DRAFT MINUTES of the 89th Meeting of the SPSC
Held on Wednesday and Thursday 5th and 6th November 2008

OPEN SESSION:

1. NA62/P326: Measurement of $R_K$  E. Goudzovski
2. NA62/P326: Status of the R&D  A. Ceccucci
3. NA60  G. Usai
4. OSQAR  L. Duvillaret
5. HARP: Results from the HARP CDP Group  I. Nefedov

CLOSED SESSION

Present:


Apologies: S. Baird$^1$, F. Close, M. Erdmann$^1$, S. Katsanevas$^2$, U. Wiedemann$^1$

$^1$) Present on Wednesday only;  $^2$) Present on Thursday only

1. MINUTES OF THE 87th and 88th MEETING OF THE SPSC, HELD ON July 15th and 16th, and September 4th and 5th.

   The Minutes of SPSC 87 and SPSC 88 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. SPSC notes again the benefits of refurbishment manifest in the relatively trouble-free start-up to data-taking in 2008, and here records its appreciation of the substantial effort to make this so.

2. In its annual review of the COMPASS experiment, the SPSC
   i) notes the substantial progress in its muon physics programme and looks forward to the publication of the final measurements of the spin asymmetry,
   ii) notes with interest the first results on diffractive meson spin-parity analysis, and
   iii) anticipates first measurements of central meson production including spin-parity analysis with 2008 data.

3. In its annual review of the OPERA experiment, the SPSC here records its appreciation of the achievements by CNGS to be ready to deliver beam reliably in 2008 to LNGS, and of the achievements by OPERA to be ready with almost full target mass to take bulk data in 2008. The SPSC reaffirms its view that the highest priority should continue to be given to achieving good beam delivery and data-taking in 2008 in the CNGS physics programme.

4. In its annual review of the ICARUS experiment, the SPSC notes impressive progress in the preparation of the T600 underground in LNGS. The SPSC shares the concerns expressed by the collaboration that the first data-taking by ICARUS could be dependent on now the completion of infrastructure at LNGS and on the delivery by industry of remaining outstanding components.

5. Following its usual procedures for the scrutiny of proposals, the SPSC recommends approval of the crystal-collimation proposal P335.

The Research Board noted points in 1 through 4 above. The recommendation by the SPSC in 5 above was accepted and confirmed by the Research Board subject to the availability of resources.

3. **STATUS OF ACCELERATORS**

S. Baird reported on the status of the accelerators.

After the incident in LHC Sectors 3-4, it was decided to advance the shutdown of all LHC injectors by one month to ensure that beam would be available for the LHC as early as possible in 2009. This also means that all fixed target physics programs are now scheduled to start one month earlier than previously planned in 2009.

The shutdown dates are 24th November to 20th February for the PS, and 24th November to 13th March for the SPS.

The MTE equipment in the PS is now fully hardware-commissioned. However, there were long delays with the beam commissioning, due mainly to problems with various PS beam measurements systems. The first MTE beam was extracted in August, but the full two-batch transfer to SPS and CNGS was only tested on the last weekend of the run, and
then at reduced intensity. It is planned to complete the MTE beam commissioning as quickly as possible in 2009. The existing CT PS extraction scheme will be fully maintained during the shutdown and will be available for CNGS operation in 2009 if needed.

The main activities for the coming shutdown are:

- Finishing the last 9 magnets in the PS main magnet renovation program. As a result, 51 magnets plus 4 spares will have been renovated out of 100 in total.

- Completing the SPS main dipole manifold repairs. The last 90 units out of a total of 235 will be repaired.

- Replacing the irradiated cables in the LSS2 (North area extraction area) of the SPS. This is a major job, as the complete extraction channel has to be removed before the work can start and it is one of the most radioactive areas in the SPS tunnel.

4. STATUS OF EXPERIMENTAL AREAS

L. Gatignon reported on the status of the experimental areas.

The North Area operated well until the morning of the 6th of October, when its operation was stopped to allow for an earlier start-up in 2009.

The user program had been adjusted accordingly and in particular the big experiments had to reschedule a number of runs with special beam conditions. The only breakdown worth mentioning was a short circuit in a main dipole in the H4 beam line that occurred on the first day of the already very short NA63 run. Fortunately an acceptable setting of the beam line could rapidly be prepared without that magnet and NA63 could take advantage of most of its running time.

The East Area operated smoothly since the previous SPSC meeting, with the number of cycles for DIRAC being reduced from up to 7 to 4 or 5 per super-cycle once the North Area had been stopped and the number of CNGS cycles increased. Also the number of cycles for the IRRAD facility was reduced. The test beams have been operating well, serving many users, with some occasional cooling problems for dipole F61N.BVT01, which will be investigated during the shutdown.

