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Minutes of the UEC meeting -- November 22, 2003

Present: Bose(GSA), Garcia, Gottschalk, Groer, Hagopian, Clark(GSA), Messier, Rolli, Sheldon, Tanaka, Trischuk, Tschirhart, White, Zimmerman

Absent: Bloom

Guests: Mike Witherell, Elliott McCrory, Jean Slaughter, Steve Pordes, Judy Jackson

1. Report from BNL Visa Issues meeting - Leslie Groer

The first meeting of the user facility administrators and members of user executive committees for all DOE scientific user facilities took place at Brookhaven National Laboratory October 27-28, 2003. The topic of discussion was foreign visitors and assignments. Representatives from various Washington, D.C. offices attended and gave presentations: Bill Nay from the Office of Security in the Office of Science, Edward Ramotowski from the Department of State, Ramona McGee and Claudia Salem from the Department of Homeland Security, James Griffin from the Office of Science and Technology Policy and Irving Lerch from the American Physical Society International Office. There were representatives from many of the national labs. Fermilab was represented by members of the Users Executive Committee, Leslie Groer (Columbia University) and William Trischuk (University of Toronto).

The main focus of the discussions were the issues in admitting foreign students and scientists into the US to participate in scientific ventures at the DOE national laboratories particularly with the new security plans that all arms of the government are charged with upholding. There is great concern over the length of time for visa issuances, the security checks that need to be applied at all levels of foreign visits and what information the national labs are responsible for collecting and tracking. These procedures have caused problems for hosting conferences in the US, allowing foreigners resident in the US to travel abroad, delayed or prevented foreign scientists and students from coming to the US or getting on to the national user facility sites. International collaboration is seriously affected by these issues.

Many of the current procedures that DOE has in place are in response to directives from the administration. In particular, there is a revised draft order DOE 142.X which is out for revision and comments that was discussed extensively at the meeting. The final order is expected early in the new year.

The meeting concluded with a formulation of plans on how to increase the communication between the user facility administrators and user executive committees from the various labs and how to help raise these serious issues within the DOE and in the rest of the US government. Letters to the department secretaries signed by representatives from all the DOE user facilities were felt to be very effective in getting the message across and will be continued in the future. Individual lobbying efforts were also strongly encouraged. (For a more complete write-up see: http://www.fnal.gov/orgs/fermilab_users_org/BNL_meet_summary.txt).

2. Status of the Laboratory - Mike Witherell

Mike reported on the work completed during the shutdown. All work was done except for installation of large aperture cavities in the booster. These cavities, designed to reduce losses in the Booster, could not be installed until additional testing is done. The two cavities will be installed in a shutdown of 2-3 shifts when they are ready. A decision about producing more such cavities will be made based on the results seen with these two.

The target date for circulating beam after the shutdown was November 17th. That milestone was met. Work continues on improving luminosity and lifetimes. Mike commented that all the changes made to the accelerator complex effectively means that we have several "new machines" which will require lots of tuning. Mike reported that beam rates in the booster were not yet up to pre-shutdown levels.

Mike reported that they had approximately 250 people working in the tunnels during the shutdown, with approximately 80 of these people from outside beams division, and even included physicists from HEP experiments. This model worked well and will be repeated as needed. Highlights of work done during the shutdown are available on the UEC web site: http://www.fnal.gov/orgs/fermilab_users_org/shutdown_notes_03.ps

The biggest success to date resulting from the shutdown is the reduction in emittance in the recycler (about a factor of 3 lower than before the shutdown). This reduction was accomplished by improving the vacuum. It is now thought that vacuum contributions to the emittance are negligible

compared with other effects. This should lead to longer beam lifetimes in the recycler. Mike commented that there were many other small improvements seen and that the Tevatron is closer to an "ideal machine" and will be easier to simulate.

