Fermilab Accelerator Advisory Committee Meeting
July 28-30, 2010

Final Report

AAC Committee:

Members present: Eric Colby (SLAC), Roland Garoby (CERN), Steve Gourlay (LBNL), Katherine Harkay (ANL) (chair), Andrew Hutton (JLab), Katsunobu Oide (KEK), Peter Ostroumov (ANL), Andrei Seryi (SLAC),
Guest members: Michael Blaskiewicz (BNL), Ferdinand Willeke (BNL)
Excused: Ilan Ben-Zvi (BNL), Lia Merminga (TRIUMF), James Rosenzweig (UCLA),

Subcommittee Assignments:

***Overview*:** K. Harkay
***Post-Run II studies*:** F. Willeke (lead), M. Blaskiewicz, K. Oide
***Advanced Accelerator R&D*:** A. Seryi (lead), E. Colby, S. Gourlay
***Project X and muon collider*:** R. Garoby (lead), A. Hutton, P. Ostroumov

Contents:

1. Executive Summary

The AAC was convened from July 28-30, 2010 and asked to comment in three distinct areas relating to Fermilab's development of future programs: goals and plans for the proposed accelerator physics studies in the Tevatron following the end-of-collider operation; opportunities for an Advanced Accelerator R&D (AARD) program at the NML facility, also proposal for A0; and concepts for evolving Project X into a muon collider front end. All three areas are in a relatively early stage of development or planning. The committee notes that the community is enthusiastically in support of accelerator physics studies for Tevatron end-of-run and for the experimental facilities at NML and A0. The eventual development of a muon-based facility (neutrino factory or muon collider) is an important long-term goal at FNAL.

FNAL has a unique opportunity to engage in accelerator physics R&D in the post-run II study period and at the NML. A more formalized planning process is recommended to both engage users and to ensure a successful, focused program.

The committee strongly supports the overall goal to use the Tevatron as an accelerator physics test bed. The committee recommends that FNAL develop a process by which priorities are established and scheduling decisions are made so as to balance the desire to be flexible with maintaining a focused program. A condition for acceptance of a proposal should be an agreement to disseminate knowledge through documentation of the results. Collimation studies are a high priority; the merits of the other proposals are detailed in the report.

For the AARD program, the science case needs to be clearly articulated, selecting 2-3 headline experiments that exploit FNAL's strengths and are tied to the unique NML beam parameters. The committee recommends that FNAL establish a program panel that selects the high-priority, unique experiments, with a view of the commitment of NML to ILC. This panel should be connected with the AAC and also with panels for other advanced accelerator R&D facilities. A user support model should also be developed with clear definitions of how user experiments are integrated.

The Source Development Lab proposal at A0 has good scientific and educational potential given an adequate level of FNAL commitment. The committee recommends that a single FNAL scientist manage the AARD program at both A0 and NML to ensure that the programs remain relevant, also to ensure that safety is well structured.

Finally, the specifications for a proton driver front end are very demanding. The committee recommends that Project X be optimized for near-term goals as soon as possible to get to CD0 as quickly as possible, focusing on LBNE and the rare decays program. ICD-2 is not directly compatible with muon collider without major impact, but can contribute towards the feasibility of a future muon facility. To this end, acceleration from 3-8 GeV with a pulsed linac is preferable. The RCS and pulsed linac are comparable in costs. However, the pulsed linac provides several advantages without compromising Project X near-term goals, for example, upgradability to higher energy and study of H- injection at 8 GeV.

The committee thanks the speakers for their efforts and expresses sincere appreciation to the FNAL directorate for its hospitality during this review.

