

Minutes of the 14th PAF working group meeting

12 December 2005

***** DRAFT VERSION 1 *****

Participants:

M. Benedikt, L. Camilleri, R. Garoby, L. Rolandi, F. Ruggiero, W. Scandale, E. Shaposhnikova, J. Wenninger

1) PAF recommendations

R. Garoby started by presenting a one-page summary of the POFPA recommendations that are appended at the end of this document. The POFPA priorities, from highest to lowest:

1. LHC and its upgrades SLHC (luminosity) and DLHC (energy).
2. Neutrino physics.
3. Optimization of the CERN accelerator complex for 1. and 2.
4. Fixed target experiments. They should adapt to the potential of the CERN complex.

It was noted by a number of people that Heavy Ions had a rather low priority (point 4), both for collider and FT experiments.

R. Garoby went on to present the views of PAF and illustrated the possible options with a few upgrade scenarios where he placed both existing and new machines on charts including the links between the machines.

The PAF recommendations are:

- *Consolidation:*
 - Phase 2 of the PS magnet renovation
 - SPS magnets
 - Other consolidation – to be defined in future meetings.
- *SPS impedance reduction*
- *Linac4*
- *R&D:*
 - IR magnets for the LHC
 - Fast cycling SC magnets
 - High power targets
 - SC RF
- *Team strengthening:*
 - High power RF
 - Radio-protection
 - Accelerator design (RCS, FFAG,...)

R. Garoby commented that following the last meeting on magnet issues, representatives from POFPA had the impression that the situation was rather dramatic on that front. R. Garoby told them that one should not get a too biased impression by the fact that PAF has so far concentrated on magnet issues, but that in fact one has to

consider the entire consolidation effort to bring the magnet issue in a real perspective. R. Garoby shortly presented the [document on magnets submitted by R. Ostojic](#) that recommends a review of the SPS magnet situation after the 2006 SPS run.

M. Benedikt gave the figures on the consolidation for the PS:

- 15-17 MCHF are already committed for the PS, with the lions share for magnets
- 5-7 MCHF are foreseen for the coming years, again with a large share for magnets.

W. Scandale commented that one must also consider upgrades that bring more performance, as compared to pure consolidation that aims at maintaining the present performance. He also indicated that the pessimistic feelings expressed by K.H. Mess on fast cycling SC magnets are not representative for the people of the AT department.

E. Shaposhnikova suggested in the discussion to move the “High power RF” point from *team strengthening* to *R&D*. Moreover, more explanations should be given for the reason to inject at higher energy in the PSB and in the SPS.

F. Ruggiero commented that the option of a booster ring directly inside the LHC tunnel was not addressed. Such an option does not require new transfer lines between SPS and LHC. In the discussion it seemed however this option, which requires bypass-tunnels around each LHC experiment, may be even more expensive than replacing the magnets of TI2 and TI8.

In total it took ~ 1 hour to comment the 6 slides available today. Therefore the consensus was that the total presentation should not exceed ~12 slides.

Concerning the written report, 2 sections have already been written by John and Ranko. PAF members are reminded to send their own part asap.

The next meeting (Thursday 15 at 14h00 in 866/2-D05) is the last one before POFPA and PAF meet R. Aymar and J. Engelen. It will be dedicated to:

- the edition of sections of the written report,
- the presentation and discussion of the new version of the “PAF views”.

Minutes by J. Wenninger, 13.12.2005

Condensed summary of POFPA results

We consider experimentation at the high-energy frontier to be the top priority in choosing a strategy for upgrading CERN's proton accelerator complex. This experimentation includes the upgrade to optimize the useful LHC luminosity integrated over the lifetime of the accelerator, a project we term the SLHC, and a possible future energy increase of the LHC, a project we term the DLHC. The absolute and relative priorities of these options will depend, in particular, on results from initial LHC running.

We consider that providing Europe with a forefront neutrino oscillation facility is the next priority for CERN's proton accelerator complex. Its principal physics objective would be to observe CP or T violation in the lepton sector. The most cost-effective way to do this – a combination of superbeam and β -beam or a neutrino factory using stored muons – will depend on physics and technical developments.

Efforts should be made to engineer the proton accelerator complex so as to accommodate optimally these two programmes

CERN's contribution to high-energy physics has always been enriched by a diverse programme of non-collider experiments, such as kaon studies, measurements of the magnetic moment of the muon, deep-inelastic scattering with muons and neutrinos, heavy-ion physics, antiproton physics and nuclear physics. The attraction of a diverse programme will be all the greater in an era when relatively few other accelerator laboratories will be continuing fixed-target particle experiments.

Among the other topics we have considered are kaon physics, muon physics, collider and fixed-target physics with heavy ions, other fixed-target physics, and nuclear physics. These topics could form a cost-effective physics programme for optimizing the exploitation of CERN's proton accelerators, and are very complementary to the physics performed at the energy frontier (LHC). However, we consider that these topics should not define but rather adapt to whatever proton accelerator upgrade scenario might be preferred on the basis of the first two priorities.