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UEC Minutes -- February 21, 2004  
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Present: Bloom, Garcia, Griffiths(GSA), Gottschalk, Hagopian, Lobo(GSA),  
Rolli, Sheldon(phone), Tanaka, Tschirhart, Trischuk, White,  
Zimmerman, apologies: Groer, Messier.

User's Meeting Planning (White)

- The Users Meeting is scheduled for June 2nd and 3rd, 2004. Our sponsors for the meeting (the URA) are pushing us to stick much closer to the budget for the meeting this year. We are considering a number cut-backs to stay on budget including: not paying for drinks at the dinner, reducing the scope of the video/audio archiving that is done for the meeting and perhaps asking users to pay \$5/person for the dinner. We hope to converge on this in the coming weeks to find a workable budget.

- Mike Turner, Irving Lerch have agreed to make presentations at the meeting. We are now trying to arrange for a visit from the Director General of CERN (Aymar) and the KEK Director (Totsuka). Still working on getting representatives from the funding agencies as we have managed to pick a date that conflicts with a SLAC DOE review. Should be no problem filling the agenda.

- Thesis competition and Postdoc competitions are on track but so far there have been few submissions -- need to work on spreading the word.

Status of the Laboratory (Mike Witherell)

- Preparing for a DOE review of the accelerator complex during the week of February 23rd. 17 reviewers formed into six subcommittees will visit for three days. There are good prospects to double the luminosity delivered up to FY03 during FY04. The "plan" is the design that will deliver  $0.31 \text{ fb}^{-1}$  in FY04. We are now two weeks ahead of the plan. The work in the Fall '03 shutdown has taken us from  $27 \text{ pb}^{-1}$  per month to somewhere beyond  $40 \text{ pb}^{-1}$  per month. All records have been broken in calendar year 2004. The only cloud on the horizon is that the increased anti-proton stacking hasn't been achieved. This will be addressed in a one-week shutdown during March. The slides from the upcoming accelerator review will be available on the web at:

<http://www-bdnew.fnal.gov/doereview04/index.htm>

- Collider programme is delivering increased luminosity. CDF has seen aging in their wire-chamber. Their plan is to increase gas flow and perhaps change the gas mixture to abate the aging, but in a one-week shutdown in March they will replace a wire-plane and examine the old plane to see if the cause of the aging can be

understood. This will be done in conjunction with the anti-proton source work as well as further alignment of low beta quads. Mini-Boone also received its best month of protons in January, but still work is still needed to increase the rate of putting protons on target including the positioning of Booster collimators to reduce the losses. These losses/collimators are now the focus of the Accelerator divisions 'rapid response' team. The switch-yard and fixed target extraction have been commissioned after working through alignment issues. Fast spill has been achieved and now they are working on slow-spill for testbeam work.

- The CD-0 for BTeV was signed in mid-February. This is the first step on the path to completion at CD-4 (CD-3 is approval for construction spending). CD-1 review planned for the end of April. Director's review of the C0 interaction region was conducted in February -- shows that there are good prospects to have a beta-star at C0 comparable to that of the current collider experiments. Operations review of the lab is being prepared to make sure that the expected funding will allow the existing programme to continue while the work on BTeV construction gets underway.

- Q: What is the current schedule for Linear Collider technology decision? A: The Director didn't attend Paris LC International steering meeting in early February but there the 12-person technical decision panel (chaired by Barrish) had its first meeting. They have access to the cold/warm cost comparison that has been done in the US. This comparison will be made public as soon as the relevant lab directors have been consulted -- hopefully by April. The 12-person committee is charged with making its decision "this year". There is still some hope it may be as early as Fall 2004. Q: HEPAP expressed some concern that LC was meeting. A: Yes, all the things in the first group were on their way to CD-0 (like BTeV). The LC was not as advanced and so the best it could make was make the second group, where it appears as the highest priority facility. The LC also does not appear in the DOE budget summaries. At the HEPAP meeting Orbach said that the inclusion of the Linear Collider in the facilities plan was an important statement of its scientific priority. He implied that any project that large would need to get special support that highest level of government for a construction start.

Q: Is the FNAL long range planning report due out soon? A: The committee is converging. The forum for the report's release is being discussed. The URA board of overseers met recently and heard a draft version. The PAC will receive an updated draft version soon. Should be available in plenty of time for the User's Meeting in June.

Q: Is the all experimenters meeting the right forum to bring up concerns over proton intensity being delivered to miniBooNE? A: Yes, but he is aware that nothing has been getting as much attention as the collider program, especially in the period leading up to the DOE review. Assigning the Rapid Response Team in the accelerator division to the problem is an important step. The accelerator division will also be developing a set of measures of Booster performance to track progress, much as is done for collider

luminosity.

#### Overview of Beam Instrumentation at Fermilab (Bob Webber)

- The slides from his talk are available at:

[http://beamdocs.fnal.gov/DocDB/0010/001033/001/UECTalk\\_02\\_2004.pdf](http://beamdocs.fnal.gov/DocDB/0010/001033/001/UECTalk_02_2004.pdf)

- There are a wide range of devices being used to monitor beams in machines and transfer lines at the lab. Apply the information to know how well the machines are working, use it for real time feedback to make the machine work better and to try to understand how the magnets are working and the machine tunes. Things that are measured include: current (intensity), position of the beams, size of the beams and beam losses.

