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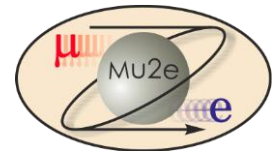
# Charge Review

## WBS 3.0

T. Lackowski

L2 Manager

10/22/2014



# Review Charge

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I request that you conduct an Independent Project Review of the Muon-to-Electron Conversion (Mu2e) Project on August 19–21, 2014 at Fermilab. The purpose of this review is to evaluate the project's readiness for Critical Decision CD-2 which will approve of the proposed Performance Management Baseline for technical scope, cost and schedule, as well as the project's readiness for Critical Decision CD-3b which will approve the continuation of procurement and fabrication. Critical Decision CD-3a permitted the initial procurement of conductor for the project.

Your review committee is requested to perform a general assessment of the project's progress, current status, and the identification of potential issues, as well as addressing the following specific questions for CD-2:

1. Do the proposed technical design and associated implementation approach satisfy the performance requirements? How has the project team ensured that the subsystems will be fully integrated? Are the CD-4 goals reasonable and well defined?
2. Is the cost estimate and schedule consistent with the plan to deliver the technical scope? Is the contingency adequate for the risk?
3. Are the management structure and resources adequate to deliver the proposed technical scope within the baseline budget and schedule as specified in the PEP?
4. Is the documentation required by DOE Order 413.3B for CD-2 complete?
5. Are ES&H aspects being properly addressed given the project's current stage of development?
6. Has the project responded satisfactorily to the recommendations from the previous independent project review?

The committee is also asked to address the following questions specifically for CD-3b:

7. Is the detailed design sufficiently mature so that the project can continue with procurement and fabrication? Has there been adequate progress on the long-lead procurement activities approved under CD-3a?
8. Is the documentation required by DOE Order 413.3B for CD-3b complete?

# Charge # 1

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- 1. Do the proposed technical design and associated implantation approach satisfy the performance requirements? How has the project team ensured that the subsystems will be fully integrated? Are the CD-4 goals reasonable and well defined.
  - The physical design is well understood by the stakeholders and much effort has been expended to insure that the technical apparatus will fit, and be serviced and operated safely. Mechanical and electrical requirements are well known and are satisfied, with reasonable margin.
  - Requirements and Interface documents are approved by stakeholders.
  - The following link take you to the Fermi Project Management Policies and procedures.

<http://www.fnal.gov/directorate/OPMO/PolProc/home.htm>

# Charge #2

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- Is the cost estimate and schedule consistent with the plan to deliver the technical scope? Is contingency adequate for the risk?
  - ICE was within .4% for the remaining work scope. The apparent successful proposal for the major construction package is 4% less than the engineers estimate.
  - The schedule was based on the experience Fermilab has had with small business subcontractors based on the MC-1 construction progress.
  - All of my major risks have been mitigated, transferred, retired or accepted. There are still a number of “standard” construction risks which are being monitored.

# Charge #3

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- 3. Are the management structure and resources adequate to deliver the proposed technical scope within the baseline budget and schedule as specified in the PEP?
  - From the sub-project management level the PM has communicated the need to stay within the cost and schedule baseline. The tools and personnel to monitor and analyze the work status exists.

# Charge #4

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- 4. Is the documentation structure by DOE Order 413.3b for CD-2 complete?
  - While many of the documents have been completed by the Level One project manager WBS 475.03 has:
    - Contributed to a number of the documents such as the HA and TDR.
    - Have read, not memorized, all of the management documents such a PEP, PMP, and Acquisition Strategy. Know where to find what I need to manage my subproject.
  - Addressed and completed those items unique to my subproject.

# Charge # 5

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- Are ES&H aspects being addressed given the project's current stage of development?
  - ES&H was considered and addressed in the design.
    - Aisles for installation, maintenance
    - Life safety
    - NEPA
  - Construction Safety
    - Building on the established ISM program
    - Separate superintendent and safety representative
    - Subcontractor's corporate ES&H involvement
    - Consultant ES&H

# Charge # 6

- 6. Has the project responded satisfactorily to the recommendations from the previous independent project review?
  - Responses from past reviews.

