MINUTES of the 130th Meeting of the SPSC
Held on Thursday 8 and Friday 9 June 2018

OPEN SESSION

1. Status and plans of the COMPASS Experiment  Jan Friedrich
2. Status and plans of the NA63 Experiment  Tobias Wistisen
3. Status and plans of the NA64 Experiment  Sergei Gninenko
4. Status and plans of the CLOUD Experiment  Urs Baltensperger

CLOSED SESSION

Present:

Apologies:  B. Panzer-Steindl, M. Krammer, R. Losito, J. Monroe
1. **DRAFT MINUTES OF THE 129th MEETING OF THE SPSC HELD ON 19 APRIL AND 20 APRIL 2018**

The minutes of SPSC129 were approved (CERN-SPSC-2018-013, SPSC-129).

2. **CHAIRMAN’S REPORT**

The Chairman reported on the last Research Board (RB) meeting, RB225. The following points were presented and, where necessary, discussed at the RB.

1. The SPSC presented the status of the NP02 (ProtoDUNE-DP) detector;
2. The Committee presented an update on the progress in assembling the NP04 (ProtoDUNE-SP) detector;
3. The SPSC presented the status and latest results of the NA62 experiment;
4. The Committee discussed requests from several experiments for support from CERN to allow them some limited running during the LS2 period and the SPSC expressed support for these requests;
5. The SPSC reported that it has received an addendum from the COMPASS experiment SPSC-P-340-ADD-1 asking for beam allocation in 2021. The SPSC recommended the COMPASS run in 2021 be approved.

The Research Board noted points 1-4 and approved point 5.

3. **STATUS OF ACCELERATORS**

Rende Steerenberg, summarised the operation of the CERN accelerators and the progress in the commissioning of the ELENA ring.

In general, the injector accelerators were performing well, however, since the last SPSC, the number of incidents disturbing operation by electrical perturbations due to extreme weather conditions was very high and reached almost 50% of all disturbances.

LINAC2 and LINAC3 were operating very smoothly, with an average availability for the last 14 weeks of 99.9%.

For the PS Booster, availability was only 95.5%, mainly caused by electrical problems of the power converters. In parallel to the operation, work to prepare the Booster for post-LS2 operation, as tests of new cavities, commissioning of a new transverse feedback system and improvements of the turn-by-turn ring pick-up system for optics measurements, is ongoing. In addition, LINAC4 operation and reliability runs preparing the LINAC4 connection to the Booster during LS2 have started. The PS has been available 93%, with the major problems and delays caused by the injection septum and the power converters.

From 9 April 2018 until 7 June 2018, the SPSC availability has been less than 75%. The majority of downtime was caused by two breakdowns, problems with the electrostatic septum for the North Area beams and a broken power transformer for the North Area beam transfer line. The issues with the septum were partially solved and operation could be resumed, however the SPS is now operating with four instead of five electro-static septa for the North Area until LS2. This leaves this year’s operation with no margin left, in case of a replacement...
required, the work would take about one month. The broken transformer is effecting the complex system to power the transfer line between SPS and the North Area experimental areas. Work is ongoing and it is expected that the operation will resume this week.

The AD is operating with a high machine availability of 90%, however the beam position is not always stable at the extraction. The issue is currently under investigation.

During the start of the AD run, because of delays very little beam time was available due to a water leak problem in the Target Area. Physics operation was nevertheless start as planned on 30 April 2018, and the leak, which is closely monitored, has diminished to almost zero. With full production beam intensity onto the target, the radiation levels remain just below the AD Hall alarm threshold.

The commissioning of the ELENA ring is proceeding well and a large number of tests are ongoing the installation of the electron cooler has been finished and heat tests are performed on all low-voltage circuits including the cathode filament. First electron beams generated in the cooler at low energy levels, and the beam can be steered onto the collector.

First tests with electron cooler solenoids on, seem to indicate that the polarities are correct and that the orbit distortion of Antiprotons at injection energy can be corrected with the compensation solenoids.

Next steps are to establish the operational conditions of the electron cooler with circulating beam and to start the first attempts at beam cooling. The understanding of AD to ELENA transfer line optics needs to be improved and the transfer of Antiprotons to GBAR is planned for end of July 2018.

Rende reported that concerning the injector schedule there are no changes, and the four weeks of Lead ion run for the SPS North Area and the PS East Area will start on 12 November 2018. The delivery of all protons will stop on 12 November 2018 to allow the start of the LINAC2 and PS Booster LS2 surface work, which requires a cool-down of the areas. Ion running will end on 10 December 2018.

4. STATUS OF EXPERIMENTAL AREAS

Lau Gatignon presented the status of the East and North Areas, AD and AWAKE.

In the East Area, the cooling circuit of the first quadrupole of the T10 beam could be unblocked and operation at 6 GeV/c re-established. Operation of the East Area was smooth, in good coordination with the on-going civil engineering works, apart from a failure of the CHARM target table the day before the SPSC meeting. The cause of the failure is under investigation.

