



Joint COMPASS-AMBER Technical Board 28-September-2021

Stefano Levorato
28.09.2021

Agenda

- **General Communications**
 - Approval of the minutes of the last TB
 - Mandate renovation
 - Dates for 2022 TB
- **HV modules for SciFi**
- **CERN CV preliminary schedule for the winter shutdown**
 - Impact on COMPASS/AMBER operations
- **COMPASS interventions: preliminary scheduling of the activities**
 - Beam Telescope interventions
 - DAQ power lines
 - Polarized target (PT Helium pipe intervention) and He4 pump maintenance
 - Detectors needs → gas availability
- **Amber PRM, scheduling of intervention**
 - Status of the TPC
- **Requirements of space in 891 during YETS**
- **Safety requirements for next year running and future**

Minutes, and TB membership

Apologies from Gerhard Mallot

Approval of the minutes of the last TB

Renewal of the mandate of

- 1) Jan Friedrich (I) November 2021 → November 2023 → Extend till End 2022**
- 2) Stephane Platchkov (I) → November 2023 → Extend till End of 2022**

Dates for the next technical board meetings

2022 Calendar

January	February	March	April	May	June	July	August	September	October	November	December
1 Sa	1 Tu	1 Tu	1 Fr	1 Su	1 We	1 Fr	1 Mo	1 Th	1 Sa	1 Tu	1 Th
2 Su	2 We	2 We	2 Sa	2 Mo DIS	2 Th	2 Sa	2 Tu	2 Fr	2 Su	2 We	2 Fr
3 Mo	3 Th	3 Th	3 Su	3 Tu DIS	3 Fr	3 Su	3 We	3 Sa	3 Mo	3 Th	3 Sa
4 Tu	4 Fr	4 Fr	4 Mo	4 We DIS	4 Sa	4 Mo	4 Th	4 Su	4 Tu	4 Fr	4 Su
5 We	5 Sa	5 Sa	5 Tu	5 Th DIS	5 Su	5 Tu	5 Fr	5 Mo	5 We	5 Sa	5 Mo
6 Th	6 Su	6 Su	6 We	6 Fr DIS	6 Mo	6 We	6 Sa	6 Tu	6 Th	6 Su	6 Tu
7 Fr	7 Mo	7 Mo	7 Th	7 Sa	7 Tu	7 Th	7 Su	7 We	7 Fr	7 Mo	7 We
8 Sa	8 Tu	8 Tu	8 Fr	8 Su	8 We	8 Fr	8 Mo	8 Th	8 Sa	8 Tu	8 Th
9 Su	9 We	9 We	9 Sa	9 Mo	9 Th	9 Sa ICHEP	9 Tu	9 Fr	9 Su	9 We	9 Fr
10 Mo	10 Th	10 Th	10 Mo	10 Tu	10 Fr	10 Su	10 We	10 Sa	10 Mo	10 Th	10 Sa
11 Tu	11 Fr	11 Fr	11 Mo	11 We	11 Sa	11 Mo	11 Th	11 Su	11 Tu	11 Fr	11 Su
12 We	12 Sa	12 Sa	12 Tu	12 Th	12 Su	12 Tu	12 Fr	12 Mo	12 We	12 Sa	12 Mo
13 Th	13 Su	13 Su	13 We	13 Fr	13 Mo	13 We	13 Sa	13 Tu	13 Th	13 Su	13 Tu
14 Fr	14 Mo	14 Mo	14 Th	14 Sa	14 Tu	14 Th	14 Su	14 We	14 Fr	14 Mo	14 We
15 Sa	15 Tu	15 Tu	15 Fr	15 Su	15 We	15 Fr	15 Mo	15 Th	15 Sa	15 Tu	15 Th
16 Su	16 We	16 We	16 Sa	16 Mo	16 Th	16 Sa	16 Tu	16 Fr	16 Su	16 We	16 Fr
17 Mo	17 Th	17 Th	17 Su	17 Tu	17 Fr	17 Su	17 We	17 Sa	17 Mo	17 Th	17 Sa
18 Tu	18 Fr	18 Fr	18 Mo	18 We	18 Sa	18 Mo	18 Th	18 Su	18 Tu	18 Fr	18 Su
19 We	19 Sa	19 Sa	19 Tu	19 Th	19 Su	19 Tu	19 Fr	19 Mo	19 We	19 Sa	19 Mo
20 Th	20 Su	20 Su	20 We	20 Fr	20 Mo	20 We	20 Sa	20 Tu	20 Th	20 Su	20 Tu
21 Fr	21 Mo	21 Mo	21 Th	21 Sa	21 Tu	21 Th	21 Su	21 We	21 Fr	21 Mo	21 We
22 Sa	22 Tu	22 Tu	22 Fr	22 Su	22 We	22 Fr	22 Mo	22 Th	22 Sa	22 Tu	22 Th
23 Su	23 We	23 We	23 Sa	23 Mo	23 Th	23 Sa	23 Tu	23 Fr	23 Su	23 We	23 Fr
24 Mo	24 Th	24 Th	24 Su	24 Tu	24 Fr	24 Su	24 We	24 Sa	24 Mo	24 Th	24 Sa
25 Tu	25 Fr	25 Fr	25 Mo	25 We	25 Sa	25 Mo	25 Th	25 Su	25 Tu	25 Fr	25 Su
26 We	26 Sa	26 Sa	26 Tu	26 Th	26 Su	26 Tu	26 Fr	26 Mo	26 We	26 Sa	26 Mo
27 Th	27 Su	27 Su	27 We	27 Fr	27 Mo	27 We	27 Sa	27 Tu	27 Th	27 Su	27 Tu
28 Fr	28 Mo	28 Mo	28 Th	28 Sa	28 Tu	28 Th	28 Su	28 We	28 Fr	28 Mo	28 We
29 Sa		29 Tu	29 Fr	29 Su	29 We	29 Fr	29 Mo	29 Th	29 Sa	29 Tu	29 Th
30 Su		30 We DPG	30 Sa	30 Mo	30 Th	30 Sa	30 Tu	30 Fr	30 Su	30 We	30 Fr
31 Mo		31 Th		31 Tu		31 Su	31 We		31 Mo		31 Sa

Proposed dates for the Joint COMPASS AMBER Technical Boards

- 8 February 2022
- 19 April 2022
- 19 July 2022
- 11 October 2022
- 13 December 2022

- holidays
- conferences
- AMBER
- CM/CB

COMPASS SCiFi HV PS: mistake in the order

7868998 - Purchase Requisition (DAI) Order signed

This document has 4 attachments

By signing this request, you acknowledge your responsibilities related to the approval of the DAI.

