

## Minutes of the Technical Board Meeting April 10, 2018

[Indico page of the meeting \(click\)](#)

Present: Vincent Andrieux, Vladimir Anosov, Jens Barth, Franco Bradamante, Nori Doshita, Christian Dreisbach, Vladimir Frolov, Alain Magnon, Daniele Panzieri, Caroline Riedl, Fulvio Tessarotto, Annika Vauth

Remotely connected: Bernhard Ketzer, Jan Friedrich, Maxim Alexeev, Marcin Ziemicki, Stephane Platchkov

**Communications:** Caroline will leave CERN by June 30, 2018, the date that her TC term will end. She had offered to prolong her term until the end of the 2018 run under certain conditions: that her husband can work at CERN for the remaining months July - November. This was excluded by the Illinois group (which both Caroline and Eric belong to).

**Status of 2018 installations (Vladimir Anosov / Caroline Riedl):** all detectors, except for FI15, FI03, FI04, VI02, Veto-up/down installed in beam position and all surveyed, except for small DCs and MMs (and DC4 should also be surveyed again because it has been pulled into garage position after survey). Are the Veto up/down needed for the 2018 run? Installed but not used in 2015. Need final conclusion from trigger experts.

All 3 test setups (Proton Radius, Straw NA-64, MUonE) installed and surveyed. Coupling of FI04 with new frame done. Concrete platform for beam telescope with FI04 and VI02 on top of it has been installed in the week before the Bonn meeting and dismantled for future installation of PT loading platform. Modification of concrete shielding (according to RP requirements - additional "balcony shielding") done on April 5; beam permit received two days later on April 7.

2 slabs of HO03 missing; to be installed by next MD. Concrete platform for beam telescope will be installed on 24.04.18. Installation of FI03 to be done first (25.04.18), then its survey with position adjustment (25.04.18), then installation of VI02, FI04, SF15 (26.-28.04.18), then survey and position adjustments (26.-28.04.18), then installation of Veto Up&Down (26.-28.04.18).

The 6-lithium absorber has arrived in France and will be installed in COMPASS upon arrival in Preveessin. It is exactly the same configuration including the thin stainless steel auxiliary plates that the two lithium sheets are glued on. Erwin Bielert agreed to be present during the first installation (variations in the setup including the 1cm polyethylene plate might follow later to find the best configuration for physics).

**2018 schedule (Caroline Riedl):** as compared to the original planning, which assumed too naively the availability of cooling water from mid- January 2018, there was a total of 4 weeks of delay in the commissioning of the target due to the consolidation of the NA cooling tower. In addition, COMPASS skipped the empty TE calibration before the start of physics data taking, which would have taken  $\sim 1$  week. One week could recently be gained because the commissioning of the target magnet took only 4 instead of 5 weeks and is scheduled to be (more or less) completed April 13. This means that the loading of the target and the installation of the full beam telescope can be anticipated by 1 week and 1 week of Drell-Yan physics data can be gained.

**Polarized target (Nori Doshita):** the commissioning of the target magnet was carried out by CERN personell from EP-DT (Laurent Deront, Sylvain Ravat) supported by Fabrice Gautheron (now EN-EA) in the period March 20-April 13. A new-old field rotation procedure (from SMC times) is prepared to avoid the 1% of polarization loss as in 2015. A 8 hour long-term test for the new power converter has been requested and various changes of electronic cards have to be commissioned. The solenoid magnetic field direction is opposite to that of the 2015 direction because of the new power converter. The MSS (Magnet Safety System) "allowed" 2dim map of operation (dipole, solenoid) has been tested for all possible configurations; sum of currents may not exceed certain value in order not to damage the system. A few magnet commissioning tasks remain to be done after target loading.

During the target loading on April 17, access to the target region is restricted. There was a safety meeting about this subject with Gerd Mallot on April 5. Before loading of the target material, older SMC material will be added. The 2015 material was produced in 2011 and cleaned in 2017, the old SMC material has almost same relaxation times, as measured last year. In the downstream target cell, only 2015 material will be filled. To mix material in the downstream cell would be too complicated (and unsafe) a procedure, since the filling starts with this part and has to be done under LN2. Mixed material will be inserted in the upstream target cell. Gerhard Reicherz will come to CERN for the target loading.

The target magnet will be ON from Friday evening April 20. Finish TE mode procedure by April 20. Will be done by Sylvain this week.

Genki's calculation of the magnetic field homogeneity is work in progress. The goal is to start tuning from new setting. Claude Marchaut's code is used and not yet perfectly understood.

The empty target TE calibration will be performed after the end of the beam.

