Joint COMPASS-AMBER Technical Board

20-September-2022

Stefano Levorato
20.09.2022

Agenda

- **Communications**
  - Approval of the minutes of the last TB
  - De-cabling Campaign
  - Energy saving 2022-2023
  - Future meetings
  - Gas status 2023
  - Low Voltage
  - Equipment transition
  - PRM setup
  - Agenda

Minutes of the last TB

Available at https://codimd.web.cern.ch/pfAycG6dT0KK7cyActjiyg

REMINDER

Each speaker, presenting at the TB, will enter the minutes of its presentation, preferably before than the TB and maximum one week after the TB was held.

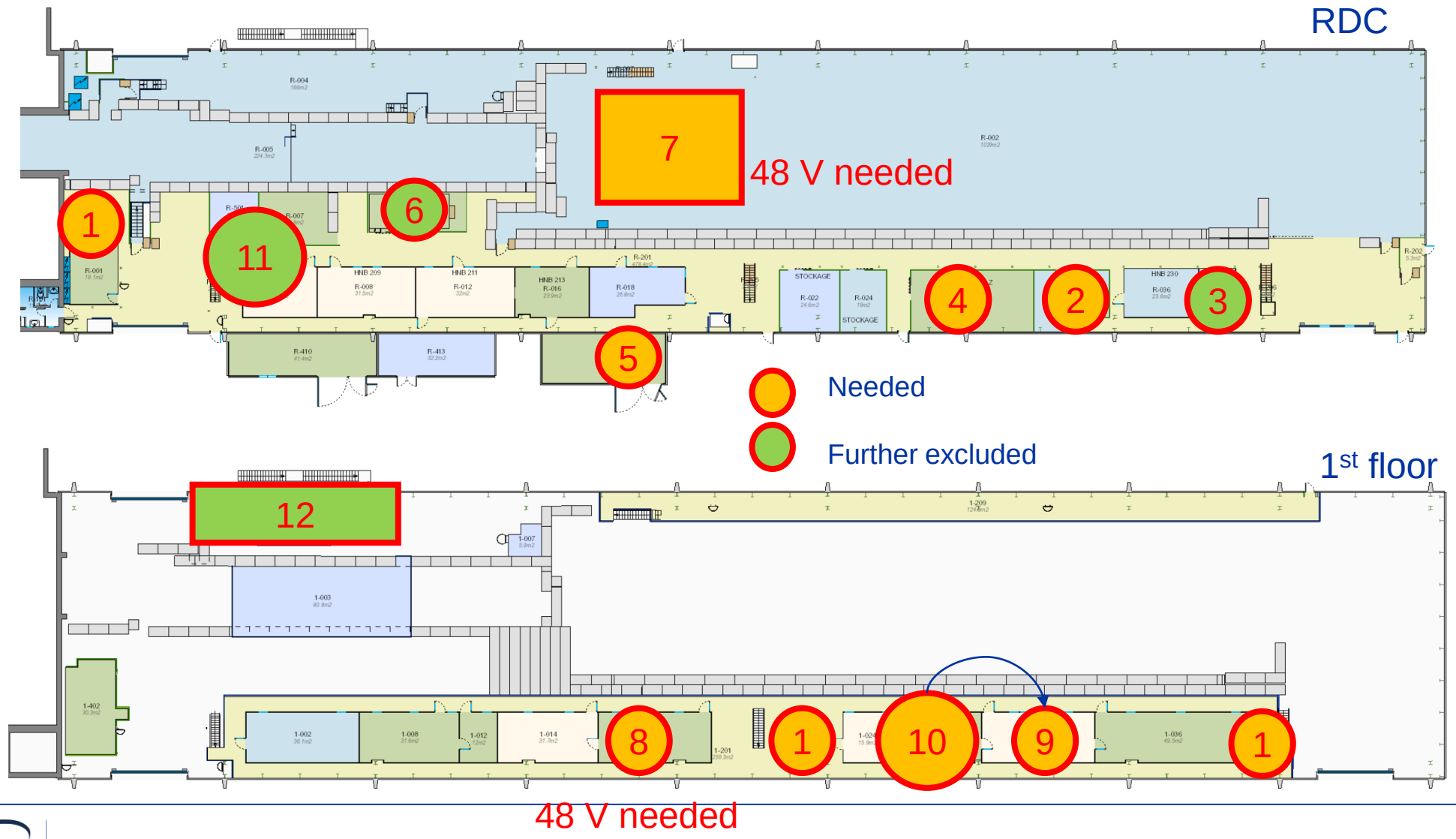
On the next TB Indico page (https://indico.cern.ch/event/XXXXX/) you can already find the link to the minutes document (https://codimd.web.cern.ch/xxx).

