



Joint COMPASS-AMBER Technical Board 19-April-2022

Stefano Levorato
19.04.2022

Agenda

- **Communications**

- EXSO meeting: new installation electrical requirements / Laser Off. / Electrical Safety
- Approval of the minutes of the last TB
- Mandate renovation → proposal for extension till EoY
- Detector Readiness status update/survey campaign
- Services Update: LN2 Dewar thresholds, Flammable gas usage.
- Electrical network: BA82 UPS status and planning.
- PRM proposal
- Anti proton production X section cedar usage
- Agenda → Detector intervention/ planning repair/ reinstallation

EXSO meeting: detector electric installation req.

New Cable Rule “SSI-FS-2-1” Replacing IS 23

Scope:

Future cables brought on the CERN site.

Requirements linked to:

- fire performance (reaction, resistance, halogen content, toxicity,...)
- Radiation resistance

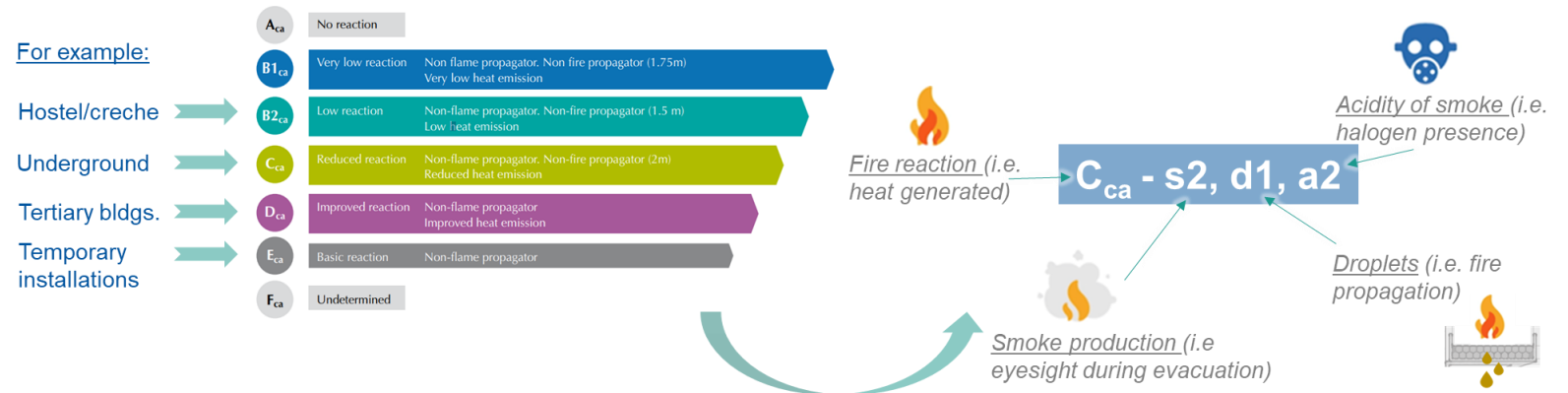
...of **cables** at CERN

added optical fibres

- EU market:

- Risk-based typology approach for cables classes (EU member state approach)

Align with the EU approach (CPR) – in force for cables since 2017



EXSO meeting: detector electric installation req.

New Cable Rule “SSI-FS-2-1” Replacing IS 23

Minimum CPR class

‘High-risk’ installation:

$C_{ca} - s2, d1, a2$

‘Low-risk’ installation:

$D_{ca} - s2, d1, a2$

or

Risk Assessment

*Case-by-case optimization
(e.g. technical incompatibility,
certification other than CPR)*

