

Minutes of the Joint COMPASS and AMBER TB meeting of 28th September 2021

S. Levorato

November 17, 2021

Attendace via Zoom only

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The material presented during the meeting is available at
<https://indico.cern.ch/event/988388/>

The meeting starts at 09:00 pm

Agenda

- 1 Approval of the minutes of the Technical Board held on 4 May 2021
- 2 News and communications
- 3 PT Update
- 4 W45 gas contamination
- 5 MWPC, RW planning for COMPASS and Alpide for PRM
- 17 AOB

1 Approval of the minutes the TB of 13 July 2021 *S. Levorato*

- a The the minutes of the Technical Board held on 13 July 2021 are approved

2 News and Communications *S. Levorato*

- a J. Friedrich and Stephane Platchkov mandates are extended till end of 2022
- b The proposed dates for the Technical Board meetings in 2022 are 8 February 2022, 19 April 2022, 19 July 2022, 11 October 2022, 13 December 2022
- c The wrong polarity order of the CAEN HV PS for the SciFi detectors is described: a mistake in the order was committed by COMPASS side. The solution adopted for 2021 was the renting of negative polarity modules. The possibility of factory polarity change has been investigated and presents a too high cost for each module. The modules can't be sent back to CAEN unless CAEN receives an order for the very same module by an external contractor. The EDH order is DL7868998, the cons of the power supply is reported in line 5. Further investigation with CAEN will follow.
- d The preliminary schedule for the CV services in view of the winter shutdown is illustrated: shutting down of 2/3 of the NA cooling tower pumps on November 15, complete shutdown at the beginning of December. The 2022 restart is foreseen in the middle of February or beginning of March.
- e The preliminary schedule for the dismantling of the silicon tracker setup in view of the 2021 data taking run for COMPASS is presented. The removal of the silicon is postponed to October 6 to allow the material unloading on 19 October. The optimization of the manpower resources is discussed in view also of the changeover with AMBER PRM run starting, the possibility of an earlier partial dismount is envisaged during the 2 and 3 of October.
- f The COMPASS Helium recovery line accident was studied via FEM calculation and the outcome presented: from the results obtained computationally one can conclude that the main pumping line of the dilution cryostat collapsed due to a buckling caused by a low safety factor i.e. 2 of the structure due to the low thickness of the pipe geometry: 2mm and the absence of enough supports or stiffeners. In order to increase the safety factor to 8, the minimum recommended in such structures, it has been proposed to increase the thickness of the pipe to 3mm and to install supports or stiffeners at a maximum distance of 1 meter from each other. The welding of the stiffeners most likely is to be performed during the end of November/beginning of December period. In parallel the winter maintenance of the He4 pumps has been submitted on YAMAGATA account. It is scheduled during the end of November 2021.
- g Requests to have the flammable gases longer than the duration of the COMPASS run needs to be communicated to the TC in view of the interventions in the 908 flammable gas barrack.

- h The Infrastructures for the AMBER pilot run for 2021 are well defined. The TC recommends to build a detailed planning of the installations to schedule the detector movement, the start of the commissioning and the booking of the safety visits for the beam clearance. The area at the end of the 888 hall is ready for the installation of the ECAL2 readout.
- i The gas system for the IKAR TPC has been partially built and is nearly over. The operational scheme has been developed in collaboration with the EP-DT and the integration with the safety system is defined.
- l The list of known activities in 891 during winter shutdown are listed in view of the optimization of the usage of space: Repair of DC5, repair of MWPC mylar foils and further tests for the IKAR TPC.
- m Several electrical non conformities and the general status of the existing electrical installations have created difficulties in obtaining the safety clearance for the use of the beam. On 29 September COMPASS will undergo an electrical inspection to identify the critical issues that will need to be solved. The report generated after the visit will be distributed to detector experts. They are requested to solve the identified problem before the restart.

3 PT Update *M. Pesek*

Michael Pesek reports about the status of polarized target since the last TB. After the collapsing of the Helium recovery line the target material was unloaded on July 5. The cause of the accident has been identified in a non sufficient wall thickness of the pipe (2mm). A 3 mm pipe was rebuilt but the displacement of the pipe forced the production of an ad hoc adapter which led the installation to end on July 20.

The DR recovery requested multiple purging due to the contamination with air. The target material was reloaded on August 10 and the 4K temperature was reached for the magnet on August 18. TE calibration was performed between 20-23 August, on 26 the Helium mixture usage started and the 80mK temperature reached.

The impossibility to keep a sufficient level of Helium in the system when both Dipole and Solenoid magnet are on led to the investigation on the status of the magnet thermal shielding by A. Dudarev on 30 and 31 of August. A possible explanation of the problem is the presence of corrosion between the Cu and Al contact occurred during 2019 during the cavity modification. An operative solution was found by adjusting the operational parameter of the Helium cooling valve.

The first polarization build-up was performed on the first of September. The magnetic field uniformity ($\approx 10^{-6}$) could not be reached initially, only after adjusting the trim coil polarity and currents. The EIO tubes showed unstable behavior in frequency and power.

It was finally decided to proceed only with the polarization buildup of the central cell via the Gunn diode. By scanning the the diode power and frequency the polarization evolution could be studied for its optimization. Via the MCS system, changing the magnet current in steps of 10 mA and the EPR bolometric spectrum was measured. The measurement of the maximum polarization reachable and the buildup time with the optimized parameter set is scheduled in the next days.

4 W45 gas purity *C. Azevedo*

The W45 detectors present a very long ramping-up time to nominal voltages, \approx a week to ramp-up, when the current limit is set to 50 μ A. A correlation with humidity was observed. On August 2021 a large oxygen contamination was measured for DW04 and DW05. At the page [https : //wwwcompass.cern.ch/compass/detector/w45/new_page/log/log.htm](https://wwwcompass.cern.ch/compass/detector/w45/new_page/log/log.htm) the appearance of a very similar detector behavior is described for 2010 run and the fixing was obtained by the installation of the new mass flowmeter and waiting 10 days of flushing the detectors with the appropriate gas mixture. The problem is under investigation.

5 MWPC, RW planning for COMPASS and Alpide for PRM *M. Alekseev*

M. Alekseev describes the planning of the intervention for the MWPC and the RW. During the YETS the group is evaluating to refurbish one (PA01) or more MWPCs. The preparation is foreseen to start in 2021 and the windows replacement during the first months of the 2022. The repair operation is 1 week for 1,5 chamber. The procurement of Mylar with laminated aluminum is still problematic.

For the RW detector the gas distribution panel will be improved for a better control on the gas flux and a screening on all the noisy channels will be installed during the winter stop.

For the MWPC the iFTDC FE installation is foreseen for the PRM pilot run, the modification of the monitoring software has started while the reconstruction software is still to be updated.

For the ALPIDE tests the mechanics components are in production and are expected to arrive before mid October. The AMUX card is being submitted, the transition board has been resubmitted to a second company and the CMUX has been produced and the firmware is in development. A test DAQ based on MOSAIC RO cards (help form GSI) is being assembled at CERN, ALPIDE carrier cards has been promised, no other ALPIDE is available at the present day.

6 AoB

- No other arguments are proposed.

The meeting ends at 13:45 pm.