The CNGS beam has been operated without major problems. The only interruption was for the exchange of a horn cooling cartridge on October 18th and 19th.

Once the North Area was stopped on October 6th, the SPS was operated almost exclusively for CNGS with one LHC cycle kept in the super-cycle. The duty cycle for CNGS was gradually increased from 37% before October 6th up to a maximum of 83% for the last day of the run. A proton delivery to the CNGS target of about $2 \times 10^{13}$/spill was
achieved, which is close to maximum achievable and limited by the RF available. At the end of the CNGS run on November 3rd the integrated number of protons on the CNGS target was $1.78 \times 10^{19}$, close to the maximum intensity nominally achievable.

The AD has been running well, mostly for the ALPHA, ATRAP and ASACUSA experiments. The beam optics for ALPHA and ASACUSA has been further improved, allowing for better efficiencies at the experiments. The intensity has remained the same since the last SPSC meeting. There is some hope that the replacement and subsequent alignment of the AD target and horn during the shutdown may lead to a slight increase of intensity. The AD4 run took place in week 44 with 500 MeV/c ejected beam. Several AD4 sub-groups were served with good beam conditions and efficiency.

5. PS, SPS AND AD SCHEDULES

E. Perez reported on the schedule of the accelerators for Fixed Target.

The consequences - from the PS and SPS users' side - of the early stop of the North Area following the LHC incident of September 19th, were reviewed:

The AD run, which was granted (last RB) an extension for 2008 as long as the PS would inject beam into the LHC, finally stops on November 12, as initially scheduled.

The stop of the NA on the morning of October 6, instead of November 12, was a severe cut in the physics programme of NA61, NA62, COMPASS and NA63:

- NA61 had just completed the installation of their new TPC electronics when the incident occurred. Only a few days of data could be taken with the commissioned upgraded system. This allowed establishing that the upgrade is a success (allowing a ten-fold increase of the event rate). The physics data taking is however postponed to next year, and NA61 will need additional beam time in 2009 to compensate for the time lost in 2008.

- NA62 started their 2008 run on September 11. The first two weeks were devoted to taking data for improving the background subtraction of the $\text{Ke}2/\text{K}\mu2$ analysis. The second period started on October 2nd, and only a fraction of the tests foreseen (Straw Tracker and Large Angle Veto prototypes) could be done. For the test of the RICH prototype, which was foreseen in November, NA62 will require two weeks of beam time as early as possible in 2009.

- COMPASS was just finishing their $\pi$- data taking when the stop was announced. A minimum amount of data (1 week) could be recorded with a positive hadron beam (both polarities being needed for their central production programme). Other tests, necessary for the collaboration to prepare the future steps, could also be done in a considerably reduced version ($\text{Drell-Yan}, \text{DVCS}$). The collaboration acknowledges the big efforts made by Experimental Areas team, allowing them to quickly switch the beam conditions several times within a few days.
• NA63 had 5 days out of the 11 days initially scheduled. They were able to observe qualitatively the effect they were looking for, but will need one week in 2009 for systematic studies - in addition to their 3-weeks request.

Other users were affected as well. In particular the CREAM group (Cosmic Ray Energetics and Mass) had their test completely cancelled. The goal was to calibrate a calorimeter before launching it in a NASA’s balloon. Since the calibration could not be done, the flight had to be postponed to mid-09. CREAM will need two weeks in 2009, with one test early in the year.

The MonoPix group could at least complete the data taking necessary for defining the architecture of the chip for EuDet, but had to drop other studies (for the vertex detector of STAR, and some resolution studies).

For the SiLC group, an arrangement was found with the ALICE groups, and SiLC could take about one week of data at the T10 beam line in the East Area.

Test-beams were also cancelled for the ATLAS, CMS and TOTEM experiments. Most of them concern tests for SLHC upgrades and can be done in 2009. The test that TOTEM planned with their Roman Pots and their T1 telescope will be done with cosmic muons, which requires some additional work to rotate the whole setup, and which will of course take more time than with the beam.

Some statistics for 2008 were given. The overall SPS efficiency for Fixed Target experiments was about 70% (and about 60% for the CNGS beam). This is lower than in 2007, and largely due to the series of unlucky events, which occurred during the summer. The CNGS run in 2008, which ended on November 3rd, is however a success, with total of $1.78 \times 10^{19}$ protons on target delivered. Approximately 40% of these were integrated during the last month, after the stop of the NA beam, when the number of protons per spill on the CNGS target routinely approached the maximum nominally achievable.