Safety Guideline SG-FS-2-1-1

Classification of Infrastructures, according to SSI-FS-2-1		
Risk	Typology	Examples
High risk	Beam Facilities and associated technical buildings and underground areas	Experimental halls, accelerator tunnels/ injector chain, experimental caverns/halls, injector chain, machine buildings, technical galleries etc.
	Laboratories	RP Lab, Laser lab, Chemical lab, RF test bench, etc.
	Industrial installations, with permanent workplaces or with a high fire hazard	Surface treatment bldg., Large Magnet Facility, Magnet Assembly hall, electrical sub-station, power converter bldg., etc.
	Storage of dangerous goods	Storage of chemicals, radioactive waste, flammable gases, etc.
	Workshops	Main workshop, workshops in experimental halls, detector assembly
	Thermal power houses	Central distribution of hot water (boilers)
	Hostels	Bldg. 41, 39, 38
	Installations open to public	Visitor points, exhibitions (Globe, Bldg. 33, Microcosm)
	School/crèche Restaurants	Jardin des Particules R1, R2, R3
Low risk	Tertiary installations	Standard office bldgs. with height < 28 m
	Storage of non-dangerous goods	Magnet storage, etc.
	Industrial installations / technical rooms, without permanent workplaces or with a low fire hazard	Compressor bldg., water towers, chiller rooms, monitoring station barracks, etc.

Common questions:

Final location of the cables is unknown. Which to choose ?
→ $C_{ca} - s2, d1, a2$

Why C_{ca} class for High-risk inst.?
1. *Regulatory level: in-line with Host States*

Trouble with finding suitable suppliers for in-house purchases ?
1. *Market is still reacting to the CPR. More and more suppliers are performing the necessary tests little-by-little.*
2. *Technically incompatible – case-specific risk assessment*

EXSO meeting: detector electric installation req.

New Cable Rule “SSI-FS-2-1” Replacing IS 23

Slight modification to IS23

IS 23:

- Lifetime dose > 100 Gy:
General purpose cables:
RI 5.7 → test at $\int Dose = 5 \times 10^5 Gy$
- Special radiation resistant cables
RI 7.7 → test at $\int Dose = 5 \times 10^7 Gy$



SSI-FS-2-1:

- **Lifetime dose > 100 Gy:**
Multi-purpose application cables (CERN stores)
RI 5.7 → test at $\int Dose = 0.5 MGy$
- **Lifetime dose > 2 MGy:**
RI 7.0 → test at $\int Dose = 10 MGy$
- **Case-specific RI class with expected lifetime dose:**
RI → test at $\int Dose = lifetime * 5$
Safety factor of 5 – see Guideline

EXSO meeting: detector electric installation req.

<https://hse.cern/content/safety-rules>

Rule: SSI-FS-2-1

[https://edms.cern.ch/ui/file/2669584/LA
ST_RELEASED/SSI-FS-2-1_EN.pdf](https://edms.cern.ch/ui/file/2669584/LA_ST_RELEASED/SSI-FS-2-1_EN.pdf)

Guideline: SG-FS-2-1-1

[https://edms.cern.ch/ui/file/2669629/LA
ST_RELEASED/SG-FS-2-1-1_EN.pdf](https://edms.cern.ch/ui/file/2669629/LA_ST_RELEASED/SG-FS-2-1-1_EN.pdf)

Electrical Safety - Working in EP experiments

Sessions every Tuesday morning – max 8 places

- ½ day training (3 hours) inc. practical elements.
- Passing the course will authorise most common electrical tasks performed by EP members at CERN.
- Activities are limited to pre-defined list, agreed with HSE.
- Anything not included is not allowed.
- **Habilitation Electrique will still be required for some EP activities/individuals (supervision of electrical works, consignation, live measurements)**
- Only members of the EP department, either MPE (CERN/FELLOWS) or MPA (USERS/ASSOCIATES)
- No contractors (country rules apply)
- Some prior experience required, supervisor/team leader will decide on attendance.
- For Users, a memo will be sent to their home institute.
- The memo must be returned, signed by their team leader, before they may complete the training.

