❖ Fermilab

Jack W. Anderson
Directorate
630.840.3930 (phone)
630.840.8752 (fax)
andersonjw@fnal.gov

Date: May 15, 2013
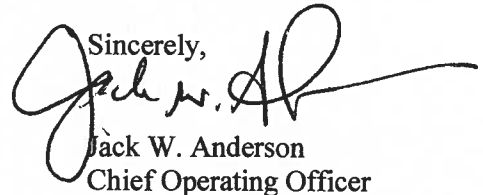
Pier Oddone
Director, Fermilab

Dear Pier:

SUBJECT: Director's Review of Fermilab Project Management Improvement Initiatives

In accordance with your direction, the plan of action with milestones that responds to the subject Director's Review has been prepared (attached).

Please note that there are actions within this initial plan that will likely produce additional corrective actions. The actions will be uploaded into the 'iTrack' issues management system for tracking until the full set of corrective actions is completed. Progress will be monitored via the Project Management Planning Board and Assurance Council.

The report and action plan will be shared with Division, Section and Center Heads, Project Managers and DOE.

Sincerely,

Jack W. Anderson
Chief Operating Officer

cc: Y-K. Kim   M. Michels
      G. Bock   C. Conger
      S. Henderson   M. Weis (DOE-FSO)
      V. White

Response to Director's Review of Fermilab Project Management Improvement Initiatives

May 14, 2013

Executive Summary

Fermilab is entering a new, transitional era defined by the transformation from operating a very large experimental facility over several decades to managing and delivering a portfolio of new projects within technical performance, budget and schedule expectations.

Throughout CY12, internal and external reviews identified some systemic weaknesses in execution of some construction activities and fabrication of components, including procurement planning and execution, cost estimating, and internal project communication. These Project Management System concerns have the potential to impact other projects and operational activities at the Laboratory if not addressed. Coincident with the recent experiences and lessons learned, Fermilab is actively planning or executing a large and growing number of new projects envisioned to come to fruition over the next decade. Any one project that does not deliver on its expectations can adversely affect the ability to obtain additional projects. To achieve this transition, the objective of the implementation plan is to identify specific actions that will provide added confidence that approved projects will be successfully completed.

This Action Plan provides an analysis and an implementation plan of action with milestones of the findings, comments and recommendations of a Director's Review Committee that was convened from March 25-27, 2013, to examine and assess the effectiveness of FNAL initiatives and plans to improve project management, including applying lessons learned from recent project performance issues.

Background

Fermilab management instituted several actions beginning in the Fall of 2012 in response to concerns arising from managing and overseeing a very large and growing construction project workload in a matrix environment during a period of contracting budgets. These actions were designed to improve the institutional capability to provide trained and effective project managers with efficient tools, systems, support and management oversight to ensure effective performance to approved baselines.

In October 2012, performance problems associated with the NOvA project were identified in a number of areas, including contingency management and reporting, that resulted in an extensive assessment and corrective actions plus lessons learned. An independent assessment of the cost to complete and needed contingency on work to go was requested by the Fermilab Directorate, and conducted in late November through early December 2012 by a team of experienced project managers external to the project.

As a result of the NOvA review and recommendations, the FNAL Director commissioned a broader and more comprehensive review, by external experts, of Fermilab project management improvement initiatives and NOvA lessons learned, with findings and recommendations delivered on April 7, 2013.

Fermilab has been on a trajectory focused on enhancements to the Project Management and Integrated Planning capabilities for some time. This is very much a work in progress - the reflections from the NOvA experience/lessons learned did further inform (and accelerate) actions that were already in process (or being planned) for the Fermilab Project Management System, while also identifying additional areas for improvement. As a result, there were several improvement themes realized with actions focused on three primary areas: *project management teams, systems/tools,* and *leadership engagement/oversight*:

Revitalizing project management teams
One of management's fundamental accountabilities is to identify, evaluate, assign and guide the development of candidates from across the Laboratory for project leadership positions. In order to facilitate this, Fermilab has established a "Project Management Planning Board" to contribute to decision making associated with leadership team appointments to each of our projects and then support those teams. The board is chaired by the Deputy Director and includes the Associate Laboratory Directors, 5 Division/Section Heads and staff support. The PMPB was established in November 2012 to provide a management board that meets regularly to identify, evaluate, develop, guide and recommend candidates from across the Laboratory (and from other organizations), for project leadership positions, capture and address lessons learned, and follow-up project leadership issues raised within Performance Oversight Group (POG) or Project Management Group (PMG) meetings. The PMPB is also charged with defining the institutional expectations for training and qualification of project management staff.