Created by [Annika Simone VAUTH \(Not at CERN\)](#) Tel: on 12.07.2019 15:00 (Last modified on 29.07.2019 16:21)
Created by BAAN: No

General Information

General Description *:	CAEN Power Supplies for COMPASS View reception history
Technical Contact *:	
Contract:	B1226/00 LOW VOLTAGE POWER SUPPLIES (05.2005 - 12.2024) (supplier: CAEN50)
Supplier:	CAEN SPA, Via Vetraia, 11, 55049 VIAREGGIO, IT (CAEN50, MA01)
Contact for order:	Ferdinando Giordano, f.giordano@caen.it, Mobile:+393202581872, Landline:+390584388398, Fax: +390584388959
Currency *:	EUR (Euro)
Transport Cost *:	Transport costs are included in the unit prices of the bid
Packaging *:	Packaging costs are included in the unit prices

[Procurement Guidelines](#)

Articles appearing in the [CERN catalogue](#), or similar articles must be requisitioned from the store.

Total Value: €183,308.88 (CHF 203,709.00) ⓘ
Exchange rate B: 1.111300 as of date 12.07.2019

5	13	A1538DP	€2,901.36	€37,717.68
WA1538DXPAAA A1538DP - SYx527 positive H.V. +1.5 KV 10 mA 12W - SHV Connector common floating (12 ch)				
Discount (already deducted): 12% , Country of origin: ITALY (IT) , Delivery: 892-R-D10 SALLE DE CONTRÔLE PREVISSIN , Procurement Code: 03041100 - Other modular electronic boards and crate components [Material] ,				
Goods already delivered: No , Date: 29.12.2019				
Budget Codes: T293900 (2019) - COMPASS COLLABORATION				

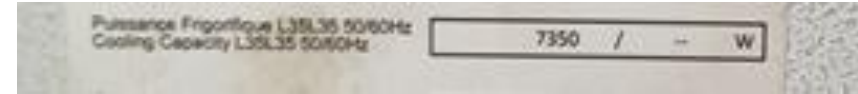
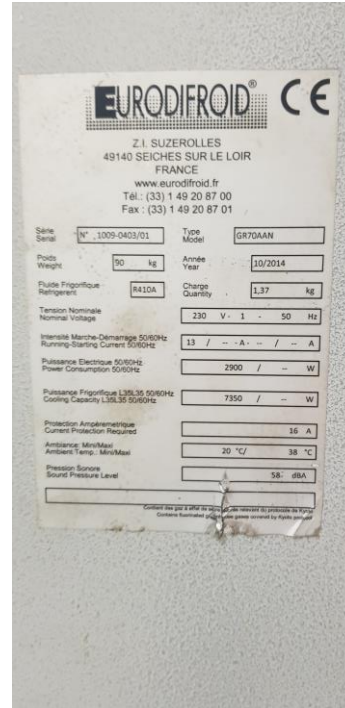
- During the COMPASS commissioning it was verified that the new SciFi High voltage power supply units have been order with the wrong polarity (no mistake from CAEN) foreseen for SciFi 6/7/8
- CAEN representative has been contacted and the possible inversion of the polarity cost investigated, approximately the same cost of the PS units (high cost for the reworking time) non feasible
 - Possibility to have them sent back to CAEN only if an order for the same modules will be issued to CAEN by externals (not CERN), more information in November/December by CAEN.
 - Temporary solution: renting of modules at Epool for ~ 450 CHF/month

CERN CV services preliminary schedule for the winter shutdown

- **Draft schedule for CV**
 - Starting the shutting down of Cooling Tower on November 15
 - From November 15 the system will run in non redundant mode (only one pump) so in case of failure no cooling water will be distributed
 - The Cooling Tower will run maximum 2 week after the **15 November** → 1 December hard deadline for any use of the Chilled-Raw Water
 - CV is needed for COMPASS He liquefier → ~ 15 November or (early) Helium will not be available any longer
 - **Restart for 2022**: the present schedule foresees the services restart for CV around **end of February/beginning of March**

CERN CV services preliminary schedule for the winter shutdown

- Few issues with services for the COMPASS spectrometer
 - CV minor interruptions for the cooling water distribution
 - Cooling of the BMS barrack is still an issue, a temporary solution was found, a reliable and appropriate solution is needed: the installed unit is not enough powerful. Fortunately, this year has not been too warm.



At the moment we have $\sim 7 + 4 \sim 11$ kW cooling power, temperature ~ 23 C
To be improved for next year
CV informed

Meeting with Jani LEHTINEN
EN-CV-INJ \rightarrow replacement during YETS

COMPASS interventions: preliminary scheduling of the activities

SPS: October 2021



schedule issue date: 17-Sep-2021

Version: 3.1

		Mon 27 Sep	Tue 28 Sep	Wed 29 Sep	Thu 30 Sep	Fri 1 Oct	Sat 2 Oct	Sun 3 Oct	Mon 4 Oct	Tue 5 Oct	Wed 6 Oct	Thu 7 Oct	Fri 8 Oct	Sat 9 Oct	Sun 10 Oct	Mon 11 Oct	Tue 12 Oct	Wed 13 Oct	Thu 14 Oct	Fri 15 Oct	Sat 16 Oct	Sun 17 Oct	Mon 18 Oct	Tue 19 Oct	Wed 20 Oct	Thu 21 Oct	Fri 22 Oct	Sat 23 Oct	Sun 24 Oct	Mon 25 Oct	Tue 26 Oct	Wed 27 Oct	Thu 28 Oct	Fri 29 Oct	Sat 30 Oct	Sun 31 Oct							
Week		39							40							41							42							43													
Machine		<div style="display: flex; justify-content: space-between;"> 8h 18h 8h 18h </div>																																									
North Area	T2 - H2	A. Ariga p 400GeV/c, PPE172							NA65							D. Lazic PPE172							J. Kowalski h+ 31 GeV/c, PPE152							NA61 SHINE													
	T2 - H4	LHCf		D. Lazic PPE164		CMS ECAL							X. Wu PPE134							HERD							M.R. Jäkel, E. Oliveri PPE134, PPE154							GIF RD51									
	T4 - H6	M. Van Leeuwen PPE146							ALICE FOCAL							ATLAS ITK (PICSEL) A. Rummler, A. Besson PPE146, PPE146							EP RDET (ATLAS ITK) D. Dannheim, A. Rummler PPE156, PPE146							ATLAS BCM (ATLAS HGTD, RD42) A. Rummler, H. Kagan PPE146, PPE146, PPE146							ATLAS HGTD (CMS PIXELS) A. Rummler, D. Lazic PPE146, PPE156						
	T4 - H8	TOTEM (UA9)		R. Jacobsson PPE168		SND HCAL / tbd							LHCb (TOTEM) H. Schindler, F. Garcia PPE128+PPE138, PPE168							CMS MTD (LHCb) D. Lazic, H. Schindler PPE158, PPE128+PPE138							LHCb (CMS MTD) H. Schindler, D. Lazic PPE138+PPE168, PPE158							LHCb (TOTEM) H. Schindler, F. Garcia PPE138+PPE168, PPE168									
	T4 - K12	H. Danielsson																																									
	T6 - M2	V. Andrieux							NA58 COMPASS							AMBER														NA64 mu (MUON-e)													