Electrical Safety - Working in EP experiments

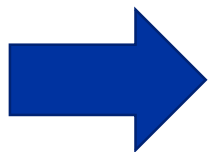
Sessions every Tuesday morning – max 8 places

- **Electrical tasks**

- Connection, disconnection and operation of equipment at plug sockets up to 63 A.
 - Install and operate standardised rack mounted electrical equipment in relation to experimental apparatus at CERN within existing racks and the connection of modules and modular power supplies with standardised connectors.
 - Performance of localised lock-out/tag-out for your own work and for equipment under your responsibility, where the point of isolation is a plug and socket outlet.
 - *Cable installation and termination in an electrical environment, up to 6 mm² for signal cabling and power distribution, and up to 16 mm² for earthing.**
- Repair and removal operations on experimental apparatus, when the equipment is disconnected and unplugged. If the operation requires the removal of any housing or protective screens these must be replaced before the equipment is re-powered.
 - Measurements on live equipment may only be taken in the course of normal operation as part of a written and verified operational procedure and risk assessment.
 - Design, construction and modification of experimental equipment, which must be subject to inspection before it is energised.

LSSO mandate defined in the General Safety Instruction GSI-SO-14

- This new safety instruction was published in May 2021 and can be found on EDMS:
https://edms.cern.ch/ui/file/2476308/LAST_RELEASED/GSI-SO-14_E.pdf
- LSSO stands for **LASER SAFETY SUPPORT OFFICER**
- This safety role has been created in the larger context of updating the current CERN safety rules related to Non-ionizing radiation (NIR).
- This GSI concerns the field of LASER optical radiations with wavelengths between 100nm and 1mm.
- The current rule (IS22) dates from 1994! HSE and the LSOC are working on editing new GSI and SSI to comply with the current international safety standards (IEC-60825) and clarify the LASER risk management at CERN.



Need of LSSO for the next future

COMPASS AMBER JOINT TB

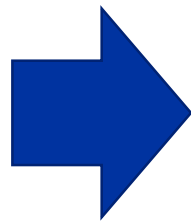
Minutes, and TB membership

-Apologies from Bernhard Ketzer, Damien Neyret. Daniele Panzieri will join later

- Approval of the minutes of the last TB

Renewal of the mandate of four members of the TB: III - May 2022

- 1) Jens Barth
- 2) Bernhard Ketzer
- 3) Igor Konorov
- 4) Daniele Panzieri



Extend the validity of the membership till end of the year to guarantee the needed continuity to the TB. At the end of 2022 as COMPASS will move to *analysis phase* the TB membership will automatically decay

Detector Readiness status update/survey campaign

Detector readiness status for 2022 data taking

Detector-System	FEE operational	Detector-System Ready	Ready for survey	Notes
BMS				
SciFi				
Silicon Trackers	10.04.2022	15.04.2022	already done	All should be done before easter.
Polarized Target				TE calibration on going (14/4 - 24/4) We come to Cern the week 11-15/4 for startup of pixelMM and checks DCs
Micromegas	week 11-15/4/22	week 21/4, after leak tests the week before		
DC0 DC1 DC4	DC4 ok, DC0-1 to be checked	week 21/4, after leak tests the week before		Grounding of 2 dcms to be improved (when DC04/ST03 will be in garage position), next threshold scan to assess the situation, next baseline scan/threshold scan once GM02 is mounted on DC05
DC5	14.04.2022	10.05.2022		
Straw 3			X	Installation of 2 new stations still tbd
GEM	22.04.2022	02.05.2022	X	
RICH				
RICH Wall				
MWPC				
ECAL1				
ECAL2				
HCAL1	20.04.2022	11.05.2022		
HCAL2				
MW1				
MW2				
W45	15/04/2022	30/04/2022	Ready for survey	We plan to go to cern on April to install the relay box for the LV PS and gas leak survey
Trigger	24.03.2022	we need about 2 weeks after we get nominal beam	X	
DAQ		Ready, problem with pccore11 to be solved.		
DCS		Ready		

Detector readiness status for 2022 data taking: readiness for commissioning with beam.

