on the developing projects will have the more significant impact on the overall effectiveness of the FRA EVMS. The EVMS Corrective Action Plan should address how the FRA EVMS will be implemented on new and developing projects.”

Fermilab Response to RCC-03: Early implementation of EVMS as noted in the report will be required on each project, with support from the Project Controls staff through OPSS. Management oversight of projects via the monthly Project Oversight Group (POG) includes attention to the timely implementation of EVMS for each project.

RCC-04: Ensuring an Adequate Support Function.

Additional text from review report: “Important EVMS activities, like modifying the EVMS Systems Description and EVMS procedures, were not completed until the surveillance review. As Fermilab moves to implement its mission through a large number of projects, the R2A2 for the Office of Project Support Services should be evaluated and a gap analysis performed to compare the size/make-up of this organization to ensure that the required project management functions, both line and support, can be effectively performed. It is necessary for Fermilab management to ensure that the right mix of staff (line and support) is available to perform the EVMS functions.”

Fermilab Response to RCC-04: The COO has initiated multi-year staff and budget planning for the functions performed by OPSS and has initiated hiring and tailored assignments of project controls and other project support expertise to support current and future projects over a 3-year window. The recent hiring of a Project Controls Manager, who coordinates project controls practices across Fermilab, has yielded substantial progress in development of documentation and training.