MINUTES of the 90th Meeting of the SPSC
Held on Tuesday and Wednesday 27\textsuperscript{th} and 28\textsuperscript{th} January 2009

OPEN SESSION:

1. AD5 - ALPHA  
   J. Hangst

2. AD2 - ATRAP  
   G. Gabrielse

3. AD3 - ASACUSA  
   R. Hayano

4. AD6 - AEGIS  
   G. Testera

5. AD4 - ACE  
   N. Bassler

CLOSED SESSION

Present:


Apologies: S. Bertolucci, T. Carli, S. Katsanevas\textsuperscript{1}, P. Schleper

\textsuperscript{1} Present on Wednesday only
1. MINUTES OF THE 89th MEETING OF THE SPSC, HELD ON NOVEMBER 4th and 5th

The Minutes of SPSC 89 were approved.

2. REPORT FROM THE CHAIRMAN

The Chairman reported on the Research Board (RB) meeting, RB184. The following points were presented to the RB and, where necessary, discussed:

1. The SPSC noted with regret and with understanding the unavoidable truncation of FT data-taking due to LHC issues.
2. The SPSC records here its appreciation, and its congratulations to the CNGS team for the excellent beam delivered to LNGS in 2008.
3. The annual review by the SPSC of the NA62/P326 project concluded that
   i) there has been very impressive progress on the analysis of data (including those taken in 2008 for efficiency optimisation) towards a final measurement of the ratio
   \[ R_K = \frac{K \to e\nu}{K \to \mu\nu}; \]
   ii) the only outstanding milestone in the R&D program P326 is the proof of principle of the “Gigatracker”, for which a conclusion is now anticipated in 2009, the delay arising primarily because of the reduction of available beam time in 2008;
   iii) the collaboration which is interested in making the measurement of the rare decays \( K^{*0} \to \pi^{0}\nu\bar{\nu} \) continues to grow;
   iv) the proposal (SPSC P-326 and M-760) to measure the rare decays \( K^+ \to \pi^+\nu\bar{\nu} \) is now recommended to the RB for approval subject to the functionality of the Gigatracker being demonstrated and to the availability of resources from the external funding agencies.

4. Following its annual review of the experiment, the SPSC reaffirms its recommendation for continued support of the NA60 analysis program.

5. Following its annual review of the OSQAR experiment, the SPSC notes the slower than anticipated progress on the initial (approved) phase of the OSQAR experiment because of LHC issues, and encourages the developments underway in planning for the future of the experiment.

6. Following its annual review of the HARP experiment, the SPSC concludes that the outcome of the experiment has been marred by an unfortunate and highly regrettable dispute within the collaboration which has persisted for a number of years, for which a solution has not been possible because of the unnecessary intransigence and the
uncooperative attitude of some of the parties involved, and which has left the SPSC with doubts concerning the validity of some results. The SPSC concludes that

i) Measurements of some value for hadron production small angles relative to the incident beam, have been made using HARP data;

ii) interesting and significant measurements of hadron production at large angle, which have substantial importance for reactor experiments (e.g. LSND), are now being published by a HARP sub-group;

iii) there remains a number of further results of value from this sub-group which are possible with the present data sample, and which could be concluded and published provided necessary resources continue to be available to it.

iv) the SPSC considers that there is no further purpose served by it continuing to review the HARP experiment in the future.

The Research Board took note of the items above, and recommended approval of the P326 Proposal, and its subsequent Amendments.

3. STATUS OF ACCELERATORS

S. Baird reported on the progress with the major ongoing shutdown activities.

A lot of preparatory work is in progress at LINAC2 for LINAC4 installation. This includes alignment checks during the civil engineering work; revised beam interlocks for LINAC2 and PSB, and additional shielding so that work can continue during LINAC2 beam operation.

At the PSB new power multi-pole corrector converters are being installed as part of the Consolidation activities, and a complete re-alignment of the PSB to PS transfer line is in progress, in order to try and reduce injection beam losses in the PS.

The renovation of the last 9 dipoles in the scope of the PS magnet renovation project is on schedule. This project will then be finished with 51 out of 100 dipoles (plus 4 spares) completely renovated. The lead ion injection line has been re-installed. It was removed in 2008 when magnet unit 25 was replaced during the run. The new Power Supply for the PS (POPS), which will replace the faithful "rotating machine", has been ordered and the infrastructure, in building 376, is being prepared. The project is on schedule to install the hardware during 2009, have first tests with the PS magnets at the end of 2009, and the first tests with beam during 2010.

