Booster Dump Relocation Review Report
July 13, 2005

The project to relocate a Booster dump was reviewed on the afternoon of July 7. The review was chaired by Chuck Ankenbrandt, and the reviewers were Dave Augustine, Mike Gerardi and Joel Misek.

The idea is to move the facilities that allow the running of study cycles and the creation of partial batches from the Booster ring to the 8-GeV beam transport line. That will simplify Booster operation and perhaps provide a modest improvement in Booster performance.

The reviewers endorse the idea, specifically preferring the alternative in which three kickers are located where there is now a shielding wall. They believe that the scheme will perform as intended. That having been said, the reviewers did express some concerns about the details of the implementation in emails to the chairman. To expedite the completion of this review, copies of the emails are appended to the end of this report rather than taking the time to reword and digest them.

The presenters requested a deferral of questions about radiation safety. Ergo, the reviewers assume that the issues raised in Mike Gerardi's email will be addressed after the review.

Following are the questions contained in the charge to the review committee, along with brief responses:

Will the new MI-8 extraction system operate as designed to extract both entire and partial Booster batches to the new dump, located in the MI-8 line? Yes.

Are the apertures between the kicker locations and the septum adequate to prevent excessive loss during extraction? Beams having emittances of 10 π and 15 π can be handled cleanly. However there is very little safety factor. The revised design is marginally better in this regard.

Will the system have any undesirable effect on the transmitted beam? In particular, will the residual field of extraction septum adversely affect the transmitted beam in the case of partial batch extraction? The effects are probably negligible; if not, they can be mitigated with simple correction schemes. Corrections should not be implemented a priori.

Is the shielding adequate for maximum envisioned beam extraction, as specified in the design? (Issue deferred until after the review.)

Will the conceptual interlock design allow beam to run to this dump while the Main Injector is in access? (Issue deferred until after the review.)

Are the budget and schedule reasonable? The budget and schedule estimates appear to be reasonable. However, they should be revisited in light of the proposed modification. The schedule is tight, and removal of the shielding wall will require additional time. This could well impact the duration of the shutdown.

From	
	Monday, July 11, 2005 1:50 pm
To	Chuck Ankenbrandt <ankenbrandt@fnal.gov>
Subject	Booster Dump Comments

Hi Chuck,
Here are my comments:

- The dump and location design needs to be MARS modeled to determine the proton limititations
- There should be a beamline physicist assigned as a reviewer if there is not one
- Does the Booster Dump relocation alter or affect the MI 8 proposed collimation scheme
- Thermal loading on the dump should be addressed since it may limit the rep rate and/or increase air activation concerns
- There will need to be an interlock "Logic Module" built to handle mode selection
- One should insure that the proposed spot size at the dump cleanly transport through the re-entrant aperature
- The trajectory between transport to the 8 GeV line, and the dump, should eliminate any scraping in order to minimize residual rates
- Conduit penetration calculations should be completed before a contract is created to be sure the design is acceptable
- The conduit corings should insure there is no water leaking into the region
- Any standing water in the region needs to be addressed to prevent activation
- Has there been agreement by lab management to re-locate people
- The MI collimation proposal identified the 8 GeV service building and enclosure hatch area as the location whwere fabrication and assembly of the collimators for that project was to take place. There needs to be a conscious coordination effort for installation
- Has the ceiling loading in the area been reviewed and approved by FESS
- Rad Safety needs to assess whether or not the wall can be disassembled, or is required
- Is the gate at 843 an acceptable exclusion location for MI access while dumping in the new location
- There needs to be a torroid installed for compiling the number of protons delivered to the dump via BBM

Cheers,
Mike

From	
Sent	Friday, July 8, 2005 2:15 pm
To	Ankenbrandt Charles <ankenbrandt@fnal.gov>
Subject	Booster Dump Review Comments

Over all, I thought that each speaker gave a reasonably understandable presentation. Every question was answered to the askers satisfaction.

I feel that the following thing are pertinent.

FESS. New penetrations leak. Water in the tunnels cause problems. A gutter or drip pan of some sort must be installed with the penetrations as part of the project. Occupancy of the tunnel area must be understood so that the AP-4 shielding and magnet installation can be worked on in parallel.

Booster. Their option 2 seems the most desirable to me. That being said, the original schedule for installation is now obsolete, and the Radiation Safety concerns must be completed. Based upon this, a new installation schedule must be created. Construction, Electrical, and Mechanical details must be shown and resources understood. I will do the mechanical end with input from Rob Reilly. A more accurate cost will surface once schedule is completed.

Once this phase is completed, it should be reviewed to other tasks in the same area competing for floor space. Over all, will the job fit in the approved down time.

From	Joel Misek <misek@fnal.gov>
Sent	Friday, July 8, 2005 1:37 pm
To	Charles Ankenbrandt <ankenbrandt@fnal.gov>
Subject	Booster Dump Review

Chuck,
Many of the points in the charge to the committee are outside my area of expertise. Never the less, from my view the presentation did show and substantiate the merits of the plan. Radiation safety issues were still under review and Mike Gerardi will have to address them as information is made available.

My general comments are pretty much as we left them yesterday. The new "alternate" plan has many advantages over the original upgrade and should be endorsed. The only negative aspects are the question of running when one of the three kickers fails and the removal of the shielding wall. These are outweighed by simplifying the installation with removal of the platform, slight increase in aperture in the septa magnet, resolving clearance issues with dump and overhead beam tube, and shorter kicker cables.
The budget and schedule presented were realistic. Some attention will have to be directed toward coordinating activities with the other projects which will compete for resources and tunnel access. A dedicated manager for the installation will be a plus in keeping to the schedule with minimal interferences.
I see no reason that would prevent us from endorsing this installation. Please let me know if you need any additional comments.

Regards, Joel