You can find more information on the tool use and features at https://codimd.web.cern.ch/

→ https://codimd.web.cern.ch/BmqDvxgQS0aRVjPboVvaNQ?view **for this TB**

DE-CABLING

Required power during lock-out of EHN2: phase 2



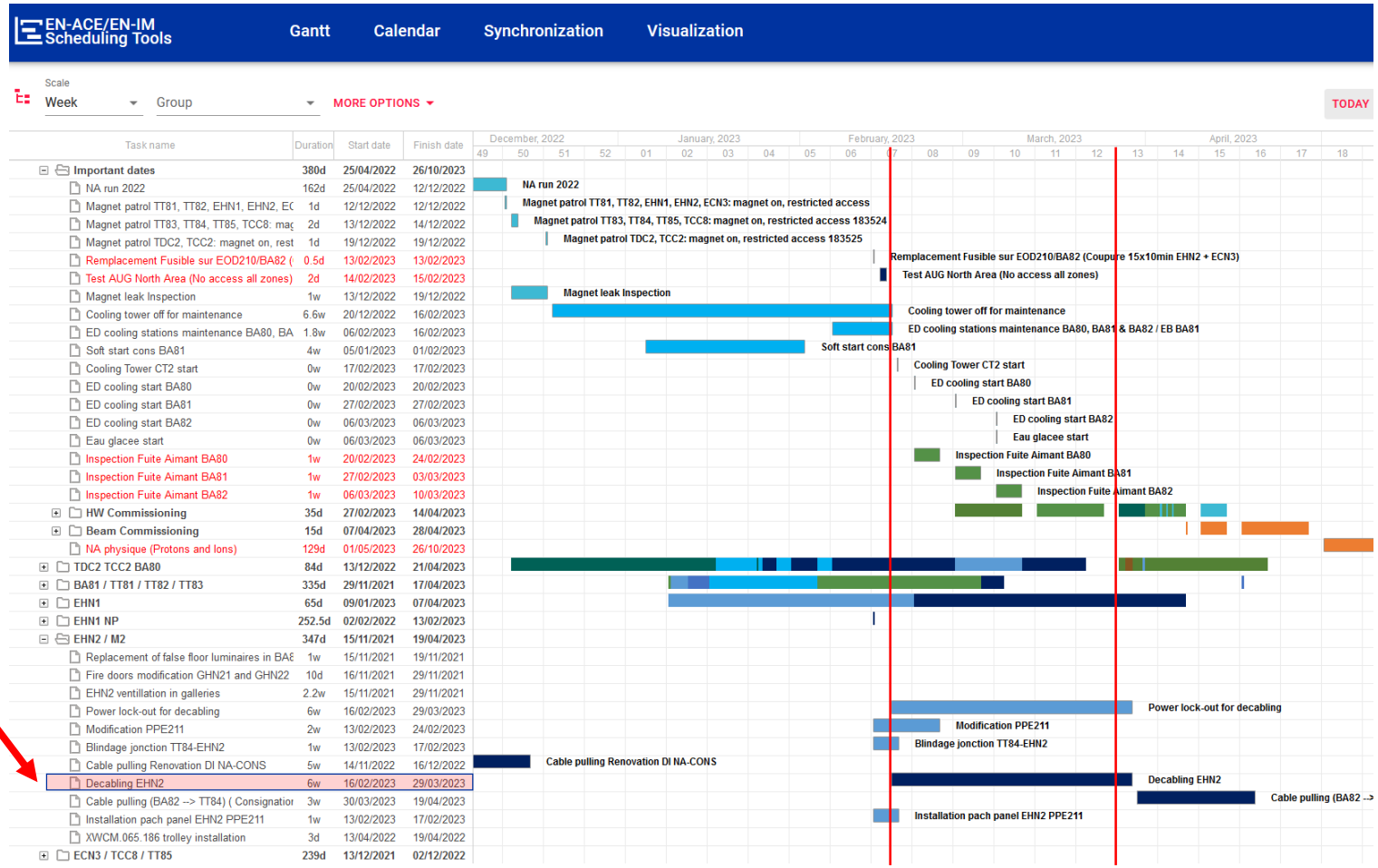
Lock out of EHN2 & BA82

Wed. 15.11.22	**End of beam in EHN2 & ECN3**
15.11. – 18.11.	**Magnet inspection with RP**
	@ EHN2, ECN3, TT83-85, TDC8 & 85 NO TCC8
18.11.22 – 29.03.23	**Lock-out of EPC in BA82**
30.03.23 ??	**Test alim. EPC BA82**
16.01.23 - 17.03.23	**Time window for de-cabling BA82**
	Lock-out of EHN2 & BA82
01.05.23 ?	**Physics in EHN2 to be defined**

Required power during lock-out of EHN2 summary

- **The lock out for the decabling campaign will start on 16 February 2023**
  - The network connection will be granted during the whole lockout
  - Part of UPS power sources will be kept operational --> Only priority ones
  - DAQ machines will be kept running with 7kW power limit (dedicated power line connection from BA82 t.b.c.)
  - COMPASS standalone cooling system will be kept operational (under study the power connection solution)
  - Move the DCS machines on UPS line and / or to the DAQ room
  - DCS will be operative during the lock out
  - PT PLC / monitoring system available and running since the 48 power line will not be depowered
  - Heating of pump room, 906, warm water operative during the lockout
  - 891 Clean room will be excluded from the lockout
- **Use of Crane during lockout should be avoided**
  - Planning of the operation that needs crane in advance (moving of detectors during December – January)

Planning



Time window for de-cabling : 16.02.23 - 17.03.23

https://oss-coordination.web.cern.ch/gantt/latest

Energy saving
From M. Brugger

Energy Limitations versus Schedule

September 13th 2022

Discussion on Options/Impact

+ Conclusion focus on 2022, rest as input for 2023+ follow-ups

M. Brugger with input from experiments

What We Want To Discuss

- **Energy restrictions and CERN YETS/Operation baseline**
- **General aspects**
- **2022 Remaining Operation Period**
- **Power shortage related and Other Concerns**

- ***Other options***
  - *SPS Energy Reduction -> Impact on Physics*
  - *SFTPRO Flat-Top Length: (i) stand-alone or (ii) combined with energy reduction*

- **Aiming for an agreement on:**
  - 2022 preferred versus alternative choice
