

Executive Session

**Director's Independent Design and
CD-2/3 Review of Muon g-2 Project
June 17-19, 2014**

Steve Holmes

Agenda for Exec Session

- Charge
- Typical CD-2/3 Documents
- Review Agenda
- Subcommittee Assignments
- Reviewer Writing Assignments
- Reporting Structure
- Discussion

Charge (excerpts)

The Committee shall conduct a Director's Independent Design and CD-2/3 Review of the Muon g-2 Project from June 17-19, 2014 to assess if the Project meets the Critical Decision (CD) 2/3 (CD-2, Approval of Performance Baseline and CD-3, Approval to Start Construction) requirements as specified in DOE O 413.3B. The Muon g-2 Project received CD-1 approval on December 19, 2013. **The Project is scheduled for a DOE CD-2/3 Review on July 29-31, 2014.**

The Committee should assess the Project's progress on addressing the recommendations from these prior Reviews.

The review committee will assess the level of maturity of the Project's design based on the Muon g-2 Project's Technical Design Report (TDR), drawings, specifications, and discussions with the Project team. **CD-2 requires design development to the preliminary level or greater, and CD-3 requires final design complete or sufficiently mature to begin procurement or construction.**

Charge (continued)

The review committee will assess the readiness of the project for CD-2/3 readiness including the completeness and self-consistency of the technical scope and final design work, cost estimate, schedule and management systems and staffing. The committee will evaluate the current schedule, taking risks into consideration, and determine if the Project's scope of work can be accomplished within the approved Total Project Cost (TPC) by the CD-4 date. The committee is to assess if the Project team is in place to implement full construction while providing monthly status/progress reports to DOE and Lab Management on cost/schedule against the Project Plan. The committee will also assess and confirm that ESH&Q has been adequately addressed.

The review committee should address the specific charge questions in determining the Project's readiness for CD-2/3

Typical CD-2/3 Documents

- Acquisition Strategy
- Project Execution Plan
- Project Management Plan
- Project Organization Chart
- Final Design Requirements Established
- Technical Design Report (TDR)
- Hazards Analysis Report (HAR)
- Integrated Safety Management Plan
- Issue final National Environmental Policy Act (NEPA) determination
- Quality Assurance Plan (QAP)
- Configuration Management Plan
- Procurement Management Plan
- Established Cost and Schedule Performance Management Baseline (PMB)
- Risk Management Plan
- Risk Register & Assessment
- Resource Loaded Schedule
- Resource Profile Graphs
- Assumptions Document
- WBS Dictionary
- Milestone Dictionary
- BOEs w/reference documents
- Monthly Status Reports

Typical CD-2/3 Documents (continued)

- Scope Contingency Plan (potential adds and removals)
- Lifecycle Costs with Alternative Assessment
- Memos of Understanding (MOUs) / Statement of Work (SOWs)
- Science & Technical Requirements and Specifications

Documentation to Demonstrate EVMS Compliance

Organization

- Project WBS
- Project Organization Chart
- Responsibility Assignment Matrix (RAM) with Dollars & % LOE by CA
- Project Execution Plan & Project Management Plan
- DOE CD Approval Documents
- CA Plan – Work Authorization Docs

Planning, Scheduling, & Budgeting

- Performance Baseline Document
 - Scope – WBS Dictionary
 - Schedule – Summary & Detailed Schedule
 - Cost Baseline – Cost Plan by Fiscal Year (includes BOE, Assumptions)
- Risk Management Plan
- Risk Registry & Analysis

Documentation to Demonstrate EVMS Compliance (continued)

Accounting Considerations

- Sponsor Work Authorization (same as DOE CD approval documents)
- Finance Charge Code Mapping to WBS (may be part of RAM)

Analysis & Management Reports

- Variance Threshold Table
- Monthly Performance Reports - (3 months preferred)
- Cost Performance Reports by CA (3 months preferred)

- Variance Analysis Reports - (3 months preferred)
- EAC Analysis (Yearly, Monthly)
- Corrective Action Log

Revisions & Data Maintenance

- Baseline Change Control Log
- Baseline Approved Changes – (3 months)
- Contingency & MR Log

Committee Organization

- This is both an IDR and a CD2/3 Review = lots of work
- Accelerator, Ring, and Detectors subcommittees are responsible for reviewing technical development (IDR) and resource identification (including looking at representative BOEs), and assessing the extent of final designs
 - From a practical perspective I would suggest we regard a design as final when it can be used as a basis for proceeding to spend funds in an efficient manner.
- Cost & Schedule Subcommittee will do both drill downs and an assessment of process and documentation of cost/schedule
 - Need to look at risk associated with elements not yet at final design
- Management Subcommittee will assess the state of all CD2/3 documentation
- ESH&Q Subcommittee will review hazards/impacts and associated documentation