2. Proposal for post-Run II Studies

2.1 Summary response to charge

General observations

- The community has responded very positively to a possible opportunity to carry out accelerator experiments in the Tevatron at the end of Run-II
- We endorse the concept that LHC not very well suited as a test bed for accelerator experiments because of the complexity of the machine and possibility of severe damage.
- There is strong interest from CERN, BNL and from Fermilab that is reflected in a long list of possible studies
- The proposals vary strongly in the degree of preparation that has been done so far. While some proposal are based on thorough study and hardware development (such as crystal collimation), there are others that are in a very preliminary stage.
- All of the proposed experiments are interesting and have an accelerator physics base. In principle, all have potential for solving practical problems or advancing understanding of accelerator science/technology. A scheme for prioritization is needed since not all requests can be accommodated in the schedule.
- We find it worthwhile to complete the accelerator science case of the Tevatron by well documenting the observed effects and backing them up by simulation and theory.
- The impact of an extended run on other projects such as Project X and NML AARD should be understood.
- List of studies that were proposed (as presented):
    - Beam-beam compensation, e-lens, wire
    - Beam optics tests with beam-beam: Half integer working point, systematics on tunes, helix etc, phase advances
    - AC dipole measurements
    - Luminosity leveling
    - Instabilities: zero chromaticity, origin of longitudinal instabilities?
    - Instrumentation: T-b-T, OTR
    - Beam lifetime contributions: IBS, vacuum, noise characterization
    - Collimation, crystal, hollow beam

Overall Recommendations

1. Prioritize experiments taking into account effort, benefit, academic interest, relevance for existing problems.

2. Need commitment of management to allocate time on experiments, thus need to iterate program planning with management.
3. Tevatron end of run-II or end of store should start to be coordinated and organized starting now and a coordinator should be designated.
4. Experiments should be formally proposed with well-defined goals.
5. A formal process should (which does not have to be very elaborate) be put in place to approve proposed experiments.
6. Experiments should be worked out well in advance with clear goals, simulations, clear understanding of needed instrumentation of hardware and needed time.
7. Each topic should have an FNAL liaison to assure feasibility and adequate preparation.
8. Completed experiments should be evaluated and results should be captured in a written report if not a publication. This should be a condition for approval.

Are the goals of the study period well defined?

Observations

- The incentive of the program as a whole appears to be clear as reflected in the above comments. As far as individual proposals are concerned, some of the experiments appear to be well prepared, others are obviously just ideas with no specific work being done at this point.

What aspects of the proposal are most compelling in terms of advancing the world's knowledge of the accelerator physics phenomena in high energy proton colliders?

Recommended order of priorities:

- Crystal collimation (except for the pbar collimation proposal)
- Hollow beam halo cleaning
- Beam-beam compensation (e-lens or wire), both practical and academic reason
- Half integer working point: potentially beneficial even for the reminder of run II
- Test effect of phase advance between IPs, phase averaging (σ_s/β^*)
- Crossing angle investigation
- AC-dipole is a great way of examining nonlinear dynamics and diagnosing dynamic aperture issues. Examining beam-beam effects with this method might be possible as well.
- Luminosity leveling is certainly important; it was not so clear what is proposed to be studied at this point

What aspects of the proposal are most compelling in terms of providing information required to maximize performance of the LHC over the upcoming decade?

Observations

- Most of the proposed items on the 10-point list submitted by CERN seem to have good potential.
- We have doubts about the collimator wake-field measurement in the Tevatron (because of different impedance situation), experiments on crab cavity effects and bunch splitting scheme.

Is the accompanying studies plan/schedule well structured to achieve the goals outlined?

Observations

- Most of the proposals are in a very preliminary stage and need significant further effort. This is true in particular for plans for hardware preparation, needed beam study time.

3. AARD Opportunities and Plans

3.1 Summary response to charge

3.1.1 AARD program at NML

Identify those elements of the potential program that hold the highest scientific interest within both a national and international context.

Observations

- The NML facility represents an exceptional opportunity to focus on ILC RF unit test with full beam intensity *and* create a unique facility for advanced accelerator R&D.
- Creating a facility for advanced accelerator R&D will greatly enhance Fermilab's contribution to the development of accelerator science, to the education of young accelerator physicists, and will open many opportunities for collaboration both on national and on international scale.
- The accelerator science and high energy physics community expressed noticeable interest in the NML facility, demonstrated via numerous experimental proposals presented at the dedicated workshops.
- The importance of the need for a balanced approach between ILC related and AARD related goals is clearly realized.