  - Priorities 2023+ possibilities and additional input

Current Baseline & Constraints

- **EDF has 3 levels of being able to reduce the energy consumption:**
  - 1. voluntary scheme: e.g. shorter run periods
  - 2. “délestage”: a few hours to cut the megawatts -> ‘early’ warning of >24h
  - 3. blackout - could happen if level 2 is not applied correctly
- **2022: Request from EDF to start YETS 2 weeks earlier due to electricity crisis in Europe**
  - approved by DG -> start of YETS 22/23 November 28th [energy availability driven]
  - ~x% reduction in running time to be shared fairly between pp and ion time (to be considered for 2023+ YETS)
  - ideally scheduling runs of lower energy consumption at end of a year
- **2023+:**
  - earlier and extended YETS for the rest of Run 3 (4 weeks extended, 6 weeks earlier) considered [budget driven]
  - LHC Ion Run Options (in discussion): [LHCC update only 3 ion runs during Run4]
    - Option A: early ion run this year, with or without an ion run in 2023
    - Option B: no ion run this year, but extended ion run in 2023, with early option (June 2023 may be possible)
  - FT ion run should coincide with LHC ion running period
- **Next/Parallel**
  - discussion with Research Director & Experiment spokespersons today/tomorrow
  - imminent decision on 2022
  - 2023+ strategy to be refined

General Aspects (Constraints)

- **Inherent limitation**
  - for many (most) users event rate is limited by the detector (DAQ, off-time, …) and not beam intensity, thus, the event statistics is proportional to the integrated flat-top time -> still this could be considered for commissioning/setup periods (where effectively it's the number of spills which are likely sufficient)
- **shorter flat-top:**
  - apart from setting up and tuning, for data-taking it would surely be more economical (also in terms of manpower to cover operation of the machines/infrastructure as well as running shifts for the experiments) to shorten the overall length of running time per year, since one would then also gain the ramp-up and ramp-down power consumption.
- **lower energy:**
  - the above would also be valid for running the SPS at 300 instead of 400 GeV/c, in particular for users/experiments where losses of flux cannot be compensated
- **short (ion) operation periods as well as proton/ion/proton switch-overs will inherently be less effective (for a given integral of physics days)**