Interfaces

- The Muon Campus AIPs are not formally part of this review, but they will be presented. We need to confirm they understand the interfaces.
- Commissioning is not part of this review. However I would suggest the technical subcommittees satisfy themselves that the team has sufficient understanding to be providing appropriate diagnostics and controls

Review Philosophy

- Q: Is the spirit of this review to assess whether what is proposed will work from a technical perspective, or whether it can be executed successfully as a project?
- A: Yes & yes

Agenda

Tuesday, June 17

EXECUTIVE SESSION – Comitium (WH-2SE)

8:00 – 8:50 AM 50 Executive Session Steve Holmes

PLENARY SESSION – Curia II (WH2SW)

8:50 – 9:10 AM 20 Welcome and the Fermilab Context Greg Bock

9:10 – 10:05 AM 55 Project Overview Chris Polly

10:05 – 10:15 AM 10 BREAK – WH2 Crossover (WH2XO)

10:15 – 10:55 AM 40 WBS 476.2 Accelerator Mary Convery

10:55 – 11:45 AM 50 WBS 476.3 Ring Hogan Nguyen

11:45 – 12:25 PM 40 WBS 476.4 Detectors Brendan Casey

12:25 – 1:15 PM 50 LUNCH – Tables available on WH2 Crossover

TOUR

1:15 – 2:15 PM 60 Tour of MC-1 Building

PARALLEL BREAKOUT SESSIONS

2:15 – 3:30 PM 75

Session 1: WBS 476.01 Project Management– Comitium (WH2SE)

Session 2: WBS 476.02 Accelerators – Theory (WH3NW)

Session 3: WBS 476.03 Ring– Curia II (WH2SW)

Session 4: WBS 476.04 Detectors – Racetrack (WH7XO)

3:30 – 3:45 PM 15 BREAK – Outside Comitium (WH2SE)

Agenda (continued)

PARALLEL BREAKOUT SESSIONS - continued

3:45 – 4:45 PM 60

Session 1: WBS 476.01 Project Management– Comitium (WH2SE)

Session 2: WBS 476.02 Accelerators– Theory (WH3NW)

Session 3: WBS 476.03 Ring– Curia II (WH2SW)

Session 4: WBS 476.04 Detectors– Racetrack (WH7XO)

4:45 – 5:30 PM 45 Subcommittee Executive Session – in Breakout Rooms

5:30 – 6:30 PM 60 Full Committee Executive Session – Comitium (WH2SE)

Wednesday, June 18

PARALLEL BREAKOUT SESSIONS - continued

8:00 – 9:45 AM 105

Session 1: WBS 476.01 Project Management – Comitium (WH2SE)

Session 2: WBS 476.02 Accelerators– Theory (WH3NW)

Session 3: WBS 476.03 Ring– Curia II (WH2SW)

Session 4: WBS 476.04 Detectors– Racetrack (WH7XO)

9:45 – 10:00 AM 15 BREAK – Outside Comitium (WH2SE)

Agenda (continued)

PARALLEL BREAKOUT SESSIONS - continued

10:00 – 11:45 AM 105

Session 1: WBS 476.01 Project Management – Comitium (WH2SE)

[Continuation if needed]

Session 2: WBS 476.02 Accelerators – Theory (WH3NW)

Session 3: WBS 476.03 Ring – Curia II (WH2SW)

Session 4: WBS 476.04 Detectors – Racetrack (WH7XO)

11:45 – 12:45 PM 60 **LUNCH – Tables Available on WH2XO**

12:45 – 1:45 PM 60 Response to reviewer questions from Day One and questions from the morning breakout sessions – Comitium (WH2SE)

1:45 – 3:30 PM 105 Subcommittee Executive Session/Report writing – **in Breakout Rooms**

3:30 – 3:45 PM 15 **BREAK – Comitium (WH2SE)**

3:45 – 5:00 PM 75 Full Committee Executive Session/Report writing - Comitium (WH2SE)

Agenda (continued)

Thursday, June 19

8:00 – 10:00	AM	120	Committee Report writing - Comitium (WH2SE)
10:00 – 10:30	AM	30	BREAK – Outside Comitium (WH2SE)
10:30 – 1:30	PM	180	Full Committee Executive Session Dry Run – Comitium (WH2SE) with Working Lunch
1:30 – 2:30	PM	60	Closeout Presentations – One West (WH1W)
2:30	PM		Adjourn

Agenda (continued)