At the SPS the repair of the water manifolds on the 244 Lintott dipoles is in it's third and final year. There were some initial concerns due to problems with the magnet transport vehicles but these have been resolved and the program will be completed this shutdown.
as planned. The replacement of the irradiated cables in LSS2 is on schedule and should be completed as planned. In LSS5 the crystal experiment is being installed.

**AD shutdown work** will start once the PS and PSB activities are finished, in early in March.

**The SPSC warmly thanked S. Baird** for his contribution to the Committee, as he moves to other responsibilities within CERN, and **welcomes S. Maury** as the new representative of the CERN Accelerator Beams department.

### 4. STATUS OF EXPERIMENTAL AREAS

L. Gatignon reported on the status of the shutdown activities in the East and North Areas, AD and CNGS.

All facilities are on schedule for start-up according to schedule.

**In the East Area** three quadrupoles of type Q120, two of which are located in the South branch towards DIRAC and the irradiation facility and one in the T9 test beam, will be replaced in the coming weeks. Two Q800 type quadrupoles in the T10 test beam as well as the last vertical bending magnet in the North branch before the test beam target will be tested soon; a decision on their replacement will be taken based on the outcome of those tests. Some magnets for which no operational spares exist will not be replaced now, but their replacement by magnets of different types will be prepared, in case they fail. The preparations for the CLOUD area are well advanced.

**In the North Area** all faulty magnets have already been replaced and the annual maintenance is ongoing. In the COMPASS beam line a vacuum leak in the section between the primary target and TAX dumps has been repaired and the TAX water-cooling connections will be improved soon. Studies are ongoing for the implementation of a new Gamma Irradiation Facility upstream of the CMS test zone in the H4 beam and for the H2 light ion beams for NA61 using a fragmentation target. The EHN1 beam lines are again heavily booked. Due to the presence of infrastructure from LHC tests combined with the need for (semi-) permanent installations for new users, the logistics in EHN1 starts to become an issue.

**The AD run** ended without major problems, the 2008 “AD only” efficiency being 93% and the overall efficiency 80%. The annual maintenance has started, but as usual part of it will be done only once the PS ring has been closed. Main item this year is the replacement of the AD target and horn. In addition sector 2 will be vented for the repairs of a scraper bellow and an Ionization Profile Monitor and subsequently baked out.

**In CNGS** standard maintenance activities are ongoing. A significant water leak on a ventilation unit was discovered in TCV4 just after the stop of CNGS operation. Fortunately the water has not caused any serious damage. The leak has been repaired. The TCV4 floor will be improved along the passage of the PPP-TSG41 shielding plug.
Finally some work will be done to improve the lifetime of the water filters in the horn and reflector cooling systems.

5. PS, SPS AND AD SCHEDULES

H. Breuker thanked E. Perez for her careful work on the preparation of the 2009 users draft schedule for PS and SPS, which he summarised.

For the PS 19 beam requests for beam were received. The approved running experiments are DIRAC (T8), CLOUD (T11), ATRAP, ASACUSA, ACE, ALPHA, and nTOF, which is restarting after 4 years of upgrade work. There are 16 requests for test beam periods in T9 and T10 and a long period for irradiation studies in T7.

For the SPS 36 requests for beam were received. The approved experiments are COMPASS (M2), NA61 (H2), NA62 (P0), NA63 (H4), OPERA (CNGS) and ICARUS (CNGS). There are 29 requests for test beam periods, mainly for SLHC, ILC and non-accelerator based experiments. The users schedules were circulated after the SPSC and work has started to implement the change requests and the additional requests, which were received after the deadline (31.10.08).

6. DISCUSSION OF THE OPEN SESSION

6.1 AD5 – ALPHA

The SPSC congratulates the ALPHA Collaboration for the continued progress made in operating the full apparatus, including the successful commissioning of the silicon detector and the demonstration of the improved diagnostics and crosschecks made possible by this.