- The need to establish a panel which would review the experimental proposals, prioritize them, and select the unique experiments, taking national and international AARD program into account, is also realized by the management.
- The beam transformation experiments based on emittance exchange (EEX), flat beam transformation (FBT), and beam microbunching generation by masking capitalize on the wealth of experience and hardware Fermilab has in this area. These experiments are very well suited to NML and have high scientific value. This list includes: EEX, FBT for image charge undulator experiments, EEX for MaRIE (Los Alamos), and slit microbunching experiments.
- The proposed experiments to test the Danilov proposal on integrable optics ring design and optical stochastic cooling concepts are high-risk, but potentially high reward. Allocating space for the compact storage-ring in the NML layout will permit these experiments to be considered in the future.
- Studies relevant for FEL science, including the 50 pC x-ray FEL oscillator, and 50 pC attosecond SASE FEL (if bunch quality permits) are important and again capitalize on the unique pulse structure available at NML.
- The high-repetition rate studies that exploit the long multipulse structure of the NML beams capitalize on one of the unique attributes of the NML facility. These include the dielectric wakefield and plasma wakefield accelerator studies to probe limitations of these techniques at high repetition rates.
- Development of novel beam diagnostic techniques, especially with the ability to resolve bunch-by-bunch motion in the ILC pulse trains is valuable. Novel techniques based on CTR interferometry and optical diffraction radiation should be pursued.

Recommendations

9. Proceed with the plans to create an advisory committee-reviewed, proposal-driven user beam facility at NML.
10. Maintain and enhance connections to potential users, keeping them updated and engaged in finalization of the planned layout and capabilities of the facility, and in particular determine and convey to the users the suggested (established) policies about balanced approach between the ILC and AARD goals.
11. Establish an appropriate program panel for the NML experiments, maintain connection of the panel to this AAC, and establish connection of the panel to the sister panels of advanced accelerator R&D facilities such as ATF at BNL, FACET at SLAC, and others.

Identify those characteristics of the NML facility that are unique, and suggest how those characteristics might best be capitalized on.

Observations

- The NML will offer an ILC-like beam, multi-bunch, long pulse length.

- The NML will offer opportunities for various beam manipulations in transverse and longitudinal phase, and a broad experience base to perform this class of experiment.
- The possibility to create a compressed and focused beam, together with the multi-bunch feature of the beam, gives a unique opportunity for AARD.
- There are presently several layouts considered, which differ in the number of bunch compressors (BCs), location of the 3rd to 6th cryomodule and their cryo system design, etc., and which correspondingly offer different scientific opportunities.
- Current beamline configuration does not accommodate needs of all proposed experiments.
- Many of the proposed experiments would benefit from the second bunch compressor, as was presented to the committee.
- The NML facility may house a small ring for advanced studies – the tentative goals were communicated to the Committee in additional presentation and include tests of integrable optics and optical stochastic cooling.

Recommendations

12. Define a process for the selection of the final NML layout, number of BCs, etc., that would maximize the science possibilities, for those unique experiments identified earlier.
13. Science case needs to be more coherent, better motivated in a worldwide AARD context, and tied closely to unique features of the facility.
14. For the selected layout, define the expected beam characteristics. Engage the potential user community in discussion of the layout and beam characteristics and in development of the detailed proposals.
15. The ideas for storage-ring based experiments in NML need to be further developed and presented to the committee in the near future.
16. Testing the stable acceleration of a current structure similar to that proposed for Project-X is potentially possible at NML. Appropriate masking of the laser pulse train to generate the multi-frequency current structure of Project-X would provide valuable information about rf controls needed for that project and the committee recommends that such possibility be explored.

Any further suggestions on the development of a competitive proposal are appreciated.

17. Clearly articulate the science case, selecting 2-3 headline experiments that exploit FNAL's strengths and are tied to the unique NML beam parameters.