A mini-review of accelerator performance was conducted by DOE on October 8th. The committee reported that the re-organization was going well and reported very good progress on Run II work. The next review will be Feb 24-26. A Director's review will be held December 20-22 and will include the latest work plan for the recycler. Mike reported that Dave McGinnis has met with CDF and D0 and will continue to communicate progress to experimenters on a regular basis.

Mike reported on an internal review of the BTeV experiment. The review determined that the detector plans are in shape and that the cost estimate was OK. Design work on the interaction region is moving forward toward a detailed plan for the IR. It is expected that little money will be available during FY'04 for BTeV. Construction funding will be required in FY'05 to keep BTeV on schedule.

A Lehman review of NuMI/MINOS went well with no recommendations on the technical and civil progress. An ES&H recommendation for increased supervisor walk-through resulted due to a small number of accidents during the weeks immediately preceding the review. The committee had high praise for the integration of NuMI work with Beams Division construction during the shutdown. NuMI/MINOS target dates were listed as follows:

Dec 28th, 2004 - Near Detector Complete; commissioning startup
Feb 4th, 2005 - Start of Operations

For comparison, the DOE date for start of operations is September, 2005.

Mike reported that the likely funding for Fermilab for FY'04 will be between 285 and 288 million dollars. This is a disappointing figure and is tens of millions below desired.

Mike responded to inquires about the facilities report stating that the results are mixed for HEP. He believes that one purpose in the high-profile public announcement was to raise awareness for the Office of Science, hopefully leading to increased funding for Office of Science projects. The list includes a confusing mix of projects with differing time scales and readiness. HEP projects listed in the report include SNAP, BTeV, LC, and a Super Neutrino Beam (a.k.a. Proton Driver). FNAL will push on R&D for a proton driver and will develop a real cost estimate. For a proton driver to succeed, it will need a strong physics justification, which may come following the current round of neutrino experiments. Ray Orbach has stated that a change in priority is possible in the future. Mike reported that the LC time scale will be determined internationally and

will be based in part by politics and foreign governments. Mike reiterated the need for other projects to keep the field active while working toward a Linear Collider. Overall, he believes that the facilities report is OK for Fermilab.

3. Monte Carlo Model of the Tevatron - Elliot McCrory

A phenomenological model of Tevatron Collider operations has been created. Key elements of the operation of the facility have been randomized in this model to reflect actual Run II performance. In particular, failures and down times occur randomly, in agreement with the rates observed in reality. Similarly, performances are randomized, also in agreement with the range of possibilities in reality. Some of the performance elements that have been randomized include: PBar transmission and emittance growth from the Accumulator to Low Beta, Shot Setup time, the Luminosity Lifetime, etc.

The data used in matching the model to reality is from the Shot Data Acquisition (SDA) online system and the weekly operations data sheet. The time between Tevatron failures is well fit by a function with 1/(av. time) of 0.975/hour, giving a probability of having stores of 1 hour: 0.975 and 10 hours (0.975)^10 = 0.776. Failures are independent of time. They are a random process! The luminosity lifetime is modeled with an exponential with a decay function which depends on time and the initial luminosity, and gives a good fit to real data.

A primary motivation for this model is to guide the Run Coordinator on how to manage the operation of the Collider. In particular, this model answers the question of how a particular criterion for ending stores affects the integrated luminosity. The best simple criteria found so far to end the store when the ratio of the potential (likely initial) luminosity, which depends on the stack size, divided by the actual luminosity is greater than a constant (now at 5.0). Future work includes improved understanding of the 2003 Tevatron performance, incorporating the "Recycler Tax", and putting the new End-Store Criteria variables into ACNET.

(Slides for this talk can be found in the Beams Division Document Data Base (Public) at http://beamdocs.fnal.gov/ under: Beams-doc-913-v1. Other related talks by Elliott McCrory on the Tevatron Luminosity MC model can also be found there.)