Survey Campaign ongoing → help of Jan Matousek with Pascal Sanvitu

Planning/schedule

https://istnazfisnucl-my.sharepoint.com/:x:/g/personal/levorato_inf_nit/Ec6rriNBaF5Bi2nryxBJ0FYBdnrlxEiDKYhDLUeOBxKXiA

BMS / SciFi (thanks Rainer !)

BMS:

The BMS is running, but it is still connected to the NA64 readout.

I checked BM01, BM02 and BM05 which could easily be switched to our readout --> ok Integration to our DAQ only after NA64 finishes.

SciFi:

All stations are mounted and switched on. Everything is connected to DAQ

Problems:

FI6V is not giving data; most likely the Low Voltage failed (again). I already had an intervention there which apparently didn't solve the problem. FI08 didn't have an uplink to DAQ; Moritz wanted to have a look --

In general the mapping of FI01, FI15 has to be checked with beam.

Plans: I will come early May to fix the remaining problems

Silicons (thanks Christian !)

Installation performed during 30.3. - 13.4.

- Beam platform was prepared — smooth installation with initial and final survey on Friday, 1.4. and Monday, 4.4.

- Easy installation due to not yet installed SciFi2 and Veto

- Cooling went without major issues: **Minor issues was a stuck valve between the valve box and SI02** which could be resolved by heating up the system and manually moving it

- No problems with HV / LV / Frontend

- Igor and I tested a DC/DC converter for the ADV LV on SI02U and SI03U. We observed that the so-called common-noise is increased (1.7 -> 2.X ADC channels) and the overall noise (sigma) is about a factor 7 to 8 increased wrt the default Deutronix PS that we use. In addition we observed a larger fluctuation (+-0.05A) of current for those planes with respect to others (+-0.02A). Since our GEM people use the same ones we informed them also about the issue. **We have now a lab power supply installed, all good. (Todo: remote control like power cycling if issues with ADCs). Igor will have a look on the DCDC converters since its kind of a nice solution if we get it to work.**

- Cooling cycle with Helium operation of target works. We can fill without issues during the whole operation. Only limit is the fill level of the outside dewar which needs to be high enough (>8k litres). Refilling every week should be sufficient (we used about. 1.5k litres per day, max volume is about. 18k liters)

- We had / have the issue of pressure spikes during filling since we directly get liquid N2 due to the He-operation. These pressure spikes tend to travel through the system and causes the stations to warm up. To lower the LN2 flow I decreased the input pressure during “cooling” before filling (1500mBar -> 1400 mBar), initial value was something like 1700 mBar (nor sure). For now it seems ok, cooling works and the pressure increase is handled by the inlet valve and does not propagate towards the system — all good.

- **Silicons are up and stable in terms of Frontend / DAQ / cooling since at least a week.**

- Todos before data taking: New pedestals + check timing with beam and beam trigger



GEMS

Dedicated talk on planning of the installation

DC/MM (thanks Damien !)

* DCs

- front-end of DC0, 1 and 4 are active and working. There are 32 channels missing on DC0X1 due certainly to a faulty ASD8 card. We have not found the spare cards at Cern, as soon as we find them we will replace that card. There were also last week some usual bad hotlinks connections on DC0 and 4, to be fixed with the usual spray method.

- Low HV values were set, without particular problem of current excepted the usual one on DC4 BK. Leak rate are measured (I sent you the numbers), as soon as the DC5 one is also measured we will put back the nominal gas mixture in DCs

* MM

- MM front-end is up and running ok. One APV card on MP01X shown saturation at low amplitude, it was replaced by another one without this problem. Pedestals were taken and registered in MySQLDB.

- Leak rates are measured, and nominal gas mixture is set since Friday. We will raise HVs to nominal values during this week, presently low values are set without particular problem

- a spare HV module is installed in the crate in case of failure of an additional channel in the modules presently used.

