DRAFT

CERN/SPSC-2005-028
SPSC-072
5 August 2005

Minutes of the 72st meeting of the SPSC

Held on Tuesday, 5th July 2005

OPEN SESSION

1. Status report from OPERA: Y. Declais
2. Status report from CAST: M. Kuster

CLOSED SESSION

Present: H. Abramowicz, G. Altarelli, R. Batley, J-J. Blaising, J.B. Dainton (Chairman), J-P. Delahaye, M. Doser, J. Fuster Verdu, L. Gatignon, G. Hamel de Monchenault, M. Hauschild, L. Kluberg, P. Kooijman, S. Kox, J. Knobloch, M. Mannelli (Secretary), M. Piccolo, C. Rembser, G. Ridolfi, J. Ritman, J-P. Riunaud, D. Schlatter, U. Stoesslein, D. Wark

Apologies: J. Engelen, A. Schaefer

1. MINUTES OF THE LAST MEETING

The Minutes of the 71th meeting were approved with the following modifications:

a) Section 6, paragraph 2 added:

First ever measurements of transverse spin effects on a deuteron target, precise measurements of g_1 at small x and a pentaquark search were published recently.

b) Section 6 paragraph 5, modified as follows:

Substantial hardware developments are on-going in preparation for the 2006 run. These include

- The commissioning of a new polarized target magnet
- The construction of new chambers to match the increased acceptance of the upgraded polarized target
- And an upgrade of the RICH, whose performance has so far not been satisfactory.

2. MATTERS ARISING

There were no matters arising.

3. REPORT FROM THE 172nd MEETING OF THE RESEARCH BOARD

The Chairman reported back from the 172nd meeting of the Research Board (RB).

The RB received the SPSC report in which

1. good progress was welcomed by the SPSC towards ensuring that as much as possible would be ready for a smooth turn-on of fixed-target data taking in 2006;
2. the annual review of the heavy ion experiment NA60 demonstrated that data-taking had been completed very successfully in 2004, and first analysis was advancing well
3. the annual review of COMPASS showed 2004 to have been a productive data-taking year both for muon and hadron beams; analysis of COMPASS muon data was progressing with improvements in analysis technique, and the first hadron beam data taken at the end of 2004 already showed evidence of a physics signal; the experiment would be ready for data-taking in 2006;
4. the proposal for next steps in antiprotonic atom physics with a view to CPT-invariance tests, the ALPHA experiment, at the CERN AD was recommended to the RB for approval, subject to a statement of its schedule in terms of technical milestones;
5. the addendum for an extension of the ASACUSA programme of antiprotonic physics also with a view to CPT-invariance tests at the CERN AD was recommended to the RB for approval.

The RB noted the points 1 to 3 above, confirmed the SPSC recommendations in 4 and 5 above, subject to the availability of resources, and requested that procedures be put in place to review at the beginning of each year the demands for beam time at the AD by all experiments.

The Minutes from the 172nd meeting of the RB will be circulated to the SPSC once they become available.

4. STATUS OF THE ACCELERATORS

J-P. Riunaud reported on the progress for shut-down activities, beam operation so far this year, and progress for the new Central Control Center.

Much of the work foreseen for the SPS consolidation program has been completed, and the rest is on schedule to be completed as expected.

There have been delays affecting the PS magnet renovation program.

The first set of Main Coils was rejected, as were 3 out of 4 of the first Pole Face Windings. Main Coils and Pole Face Windings which are within specification, are expected to be delivered before the end of July, five months behind schedule.

The current situation is that 5, out of 40 magnets targeted for renovation during this shutdown, have been removed from the PS, 4 dismantled, but none have been refurbished yet.

Different techniques have been explored to repair the radiation induced de-lamination of the central blocks of the PS magnets, and final tests are under way. It was pointed out that this repair has an anticipated life-time of 5 to 10 years of operation.

As a result of the delays outlined above, and in order to maintain the schedule for operations in 2006, it is now foreseen that the number of magnets renovated during this shutdown will be between 21 to 31, compared with the 40 magnets initially expected. The remaining magnets will be renovated in the following shutdowns, at a rate of 6 to 8 a year.

For the AD, because of the limited resources available, only essential repairs are being carried out. It is nevertheless expected that the overall efficiency of the AD program will benefit by the improved performance resulting from the consolidation work on the rest of the accelerator complex.
The SPSC **appreciates greatly** the investment to refurbish as much as possible **of the CERN accelerator complex**, and **considers it very important** that the funded program be completed as originally planned ready for data-taking in 2006.

Beam operation so far this year has continued successfully and on schedule.

The LINAC II to PSB beam for the ISOLDE physics run has operated as scheduled, with ISOLDE as the single user.

In addition, a successful 3 week test of the LINAC II to PSB beam with a 900ms cycle, instead of the usual 1.2s, has been carried out. An analysis of possible improvements in intensity resulting from this faster cycle is in progress, the results of which will be presented in September.

