

LBNE Reconfiguration Engineering/Cost Working Group 1st Meeting

April 13, 2012

Present Committee Members:

- Mark Reichanadter, SLAC (chair)
- Bruce Baller, FNAL
- Mike Headley, SURF
- Marvin Marshak, U. Minnesota
- Christopher Mauger, LANL
- Elaine McCluskey, FNAL
- Vaia Papadimitriou, FNAL
- Bob O'Sullivan, FNAL
- Jeff Sims, ANL
- Jim Strait, FNAL
- Jeffrey Appel, FNAL (Scientific Secretary)

Present Invitees:

- Jeff Dolph (LBNE Systems Engineer)
- Tracy Lundin (LBNE CF project manager)
- Joel Sefcovic (LBNE project controls for CF)
- Jim Stewart (LBNE (former) WCD project manager and expert-at-large)

Due to an offsite power failure at SLAC (storm induced), Chair Mark Reichanadter was only able to attend part of the meeting, and the meeting was chaired by Jim Strait.

Jim reviewed the charge from Brinkman, organization of current Reconfiguration effort in response to the charge, options to be considered, and other material underlying the effort. In addition to the material available on the LBNE Reconfiguration web site, he made the following points. [Jim's slides will be put on the meeting web site.]

The Working Group should include explicitly what is not known when the estimates are made.

A mini near detector is worth including in the cost estimates

An LBNE beamline (to Homestake) should be costed with phasing and/or reduced capability if there are reasonable ways to obtain significant cost reductions or deferrals.

The Working Group has been given a list of building blocks which can be combined in various combinations to give cost estimates matching the options to be costed. The Group went over the list briefly, and raised the questions given below. The plan is to use common assumptions

and costs as much as possible and reasonable, independent of site. The draft list will be available on the meeting web site. Work on many of the building block cost estimates began almost as soon as the Brinkman letter was known, both inside the LBNE Collaboration and by the LBNE Project team.

The next step is to fill out the costs for each element of the list using the work done for the LBNE design report and extrapolating from there as possible and appropriate. Costs for NOvA at Ash River will be used where relevant for surface-detector costs in Minnesota.

The number of detector masses in the Steering Committee charge was viewed as too large, and Jim took the proposal to limit costs to three: 33-34 kT, 16.5-17 kT, and a small size between 5 and 10 kT. The sizes should be the same whether for Homestake or Minnesota. Shared detector mass between SOUDAN and Ash River options should be 50/50; i.e., equal at the two sites. [At the Steering Committee meeting following the Engineering/Cost Working Group meeting, it was agreed to use 5kT (not, e.g., 8.5 kT) and add a fourth if the scaling is not at least approximately linear.] Estimating costs for options far from the optimum option, even if the criteria for an optimum were agreed upon, will be useful in demonstrating that a wide range of options is being considered and understanding/documenting how and when scaling can be used. Furthermore, the variations in criteria will make one or another option closer to optimum depending on criteria.

Among the criteria not part of this stage of planning is how any Phase 2 could benefit from the choices made for Phase 1. The current exercise is to focus on Phase 1 costs and physics reach. However, for example, any Phase 1 beam would have to be capable of the LBNE baseline or upgradable reasonably to that level.

Anything which needs to be added to achieve each option other than what already exists or is currently budgeted should be included in costs; e.g., new shafts at either Homestake or SOUDAN, upgrades of the NOvA beam at NuMI for operation in a low-energy configuration (different from that being built for NOvA's medium-energy configuration). Similarly, operating costs during construction should be included since these get charged to any project.

Costs for a surface detector at Homestake have not been worked out yet. Nor is it known yet if a large detector will fit in the MINOS hall.

The same criteria for what cost details to make public will be used as was used by the Marx/Reichanadter committee. This should avoid issues of Fair Building Competition later when bids are called for.

Unresolved issues:

- How much near detector is needed
- How to handle Phase 2 impacts

The division of labor that we decided "is the obvious one":

- Vaia Papadimitriou – Beam
- Bruce Baller – LAr Detectors
- Christopher Mauger - Near Detector
- Tracy Lundin – Conventional Facilities, with input and help from
Mike Headley for Homestake
Marvin Marshak for Soudan and Ash River
- Bob O'Sullivan and Jim Strait - compilation of costs
- Mark Reichenadter, Jeff Sims, Jeff Dolph, Jim Stewart - "Internal Review Team"
- Elaine McCluskey - somehow Elaine was left off the list!

At the steering committee meeting that followed our meeting, Jim forwarded the proposal that we limit our cost estimating exercise to three detector sizes - 34kT, 17kT and something small - and suggested that the "something small" should be the smallest size that can still do "physics worth doing." After brief discussion, the steering committee recommended that that we set the size to be 5 kT, that being the smallest size that the physics WG will look at, and one that will bracket a large size range.

For the workshop on the 24-25th April, it was clarified that the parallel sessions on Wednesday afternoon are designed for interaction with "the community." What that means is that when there are questions raised in the morning session that look like they would require extended discussion to address, we defer them to the afternoon parallel sessions. Also, the morning talks are too short to go into much detail. Probably the talks then will focus on methods and conclusions so far.

The next two meetings of the Working Group will be Wednesday p.m. or Thursday and the following Monday. A Doodle Poll will be taken to find the best times.