The SPSC congratulates the CNGS team for the successful run in 2008.

The draft of the accelerator schedule for 2009 was presented. The start-up of physics at the East Area should happen on April 23rd. Physics at the North Area and the CNGS facility should resume on May 4th. This corresponds to about 4 more weeks compared to 2008.

The deadline to send beam requests for 2009 was on October 31st. So far the number of requests received is similar to that of 2008.

As of January 1st, Horst Breuker will take over from E. Perez as the PS and SPS coordinator.

The SPSC joined in warmly thanking E. Perez for her excellent work on behalf of the accelerator user community.
6. DISCUSSION OF THE OPEN SESSION

5.1 NA62/P326

The SPSC notes with pleasure the rapid progress and high quality of the preliminary results presented for the analysis of the $R_K$ measurement.

The SPSC also congratulates NA62/P326 for the continued progress achieved so far on the R&D and design issues critical for the success of the experiment. The remaining outstanding issue concerns the time resolution of the Giga-Tracker. Two variants of the design have been developed, and subjected to a detailed and successful design review. As a result, the Giga-Tracker is well on track to be tested in the SPS beam with realistic prototypes next year.

Good progress is also being made in further strengthening the Collaboration, and a draft MoU is under discussion, to ensure resources adequate for the needs of the experiment.

In the light of this, the SPSC recommends approval of the P326 proposal, in the expectation of the satisfactory performance of the Giga-Tracker, and anticipating adequate resourcing of the Collaboration.

5.2 NA60

The collaboration continues to publish interesting new physics results.

The SPSC reaffirms its recommendation for continued support of the NA60 analysis program.

Preliminary ideas for a possible next generation experiment were also presented.

6.3 OSQAR

The SPSC congratulates OSQAR on the results of their axion regeneration experiment, which have now been accepted for publication (to be checked).

The SPSC notes that circumstances beyond the control of the OSQAR collaboration have limited the progress that could be achieved in 2008.

The SPSC also notes that a substantially revised configuration for the VMB measurement has been presented.

6.4 HARP

The SPSC notes the refusal of the HARP collaboration to participate fully in the Open Session as requested as part of their Annual Review. The SPSC asks its Chair to communicate its displeasure to the collaboration.
The SPSC is critical of the publication of several results based on one of the two analyses of the HARP large angle data, given that significant discrepancies remain with the second analysis of those data.

It is now manifest that unfortunately the parties involved have failed to resolve these issues internally to HARP, as would normally be expected of a functional collaboration, and that the results of these two analyses will be published independently of each other.

Comparisons of the pi+/pi- production cross-sections from the two analyses have been reported to the SPSC. A substantial pi+/pi- production asymmetry is observed in the published analysis, which is not present in the second analysis. The authors of the second analysis point out that, such an asymmetry could at least in part be attributed to the Pt bias found by the Review Committee called by the main Funding Agencies, CERN and INFN. This effect alone, however, most likely cannot fully account for the discrepancies in the two sets of results, and to do so a more detailed and common evaluation by the collaboration would be required.

The SPSC considers its review process for the HARP experiment to be concluded.

7. FOLLOW UP ON EXPERIMENTS AND PROPOSALS

7.1 CNGS1-OPERA

The SPSC congratulates the CNGS team for the very successful delivery of high intensity beam in 2008.

OPERA is fully operational, and the physics analysis chain is operating efficiently.

7.2 CNGS2-ICARUS

The SPSC notes the substantial advances made towards the completion of the ICARUS detector.

The SPSC notes that inadequate design of the liquefier plant by the industrial partner responsible for it will result in a delay of approximately four months. ICARUS now plans to be ready for data taking by May of 2009.

8. A.O.B.

SPSC Dates in 2009:
Tuesday and Wednesday January 27 and 28
Thursday and Friday April 16 and 17
Tuesday and Wednesday June 30 and July 1
Tuesday and Wednesday September 29 and 30
Tuesday and Wednesday November 24 and 25
9. DOCUMENTS RECEIVED

1. Minutes of the 88th Meeting of the SPSC held on 4-5 September 2008; CERN-SPSC-2008-029 / SPSC-088.


3. NA60 Status Report; CERN-SPSC-2008-032 / M-767.

4. Status of the Ke2/Kmu2 measurement at the NA62 experiment; CERN-SPSC-2008-031 / M-766.


9. Proposal to perform a testbeam run at CERN to characterise the T2K ECAL. CERN-SPSC-2008-025/ P-336.