Systems and tools
Fermilab has been modernizing and standardizing systems and tools -- critical tools such as Primavera P6 and Cobra have been upgraded and their availability expanded to project staff. This has also included providing focused training on these tools for the project staff.

Attention has also been turned to providing improved service support for the projects. The Office of Integrated Planning was restructured to become the *Office of Integrated Planning and Performance Management*. Primary roles for this organization are to: (a) Leading multi-year, forward-looking planning and integration of institutional plans, programs, projects, operations and budgets; and (b) developing and maintaining integrated laboratory systems and management processes for strategic planning and goal setting, project and program oversight, enterprise risk management and performance planning and oversight. On a similar vein, the office of *Project Support Services* (formerly Office of Project Management Oversight) has been focused on enabling services, elevating the 'oversight' accountability to the Leadership Team. These changes were made effective December 1, 2012. The primary accountabilities for the Office of Project Support Services transitioned to**:**
- Providing project controls skills/staff as needed

- Supporting/Facilitating PM training and certification
- Optimizing core project management processes (scheduling, cost estimating, risk management, etc.)
- Assisting IPT leaders with project initiation phase activities
- Maintaining templates/standardized system/approaches for PM plans

In order to meet these accountabilities, additional project control staffing resources are in the process of being added to the office.

Enhanced leadership engagement and oversight
Fermilab has re-framed the manner in which projects are reviewed. Oversight of projects is transforming, and takes place at several levels.

- The "Project Management Groups" have been enhanced to provide an important forum for the Project Manager to coordinate project planning and problem solving with project team members and collaborators, laboratory and other interfacing organizations. The PMG is critical as the first-level oversight mechanism that supports the Director, ALDs and Division Heads in fulfilling laboratory project oversight responsibilities and provides a venue for Project Managers to raise significant issues to lab management for assistance, if required. The PMG meets regularly to manage issues, assess progress, evaluate performance metrics and trends, and initiate actions as needed to maintain satisfactory progress to plans. These meetings commence once a project has attained CD-0 and provide a structured forum for Project Manager to coordinate project planning and manage issues. They are co-chaired by the Project Manager and responsible line manager (with oversight accountability). The PMGs provide a structured forum for the review of:
  - Overall Project Assessment
  - Cost/Budget performance
  - Contingency management
  - Schedule performance
  - ETC/EAC
  - Risk management
  - Procurement Issues
  - Labor/staffing issues
  - Change requests

- In addition, a forum and protocol for direct engagement between the Leadership Team and the entire community of 413.3 Project Managers has been formed. The 'Performance Oversight Group' was established in December 2012 and is chaired by the Laboratory Director. The group includes the Deputy Director, Associate Laboratory Directors, the Division Heads from the Accelerator, Particle Physics and Computing Sectors and the Sections Heads from Facilities Engineering Services and ESH&Q. The POG meets on a regularly scheduled basis – the 4th week of each month (which allows for performance data to be processed through the previous month. This is a new and important environment that has been created for the community of Project Management leadership and senior Laboratory leadership to engage directly to discuss project performance with emphasis on issues that can jeopardize the project baseline. Each project provides a summary of:

- Project at a glance
- Schedule status
- Budget/cost/funding
- Contingency

- management
- Risk summary
- ES&H issues
- Project Manager Issues

The POG has also created a productive setting for project managers to learn from one-another while they are engaging line management and senior Lab leadership in a dialogue about project performance, issues, trends, challenges and lessons learned. POG meetings will also serve as an opportunity to share common experiences and identify common issues between Project and Laboratory managers.

The Director's Review of Project Management Improvement Initiatives identified a number of recommendations and areas requiring improvement, but it also reinforced the merit of the aforementioned actions taken (to date). This is important because the actions planned going forward will leverage the actions already taken. In addition, this Director's Review is the first of several reviews envisioned over the next 12-24 months to help provide added assurance that corrective actions have been effective.

Analysis and Categorization of Report Findings, Comments and Recommendations

The review committee identified a number of findings leading to six overarching recommendations that encompassed twenty-three specific observations.

Fermilab management reviewed and analyzed the committee report and identified several overarching themes (discussed below) that provided a framework and context within which to organize actions and responses. Implementation actions and responsibilities were aggregated accordingly. The goal of this approach is to ensure that the responses to the review thoroughly and effectively address the recommendations in the near and long terms to achieve sustained good project performance at Fermilab. The overarching themes determined in this characterization of the report were:

- A substantial management effort with top-down leadership is necessary to define and guide the evolution of a sustainable project management culture in the Laboratory.