The SPSC notes with appreciation that drafts for publication of the results obtained in 2008 are well advanced, and encourage ALPHA to continue pursuing the goal of cold anti-hydrogen trapping for spectroscopic studies.

6.2 AD2 – ATRAP

The SPSC notes with appreciation the substantial progress achieved by ATRAP in 2008, in inducing controlled quenches of the Ioffe trap, reducing plasma temperatures, improving the anti-proton capture rate, and demonstrating sensitivity to single trapped anti-protons.

The SPSC encourages ATRAP to continue pursuing the goal of cold anti-hydrogen trapping for spectroscopic studies.
6.3 AD3 – ASACUSA

The SPSC continues to be impressed with the excellent quality of the ASACUSA results, and the elegance of the techniques used. The SPSC looks forward to continued progress in 2009, in particular towards establishing the capability for anti-hydrogen spectroscopy.

6.4 AD6 – AEGIS

The SPSC notes with appreciation the coherent effort of the AEGIS Collaboration in addressing the critical issues in the implementation of their conceptual design, and the progress towards the detailed design of the experimental apparatus.

A key challenge is the development of a suitable positronium source. The SPSC notes the progress made towards this, and looks forward to a proof of principle for the chosen approach. This constitutes an important milestone for further studies of the novel cold anti-hydrogen beam proposed by the experiment.

6.5 AD4 – ACE

The SPSC congratulates the ACE Collaboration for their successful run in 2008, and looks forward to the final analysis of this data.

The SPSC notes with appreciation the present development in the understanding of peripheral damage of anti-proton beams, and looks forward to further progress in the comparison with both proton and Carbon ion beams.

7. FOLLOW UP ON EXPERIMENTS AND PROPOSALS

7.1 CNGS1 – OPERA

In view of the state of readiness of the OPERA experiment and their successful data taking in 2008, the SPSC strongly supports their request for CNGS beam in 2009.

7.2 CNGS2 – ICARUS
In light of the importance that the SPSC attaches to ICARUS taking data with the CNGS beam, the SPSC notes with appreciation that the completion of the ICARUS detector appears to remain on track for readiness in May 2009.

7.3 COMPASS

The SPSC notes that in 2008 COMPASS has taken data both for forward hadron dissociation and central production measurements. The SPSC looks forward to analysis of these data, in particular with a view of establishing the viability of the central production measurements, and the interest of further central production data taking.

The SPSC notes receipt of a Letter of Intent from COMPASS, outlining the present understanding of the future plans of the Collaboration; (CERN-SPSC-2009-003; SPSC-I-238).

7.4 DIRAC

The SPSC notes with appreciation the successful operation of DIRAC in 2008, which supports the case for continued data taking in 2009.

7.5 NA61

The SPSC supports the NA61 beam request for 2009. The SPSC notes receipt of an Addendum to the Proposal, for the use of secondary Ion beams. The SPSC looks forward to a detailed evaluation of the feasibility and suitability of such beams to achieve the physics goals of the experiment.

7.6 NA62 – P326

The SPSC supports the beam request of NA62, to further progress their R&D program.

7.7 OSQAR

The SPSC notes the unavoidable interruption to the OSQAR program, as a result of the LHC incident. The SPSC looks forward to a detailed proposal, and the securing of sufficient resources, in view of the ultimate goal of the experiment, of measuring the Vacuum Magnetic Birefringence.
8. DOCUMENTS RECEIVED

Minutes of the 89th Meeting of the SPSC held on 5th and 6th November 2008; CERN-SPSC-2008-033 / SPSC-089.

Minutes of the 186th Meeting of the Research Board held on 5th December 2008: CERN/DG/Research Board 2008-388; Minutes-186.

NA61 Collaboration: Proposal for secondary ion beams and update of data taking schedule for 2009-2013; CERN-SPSC-2009-001; SPSC-P-330-ADD.1

Status Report for Experiment AD-4/ACE Biological Effectiveness of Antiproton Annihilation; CERN-SPSC-2009-002; SPSC-SR-039.

COMPASS Medium and Long Term Plans; CERN-SPSC-2009-003; SPSC-I-238.


The Production and Study of Cold Anti-hydrogen: The Annual Progress Report by the Anti-hydrogen TRAP Collaboration (ATRAP); CERN-SPSC-2009-007; SPSC-SR-042.