Table 1
Subcommittee Breakout Session Available Talks

Tuesday, June 17, 2014

- B01 WBS 476.01 Project Management – Comitium (WH2SE)
 - B01-1 Cost and Schedule: Chris Polly (Fermilab)
 - B01-2 Risk Registry: Chris Polly (Fermilab)
 - B01-3 Muon Campus Interface: Chris Polly (Fermilab)
 - B01-4 ESH&Q: Wyatt Merritt (Fermilab)
 - B01-5 Documentation Status: Wyatt Merritt (Fermilab)
 - B01-6 Review Responses to Previous Reviews: Wyatt Merritt (Fermilab)

- B02 WBS 476.2 Accelerators – Theory (WH3NW)
 - B02-1 Accelerator Management: Mary Convery (Fermilab)
 - B02-2 Muon Campus Program: Mary Convery (Fermilab)
 - B02-3 Muon g-2 WBS 476.02.02 Target Station: Dean Still (Fermilab)
 - B02-4 Final Focus, M2 & M3 Lines: Jim Morgan (Fermilab)

- B03 WBS 476.3 Ring – Curia II (WH2SW)
 - B03-1 L3 Talk for Ring Magnet: Del Allspach (Fermilab)
 - B03-2 L3 Controls and Instrumentation: Dan Markley (Fermilab)
 - B03-3 g-2 Inflector 476.03.03: B. Lee Roberts (Boston)
 - B03-4 Installation Technical Talk: Aria Soha (Fermilab)
 - B03-5 Inflector Magnet – New Design: Vladimir Kashikhin (Fermilab)
 - B03-6 Shield Studies: Emanuela Barzi (Fermilab)
 - B03-7 Alignment Technical Talk: Horst Friedsam (Fermilab)
 - B03-8 Power Supplies, Electrical Distribution and Grounding: Steve Chappa (Fermilab)
 - B03-9 Test of Splices for G-2 Muon Ring Main Magnet: Emanuela Barzi (Fermilab)

- B04 WBS 476.4 Detectors – Racetrack (WH7XO)
 - B04-1 Omega g Overview: David Hertzog (University of Washington)
 - B04-2 Beam Dynamics: Thomas Gadfort (Fermilab)
 - B04-3 L3 Tracker: Brendan Casey (Fermilab)
 - B04-4 Auxiliary Detectors: Fred Gray (Regis)

Executive Sessions

- Tuesday pm
 - Subcommittees 4:45-5:30
 - Start developing an initial reaction and identification of any issues
 - Full Committee 5:30-6:30
 - Concise (10') report from each (of 6) subcommittee chair
 - Initial reactions
 - Follow-up requests for tomorrow
- If any additional requests for follow-up come up on Wednesday am, please feed to me immediately

Executive Sessions

- Wednesday pm
 - Response to questions 12:45-1:45
 - Any additional requests for follow-up that arise on Wednesday am need to be fed to me immediately
 - Subcommittees 1:45-3:30
 - Draft findings, comments, and recommendations
 - Initial thoughts on responses to specific charge questions
 - Full Committee 3:45-5:00
 - Concise (10') report from each (of 6) subcommittee chair
 - Draft comments and recommendations
 - Initial thoughts on specific charge questions

Executive Sessions

- Thursday am
 - Report writing 8:00-10:00
 - Final draft of subcommittee reports
 - Draft of responses to specific charge questions
 - Full Committee dry run 10:30-1:30
 - Subcommittee chairs will present comments and recommendations
 - Designated committee members will present charge questions
- Thursday pm
 - Closeout 1:30-2:30
- Aftermath
 - I will ask the subcommittee chairs and the members assigned to specific charge questions to update final drafts as needed and forward to me and Dean by June 25

Reviewer Subcommittee Breakout Assignments

Breakout Sessions	Reviewers
1. Project Management – Comitium (WH2SE)	Jemila Adetunji* Ruben Carcago - Observer Nancy Grossman Steve Holmes Sherese Humphrey* Marc Kaducak Amber Kenney* Richard Marcum* - Observer Elmie Peoples-Evans* Pam Utley*
1. Accelerator (WBS 476.02) - Theory (WH3NW)	Dave Capista Marion White Bob Webber
1. Ring (WBS 476.03) – Curia II (WH2SW)	Wuzheng Meng Lou Snystrup Mike Tartaglia
1. Detectors (WBS 476.04) – Racetrack (WH7XO)	Harry Cheung Brenna Flaughter Alan Hahn

*Cost/Schedule and ESH&Q Reviewers will rotate between breakouts

Reviewer Writing Assignments

Executive Summary	<u>Steve Holmes</u>
<u>1.0 Introduction</u>	
2.0 Technical	
2.1 Accelerator	<u>Marion White*</u> Dave Capista Bob Webber
2.2 Ring	<u>Lou Snyder*</u> Wuzheng Meng Mike Tartaglia
2.3 Detectors	<u>Alan Hahn *</u> Harry Cheung Brenna Flaughner
3.0 Cost and Schedule	
3.1 Cost	<u>Elmie Peoples-Evans*</u> Sherese Humphrey Pam Utley Richard Marcum
3.2 Schedule	
4.0 ESH&Q	<u>Amber Kenney*</u> Jemila Adetunji
5.0 Management	<u>Ken Stanfield*</u> Marc Kaducak Nancy Grossman Ruben Carcagno

Note: * Indicates Subcommittee Lead and integrator of write-ups
Underlined names are the primary writer.