- Significant aspects of the Laboratory culture require strengthening or modification, including self-assessment of project performance, communication of focused priorities for decision making, and ensuring adequate systems are in place while reducing the complexity of laboratory systems and interfaces that require undue effort by projects and jeopardize project success.

- Lessons learned from performance problems on NOvA and other projects need further assessment and systematic deployment and follow up.

- A desired end-state of project management performance and support is needed in order to develop a comprehensive plan and make periodic assessments of progress to achieve that vision.

- The Laboratory project portfolio requires a plan for continuous investment in staff, infrastructure and systems, with management oversight commensurate with this important aspect of the laboratory strategic plan and initiatives.

Implementation of Recommendations/actions.

Implementation of all actions as part of the on-going Fermilab Project Management Improvement Initiative (PMII), including those identified within this plan and any subsequent modifications, will be undertaken within a project-like structure, with assigned roles and responsibilities for coordinating with line organizations to make needed assessments, develop detailed actions, implementation schedules and milestones and regularly communicating and reporting progress to senior Laboratory management and DOE.

An accountable management structure is essential to fully develop and ensure implementation of PMII actions over a sustained period of time. The Chief Operating Officer will be accountable to the Laboratory Director for the delivery of the outcomes expressed in this Plan.

There are three particular corrective actions (1.a, 1.b, 1.c) in Attachment A that are of immediate importance. These actions focus on the development of a future end state description for Project Management at Fermilab. As an outcome of these actions, the corrective action plan will be amended with additional actions and a project plan will be developed.

The PMII Implementation Plan (Attachment A) includes milestones with which to measure progress and support communication and reporting.

Recommendation	Action	Accountability	Date
1. Perform a gap analysis to develop a more detailed plan of action for improving project management at Fermilab. This will require the development of a description of the future end state for Project Management.	a) Charter a Working Group to develop a description of the future end state for Project Management. The Working Group will include representatives from the Fermilab Project Management, Line Management and Support organization communities and will report to the Project Management Planning Board (PMPB)	Directorate (Anderson)	May 8, 2013
	b) Develop a description of the envisioned end state condition for project management at Fermilab	Working Group (Flaugher)	July 7, 2013
	c) Perform a gap analysis between as-is condition and envisioned end state. Integrate additional items into the Action Plan.	Working Group/Directorate (Anderson)	August 15, 2013
	d) Define the process for identifying, analyzing and determining potential impacts to Fermilab project management from lessons learned arising from specific issues and trends on Fermilab projects (including NOvA) and other DOE SC projects	Project Support Services (Hoffer)	June 30, 2013
	e) Assess the potential and effectiveness of the existing Fermilab QA database for lessons learned, from completeness, improvements to ease-of-use and if the project managements LL should be incorporated	Quality Assurance (Sarlina)	June 30, 2013
	f) Define and communicate uniformly to all levels of management the effort, leadership and focus required to implement LL from NOvA and other Fermilab projects	Directorate (Anderson)	July 30, 2013
	g) Develop actions to bridge the gaps (1.c) in the near and longer terms; include project management initiatives underway as part of corrective actions. Include metrics and reporting provisions to measure progress to the defined end state	IPPM (TBD[1], Anderson)	September 15, 2013
	h) Plan and schedule follow-up Director's Review(s) to provide objective assessment of effectiveness	Directorate (Oddone)	January 31, 2014

[1] Refer to action 2.a

Recommendation:	Action:	Accountability	Date
2. Clarify R2A2s for project management and oversight personnel for key personal (POG membership). This is important to ensure that clear and timely decisions are being made by the people with authority for those decisions.	a) Recruit a Head for the Office of Integrated Planning and Performance Management (IPPM)	Directorate (Anderson)	July 31,2013
	b) Identify and define R2A2's for project management and oversight personnel for key personnel	IPPM (TBD[2], Anderson)	December 1, 2013