4. How Experimenters Can Help Improve Accelerator Performance - Jean Slaughter

Jean Slaughter gave a recruiting talk on how experimenters can help

with improving luminosity and the number of protons. Jean started by summarizing a number of examples in which university and Fermilab experimenters have already made substantial contributions to improving the performance of the complex. She stressed that experimenters have a number of very valuable skills and bring a fresh perspective to problems. They are not tied down by day to day operations, so they can tackle projects that otherwise might not get done in a timely manner. She then gave examples of projects that people could help with, emphasizing that there will be a learning curve, so initiative and an appropriate match between the experimenter's interests and skills to projects are very important. Jean emphasized that persistence helps, since many Beams Division people are buried in day to day operations, and expertise is often concentrated in a few people. Summarizing, Jean reminded people that D0 and CDF both allow work in the Beams Division to count towards service work, that there is a variety of interesting projects, and to contact her or Stephen Pordes for ideas on specific projects.

(Slides for this talk can be found in the Beams Division Document Data Base (Public) at http://beamdocs.fnal.gov/ under: Beams-doc-927-v1.

5. Fermilab Public Relations - Judy Jackson

Judy reported on Fermilab publications. Fermi News has a circulation of more than 15,000 and is read all over the world. Among the target audience are policy makers in Washington, DC. As such, the periodical is written with this audience in mind. She commented that the classified ads (and even the Chez Leon menu) were popular in DC and helped put a human face on activities at Fermilab for DC insiders. Articles are short, focus on people, and include information that can be used to help promote FNAL. Due to the roll-out last summer of the daily online newsletter, Fermilab Today, Fermi News has become a monthly publication.

Fermilab Today is a direct result of internal focus groups that indicated a need for improved internal communication. All employees are automatically subscribed, while user subscription is voluntary. LBL has a similar service and provided a model and contributed valuable experience. Judy reported that her office possesses excellent software that allows her staff to assemble each issue in just a few man hours. Judy and her office are pleased with the new online publication and their ability to rapidly communicate with the Fermilab community.

Judy also discussed the new interactions.org web site. This site is a

collaborative effort between most of the world's HEP laboratories and is suppose to be a central clearing house for information, pictures, figures, talks, and news. Many in DC have already subscribed to receive interactions.org press releases. This is yet another venue for communication and information dissemination to decision and policy makers. The web site can also be used by physicists to obtain images of laboratories, people, event displays, etc. Judy asked that anyone with a pretty picture or event display make that image available on the interactions.org web site for use within the community.

A new US HEP magazine is under development. It has yet to be named. It will be a joint effort between SLAC and FNAL. The editor will be David Harris (currently at APS). David will be employed by SLAC but will travel between the labs. Fermilab will provide graphic design and format support. The publication will be monthly with the first issue slated for April 2004. In Judy's words, "This is not your father's physics magazine."

Judy also reported on increased collaboration between the FNAL and SLAC offices for public affairs. Weekly video conferences are held with the goal of promoting HEP in general (as opposed to individual laboratories). She reported that for the first time in a long time, the public as well as politicians are excited about physics due to the discovery of dark energy and dark matter. Whereas the Higgs Boson and mass never interested policy makers, dark energy, dark matter, and neutrinos do interest them. Judy told us that the HEP community needs to relate what we do with these issues. She also commented that the HEP community needs to show that HEP is relevant and can contribute to solving mysteries of the universe. For example, she commented that the Quarks to the Cosmos report is commonly held-up as exciting science that needs to be pursued.

Judy told us about the formation of the HEPAP Cosmos sub-Committee which is charged with determining HEPs role in deciphering the mysteries associated with Dark Energy and Dark Matter. The committee has met with DOE, NSF, OMB, and OSTP. The committee will develop the intellectual framework for this research mapped onto existing and future HEP facilities. The membership of this committee can be found at:
http://www.fnal.gov/orgs/fermilab_users_org/cosmos_subcommittee.txt

| The next UEC meeting is scheduled for December 13 |