3.1.2 Source Development Laboratory at A0

How compelling and timely are the scientific objectives?

Observations

- The A0 facility has created many unique scientific results and has significantly contributed to accelerator science education via connection to Universities and providing training opportunities to young scientists.
- The source development laboratory (HBESL) at A0 is timely, it will significantly contribute to the accelerator science, enhance the capabilities of NML, and it will also efficiently utilize the hardware available at the A0 location.
- While the decision to locate the HBESL at A0 hasn't yet been finalized and other locations are being discussed, the A0 is the most attractive location for this facility.
- Based on the presentation, it was not clear how the cathode development program complemented the numerous existing programs.

Recommendations

18. Proceed with establishing of HBESL facility
19. While offering an opportunity for training students and early career scientists the program should have relevance to the needs of the community and particularly the NML R&D program
20. Explore opportunities to collaborate with ANL on cathode development

How credible is the plan for achieving the objectives?

Observations

- NIU express its commitment to support this program, and several other local universities and colleges expressed interest to join the proposal.
- It was suggested that about $100k/year of matching contribution from Fermilab may be required to support the HBESL which however appear insufficient to the judgment of the committee.
- In general the development of the A0 facility into a dedicated gun test stand that supports education is extremely worthwhile. Careful thought should be given to the scientific program to justify the ongoing operating expense.
- Near-term elements of this proposal are: Education of accelerator physicists, Rebuild elements of the A0 facility, Novel field-emission sources, Test DULY 1.3GHz PWT.
- Many elements of this proposal will benefit from more thorough background research and consideration of the scientific outcomes. The proposal for FEM tip research would benefit from the work already done at PSI, which showed severe lifetime and reliability issues with the sources. What will NIU do differently? How can the high-brightness beamlets from the tip sources be merged optimally and produce a bright beam? Paths to address these issues should be discussed.
- One aspect of the proposal is puzzling—the introduction of two frequencies of guns. This will double the workload without providing a clear increase in scientific capability.

Private discussions with collaboration members showed that it was to avoid the risk of working with CsTe cathodes in the L-band gun—a problem which can be solved by making a copper blank cathode and making use of the cathode prep chamber to swap cathodes as experiments require.

- Longer-term elements of the proposal are: Education of accelerator physicists. Develop variants of the coax-coupler gun: Novel photo-emission sources, Beam dynamics studies: Benchmarking between codes, and against experiment, Beam diagnostics: halo monitor. Measure beam phase space through EEX/FBT to measure other projections, and novel protons/ions for medical therapy.
- No description of the beam halo monitor was made, so there is insufficient information to comment.
- Plans for the more distant future are not well spelled out; however, some comments can be made. Developing variants on the coaxial-coupler gun will require considerable attention and is not especially suitable for a university-sized research group. With strong Fermilab engineering backing, this element could succeed.
- The benchmarking of beam-dynamics codes against experiment and other simulation codes is an excellent educational task for students, is important for vetting simulation codes, and is well worth pursuing in the more immediate term.
- Extension of the TW-class laser system to support a laser-plasma acceleration program suitable for medical accelerators may be out of scale for the facility. Studies to date indicate that proton sources in the 250 MeV range based on laser-driven foils will require 5-10 PW class laser systems and simulation capability far beyond anything available at A0.

Recommendations

21. Evaluate the level of support needed for this facility and determine the funding and operation model of the facility, taking into account contribution of all parties, and the need to have strong core contribution from the host.
22. Recommend identifying a single Fermilab scientist to manage the AARD program at both NML and A0 in a cohesive manner.
23. Recommend assigning Fermilab engineers/scientists to act as technical coordinators of the NML and A0 Laboratories to handle interface and safety issues.
24. A clear structural model for operating the NML and A0 facilities should be developed, which includes:
    - A transparent mechanism for proposal review and ranking
    - Configuration control of the facility, with user participation as appropriate
    - Balancing the tension between ILC objectives and AARD needs for access and beam time
    - Communication of clear expectations to users about the availability of resources, especially the schedule of the ILC activities

- Continuity of knowledge and equipment from one experiment program to another (i.e. via operators the Fermilab operation department)
- Uniform facilitation of safety and experimental integration issues

What are the opportunities for development of the facility beyond initial objectives?