---

[2] Refer to action 2.a

Recommendation:	Action:	Accountability	Date
3. Ensure that adequate Laboratory-wide project management tools are in place and being actively used to manage the proposed projects. Compare the existing project management tools to those being used by other DOE labs to assist in determining an appropriate standard. Make the investment to ensure that Fermilab project management systems are consistent with other DOE labs.	a) Develop/refine project stoplights/dashboards for PMG and POG as an assurance tool for management	IPPM (Strawbridge)	May 31,2013
	b) Add the WDRS Head to the POG	Directorate (Oddone)	May 31, 2013
	c) Evaluate and identify measures that optimize the partnership between the scientific & technical divisions, senior support staff and projects as they affect the ability to deliver on lab-wide priorities.	COO, CRO (Anderson, Kim)	June 15, 2013
	d) Identify measures and management support needed (including a resources assessment) to improve rate of progress in making PSS fully functional and effective	Directorate (Anderson)	June 30, 2013
	e) Develop and implement a consistent risk management approach with templates that consider risk identification, mitigation measures and tracking/trending capability	IPPM/PSS (Strawbridge/ Hoffer)	June 30, 2013
	f) To facilitate early planning for projects develop guidelines that include standardized "best example" (i.e., template) documents	Project Support Services (Hoffer)	August 1, 2013
	g) Develop and implement a consistent approach to developing EAC, ETC, cost contingency, schedule float, etc. on all projects	Project Support Services (Hoffer)	August 31, 2013
	h) Standardize and implement project management tools and training. Evaluate and consider adopting effective tools in other labs, as appropriate	Project Support Services (Hoffer)	September 30, 2013
	i) Develop and implement a consistent project management self-assessment system that provides Lab and project management confidence that proposed project baselines are credible and can be achieved before submitting to external (DOE) review.	IPPM (TBD[3], Anderson)	September 30, 2013

[3] Refer to action 2.a

	j) Implement all planned project management procedures, prioritizing those that support the EVMS certification process.	Project Support Services (Hoffer)	December 1, 2013
	k) Complete corrective actions remaining from the Project Procurement Review and ensure procurement systems are effectively implemented.	Business Services (Irvin)	September 30, 2014

Recommendation:	Action:		Accountability	Date
4. Create a budget profile for all Fermilab projects for the next 5 years and compare totals to anticipated funding levels to determine if adequate funding exists to meet existing project assumptions. Reconcile any discrepancies between the anticipated and assumed funding levels and establish laboratory priorities for project needs.	c)	Recruit a Head for the Office of Integrated Planning and Performance Management (IPPM)	Directorate (Anderson)	July 31, 2013
	d)	Define a laboratory strategy and portfolio management process for resourcing multiple simultaneous projects with clear laboratory priorities and decision-paths that reflects budget realities	IPPM (TBD[4], Anderson)	December 1, 2013

---

[4] Refer to action 2.a

Recommendations:	Action:	Accountability	Date
5. The Fermilab matrix management system has an inordinate number of requirements and constraints. For the matrix resources, the BOEs should be summed up/consolidated to identify specific skill set deficiencies. This should be done early to ensure that these critical skill sets deficiencies do not become critical path items.	a) Assess methods to improve strategic HR planning that supports project and laboratory critical skills, including competitive compensation programs, retention of key staff and recognition of those who deliver on key missions, and hiring of specialized skills	WDRS (Van Vreede)	September 30, 2013
	b) Assess/verify the documented basis for agreement between the project manager and matrix organizations to understand and agree on project requirements. Verify that these requirements— including availability of specific critical skill sets and infrastructure -- are the basis for project cost, schedule and resource assessments.	Project Management Planning Board	September 30, 2013
	c) Consider ways to simplify matrix resource interfaces and requirements and also methods to increase/improve communication and coordination effectiveness.	Project Management Planning Board	October 31, 2013
	d) Develop a process for evaluating the matrix model support to large projects that ensures the project has the necessary long-term dedicated resources, recognizing that some amount of matrixed resources may still be needed	Project Management Planning Board	October 31, 2013
	e) Assess ways to reduce/mitigate the management challenges and risks associated with high staff fragmentation on projects.	Project Management Planning Board	October 31, 2013

Recommendations:	Action:	Accountability	Date
6. Ensure that there are clear assumptions for all Fermilab projects and manage these assumptions as if they were requirements. Examples are: timing for availability of matrix resources, assumed funding profiles, lab overhead and labor rates, Muon Campus improvements, and existing infrastructure to be available when needed.	a) Review the process for developing baselines to ensure the documentation of assumptions and other critical constraints.	Project Support Services (Hoffer)	July 15, 2013
	b) Assess/verify if assumptions used to establish project baselines are adequately documented such that any significant changes proposed that impact project scope, cost or schedule are able to be analyzed before making decisions	Project Support Services (Hoffer)	August 15, 2013