DC5

Grounding of 2 DCMs improved (when DC04/ST03 will be in garage position),

next threshold scan to assess the situation,

next baseline scan/threshold scan once GM02 is mounted on DC05

STRAW 3 station

RICH-1

Dedicated talks,

Intense activity las week to fix the MPGD/gaseous based detector

FEE for Gas based PD up and running, Electronic cooling ok

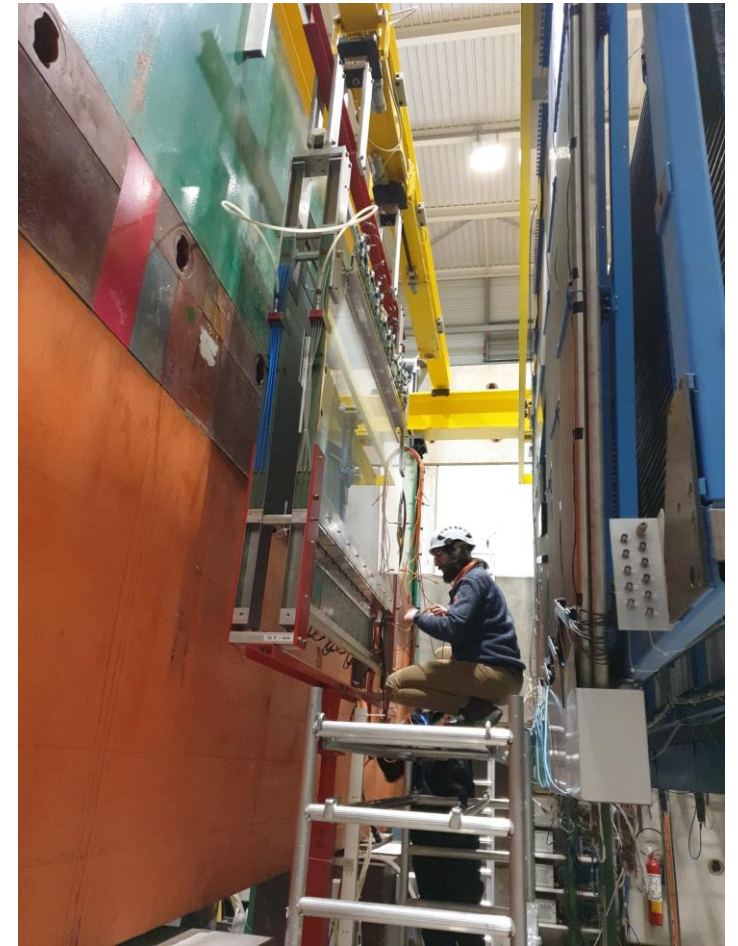
New LV power supply integrated and fully operational for MAPMT → still to be commissioned

RICHWall / MWPC

Dedicated talk,

Dedicated activity to fix the RW gas system issues and shielding.

PB repair operation performed and reinstalled back on 5th of April



ECAL 1 and ECAL 2

JINR experts should arrive at CERN around 11 of May

Donskov at CERN from of 18 of April

HCAL 1 and HCAL 2

HCAL 1 Gavrishchuk arriving on 11 of May

HCAL 2 has been switched on by V. Poliakov

MW1/MW2

MW1 - Golovanov e Piskun (JINR) 11 of May

MW2 - Ereemeev ~ mid May

W45

Hardware preparation ongoing (home institute)

Preliminary testing of the detector behaviour ongoing (from remote)

On site in the beginning of May

TRIGGER

Ready

DAQ

Ready

DCS

Ready

Activities planned

- **Removal of the scaffolding to access the BTP on 27 of April**
- **Survey...**

Services Update: LN2 Dewar thresholds, Flammable gas usage.

To avoid the Silicon Dewar not to be continuously filled with LN from the EHN2 dewar the refilling threshold of the external dewar has been changed: should always contains at least 9000 liters of LN.

Flammable gas usage is granted even if no shift crew is available: discussed and agreed with FGSO. Commissioning of all detector is possible as soon as leak rate has been communicated

Received for DC0 DC1 DC4

STRAW and W4/5 gas filters has been regenerated and reinstalled back, ready for use

Electrical safety visits being planned in the next days

Electrical network: BA82 UPS status and planning

The UPS installed in BA82 and feeding the 888 OD switchboard failed ~ 1 month ago. The equipment is old and no replacement could be found/was/is available → the repair went under the umbrella of NACONS since the system is going to be replaced.