Observations

- The cathode preparation chamber and gun form a unique facility for testing a variety of photocathode issues including the effects of stoichiometry on the QE of CsTe cathodes, effects of substrate material preparation, to study the thermal emittance of CsTe in detail (e.g. vs. wavelength), consider other materials such as CsBr that are compatible with the chamber's source configuration. Bringing in collaborators who have strong material science background and analysis capabilities will be essential to the success of this effort.

Recommendations

- Seek collaborators at NIU or ANL-APS with the necessary surface science experience and analytical tools to support the photocathode R&D effort.
- Explore new opportunities for performing photocathode work on high-QE low thermal emittance photoemitters.

4. Project X and Muon Accelerators

4.1 Summary response to charge

Have the fundamental physics/technical issues that need to overcome to utilize Project X as a muon front end been identified?

Findings

- The specifications of the proton driver for a Neutrino Factory and a Muon Collider are very demanding. The only accelerator set-up potentially capable of meeting these requirements is based on an 8 GeV H^- linac followed by one or more pairs of fixed energy rings, one for accumulation and one for compression.
- Crucial subjects are charge-exchange injection and accumulation in the first ring. Depending on the stripping scheme (foil, laser or Li film) and on beam stability in the accumulator, the linac beam current is probably going to be far above 1 mA. Handling beam loss (~5% or up to 200 kW) is going to be a challenge, as well as preserving a small enough longitudinal emittance.

Observations

- Extensive design and R & D work remains to be invested to arrive at a convincing solution.

Recommendations

25. Reformulate the Project X muon goal from "Develop Project X to serve as the front end of future facilities like a Neutrino Factory or Muon Collider" to "Develop Project X as a first step towards future facilities like a Neutrino Factory or Muon Collider."

What is the level of understanding relative to translating these issues into performance requirements for Project X, either in its initial or upgraded configuration?

Findings

- To fulfill its objectives for physics at 3 GeV, the low energy part of Project-X has to be a CW linac accelerating an average current of 1 mA.
- Acceleration from 3 to 8 GeV could be done either in a 10 Hz RCS or in a pulsed superconducting linac (1 mA - 10 Hz – 4.2 ms). In both cases, beam pulses are stacked in the Recycler to minimize the duration of the injection flat porch of the Main Injector.
- The RCS will be unable to approach the level of performance required by NF and MC, and will not be useful for experiments preparing for these applications.
- The linac can be made capable of delivering 4 MW beam power by increasing its duty factor to 50 % at 1 mA beam current (quasi-CW), by increasing the beam current to 12 mA at constant duty factor, or by a combination of both. Creating the required time structure on the beam is a challenging subject of development.

Recommendations

26. Acceleration from 3 to 8 GeV with a pulsed superconducting linac is preferable:
    - ⇨ It will allow experimenting with 8 GeV H^- injection in a ring, first at the 200 kW level in the Recycler for the LBNE program, and afterwards on potential future test set-up(s) investigating alternative charge exchange and accumulation schemes.
    - ⇨ It could become a significant portion (100's of M$) of a future multi-MW proton driver.

Do the general concepts outlined lead one to conclude that an upgrade path should, in principle, exist?

Observations

- Although the design of the proton driver of an NF or an MC is far from established, it is likely that extensive changes will have to be made to the accelerators built in the context of Project-X.

- However, the 3-8 GeV sc linac of Project-X will provide the capability to develop and demonstrate potential technological solutions to the challenges of NF and MC, and it is likely to be an important asset for a future multi-MW proton driver.

Recommendations

27. Design the infrastructure of Project X with margin for future high-power upgrades (space for RF systems, radiation shielding …).

Does the program of study proposed provide confidence that such an upgrade path, and corresponding requirements on Project X, could be established over the next two years?