In view of the demand for protons-on-target in the CERN FT program in forthcoming years, the SPSC **considers it essential** that any future work which will make possible increases in the available proton intensity in these years is completed.

The CTF3 started as foreseen in May, and operated for four weeks. It is now shut down pending installation of new equipment, and scheduled to restart operation on September 19th.

Commissioning of the injector chain for running with **ions** into the LHC is proceeding, using first O^{4+} ions to be followed by Pb^{54+}. Present difficulties concern the cooling of the ion source solenoid, and the control system software, which is being used as a test bench for the new LHC control software. It is planned to switch over to Pb^{54+} ions in the second half of July, and to have first circulating beam in the LEIR by the end of August.

The building housing the new CCC will soon be ready for the installation of the required services.

5. STATUS OF THE EXPERIMENTAL AREAS

L. Gatignon reported on progress in the North Area and East Area, and referred to the presentation by K Elsener for the status of CNGS (section 6 below).

Dismantling of the NA45 experiment is now completed.

The upgrade of the North Area control system, which includes the replacement of the original CAMAC electronics with new VME modules, and replacement of the NODAL software applications, which are now 25 year old, with modern software, is continuing on schedule. The development of the new expert and diagnostic software applications is on the critical path.

Studies of both shielding and halo reduction for the M2 beam line, aimed at increasing the proton rate for COMPASS**,** are also well advanced.

While again emphasizing its strong support for any measures which will enhance proton intensity in forthcoming years, the SPSC expects that every effort will continue to be made by the COMPASS experiment to make the very best use of any increases in beam intensity which result so as to enhance its useful data-taking rate.

Modifications for the DIRAC experiment, in the EAST area, are ongoing.

6. DISCUSSION OF THE OPEN SESSION

OPERA:

The construction of the two magnetic spectrometers of the OPERA detector is well advanced: the full mechanical structure for the detector, as well as both magnets and a number of the chambers are in place. In-situ efficiency curves for the RPC's indicate excellent performance. Commissioning of the spectrometer is foreseen to start in January 2006.

Mechanical problems due to interference between the Target Tracker and the Brick Walls have been solved by increasing the spacing between modules by 1 cm.

The required functionality of the robots for the automatic Brick Assembly Machine (BAM) has been demonstrated, as has the procedure for the safe handling of the film emulsions during assembly of the bricks. The BAM design is frozen, and the machine is to be moved to the LNGS site by the end of 2005.

The precision and reproducibility of the Brick Manipulator System has also been demonstrated to be well within the required 1mm for brick insertion over the full surface of the Brick Walls.

About 78% of the emulsion has been produced, of which 43% has been refreshed and 30% has been delivered to the LNGS site.

The performance of the Bricks themselves, and of the automatic scanning system, has been studied with data collected in test beams, and further studies, in particular for electron identification, are planned.

The SPSC **commends the collaboration** on its progress in the last year. The SPSC has the following concerns:

- funding to complete the construction of the experiment may still not be in place;
- progress adequate for the completion of infrastructure at LNGS, which is essential for the experiment, was not evident;
- manpower available throughout all phases of the OPERA experiment on to its completion may not be adequate.

The SPSC **considers it to be of the utmost importance** that the completion and commissioning of OPERA continue on a schedule so that the experiment will be ready to take useful data in 2006.

CAST:

Many improvements have been made to the CAST apparatus which were in place during its 2004 period of data taking. Analysis of data taken in 2002 and 2003 is complete, and analysis of the 2004 data is now well advanced.

In addition, impressive progress was reported on CAST Phase II, approved in December 2004, which will make possible an extension of the mass sensitivity for solar axions by operating with He4 and He3 inside the superconducting magnet bore.

The SPSC **congratulates** the CAST Collaboration on its new results and on the progress which it has made in preparation for data taking in Phase II.

7. STATUS REPORT FROM CNGS

K. Elsener provided an overview of the status of CNGS facility, and reported on the schedule and progress in the CNGS beam line construction and commissioning.

The overall schedule remains as defined in 2002 and there is no reason to anticipate any slippage before commissioning is due.

The civil engineering was completed in mid-2004 and, at present, installation of general services and infrastructure underground is complete. The installation of equipment is starting. There are small delays which are off the critical path. Substantial work still remains to be done for the water cooling installation on the surface.

The goal remains for all equipment to be installed by January 2006. The main issues today concern the horn, reflector and strip lines.

The dipoles, quadrupoles and corrector magnets for the TT41 beam line will all be in hand by the end of July, and installation of the quadrupoles in TT41 will start on July

12th. Installation of the BB4 power converters is nearing completion, and the beam monitoring equipment is almost ready.

All mechanical components of the T40 target station are in hand at CERN, and in the process of being assembled, and the electronics and controls for the target station's motors are in progress. Installation of the T40 target station in the target chamber is planned for this September.