2022 Remaining Operation Period

Starting point:

- November 28th start of YETS, unlikely that 2023 start-up would be advanced
- No change in cool-down period if ion run is maintained, otherwise assuming that advancing the operation stop by two weeks would compensate, thus current YETS work schedule feasible (as long as not shortened in the end)
- Schedule-wise we can advance the ions (at the cost of proton physics), only constraint being to disentangle LHC ion and FT ion start-up (possible few days before or after)
- Indirect optimization aspects (duty cycle) to be considered: if no ions in the LHC/SPS-FT: e.g., (i) LHC ion setup; (ii) finish or not LIU MDs during 2022
- inefficiency to be considered for proton/ion changeover constraints (2-3d for FT physics: 0.5d DSO/SPS, 0.5d matrix change, 1d steering and commissioning, 0.5d/1d tuning, problems out of experience)
- NA61 not yet commissioning with ions, nor seen Pb-beams despite major detector upgrades
- Other users affected both for EA and NA (CHIMERA, NA60+, R2E, etc.)

2022 Remaining Operation Period

- **Advancing the Ion Run (shortening the proton run)**
  - at cost of the proton run statistics
  - AMBER/COMPASS +? MUONE end-of run schedule
    - only limited (no) option left without impact on COMPASS data taking
  - EHN1 user schedule
    - ALICE, ATLAS, CMS, SND -> advanced/cancelled?
    - GIF++ shortened
    - CEDAR-H test would be affected -> critical for YETS installation

- **How to get to a conclusion -> Barbara picking-up input and discussing with Jordan, taking into account LHC baseline**
  - Maintaining a short ion Run
    - Advantages: …
    - Disadvantages: …
  - Having a slightly longer proton Run
    - Advantages: …
    - Disadvantages: …

Power shortage related concerns

- **LKr calorimeter**
  - protection or gas availabilities in case of extended power cuts (status of Diesel, monitoring) -> constraints and any verifications required?
  - EATM next week

- **AMBER RICH** critical
  - -> protected by the UPS/Diesel, but loosing cooling (gas) after …

- **…**

Next Joint COMPASS/AMBER TB

Request to anticipate the next technical board one week in advance to December 6 (Instead of December 13 personal unavailability)

N.B. it will be the last COMPASS TB, need to move towards the AMBER TB

During the next TB I will prepare the usual yearly planning for the AMBER technical board meeting.

Detector responsible groups (services, operation, maintenance) are to be officially **confirmed/defined**
→ Address this problem during the CB

Gas status 2022-23

CF4 availability is still marginal,

- → **we expect to receive the last ordered batch of CF4 bottles middle of October, this will grant the operation of the detector using CF4 gas till the end of data taking with basically no spare gas**
- → **We should keep the CF4 gas consumption as it is now, there is no room for an increase**
- → **We have been warned Helium deliveries may be affected in the near future (at COMPASS we use it for the RICH pipe and sporadically for the PT)**
- → **Next year (since we start with the very same spectrometer configuration) we will need to face the same problems**
  - → Invite to improve the monitoring of the gas quality of the detector (as it is done with straws)
  - → We may be asked to reduce further the gas consumption (Environmental issues/missing of recovery system)

AMBER, low voltage power supply

Should address the problem of Low Voltage power supply for crates.

Critical for next year running since we are most of the time with no spare or spare already broken

We can go as done in 2021 for a campaign of repair for the non working PS (if possible) as temporary buffer

Can not be the solution on a long time scale→ detector responsible/expert should start to address a replacement / change / upgrade of the equipment

The HV campaign with the replacement of CAEN HV P.S. proved to be successful

Should go in the same direction even if it is more complicated for the LV

Equipment transition COMPASS to AMBER

Based on the collected inputs from the physics coordinators and SPs all COMPASS equipment will be transmitted to AMBER

- Saclay detectors will be available for anti-p measurement
- Micromegas may be brought back to Saclay after anti-p run
- For the moment there is no identified group who will take care of the Saclay DCs (to my best knowledge)