Deuterated Lithium unload

Si + Beam Telescope + platform removal

Confirmation of availability of TUM people for Silicon dismounting, Joosten for SCiFi VI2, Storage of SILICON → Booking of CRANE Operator

COMPASS interventions: preliminary scheduling of the activities

SPS: October 2021



schedule issue date: 17-Sep-2021

Version: 3.1

		Mon 27 Sep	Tue 28 Sep	Wed 29 Sep	Thu 30 Sep	Fri 1 Oct	Sat 2 Oct	Sun 3 Oct	Mon 4 Oct	Tue 5 Oct	Wed 6 Oct	Thu 7 Oct	Fri 8 Oct	Sat 9 Oct	Sun 10 Oct	Mon 11 Oct	Tue 12 Oct	Wed 13 Oct	Thu 14 Oct	Fri 15 Oct	Sat 16 Oct	Sun 17 Oct	Mon 18 Oct	Tue 19 Oct	Wed 20 Oct	Thu 21 Oct	Fri 22 Oct	Sat 23 Oct	Sun 24 Oct	Mon 25 Oct	Tue 26 Oct	Wed 27 Oct	Thu 28 Oct	Fri 29 Oct	Sat 30 Oct	Sun 31 Oct																					
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North Area		T2 - H2							T2 - H4							T4 - H6							T4 - H8							T4 - K12							T6 - M2																				
		ALICE FOCAL														ATLAS ITK (PICSEL)														EP RDET (ATLAS ITK)														ATLAS BCM (ATLAS HGTD, RD42)							ATLAS HGTD (CMS PIXELS)						
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		SND HCAL / tbd														LHCb (TOTEM)														CMS MTD (LHCb)														LHCb (CMS MTD)							LHCb (TOTEM)						
		TOTEM (UA9) R. Jacobsson PPE168														H. Schindler, F. Garcia PPE128+PPE138, PPE168														D. Lazic, H. Schindler PPE158, PPE128+PPE138														H. Schindler, D. Lazic PPE138+PPE168, PPE158							H. Schindler, F. Garcia PPE138+PPE168, PPE168						
		H. Danielsson														NA62																																									
		NA58 COMPASS														AMBER														NA64 mu (MUON-e)																											

- Ready to power the new 3 crates for AMBER DAQ

- Requires the power cut at the level of the COMPASS DAQ barrack, EN-EL is on hold for the date of the intervention → postponing to YETS (unless mandatory), power cut duration ½ of day

COMPASS, Helium recovery line problem 3rd of July

The reason, buckling due pipe thickness DY → SIDIS changeover and missing of the stiffening

CERN
Esplanade des Particules 1
P.O. Box
1211 Geneva 23 - Switzerland



EDMS NO. -----	REV. 0.1	VALIDITY DRAFT
REFERENCE		
EXPERIMENTAL AREAS		

Date: 2021-07-26

ENGINEERING NOTE

IMPLOSION OF COMPASS PUMPING LINE OF THE DILUTION CRYSTOTAT

ABSTRACT:

This documents describes the hypothesis behind the collapse of a section of the main pumping line of the dilution cryostat in the COMPASS experiment. A buckling analysis was performed using ANSYS mechanical to see the critical points of the current design and to propose a new solution to increase the safety load factor.

DOCUMENT PREPARED BY:
J. Buesa Orgaz (BE-EA)

DOCUMENT TO BE CHECKED BY:
F. Sanchez Galan (BE-EA)

DOCUMENT TO BE APPROVED BY:
Johannes Bernhard (BE-EA)
Stefano Levorato (EP-SME)

5.1 2mm thickness

Figure 5 shows the deformation due to a buckling of the structure. The collapse of the pipe occurred with a load multiplier of 1.985 meaning that the safety factor of the former design was ~2. As seen in the figure below, the resemblance between the simulation and the real case is significantly high. It can be observed that the buckling appears in the first place in the region where there are no supports nearby as occurred in reality.

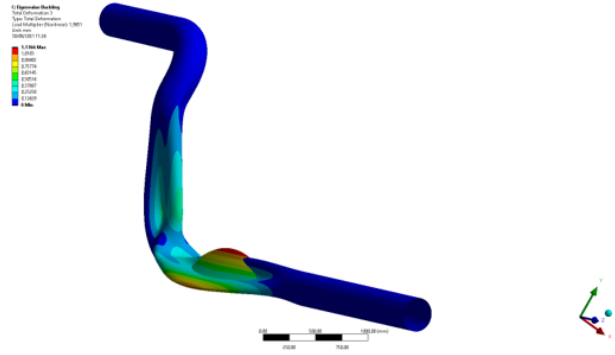


Figure 5: Eigenvalue Buckling deformation for 2mm pipe thickness with original supports.

5.3 3mm thickness + extra supports

In order to increase the safety factor to a minimum of 8 so as to avoid future buckling occurring with 3mm thickness geometry for the studied loads, it is crucial to increase the number of supports. Those supports not only act as conventional supports to fix the structure in a desired place, but they act as well as stiffeners. These required new supports or stiffeners are meant to be installed at a maximum distance of 1 meter between each other as seen in Figure 7.



Figure 7: 3D design of the pumping line with additional supports in orange.

With the increase of the thickness to 3 mm and the installation of new supports or stiffeners every 1 m, the safety factor increased up to 11.6. Furthermore, the region where the first buckling would appear had as well changed, being now in the upper part of the pipe as seen in Figure 8.