Reviewer Writing Assignments (continued)

6.0 Charge Questions	
TECHNICAL	
6.1 Is the Project's design appropriately developed and documented in the Muon g-2 Technical Design Report (TDR)? Does the design satisfy the performance requirements to carry out the scientific mission? Is the final design sufficiently mature such that the Project can initiate procurements and start construction? What outstanding design risks remain? For those elements of the design that are not yet finalized, has the Project shown that there are no major risks or issues that impede a clear path to a final design?	<u>Bob Webber</u> <u>Mike Tartaglia</u> <u>Harry Cheung</u> All
COST/SCHEDULE/FUNDING	
6.2 Has the Project developed a resource-loaded schedule that includes the Project's full scope of work? Is the schedule realistic and achievable?	<u>Pam Utley</u> All
6.3 Are the cost and schedule estimates complete and credible? Do they include adequate scope, cost and schedule contingency?	<u>Sherese Humphrey</u> All
6.4 Has the Project documented the Basis of Estimate (BOE) that supports the baseline cost and schedule presented?	<u>Elmie Peoples-Evans</u> All
6.5 Is the scope of work clearly defined between what is funded by DOE or NSF, and is this reflected in the cost, schedule and risk assessment presented to the committee?	<u>Richard Marcum</u> All

Note: * Indicates Subcommittee Lead and integrator of write-ups
Underlined names are the primary writer.

Reviewer Writing Assignments (continued)

MANAGEMENT	
6.6 Has the Project implemented Risk Management by identifying risks, performing a risk assessment (qualitative and quantitative) and developing mitigation plans?	<u>Nancy Grossman</u> All
6.7 Is CD-4 achievable with the Project's risks and within the DOE approved Total Project Cost?	<u>Nancy Grossman</u> All
6.8 Has the Project updated required project management documents per DOE Order 413.3B for CD-2/3 and per the Fermilab Project Management System?	<u>Marc Kaducak</u> All
6.9 Are the Project organization and staffing levels adequate to initiate construction and manage the work to achieve CD-4?	<u>Ken Stanfield</u> All
6.10 Are ESH&Q aspects being properly addressed at this stage?	<u>Amber Kenney</u> <u>Jemila Adetunji</u> All
6.11 Does the Project's process for monthly progress reporting satisfy DOE and Laboratory requirements?	<u>Marc Kaducak</u> <u>Elmie Peoples-Evans</u> All
6.12 Has the Project properly addressed the recommendations from the DOE CD-1 Review, the Director's CD-1 Review and the Independent Conceptual Design Review?	<u>Marc Kaducak</u> <u>Ruben Carcagno</u> All
6.13 Is the Muon g-2 Project ready for a DOE CD-2/3 review in July?	<u>Steve Holmes</u> All

Note: * Indicates Subcommittee Lead and integrator of write-ups
Underlined names are the primary writer.

Reporting Structure

- Results of the review are to be documented as findings, comments, and recommendations.
- The answers to the charge questions are to include feedback from each subcommittee.
- Any additional actions required to be completed by the project team to acceptably address the review charge are to be documented as Recommendations.
- Findings, Comments , Recommendations and answers to the questions are to be presented in writing at a closeout with Muon g-2 project team and Fermilab's management.

Findings, Comments, and Recommendations

- Findings
 - Findings are statements of fact that summarize noteworthy information presented during the review.
- Comments
 - Comments are judgment statements about the facts presented during the review. The reviewers' comments are based on their experiences and expertise.
 - The comments are to be evaluated by the project team and actions taken as deemed appropriate.
- Recommendations
 - Recommendations are statements of actions that should be addressed by the project team.
 - A response to the recommendation is expected and that the actions taken would be reported on during future reviews.

Reviewer Write-ups

- Write-up Closeout Template is posted on Director's Review Webpage.

http://www.fnal.gov/directorate/OPMO/Projects/g-2/DirRev/20140617/Closeout_Presentation_g-2_DI_CD-2-3_Review.docx

- Write-ups (including answers to charge questions) are to be sent to Lisa Temple at ltemple@fnal.gov prior to 10:00 AM on Thursday, June 19 for the Closeout Dry Run starting at 10:30 AM in the Comitium
- A final report will be issued within 2 weeks after the closeout.

Discussion

- Questions and Answers