Mu2e-doc-#	Title	Author(s)	Topic(s)	Last Updated
<a href="#">4405-v8</a>	<a href="#">Replies to Recommendations from Director's pre-CD-2/3b Review</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">FNAL Reviews</a>	13 Oct 2014
<a href="#">4657-v0</a>	<a href="#">Replies to Recommendations from Solenoid AOC meeting no. 6</a>	<a href="#">Michael J Lamm et al.</a>	<a href="#">Internal Reviews</a> <a href="#">Solenoids</a>	10 Oct 2014
<a href="#">2358-v8</a>	<a href="#">Replies to CD-1 Recommendations</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">CD-1</a>	10 Oct 2014
<a href="#">2067-v9</a>	<a href="#">Replies to Recommendations from Independent Design Review</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">FNAL Reviews</a>	10 Oct 2014
<a href="#">4316-v2</a>	<a href="#">Replies to Action Items from the CD-3a Review</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">DoE Reviews</a>	10 Oct 2014
<a href="#">4155-v2</a>	<a href="#">Replies to Action Items for DOE 27-February-2014 Briefing</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">DoE Reviews</a>	25 Jun 2014
<a href="#">3457-v4</a>	<a href="#">Replies to Action Items for DOE 25-September-2013 Briefing</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">DoE Reviews</a>	14 May 2014
<a href="#">2240-v7</a>	<a href="#">Responses to Recommendations from the Director's pre-CD1 Review</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">FNAL Reviews</a> <a href="#">CD-1</a>	14 May 2014
<a href="#">4076-v2</a>	<a href="#">Minutes from IB Meeting of 17 April 2014</a>	<a href="#">Doug Glenzinski</a>	<a href="#">Institutional Board</a>	28 Apr 2014
<a href="#">4112-v1</a>	<a href="#">Questions/Replies from Tracker digitizer review</a>	<a href="#">Vadim L Rusu</a>	<a href="#">Internal Reviews</a>	25 Apr 2014
<a href="#">2579-v5</a>	<a href="#">Replies to Nov-2012 DOE mini-Review Recommendations</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">DoE Reviews</a>	25 Feb 2014
<a href="#">3300-v1</a>	<a href="#">Responses to Recommendations from the Solenoid AOC</a>	<a href="#">Giorgio Ambrosio et al.</a>	<a href="#">Internal Reviews</a> <a href="#">Solenoids</a>	13 Nov 2013
<a href="#">2939-v2</a>	<a href="#">Replies to Recommendations for DOE 09-April-2013 mini-Review</a>	<a href="#">Doug Glenzinski et al.</a>	<a href="#">DoE Reviews</a>	28 Oct 2013
<a href="#">2500-v1</a>	<a href="#">Replies to CD-1 Recommendations Relevant for 19-Nov-2012 DOE mini-Review</a>	<a href="#">Doug Glenzinski</a>	<a href="#">Project Management</a> <a href="#">CD-1</a>	05 Nov 2012
<a href="#">2466-v2</a>	<a href="#">Responses to Tracker Review Committee</a>	<a href="#">Aseet Mukherjee</a>	<a href="#">T Tracker</a>	25 Oct 2012



# Responses from Director's CD-2/3b review

Original : 24 July 2014

Last Updated : 09 October 2014

#	Recommendation	Assigned to	Status	Response	Date
	<b>Conventional Construction</b>				
9.	Address the CC “deduct option #1” and the process for exercising the option in the plenary session of future reviews.	T. Lackowski	Done	OK	22 July 2014
10.	Add a project level risk to the Risk Register regarding the possibility of technical system changes, including but not limited to exercising deduct option #1, causing changes to the CC scope/cost/schedule. Assess the magnitude and probability of this risk with respect the “savings lost” by delaying award of the CC construction contract. The risk value should be reviewed periodically.	T. Lackowski	Done	Risk added back into Risk Registry.	22 July 2014
11.	An Independent Cost Estimate (ICE) should be performed.	R. Ray	Done	ICE for conventional construction has been completed with the ICE estimate coming in 2% below the Mu2e estimate. Face-to-face review of the other Mu2e subsystems took place 26-28 August. ICE team will prepare their independent estimate in time for the DOE CD-2 review.	18 July 2014
12.	Perform a secondary commissioning of the MEP systems after scientific technical components are installed and commissioned.	T. Lackowski	Done	This is already part of the plan.	18 July 2014
13.	Develop the selection criteria for selecting the Mu2e detector hall construction contractor.	T. Lackowski	Done	Criteria were developed before bids were received.	22 July 2014
14.	Add the requirement to Exhibit A for contractor to have a dedicated Project Manager – not necessarily full time.	T. Lackowski	Done	We have added the requirement you suggest.	18 July 2014

# Responses from Director's CD-2/3b review

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15.	Recommend advancement for CD-2/3 DOE review contingent upon addressing all recommendations.	R. Ray	Done	The DOE CD-2/3b review is scheduled for 21-24 October, 2014.	09 Oct 2014
	<b>ESH&amp;Q</b>				
36.	Modify conventional facilities Mu2e and MC Beamline RFP documentation (Exhibit A, Addendum A) to incorporate a separate ESH staffing requirement for a Construction Sub-Contractor Safety Representative.	T. Lackowski	Done		22 July 2014
37.	Develop a Construction Project Safety and Health Plan which incorporates both construction and installation activities with approval prior to CD-3.	T. Lackowski	Done	Available as doc-db-4432	18 July 2014

# Charge # 7

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- 7. Is the detailed design sufficiently mature so that the project can continue with procurement and fabrication? Has there been adequate progress on the long-lead procurement activities approved under CD-3a?
  - There are contract documents that are complete and buildable for the Mu2e Conventional Facilities.
  - The Delivery Ring Upgrade and the procured items are either substantially complete or off the shelf specifications. None are schedule critical.

# Charge # 8

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- 8. Is the documentation required by DOE Order 413.3b for CD-3b complete?
  - The WBS 475.03 documents / actions are complete.
  - Some of project level documents (such as PEP, PMP) may have minor updates by CD-3c but are now complete.

# Review Summary

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- We have met the requirements for CD-2/3b approval by:
  - Project Management
    - Strong, experienced team in place with a history of success of similar Fermilab projects;
    - Actively managing the project using a properly tailored DOE 413.3B approach.
    - Well matured front-end planning, cost, scope and schedule.
    - Conventional Facilities subproject fully integrated with the rest of the Project and lab certified system. (i.e. WBS, risks, milestones, tools)
  - Construction Documents:
    - Based on known technical requirements and interfaces;
    - Completed a fixed price subcontractor solicitation;
    - Proposals in hand, ready to award
    - Within the budgeted cost and schedule.
    - Required permitting in place.