→ URGENT

- DC4 V/V' planes are currently unusable (repair ? → planning)

- For all the equipment under the responsibility of our Russian Colleagues the status is to be clarified
  MW1 and HCAL1 Dubna
  MW2 and ECAL1/2 HCAL2 Protvino

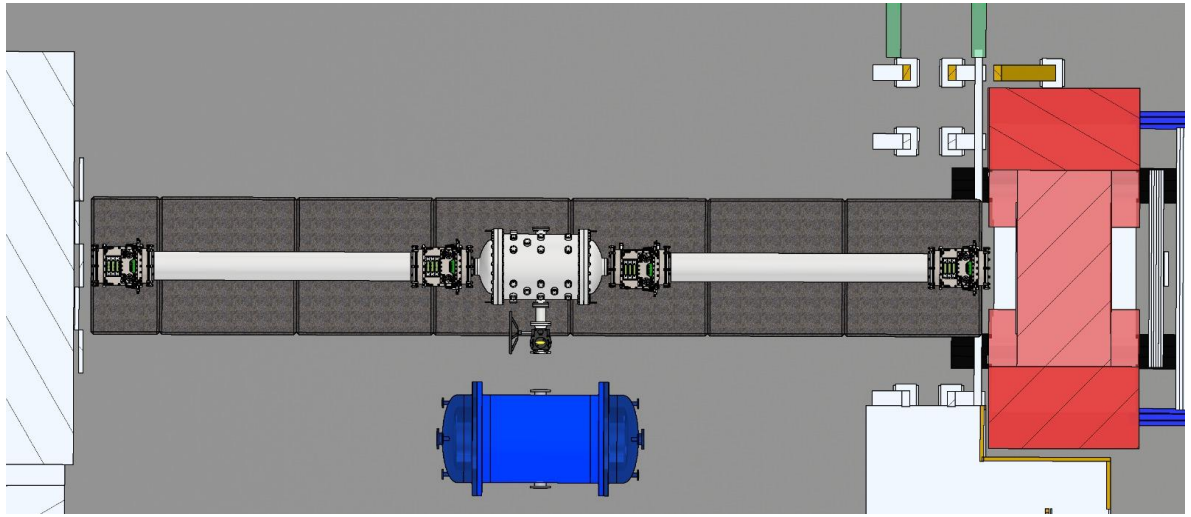
- For all the groups that will transit from COMPASS to AMBER with detector responsibility a smooth transition is expected

TIMESCALE

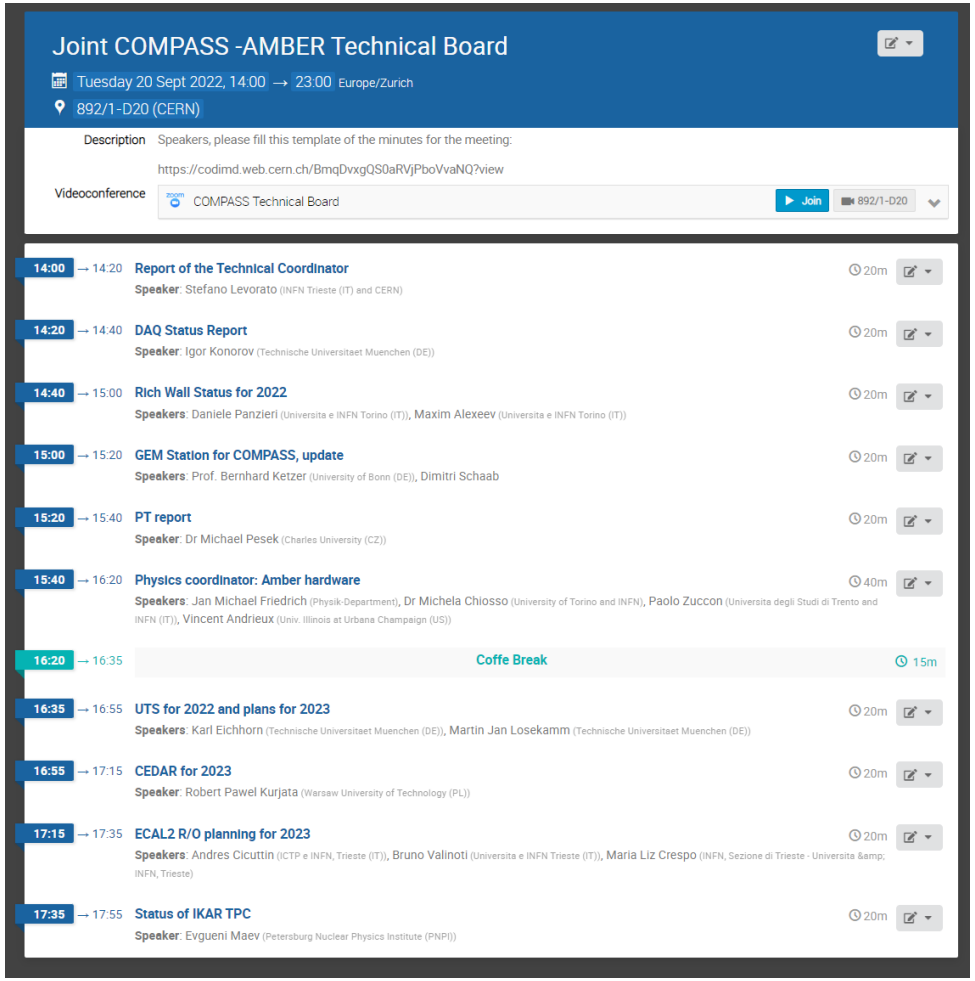
- Saclay equipment transition is dictated by the availability of a group to take the responsibility
- The remaining is defined in the MoU