- Customers include Tevatron/RunII programme which absorb the lion's share of the operational support. Considerable effort going into upgrades of the PBar transfer line monitoring and Tevatron abort gap loss monitors. His group is also working on upgrades to the beam loss monitors that will contribute to a more robust Tevatron abort system. Have been re-commissioning old systems in testbeam extraction to the Meson Hall. NUMI is getting a set of new monitors as they approach first beam later this year.

- Provided a list of priorities from his perspective includes identifying the objectives and getting devices ready for NuMI's first beam. Tevatron beam position monitor (BPM) data acquisition system is being upgraded with help from the computing division. PBar transfer lines, BPMs and Tevatron beam loss monitors are also high on his list. The Particle Physics Division is contributing effort in numerous areas including the Tevatron loss monitors.

- Showed some results from prototype new Tevatron beam position monitor electronics with dramatically improved resolutions and significantly reduced systematics. Resolutions better than 10 microns have been demonstrated (current system has a least count of 150 microns). Showed results of turn-by-turn studies of beams, that have been given explicit orbit kicks.

#### Implementation of Proton Source Recommendations (Eric Prebys)

The slides from his talk are available at:

[http://home.fnal.gov/~prebys/talks/uec\\_20040221.ppt](http://home.fnal.gov/~prebys/talks/uec_20040221.ppt)

- Following up on the Finley report that highlighted the "proton crunch" that is coming when NuMI comes online. Most of the proton source (Cockroft Walton, original Linac, "new" Linac and Booster) is basically original lab equipment dating back 30 years ("new" Linac is 10 years old). The main injector is a key component for NuMI -- relatively new. Booster can supply  $5E12$  protons at 7.5Hz. Would have to go to 10Hz to supply both BoONE and NuMI. Loading the MI takes about 1.4s setup + 1/15s from one

Booster cycle. The Booster operation/rep rate is currently limited by beam losses and the resulting activation of machine components. If components become too activated they can't be maintained. The number of protons that can be accelerated is currently limited by a limit of 400W of overall power loss around the ring.

- Discussed the widely distributed "proton demand" plot and how they are working on reducing losses to get closer to the miniBooNE request for protons. FY03 projects included improvements to the Linac system (including cooling) and lots of work on the Booster to mitigate losses (collimators, dogleg in the extraction region, etc.).

- Near time priorities: optimising lattice, further tuning of collimator positions and increasing the aperture in key locations. New pieces of the vacuum system were almost ready for the past shutdown. They will go in soon. Further work by the Accelerator Division rapid response team and alignment task force is expected to help. Trying to satisfy conflicting demands of improved alignment of machine elements and optimising the aperture. Learning how to integrate surveys with known displacements that have been made to Booster machine elements.

- For the next year want to further improve the Linac instrumentation but the bulk of the work will be on the Booster. Will also begin to focus on 'multi-batch' filling of Main Injector (MI). Need to synchronise the Booster and MI timing to allow multiple transfers per MI cycle. This kind of timing synchronisation is also necessary for the slip-stacking of anti-protons.

- Developing a plan to maintain the current proton source through FY08 under the assumption that a new proton source will be built in the out-years. Has been given some budgetary guidance that consists of spending \$18M over the next 5 years. This is not sufficient to consider replacing Linac front end or changing the MI ramping time. Could rebuild the Booster RF and nothing else. Could also consider adding two additional RF cavities. Hope to have detailed plan by the summer of this year.

- Reasonable expectations:  $1E13$  protons per pulse for pBar production;  $5E20$  protons to miniBooNE before NuMI turns on. Then should be able to achieve 2 to  $2.5E20$ p/yr for NuMI. If things go well might be able to satisfy pBar, NuMI and still supply enough protons to make it worthwhile continuing to run miniBooNE. Supplying more than  $4E20$  p/yr seems unrealistic. Off Axis neutrinos want at least twice this. This would require an investment in the current system on the order of \$100M, which would directly compete for resources with a new proton driver -- one of the projects being considered by the lab's long range planning committee.

GSA report (Lobo)

- Shared a list of concerns of the GSA membership with the UEC. These include: rooms on site for students doing owl shifts -- would require some arrangement with the housing office in the

village and ask the experiment spokespeople; investigating further extensions of the taxi service off-site and after 4pm (might want to consider inviting a PACE bus on-site if there is sufficient interest); also concerned about the cafeteria's use of disposable dishes and cutlery (and the lack of recycling on-site in general). Finally there are still major concerns about visa issues and the process of fingerprinting visitors who need visas to enter the US.

- Are in the process of planning the GSA sponsored "New Perspectives" meeting that will follow the users meeting in June. They are currently looking for speakers.

Planning for the UEC/SLUO DC trip (Zimmerman)

- 13 people from the UEC (and GSA) and 11 people from SLUO (the SLAC Users Organisation) will visit Washington from March 24/25/26. The meeting

will start with visits to members of congress and the senate. We are making

every effort to visit members of all the relevant/important sub-committees.

An initial pass of assignments to make appointments, based on where people

live is now final, but a second pass is being prepared as there seems to be time to visit with more members.

Next meeting March 20, 2004