# Mu2e Extinction Monitoring System Filter Construction Readiness Review Charge (Aug 15, 2018)

The Mu2e project received CD-3 approval from the DOE on July 14, 2016, allowing the project to start construction of the Accelerator subsystem components. Before initiating fabrication, a Construction Readiness Review is required to confirm the soundness and completeness of the design, to ensure that the procurement and quality assurance plans are in place and to guarantee the coherence of all interfaces with respect to neighboring sub-detectors. Peer review of key technical elements of the project are an important part of this process.

In order to reach the Mu2e design sensitivity, the experiment requires a high statistics sample of pulsed muons to reach the stopping target with a fractional beam background extinction level of $10^{-10}$ between pulses to reduce out of time backgrounds. The required beam extinction is achieved through a combination of an RF system in the Recycler Ring and a series of deflecting magnets and collimators in the M4 beamline.

The extinction monitor system measures the extinction of the proton beam that hits the primary target. The target extinction monitor design consists of a momentum-selecting filter consisting of collimators and a permanent dipole magnet, a magnetic spectrometer of scintillator trigger counters, a dipole magnet, a silicon pixel detector and a muon range stack.

This review will focus on the construction readiness of the extinction monitoring filter elements.

The filter consists of three major components:

1. Entry collimator that selects secondary particles produced within a small solid angle from the production target and defines the location of the detector.
2. A permanent dipole magnet that is oriented to transport charged particles with an average momentum of 4.2 GeV/c.
3. An exit collimator, which is embedded in a two-meter thick concrete wall that shields the detector from radiation produced by the particles that did not make it through the collimation system.

We would like the committee to address the following charge questions:

1. Have all recommendations from previous reviews (CD-3c and Final Design Reviews) been addressed in a satisfactory manner?

2. Is the extinction filter system design complete? Have all design issues that have emerged been addressed? Does it continue to meet the Mu2e requirements?

3. Are the extinction filter system fabrication drawings and specifications completed, reviewed, and documented in docDB and TeamCenter? Has the Integration Model been updated?

4. Have all interface documents and drawings been completed and signed by all relevant parties?

5. Have all relevant ES&H Reviews been completed?

6. Have all QA procedures been defined and the QA plan been documented?

The review is scheduled for **Aug 15, 2018**, with presentations a Q&A period and an executive session in the morning. The committee is requested to submit a report containing its answers to the charge questions and its comments and recommendations to the Mu2e Project Manager within two weeks after the conclusion of the review.

The Review Committee:

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