Observations

- The proposed program of study addresses the refinement of the design of the proton driver of an NF or an MC, provided adequate resources are invested. It should end up by outlining the required subjects of R & D.
- Defining Project X to meet reduced goals for the muon program should be carried out over the next six months.

Recommendations

28. Establish the list of subjects that need to be investigated for demonstrating the feasibility of the technologies needed for the proton driver of an NF or MC. Define how they could be addressed with Project X, possibly marginally influencing its design.
29. Considering the difficulty of the challenge, imagine intermediate steps (e.g. implementing a 1 MW device before attempting full power).

Additional Recommendation

1. Check feasibility of the preferred solution for Project X.
2. Focus on designing in detail the Project X accelerators and their components. That includes sc cavities and related auxiliary equipment, beam chopper, collimators and dumps, H^- charge exchange injection at 8 GeV in the Recycler, stability of high intensity beam in the Recycler and Main Injector etc.

Rev. 5/9/10

Fermilab Accelerator Advisory Committee
July 28-30, 2010
Charge (Draft Rev. 2)

The Fermilab Accelerator Advisory Committee is asked to look at activities in three distinct areas related to the development of future programs. The three primary topics for review and discussion are:

1. Proposed Tevatron Collider Studies Following the End of Collider Operations

The Tevatron Collider program is scheduled to end on October 1, 2011. The end of operations offers a unique opportunity to utilize the accelerator complex for a number of studies that could either advance generic knowledge of accelerator physics phenomena in colliders, or provide specific knowledge of utility in maximizing performance of the LHC over the coming decade. A proposal for an extended (4-8 weeks) has been prepared by interested parties at Fermilab, CERN, BNL and elsewhere.

The Committee is asked to review and offer comments/recommendations relative to the end-of-run Tevatron studies proposal. In particular we request specific comments and recommendations in the following areas:

- Are goals of the study period well defined?
- What aspects of the proposal are most compelling in terms of advancing the world's knowledge of the accelerator physics phenomena in high energy proton colliders?
- What aspects of the proposal are most compelling in terms of providing information required to maximize performance of the LHC over the upcoming decade?
- Is the accompanying studies plan/schedule well structured to achieve the goals outlined?

More generally, we would be happy to receive comments and suggestions from the AAC on how the studies plan could be strengthened.

2. Advanced Accelerator R&D Program at A0 and the New Muon Lab (NML)

The photoinjector that has resided at A0 for more than a decade is scheduled to be relocated to NML in 2011 in order to provide direct support of the ILC rf unit test. This move affords the opportunity for development of a world-class program of Advanced Accelerator R&D based on the photoinjector and the ILC cryomodules. The Committee will be presented with an overview

of a potential program that could be mounted at NML beyond 2012 and beyond. Fermilab would like the AAC's advice in identifying potential activities that could form the basis of a competitive proposal for AARD to be submitted to DOE.

The Committee is asked to review the scientific possibilities for an AARD program based on the relocated photoinjector and the ILC cryomodule string that will be operational at NML beyond 2012. We are particularly interested in the Committee's comments and recommendations relative to the following:

- Identify those elements of the potential program that hold the highest scientific interest within both a national and international context.
- Identify those characteristics of the NML facility that are unique, and suggest how those characteristics might best be capitalized on.
- Any further suggestions on the development of a competitive proposal are appreciated.

In addition, Fermilab has received a proposal from Northern Illinois University, and our own Accelerator Physics Center, for a Source Development Laboratory at A0 following the departure of the photoinjector. The Committee is asked to review this proposal and offer advice in the following areas:

- How compelling and timely are the scientific objectives?
- How credible is the plan for achieving the objectives?
- What are the opportunities for development of the facility beyond initial objectives?

3. Concepts for Evolving Project X into a Muon Collider Front End

An important mission of Project X is to provide a basis for the eventual development of a muon based facility (Neutrino Factory or Muon Collider) on the Fermilab site. It is important to Fermilab to understand in the early design stages what the requirements on Project X might be, and what upgrades or auxiliary facilities might be required, to support muon applications. The effort in defining requirements and upgrade paths has just begun, and we would like the committee to look at and comment on the approach.