The planning is not fully defined yet (material delivery) the expected date is end of May, to be confirmed yet

Once the study for the replacement of the UPS has been finished, **we have seen that we will need to change the existing fuses on the EOD210/A82 feeder by feeder**. This means that we will cut each feeder for some minutes. **I think we could do it in less of 10 min for the feeders related to EHN2, but there is always a risk if something is not going well during the operation as the equipment is very old**. Could you please confirm which are the critical switchboards? EOD417/HN2, EOD418/HN2 and EOD1/HN2? And, could you also confirm the commissioning date of the COMPASS spectrometer? Thanks Best regards, Eva

The change of fuses feeder by feeder should take in total 10 minutes which are tolerable for the experimental equipment powered via the UPS system (the non UPS network should stay unaffected).

Under evaluation **compensatory measures in case this time limit can not be respected**

CEDAR usage for anti p production

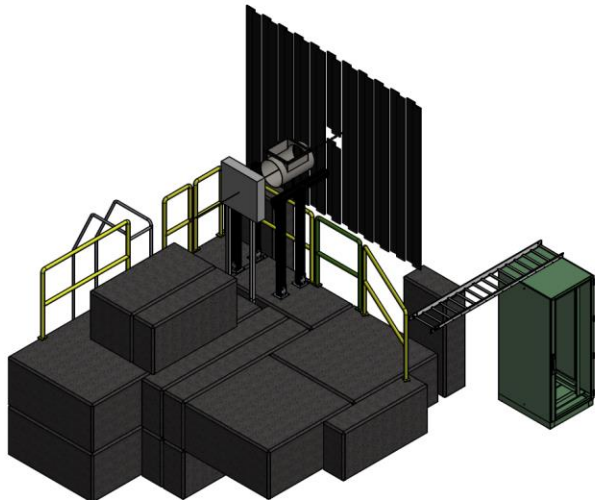
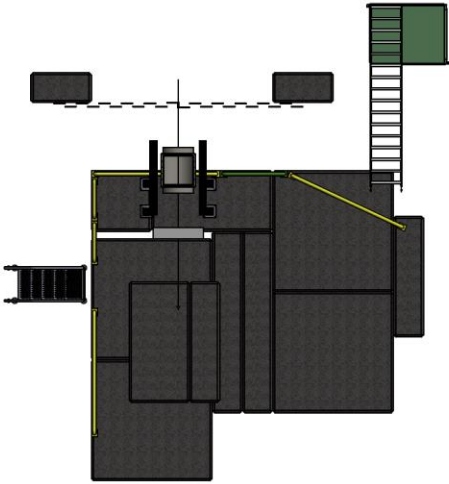
Discussion with Dipanwita about the possibility to test M2 CEDARS during 2022 (April 1th)

- Proposal to participate to the test of the NA62 CEDARs in view of getting used to the pressure scan procedure
- Proposal to use the M2 cedar in parasitic mode during October test in EHN1

- Discussed within the AntiPproduction group
 - Possible participation to the NA62 cedar commissioning/test in week 21/22 (for next year need of reinstallation – recommissioning of the CEDAR FEE)

- Dedicated hardware preparation by Moritz for the beam killer hodoscope → talk by Moritz

