CERN-SPSC-2024-020
SPSC-153
May 2024

Minutes of the 153 Meeting of the SPSC
Tuesday 7 and Wednesday 8 May 2024

OPEN SESSION 7 May 2024

1. Status and plans of NP02/ProtoDUNE-VD	Dominique Duchesneau
2. Status and plans of NP04/ProtoDUNE-HD	Christos Touramanis
3. Status and plans of NP06/ENUBET	Andrea Longhin
4. Status of NP07/ND280	Claudio Giganti
5. Status and plans of NA62	Giuseppe Ruggiero
6. Status and plans of WCTE	Mark Patrick Hartz
7. Proposal of MUonE	Riccardo Pilato

CLOSED SESSION 7 AND 8 MAY 2024

Present:
Achim Geiser, Alessandro Bacchetta, Barbara Holzer, Carl Lindstrøm, Carlos Lourenço (Scientific Secretary), Christine Marquet, Daniel Rodriguez*, Eve Stenson, Gabor Veres, Johannes Bernhard, Jordan Nash (Chairperson), Lars Eklund*, Marcella Bona, Marco Contalbrigo, Michael Wurm, Pippa Wells, Rende Steerenberg, Richard Hawkings, Rocio Cortabitarte, Thomas Udem*, Urs Wiedemann

* via zoom

1. MINUTES OF THE 152nd MEETING OF THE SPSC

The SPSC-152 minutes were approved (CERN-SPSC-2024-008, SPSC-152).

2. CHAIRPERSONS'S REPORT

The Chair reported on the last Research Board (RB 248) meeting. The following points were presented to the RB and, where necessary, discussed.

1) The SPSC presented the progress shown at the annual reviews for the AD experiments GBAR, AEGIS, BASE, ALPHA, ASACUSA, and PUMA.
2) The SPSC updated the RB on the usage of the EHN2 muon beamline.
3) The SPSC presented the request by NA61 for a proposed **low-energy beamline**.

The RB noted points 1 and 2.

The RB stated that the low-energy beamline in point 3 "**could only be considered after LS3 and would require submission of a new proposal."**

The Director of Research presented the conclusions of the ECN3 review by the CERN management. The Research Board **"approved SHiP/BDF to move forward to the Technical Design Report (TDR) phase in preparation for installation in ECN3."** The SPSC was asked to review the TDR and the experiment progress will now formally be reviewed by the SPSC.

3. STATUS OF THE ACCELERATOR COMPLEX

Rende Steerenberg informed the SPSC members that the 2024 run for the injectors was extended by 5 weeks, moving the YETS start date from 28 October to 2 December. He added that the length of the YETS was also shortened by 3 weeks, which represents an equivalent gain in physics time.

He then continued his presentation showing and explaining the 2024 injectors schedule together with the changes applied following the extension. In a table he summarised the schedule in numbers, showing a gain in physics time for the majority of the users of more than 30 days. Rende also presented a preliminary draft of the 2025 injectors schedule that is now available for feedback and iteration. This was complemented with a table indicating the physics time for each facility in 2024, 2025 and the sum of the two. Rende finished his presentation with a brief overview of the accelerator complex, focusing on the 2024 machine availability so far, and for which the figures are given in the table below.

Facility	Destination	2024 Overall [%]	2024 by destination [%]	Period
LINAC4	PSB	95.5	95.5	15.02.2024 – 05.05.2024
PSB	PS	93.9	93.9	21.02.2024 – 05.05.2024
	ISOLDE		97.4	28.03.2024 – 05.05.2024
PS	SPS	90.1	90.9	01.03.2024 – 05.05.2024
	East Area		91.1	22.03.2024 – 05.05.2024
	nTOF		91.6	25.03.2024 – 05.05.2024
	AD		91.8	14.03.2024 – 05.05.2024
SPS	LHC	86.0	96.7	08.04.2024 – 05.05.2024
	North Area		86.5	25.03.2024 – 05.05.2024
	AWAKE		98.2	15.04.2024 – 28.04.2024
	HiRadMat		95.1	29.04.2024 – 03.05.2024

The Linac 4 availability is about 2% lower than in previous years and this is dominated by a few major faults. The availability of the other machines is equivalent or higher than in 2023 when the 2% additional downtime of Linac 4 is discounted.

4. STATUS OF EXPERIMENTAL AREAS

Johannes Bernhard reported on the status of the North and East Areas, as well as the experimental areas of AD/ELENA. He began by introducing the commissioning activities in the experimental areas to the new committee members in view of the beam commissioning achievements presented in his talk.

The North Area beam commissioning proceeded well, addressing and resolving several issues from previous years. For some users it was possible to offer starting their physics runs up to one week in advance. Where this was not feasible for the users, several studies for electron beam quality and upcoming projects, such as HIECN3, have been conducted and one day was given as MD time to the machine. The H4 VLE beam branch was successfully commissioned for the operation of NP04. In H6, good electron beam purity was demonstrated in tertiary beams with different wobbling settings, qualifying the line to host, again, low-intensity electron beam users. In H8, synchrotron-radiation separated electron beams at very high energies, up to 300 GeV, are now available again. All hadron and muon beam configurations have been commissioned successfully in the M2 line. Both CEDAR detectors were refurbished, with small issues on one of them being addressed. For P42, several tests have been performed during the commissioning period that are relevant for the operation of NA62 and the upcoming HIECN3 project. An agreement was reached for early announcements of Machine Developments and ad-hoc scheduling of accesses for NA62.