From the results obtained computationally it can be concluded that the main pumping line of the dilution cryostat collapsed due to a buckling caused essentially by a low safety factor, 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 safety factor should be increased up to 11.6

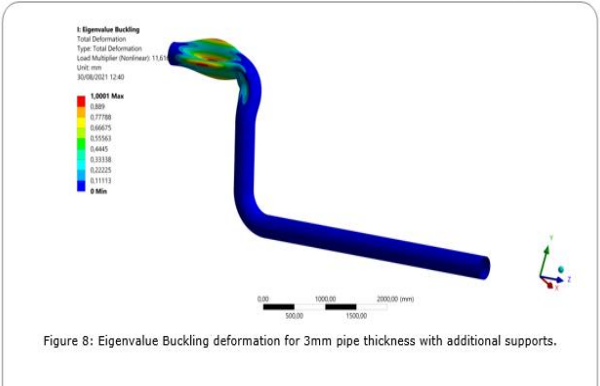
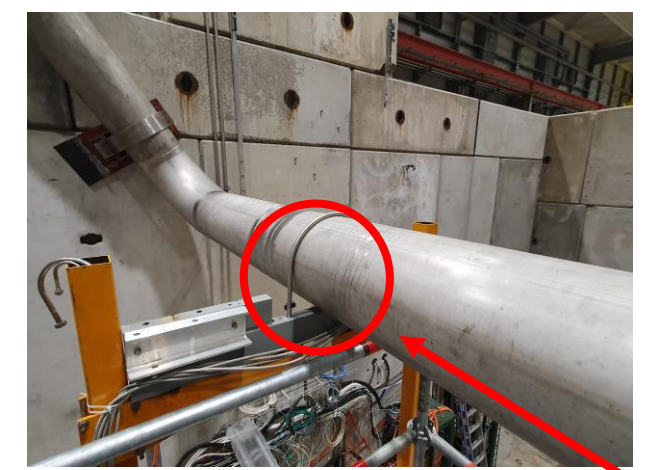
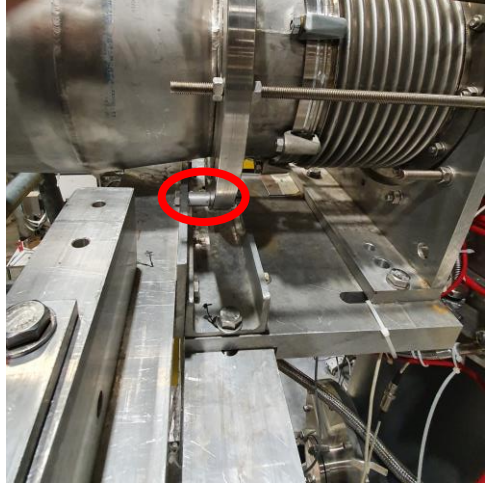
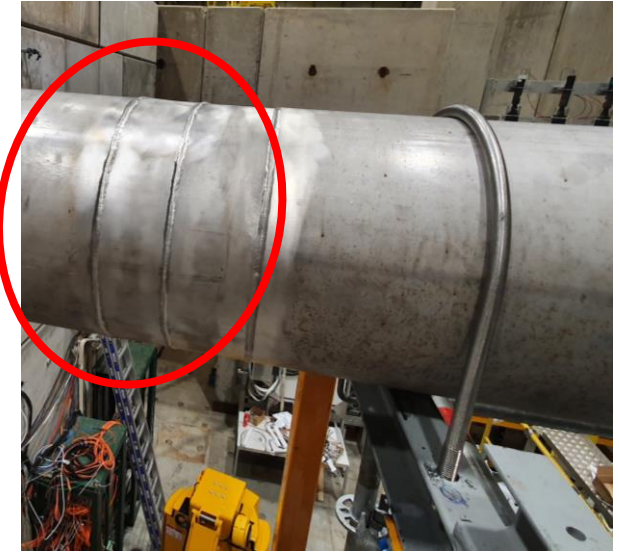
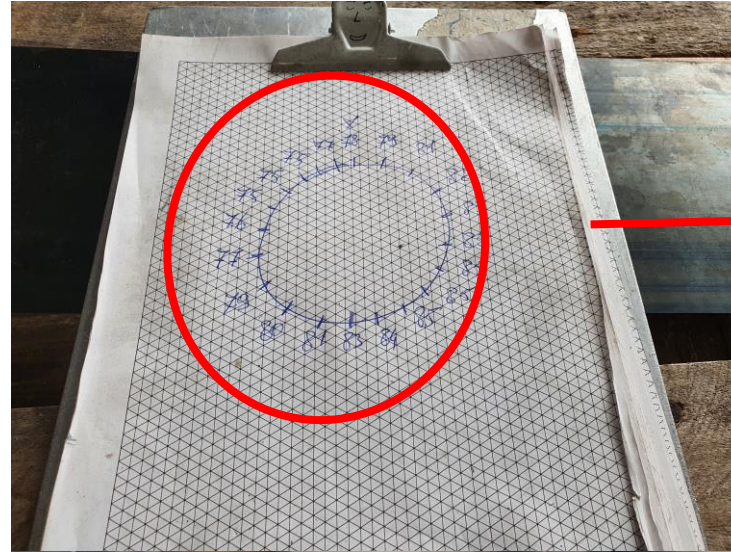
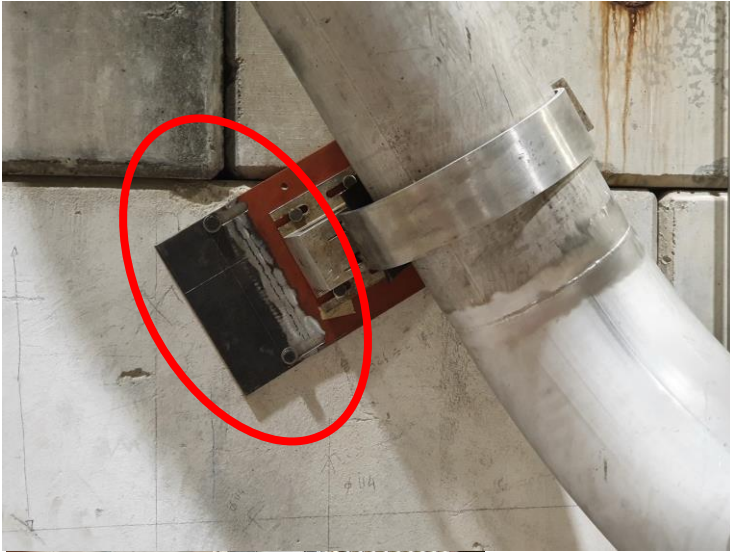