At the North Area, which this year turned 40 years old, the installation of the new H2 and H4 beam line extensions for the Neutrino Platform continues. The area preparations for the SHiP measurements of muon and charm production are well on track. NA64 profited from excellent electron beam quality and intensity, but lost significant beam time due to machine problems. COMPASS is taking physics data since 11 May 2018 with higher intensities than in the 2015 Drell-Yan run, thanks to improved radiation shielding. In parallel, tests for a possible future proton radius measurement and for the MuonE project could be performed.

The upgraded temperature control for the CEDAR counters is performing well. NA62 has been taking data at between 60% and 70% of nominal beam conditions as foreseen, until the last quadrupole before the T10 target failed. This was replaced at the time of the SPSC
meeting. Otherwise beam conditions were good, apart from occasional spikes at the beginning of the spill. A new fixed collimator will be installed during the Technical Stop in June to further reduce a possible small background for the $\pi\nu\nu$ decays.

The physics run at the AD started as planned on the 30 April 2018, in spite of a small water leak in the AD target area. So far $6 \times 10^{11}$ antiprotons were delivered, at slightly larger emittance than usual. In parallel, preparations for ALPHA-a-g, GBAR, PUMA, AElIS and ASACUSA are ongoing.

AWAKE was ready in time for its first running period which was very successful, with improved electron injection and diagnostics around the plasma cell. Measurements were done at several plasma densities and gradients as well as different electron injection angles. Currently AWAKE is preparing for the next three runs planned during the year.

5. PS AND SPS USER SCHEDULES

Henric Wilkens presented the updates to the AD, PS and SPS user schedules.

The East Area has been operating very well, with a sharing of 1/10 cycles for the irradiation facilities, 1/15 cycles for the T9, T10 and T11, which is at the edge of the RP limits. The eAstrogam run in T10, is reduced to one week as the project received additional beam time at the SPS H8, where the Morpurgo magnet will be used. The freed beam time in T10 will be used by the ALICE Collaboration. The winners of the Beamline-for-Schools competition were selected and will be announced on 19 June 2018.

The optimisation of North Area supercycle and MD programme, and the smooth operation of the LHC allowed the delivery of 3600 fixed target cycles per day until the failure of the North Area transformer. During the repairs, the SPS is operated to advance the accelerator machine development programme and irradiation programmes at the HiRadMat facility. Additional beam time could be found for the TIC test and the ATLAS Tile Calorimeter test to compensate for the lost beam time. The tests for the Physics-beyond-Colliders Mu-e studies were performed in the M2 beam line at the start of the 2018 SPS run. The Mu-e team release their beam time in H8 this summer, allowing to schedule a characterisation of the LHC Beam Loss Monitors in a magnetic field.

6. DISCUSSION OF THE OPEN SESSION

6.1 COMPASS

The SPSC acknowledges the successful DVCS data taking in 2017.

6.2 NA63

The SPSC congratulates the NA63 collaboration for the publication of its 2016 data, demonstrating the phenomenon of radiation reaction in the propagation of a positron beam through silicon.

The Committee congratulates NA63 for the successful run in 2018 and looks forward to the results of the analysis of both the 2017 and 2018 datasets.

6.3 NA64

The SPSC congratulates the NA64 Collaboration on the publication of the results from its 2016 data-taking on the search for a vector mediator of Dark Matter production in the invisible decay mode and from its 2017 data-taking on the search for a new X(16,7) boson and dark photons decaying to $e^+e^-$. 

The Committee considers an NA64 run in the first year after the Long Shutdown LS2 to be well motivated, as it will allow to exceed the sensitivity of beam-dump experiments (Majorana TDM), to probe new areas of the mixing and parameters of the sub-GeV (Scalar, Majorana, Pseudo-Dirac) models, and to constrain the X(16,7) boson 8Be anomaly. The SPSC recommends approval of this run.

The Committee recognises the value of the planned detector upgrades which will allow the NA64 Collaboration to make more efficient use of the beam time available.

6.4 CLOUD

The SPSC is pleased by the successful CLOUD12 run and the results obtained for the development of global models based on experimental nucleation rates.

7. FOLLOW-UP ON EXPERIMENTS AND PROPOSALS

7.1 NA61

The SPSC recognises the broad interest of the NA61 physics programme after Long Shutdown LS2 as outlined in the addenda CERN-SPSC-P-330-ADD-10/11. The Committee recommends approval of beam times in 2021 for detector commissioning with hadron beams, for the measurement of hadron production with the T2K target with proton beams, and for the measurement of open charm production with Lead ion beams.

8. DOCUMENTS RECEIVED

- Call for proposals for projects at the CERN Neutrino Platform after LS2, CERN-SPSC-2018-012, SPSC-G-034;
Minutes of the 129th Meeting of the SPSC, Thursday and Friday, 19-20 April 2018, CERN-SPSC-2018-013, SPSC-129;
Agenda of the 130th Meeting of the SPSC, Thursday and Friday, 7-8 June 2018, CERN-SPSC-2018-014, SPSC-A-130;
Status for 2018, CERN NA63, CERN-SPSC-2018-017, SPSC-SR-233;

SPSC documents on the CERN Document Server (CDS):
http://cdsweb.cern.ch/search?sc=1&p=SPSC

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