Proposal for the UTS tests at COMPASS

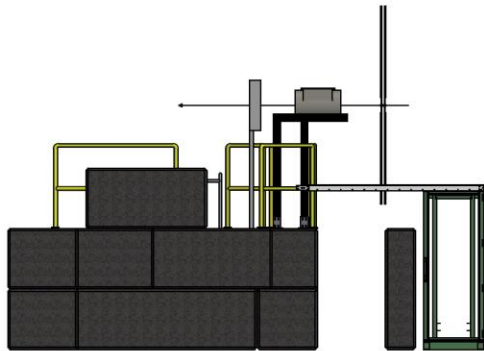
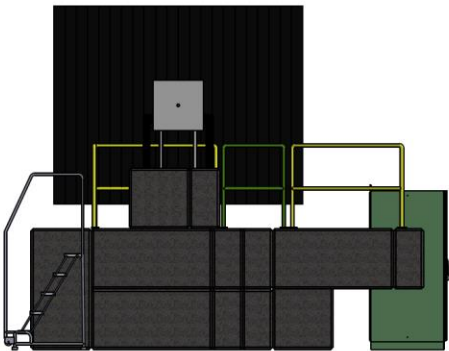


Sent to people involved in the Project: scientific coordinator, spokesperson

- Waiting for feedback
- Material procurement
- Installation

- Missing information about the UTS fixing system...

- The earlier the feedback the sooner the construction and the intervention can be planned → before the run starts



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- funds for purchasing

Next steps for the PRM program

- HSE will consider as a PESS project (correspondent is Joanna) only the new installation coming for AMBER (not the existing COMPASS installations). Thus, the LSD (Launch Safety Discussion) will contain only the hazards coming from the new installations.
- In order to prepare this LSD document, at least a draft of the final experimental installation should be provided. For this reason, we will wait for the AMBER collaboration to come back to us with a more “final” design of the new TPC and of the additional detectors, before starting specific safety discussions (about mechanical, structural, electrical, fire, chemical safety, etc.). For example, in order to continue on the already started discussion about the mechanical safety aspects for the beam window, we will need the collaboration to come back to us with further details. The new HSE rule concerning the cables requirements here attached) has been discussed considering the future cabling for AMBER.
- for what concerns flammable gas, a meeting has been organized last week with an external company that will provide the Explosion risk assessment and classification of hazardous areas. This company will send a first price estimation this week. In case their offer is accepted, they would be available to work on this project from June onwards (Oleg and Jan specified that probably June will be too early to have enough information to start the discussions with the external company).

Agenda

Tuesday 19 Apr 2022, 13:50 → 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/Pg8_uW9pRnONFQqNTP4fA?view

  08_02_22_TB_minu...

Videoconference  COMPASS Technical Board 🔒 Please log in

13:50	→ 14:10	Communications from the technical coordinator Speaker: Dr Stefano Levorato (INFN Trieste (IT) and CERN)	🕒 20m
14:10	→ 14:25	Update on the status of the 2022 run Speaker: COMPASS run coordinator	🕒 15m
14:25	→ 14:40	GEM planning update Speaker: Dimitri Schaab	🕒 15m
14:40	→ 15:00	PT update Speaker: Norihiro Doshita (Yamagata University (JP))	🕒 20m
15:00	→ 15:20	RICH-1 update Speakers: Chandray Chatterjee (INFN Trieste (IT)), Triloki Triloki (Universita e INFN Trieste (IT))	🕒 20m
15:20	→ 15:40	AMBER beam killer update Speaker: Benjamin Moritz Veit (Johannes Gutenberg Universitaet Mainz (DE))	🕒 20m
15:40	→ 16:00	AMBER DAQ plans and needs Speaker: Igor Konorov (Technische Universitaet Muenchen (DE))	🕒 20m
16:00	→ 16:20	SciFi UTS update Speaker: Karl Eichhorn (Technische Universitaet Muenchen (DE))	🕒 20m
16:20	→ 16:40	Alipde Update Speaker: Maxim Alexeev (Universita e INFN Torino (IT))	🕒 20m
16:40	→ 17:00	RW and MWPC repair report Speakers: Daniele Panzieri (Universita e INFN Torino (IT)), Maxim Alexeev (Universita e INFN Torino (IT))	🕒 20m
17:00	→ 17:20	The PHENIX Forward Silicon Vertex Detector/FPHX FEE for DY Speaker: Dr Kun Liu	🕒 20m
17:20	→ 17:50	Detector Round Table	🕒 30m