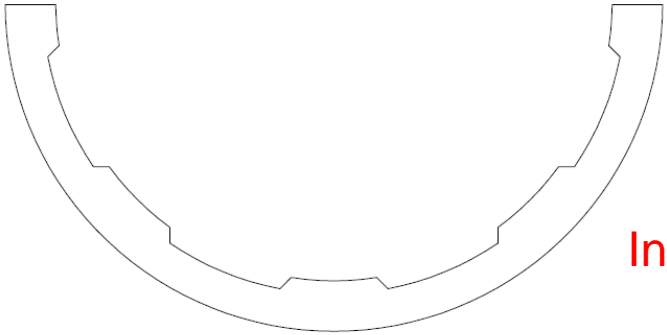
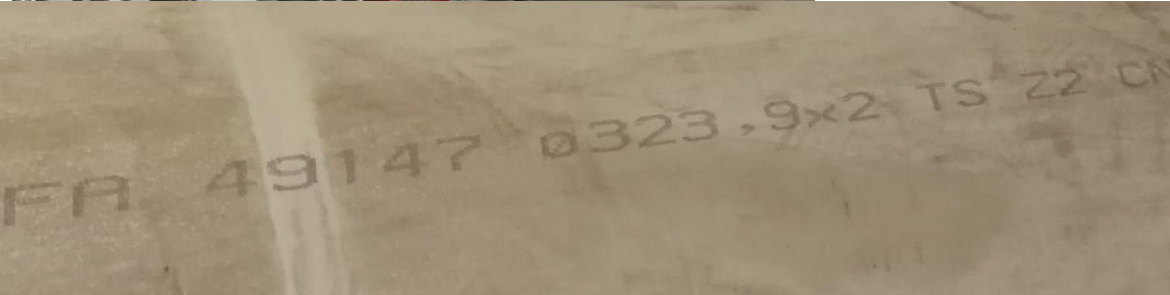
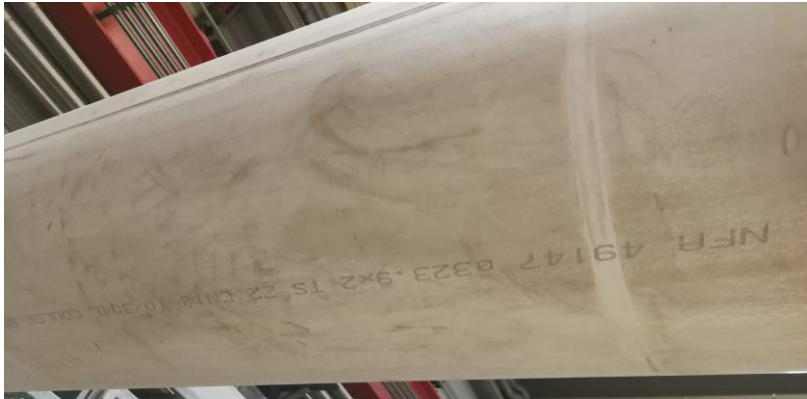
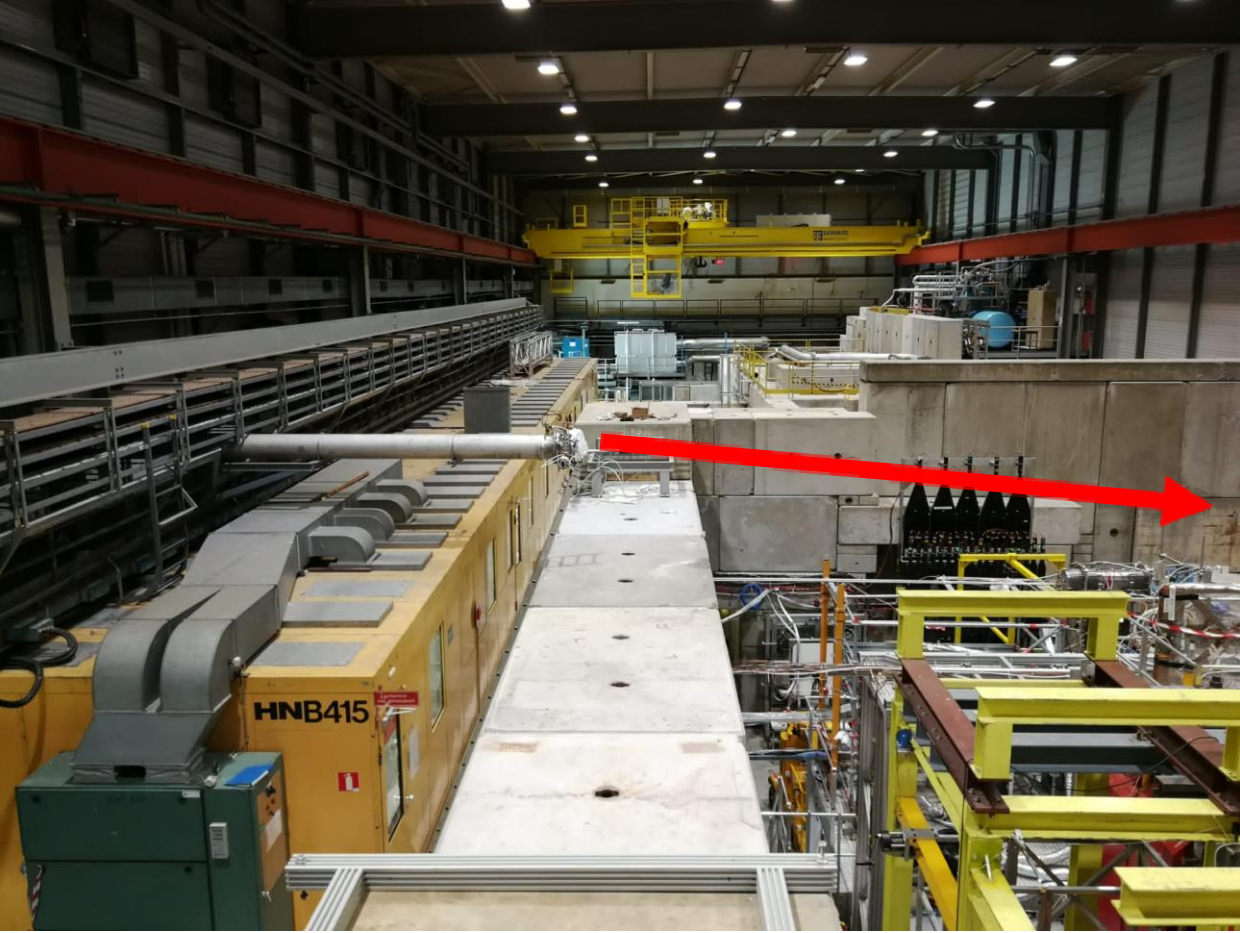
Figure 8: Eigenvalue Buckling deformation for 3mm pipe thickness with additional supports.