Specifically, we would like feedback from the Committee on the following points:

- Have the fundamental physics/technical issues that need to overcome to utilize Project X as a muon front end been identified?

- What is the level of understanding relative to translating these issues into performance requirements for Project X, either in its initial or upgraded configuration?
- Do the general concepts outlined lead one to conclude that an upgrade path should, in principle, exist?
- Does the program of study proposed provide confidence that such an upgrade path, and corresponding requirements on Project X, could be established over the next two years?

As usual the committee is invited to issue comments or suggestions on any aspect of the programs discussed beyond those specifically included in this charge. It is requested that a concise report responsive to this charge be forwarded to the Fermilab Director by September 1, 2010. Thank you.

Agenda

Comitium, Wilson Hall 2SE

Accelerator Advisory Committee Meeting

Wednesday 28 July 2010

Committee Executive Session - Comitium (08:30-09:00)

- **Speakers: K. HARKAY**

Welcome, Overview, and Presentation of Charge - Comitium (09:00-09:30)

- **Speakers: HOLMES, Stephen**

AARD Opportunities and Plans - Comitium (09:30-12:10)

time	[id] title	presenter
09:30	[2] Status and Plans for Beam at NML (00h40')	NAGAITSEV, Sergei
10:10	[3] Future AARD Possibilities and Options for NML (00h40')	SUN, Yin-e
10:50	Coffee Break (00h20')	
11:10	[4] Proposal for a Source Development Laboratory at A0 (00h20')	PIOT, Philippe
11:30	[5] Proposal to Explore Dielectric Wakefield Acceleratoration with Flat Beams (00h20')	PIOT, Philippe
11:50	[6] Discussion (00h20')	

Working Lunch - Comitium (12:10-13:10)

Tour - NML - Comitium (13:10-14:15)

Proposal for post-Run II Studies - Comitium (14:15-17:00)

time	[id] title	presenter
14:15	[8] Introduction/Workshop Summary (00h15')	MOORE, Ronald
14:30	[9] CERN/LHC Needs Overview (00h20')	SCHMIDT, Frank
14:50	[25] Collimation Tests fro LHC (00h20')	RODERIK, Bruce
15:10	[10] BNL Needs (00h30')	FISCHER, Wolfram
15:40	Coffee Break (00h20')	
16:00	[11] Tevatron Needs (00h30')	MOORE, Ronald
16:30	[12] Summary/What's Next (00h15')	MOORE, Ronald
16:45	[13] Discussion (00h15')	

Committee Executive Session - Comitium (17:00-18:30)

Dinner at Chez Leon - Comitium (18:30-21:00)

Thursday 29 July 2010

Proposal for post-Run II Studies (cont.) - Comitium (08:30-08:50)

time	[id] title	presenter
08:30	[15] T980/Crystal Collimator (00h20')	Dr. MOKHOV, Nikolai

Project X and Muon Accelerators - Comitium (08:50-10:45)

time	[id] title	presenter
08:50	[16] Introduction: Project X and NF/MC Requirements (00h30')	Dr. GOLLWITZER, Keith
09:20	[17] Reformatting Beam and Associated Issues (00h30')	Dr. LEBEDEV, Valeri
09:50	[18] Siting Issues (00h10')	ALBER, Russell
10:00	[19] Wrap-up and Accelerator R Projects (00h20')	Dr. GOLLWITZER, Keith
10:20	[20] Discussion (00h25')	

Coffee Break - Comitium (10:45-11:00)

Supplementary presentations and/or breakout discussions as requested by the committee. Committee Executive Session - Comitium (11:00-12:00)

Working Lunch - Comitium (12:00-13:00)

Committee Executive Session - Comitium (13:00-17:00)

Friday 30 July 2010

Committee Executive Session - Comitium (08:30-11:00)

Closeout - Comitium (11:00-12:00)