**CEDAR upgrade, CERN (coordinated by Serge Mathot, reported by Anika Vauth):** the thermal housing and the air ducts and water connections for the active thermal insulation upgrade have been completed by EN-CV (even though some small works are still ongoing in the 2nd week of April).

**CEDAR upgrade, WUT (Marcin Ziembicki):** The PMTs were temporarily cleared from customs in Warsaw the day before the TB meeting after they had been stuck for 3 weeks. They were directly shipped to CERN and no testing had been possible at WUT. The FEE yet has to be shipped to CERN from Taipei. For the mechanics: not much needs to be done, only endcaps need modification, for which Marcin requests access to the technician's workshop. The corresponding authorization form is Safety Form SF-SO-12-0-1 (agreement concerning the use of work equipment in CERN workshops by members of personnel).

A new graduate student (Adam) has developed the optical system. He will arrive together with Marcin and Robert Kurjata at CERN on April 16 for 2-3 weeks for installation of the PMTs and the FEE.

**MWPCs and RICHwall (Daniele Panzieri):** the RJ45 connector on the FEEs had developed problems and were exchanged on 3 stations (PA02, PA03, PA04) with old-style RS232 connectors. The RICHwall has been moved back into the beam on February 8. Both for RICHwall and MWPC, the spare situation is under control, and in case needed, possibly broken FEE cards can be repaired during the year, both at CERN or in Torino.

**Electronic spares (Maxim Alexeev):** spare status: no spare CATCH's scaler mezzanine cards; no spare CATCH's TDC mezzanine cards (not important in 2018); 2 spare 9U VME crates are not equipped by PS and fan-trays. For CEDARs, it would be good to have a newer 6U VME crate available.

The repair of catches, 3-4 in Freiburg barrack, mezzanine cards, seems not to be a problem. But very limited number of scalers. Vladimir F. and Moritz: found no spares yesterday. Last year Horst had sent everything he had in Freiburg.

If equipment cannot be borrowed from other COMPASS groups or if it can't be rented from the pool: consider to purchase from common fund.

**DAQ status (Vladimir Frolov):** 2015 (DY) was the first year with the new DAQ, in total 1,003 TB of raw data, 20-25 kbyte per event, 211GB per hour = 10M events. In 2017 (GPD), 1,389 TB of raw data, 414GB/h, 40kbyte per event (calos including ecal0 and camera).

Limitations: 4 triggers can not be closer than 4 musec (MWPCs); 30 time for 3 triggers; 10x25 if we have very close 10 triggers, difference between them; should not be less than 25 microsecs.

**Status of proton radius setup (Christian Dreisbach):** a TPC owned by St. Petersburg / Gatchina, which was used at GSI before, was installed downstream of COMPASS on a concrete pedestal in between 2 sets of each 2 COMPASS silicon stations. The calibration is done by an alpha americium source. The alpha line shifts by 3% per day due to impurities (outgassing materials). The TPC has to be refilled once per week; the flashing of the gas takes 2-3 hours. The nominal pressure is 8 atm. For the final measurement, a different TPC (longer, higher pressure) will likely be used.

The COMPASS silicons are not cooled with LN2. The APVs are cooled with nitrogen gas stream. The beam trigger of 7 cm×5 cm covers the area of the silicons. There is a separate, self-triggering TPC DAQ and a stand-alone silicon DAQ. The events from the two data sets will have to be matched offline with time stamp on event basis. Both DAQs are functional.

In the final experiment, the plan is to trigger on the kink of the scattered muon. For this test experiment, there will be no kink trigger.

The Proton Radius Measurement has also been integrated into DCS, both the COOMPASS silicons and the TPC.

**Planning for LS2 (Caroline Riedl, Annika Vauth)** : it was requested to report on COMPASS' needs during Long Shutdown 2 at the ETAM on April 10 (same day as TB meeting). In addition to the resources indicated in the table provided by Lau Gatignon (EN-CV, TE-CRG, EN-EA), COMPASS made the following remarks and added EN-HE and EN-EL: *The target region will be changed over from DY to SIDIS right after the 2018 run (if the 2021 SIDIS run gets approved). Work might leak into 2019.*

- EN/HE removal of absorber, displacement of the target platform and removal of some large trackers from the spectrometer for repair.
- EN/EL disconnection and connection of PT magnet power lines
- TE/CRG removal of pump lines and re-installation of old or modified pump lines. Disconnection and reconnection of LHe line.

At present, it considered to repair RICHwall and potentially DC4 during LS2.

**The next TB meeting is scheduled for June 5, 2018.**