COMPASS, Helium recovery line problem 3rd of July



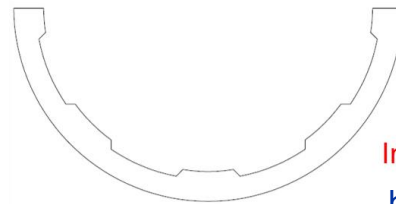
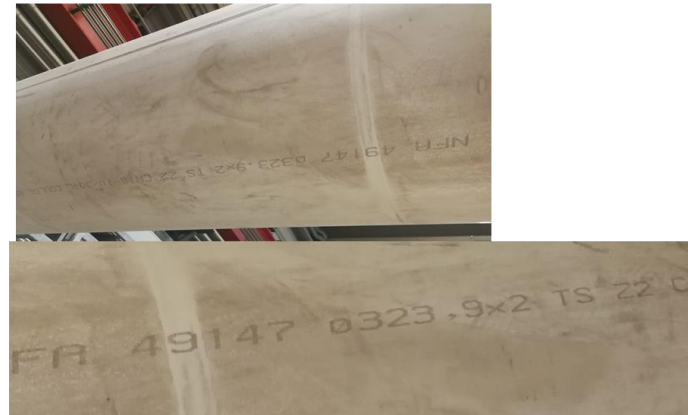
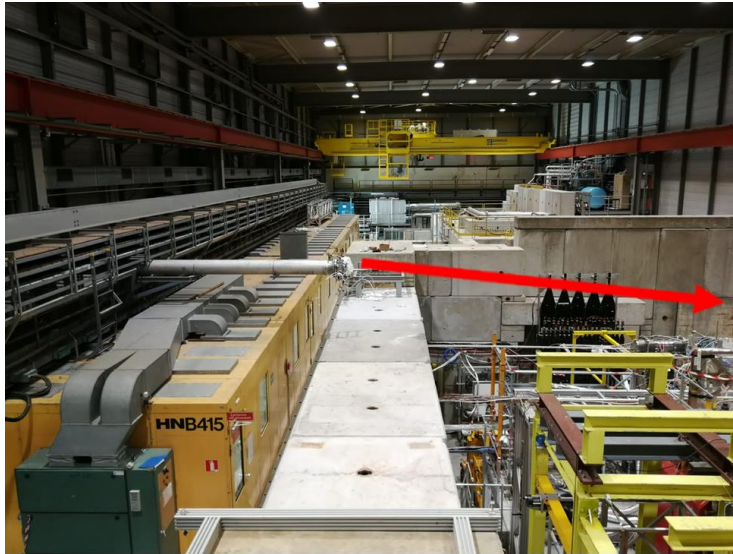
Later confirmed by the need of modification of the support system, one remark more about the stiffening system

COMPASS interventions: preliminary scheduling of the activities



Installation during YETS

COMPASS interventions: preliminary scheduling of the activities



Installation during YETS

<https://edh.cern.ch/Document/SupplyChain/DAI/8843266>

The Intervention is being discussed with the TE-CRG-ME group and PT

- Main constrain is the warming up time of the PT system ~ 1 month after unloading
- Need of disconnection of the Helium recovery line at the level of gate valve
- Scaffolding installation and need of “fire permit”
- Constrain on the availability of welding team

The welding of the stiffeners most likely to be during the end of November/beginning of December

In parallel winter maintenance of the He 4 pumps, order submitted on YAMAGATA account, to be performed before 2022 <https://edh.cern.ch/Document/SupplyChain/DAI/8925878> Intervention scheduled W49 (28 Nov)

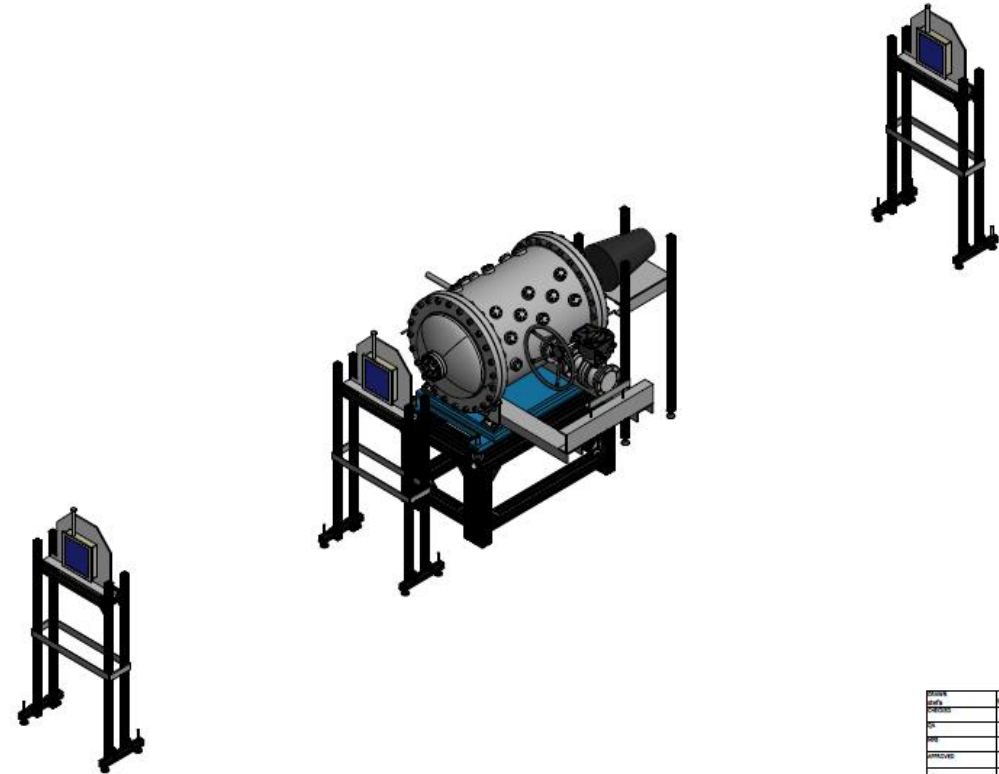
Repair/Fix of the Dipole summer shield bad thermal contact in discussion. EP-DT

COMPASS interventions: preliminary scheduling of the activities

- **Gas need for the spectrometer: proposal to the Gas Group**
 - **Flammable gas needs:**
 - CH₄ for RICH and MW2 → RICH not needed to Ar ?
 - Ethane for MM and DC, switch off at the end of AMBER Pilot RUN.
 - **Neutral Gases:**
 - Switch to Nitrogen at the beginning of December
- **Unless specific request from detector experts, to be communicated asap.**
- **Coordinate with the gas group to plan the gas delivery stop (intervention in 908/in front of 908 are planned)**