Johannes Bernhard continued with an overview on the North Area Consolidation project (NA-CONS), emphasizing the project's importance for the reliable future operation of the NA beam lines and experiments. CERN has decided to invest considerable resources into the project, covering a consolidation program (Phase-II) reaching into LS4.

In the East Area, commissioning for all beam configurations was completed on time. Several tests have been completed varying the flat-top length at the request of test beam users. Additionally, longer flat-top lengths will be tested at lower extracted proton energies this year. For T9, the WCTE infrastructure preparation is on schedule. Some last issues have been resolved and equipment is being delivered. For T10, a significantly smaller beam spot has been achieved for test beam users requiring high intensity beams. For T11, all beams are prepared and ready for CLOUD.

In the AD/ELENA hall, the ALPHA control room refurbishment is complete. Preparation for the new test beam line, TELMAX, is progressing well, with all prior ATRAP structures dismantled and a new shielding arrangement in place. The beam line is expected to be ready for the first users by the end of summer.

The report concluded by highlighting the requests for experiments running during LS3. The IEFC (LHC Injectors and Experimental Facilities Committee) would appreciate a statement and recommendation from the SPSC on the scientific importance of these requests. The SPSC will review the requests at their next meeting, in September.

5. NEWS FROM THE PS AND SPS COORDINATOR

Eva Barbara Holzer presented the user schedules for 2024. The user schedules had previously been released for roughly the first half of the run. They are currently being updated for the second half of the run, following the extension of the 2024 run and the release of the new injector schedule v2.0.

Due to the run extension, most of the activities reviewed by a CERN scientific committee can be scheduled according to their requests. Parallel running of different user teams in the same beam line remains the norm, wherever the measurement program allows for it.

6. DISCUSSIONS ON PROJECTS PRESENTED IN THE OPEN SESSION

6.1 NP02

The SPSC **congratulates** the collaboration for the excellent progress with the preparation of NP02 Module 0 and for the improvements of the CRPs and PDS electronics for the Vertical Drift detector, shown in the Cold Box tests. The committee **notes** the need for the preparation of the DUNE FD2 Integration Test at CERN.

6.2 NP04

The SPSC **congratulates** the collaboration for the successful physics analyses programme and the final NP04 phase 2 prototype construction, for the completion of the Lar filling, and for the readiness for beam data taking. The committee **acknowledges** the joint effort with NP02 regarding scheduling. The SPSC **recommends** the requested beam time, up to 8 weeks, as long as the collaboration is ready to make effective use of that time.

6.3 NP06

The SPSC **congratulates** the collaboration for the publication of the monitored beamline study. The committee is **pleased to see** the preliminary results of the beam test of the demonstrator and **supports** the collaboration's effort to complete the measurement programme and analysis in 2024.

6.4 NP07

The SPSC **congratulates** the collaboration for the successful completion of NP07 and of the ND280 upgrade. This concludes the SPSC review; future beam time requests, if any, should be handled within the "recognised experiment" context.

6.5 NA62

The SPSC **congratulates** the collaboration for the result on ultra-rare kaon decays and **looks forward to** seeing the new $K^+ \rightarrow pi^+$ nu nubar decay rate measurement, based on the combination of the 2021 and 2022 data sets.

6.6 WCTE

The committee **congratulates** WCTE for the successful operation of both beam monitors for low momentum charged particle identification and tagged photons. The SPSC **acknowledges** the progress made in completing the production and assembly of all the detector systems and **looks forward to** seeing the detector installed in the T9 beam area and the first results on particle discrimination and charged lepton scattering. The SPSC **recommends** that WCTE be the first experiment to operate in 2025, to keep the detector in place over the winter shutdown period.

6.7 MUonE

The SPSC **acknowledges** the reception of a proposal submitted by the MUonE collaboration for a first phase of the experiment, aiming for a physics run in the M2 beamline during 2025 with a reduced version of the detector. The committee **will review** the proposal and **formulate a recommendation** at its September meeting.

7. DISCUSSIONS ON OTHER PROJECTS

7.1 MADMAX

The SPSC **acknowledges** the reception of the addendum to the MADMAX proposal, which presents a compelling programme for axion searches during LS3, probing axion masses around 80 μeV with unprecedented precision. The experimental technique has been validated with smaller prototypes and the apparatus is on track to be ready for data taking in 2026. The committee **emphasises** that any agreed programme will have to be compatible with the LS3 North Area activities. The SPSC will **continue to review** the addendum in view of formulating a recommendation in September and **looks forward to** seeing final results on a limit on the axion coupling from the previous measurements.

8. DOCUMENTS SUBMITTED

- Minutes of the 152nd Meeting of the SPSC, https://cds.cern.ch/record/2889575
- NP02 Status Report, WCTE Status Report, http://cds.cern.ch/record/2896627
- NP04 Status Report, http://cds.cern.ch/record/2896494
- NP06 Status Report, http://cds.cern.ch/record/2896594
- NP07 Status Report, https://cds.cern.ch/record/2896440
- NA62 Status Report, https://cds.cern.ch/record/2896093
- WCTE Status Report, https://cds.cern.ch/record/2896252/
- MUonE Phase 1 Proposal, https://cds.cern.ch/record/2896293

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

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