The horn, reflector and strip lines have required extensive repair work and/or re-design., and are on the critical path.

The target chamber itself is progressing on schedule.

Commissioning with beam is planned to start in week 22 (end of May) 2006, with the goal of having the CNGS beam fully operational after week 27 (July) 2006.

The SPSC **continues to be impressed** by the excellent progress made on the completion of the CNGS beam, and **congratulates** all concerned.

8. STATUS OF THE PS AND SPS EXPERIMENTS AND SCHEDULE

M. Hauschild reported on the recent changes to the schedule for operations in 2006.

The previous schedule was based on physics running until completion of the LHC sector test, in December 2006. Because of financial limitations, FT physics running now stops on November 5th. The LHC sector test schedule is now independent of FT running.

The accelerator complex will therefore operate for a similar time as was the case in 2004, but the additional commissioning time required following the long shutdown results in 20% less beam time for physics than in 2004. The initial part of the run, until September, is left unchanged, and the main consequence of the revised schedule is a reduction in the running time available for COMPASS and CNGS.

In addition, DIRAC will have to start their run one month earlier in order to benefit from the four months of beam time foreseen.

The SPSC **takes note of the revised schedule**, and is extremely disappointed that a situation now prevails in which the truncation in the physics running time foreseen for 2006 is substantial. The SPSC is **very concerned** that already a timely completion of both the CNGS and the COMPASS physics programs by the end of this decade may be in jeopardy.

9. STATUS REPORT OF HARP

In view of the ongoing discussions within the HARP collaboration concerning in particular different approaches to the analysis of data from the large angle spectrometer, the collaboration was requested to present its present results to the closed session of the SPSC, rather than to the Open session.

J.J. Gomez-Cadenas presented first detailed results from the HARP small angle analysis, which is now close to being published. This analysis, which is carried out specifically for the Aluminum target, sets the stage for the analysis of data from the full set of targets. **The SPSC encourages** the collaboration to complete this analysis as quickly as possible, and **looks forward to the publication** of the full small angle results in a timely manner.

In addition, J.J. Gomez-Cadenas presented preliminary results for elastic scattering with the large angle spectrometer, with particular emphasis on checking the performance of the TPC. In this analysis, only the first 10 to 20% of the beam spill is used in order to avoid the large dynamical distortions of the HARP TPC, and empirical corrections are used to account for the remaining distortions.

I. Boiko presented the results of an ongoing analysis for the large angle spectrometer, performed by a CERN-Dubna-Protvino group within HARP. This analysis is built on a careful, and detailed, understanding of distortions, both static and dynamic, in terms of the physics of TPC operation and in terms of the RPC timing response, such that corrections can then be made. For the TPC in particular, the measured distortions, if uncorrected, give rise to systematic errors which are significantly larger than the intrinsic detector resolution. When the corrections are included, it is possible to foresee the use of TPC data from the whole of the beam spill.

The SPSC looks forward to large angle physics results from HARP in which best use is made of the available data, based on a robust understanding of systematic errors.

10. COMPASS Experiment: follow up to annual review

Following a brief, positive report from the COMPASS referees on the ongoing upgrade program, the detailed discussion was postponed to the next meeting of the SPSC.

11. Anti-hydrogen Laser Physics Apparatus (ALPHA): follow up to proposal CERN-SPSC-2005-006/P-325

Following the confirmation by the RB of the recommendation for approval by the SPSC at RB172, the SPSC awaits receipt from the collaboration of the statement of the schedule for the ALPHA experiment in terms of technical milestones.

12. A.O.B.

Proposal to Measure *K+ ->pi+ nu-nubar* at the SPS (SPSC-2005-013/P-326)

The SPSC notes the receipt recently of the Proposal to Measure K+ -> pi+ nu-nubar at the SPS. It looks forward to detailed consideration of the proposal beginning at its next meeting SPSC73.

Request to endorse the P326 R&D (SPSC-2005-026/M739)

The SPSC considers it important that an R&D programme continues concerned with the possibility of an experiment to measure the rare decay $K^+ \rightarrow pi+nu\text{-}nubar$.

AD-4: Biological Effectiveness of Antiprotons - Proposal for an Extension of Experiment AD-4 (SPSC-2005-027/P-324-Add.2)

The SPSC notes the receipt recently of the Proposal for an Extension of Experiment AD-4. It looks forward to detailed consideration of the proposal beginning at its next meeting SPSC73.

13. DOCUMENTS RECEIVED:

Proposal to Measure $K^+ \rightarrow pi+nu\text{-}nubar$ at the SPS (SPSC-2005-013/P-326)

Request to endorse the P326 R&D (SPSC-2005-026/M739)

Proposal for an Extension of Experiment AD-4 (SPSC-2005-027/P-324-Add.2)

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