PRM next year

- The setup with 3 m long pipes critical in terms of the space requirements
- Not compatible with the large TPC
- Reduce the pipe length (3 m→2 m?) t.b.d.
- Start the mechanical support project (A.S.)
  - Address the space requirement needs
  - Address the new IKAR table support
  - Address the detector access needs
  - Address the possible needs of non used detector storage



Agenda



Joint COMPASS -AMBER Technical Board

Tuesday 20 Sept 2022, 14:00 → 23:00 Europe/Zurich

892/1-D20 (CERN)

Description Speakers, please fill this template of the minutes for the meeting:

https://codimd.web.cern.ch/BmqDvxgQS0aRVjPboVvaNQ?view

Videoconference COMPASS Technical Board — Join — 892/1-D20

14:00 → 14:20	**Report of the Technical Coordinator** **Speaker**: Stefano Levorato (INFN Trieste (IT) and CERN)	20m
14:20 → 14:40	**DAQ Status Report** **Speaker**: Igor Konorov (Technische Universitaet Muenchen (DE))	20m
14:40 → 15:00	**Rich Wall Status for 2022** **Speakers**: Daniele Panzieri (Universita e INFN Torino (IT)), Maxim Alexeev (Universita e INFN Torino (IT))	20m
15:00 → 15:20	**GEM Station for COMPASS, update** **Speakers**: Prof. Bernhard Ketzer (University of Bonn (DE)), Dimitri Schaab	20m
15:20 → 15:40	**PT report** **Speaker**: Dr Michael Pesek (Charles University (CZ))	20m
15:40 → 16:20	**Physics coordinator: Amber hardware** **Speakers**: Jan Michael Friedrich (Physik-Department), Dr Michela Chiosso (University of Torino and INFN), Paolo Zuccon (Universita degli Studi di Trento and INFN (IT)), Vincent Andrieux (Univ. Illinois at Urbana Champaign (US))	40m
16:20 → 16:35	**Coffe Break**	15m
16:35 → 16:55	**UTS for 2022 and plans for 2023** **Speakers**: Karl Eichhorn (Technische Universitaet Muenchen (DE)), Martin Jan Losekamm (Technische Universitaet Muenchen (DE))	20m
16:55 → 17:15	**CEDAR for 2023** **Speaker**: Robert Pawel Kurjata (Warsaw University of Technology (PL))	20m
17:15 → 17:35	**ECAL2 R/O planning for 2023** **Speakers**: Andres Cicuttin (ICTP e INFN, Trieste (IT)), Bruno Valinoti (Universita e INFN Trieste (IT)), Maria Liz Crespo (INFN, Sezione di Trieste - Universita & INFN, Trieste)	20m
17:35 → 17:55	**Status of IKAR TPC** **Speaker**: Evgueni Maev (Petersburg Nuclear Physics Institute (PNPI))	20m