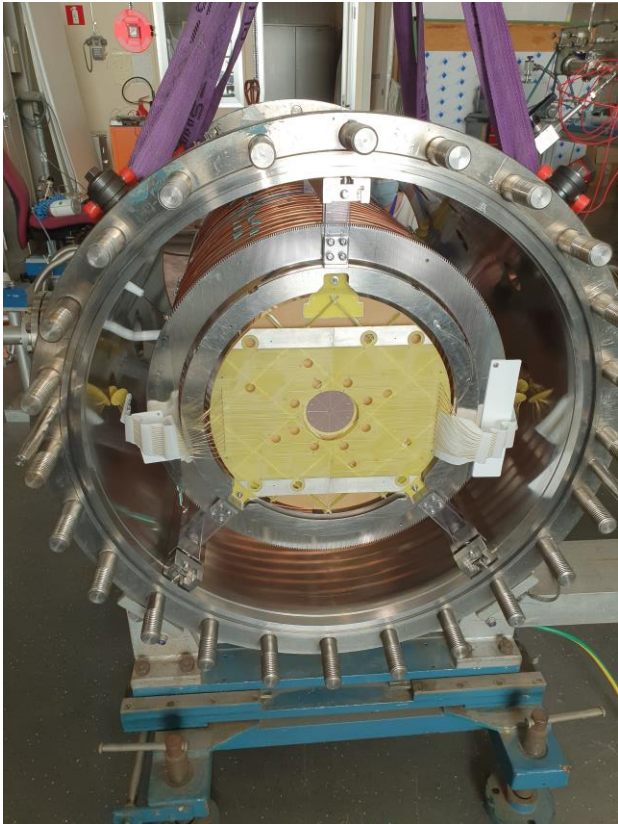
AMBER interventions: preliminary scheduling of the activities

- **Infrastructures**
 - Defined for the M2 beam line
- **Installation**
 - M2 Missing a planning of the installations: → important to plan the detector movement, commissioning in view of the services needed / booking of the safety visits for the beam clearance (AMBER is a new installation)
 - 888 end of the spectrometer space is available, ECAL2 redout + (fibers in preparation from Moritz) other needs ?
 - More feedback is needed to make an effective use of the allocated beam time

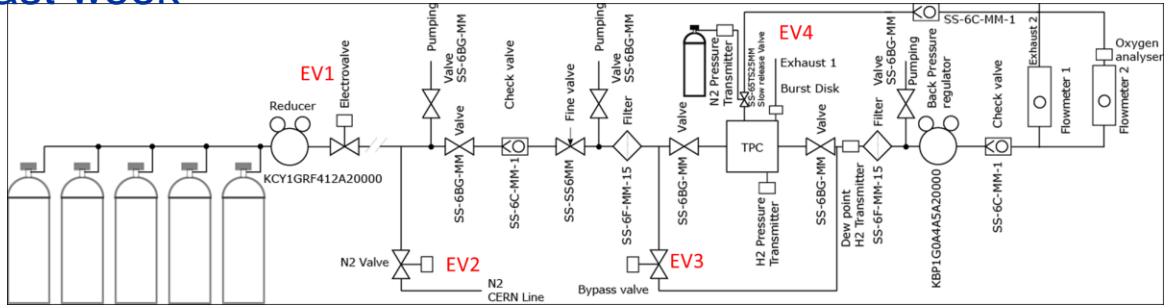


DATE	2021/09/28
BY	
REV	
APPROVED	
TH	

AMBER interventions: TPC status



O Kiselev + colleague @ CERN
last week



Safety issues with Gas System COMPONENTS are ok, Mechanical structure studies ongoing with BE support (mechanical engineering report request from EP-Safety)
PLC System will start to be connected this week (EP-DT)

Winter interventions and needs for the 891 (Clean room) space usage

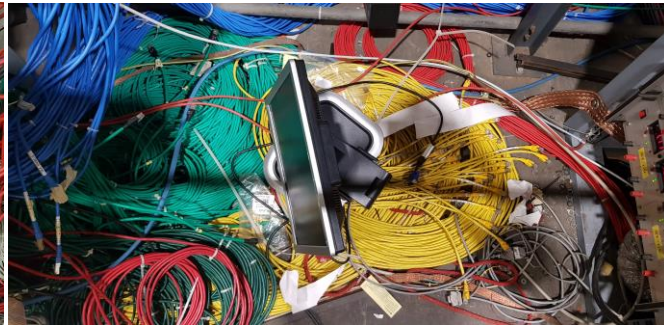
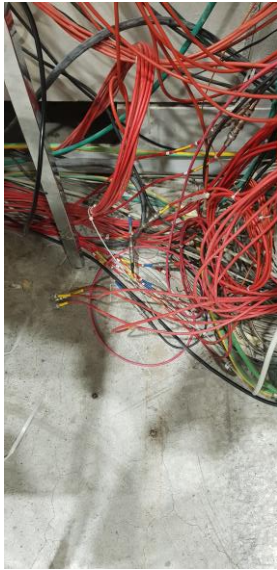
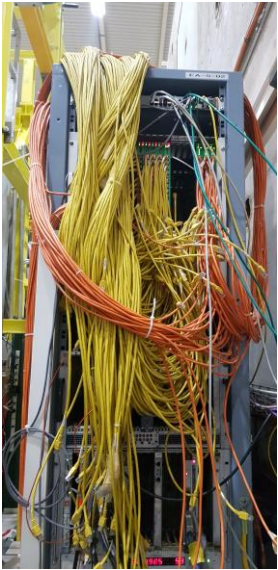
- **Repair of DC5: date of the intervention January, February space OK**
- **Repair of MWPC: date of intervention (?), some space issues and needs to restore the operation of the stretching machine**
- **IKAR TPC after the Pilot Run, needed storage in 891 (how long)**
- **W45, discuss the planning for the repair if any.**
- **New GEM installation → can we plan it during the YETS**

AMBER/COMPASS safety issues

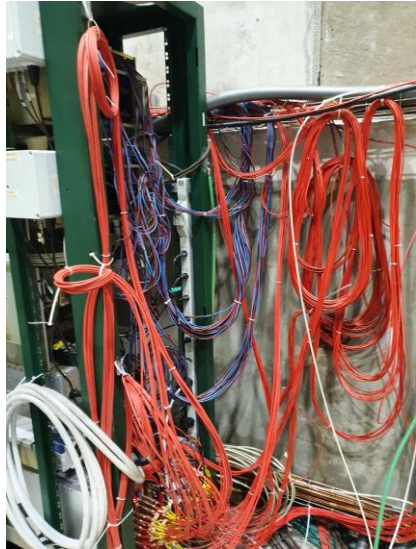
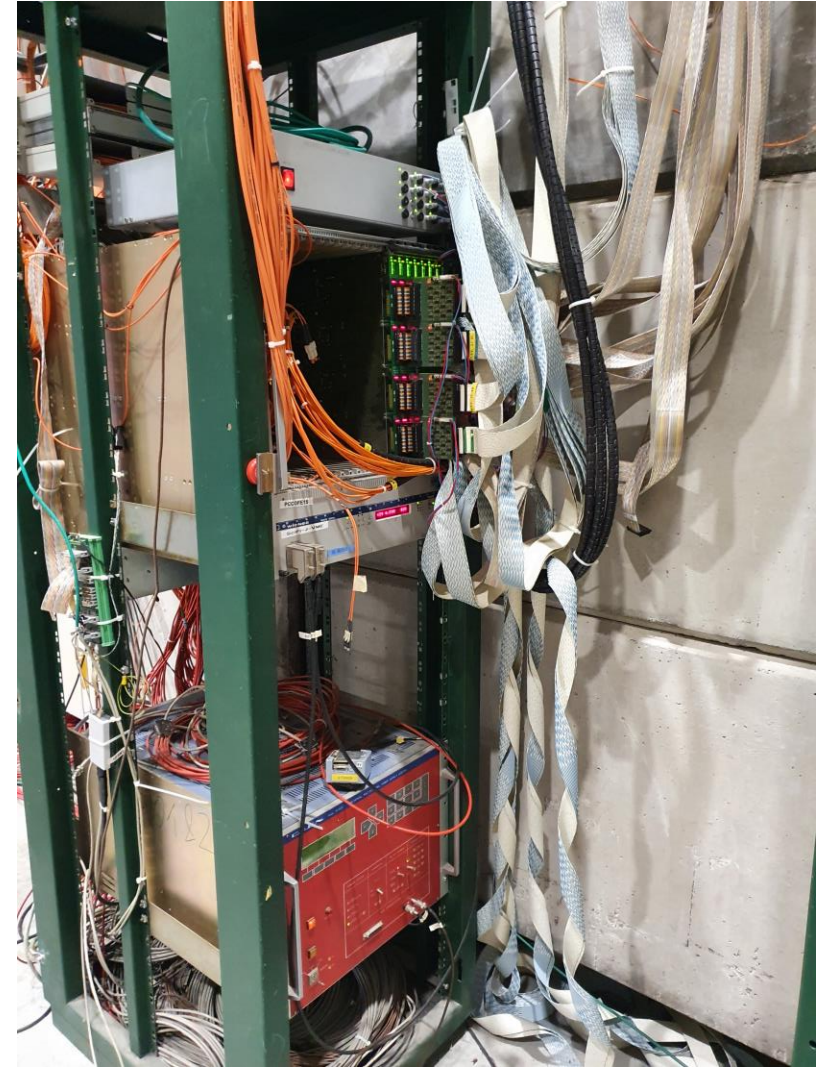
- **Several remarks at level of electrical installations for the COMPASS spectrometer.**

Electrical Conformities and general status of the existing electrical installations have created difficulties in obtaining the safety clearance for the use of the beam. This year we managed to find an agreement with EP-safety, next year we need to be ready earlier.

On 29 September 9:30-11:30 COMPASS will undergo an electrical inspection to identify the criticalities that will need to be solved. I will forward the report to the interested groups/people, but if you are already aware of some issue plan now the intervention during YETS.



Some solutions, but more work is needed





Overall services for EHN2

- **Few issues with services for the COMPASS spectrometer**

- Flammable gases were available later than foreseen but there was with no impact on detector commissioning, the flammable gas distribution system is fully renovated, delays in the delivery of the Atex components to CERN for the ventilation lead to the delay and to find a solution for COMPASS. The switch to the final system will be performed on 20 September, should be totally transparent for us. We should have available the specific gas consumptions measured ready to be integrated in the DCS.
- No major disruption in the electrical power distribution system



Please monitor the
detector gas status
During the changeover
days

EHN2, Beamline access system

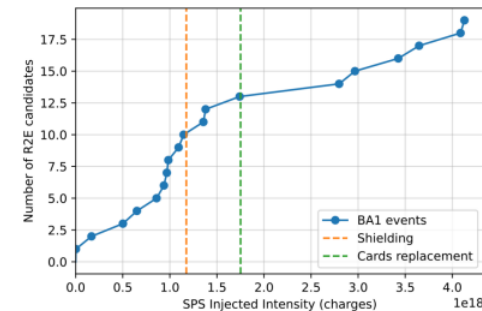
- **Loss of beam due to loss of patrol rights**
 - During this year we have experience beam loss due to “loss of patrol rights”: the M2 beamline was affected too, the problem has been understood and is going to be solved

SPS Access System Input Cards Failures Situation

- **Failures continue in the intermediate racks located underground in BA1, BA80, BA2, TCC8, TAG41 despite the actions taken already**
 - B4C shielding in BA1, BA2, BA80
 - Exchange of all cards for new ones with ULA conform chip molding
 - > strong suspicion that failures are **radiation induced**
- **Major contributor to SPS downtime**
 - Directly - **a card failure can lead to a Beam Stop** (if cabled to door position or emergency exit contacts)
 - Indirectly – requires reset and re-establishing patrol
- **Short Term Actions**
 - Heavy shielding in BA1
 - Reduce recovery time elsewhere (& more if required)

Location	Number of Events	With B4C Shielding	With New Cards
BA1	20	9(6)	6
BA80	7	2	5
BA2	3	1	1
TCC8	2	-	2
TAG41	4	-	2
BA6	1	-	0
BA3	1	-	0
ECN3	1	-	0
	39		16

Period: 30 January – 6 September



Y. Aguiar et al, presented at R2E MCWG 7/09/21

CERN CV preliminary schedule for the winter shutdown

- **Draft schedule for CV**
 - Starting the shutting down of Cooling Tower on November 15
 - From November 15 the system will run in non redundant mode (only one pump) so in case of failure no cooling water will be distributed
 - The Cooling Tower will run maximum 2 week after the **15 November** → 1 December hard deadline for any use of the Chilled-Raw Water
 - CV is needed for COMPASS He liquefier → ~ 15 November or (early) most likely Helium-4 will not be available any longer
 - **Restart for 2022:** the present schedule foresees the services restart for CV around **end of February/beginning of March**

EHN2, Beamline access system

- **Loss of beam due to loss of patrol rights**
 - During this year we have experience beam loss due to “loss of patrol rights” M2 beamline was affected few times, the problem has been understood and is going to be solved

Fault Masking & Recovery

- **PLC system (impacted by single event upset) is complemented by a rudimentary Hardware Loop relay logic**
- **In case a fault arrives and an input card requires resetting, full system recovery is obtained by re-establishing the patrol iff the HL Patrol Memory is OK**
- **Minimizing fault recovery time**
 - The Access first-line reset the cards manually, requiring access to the underground intermediate racks – with several hours of cool-down, this was further increasing downtime - NOK
 - Remote power down cycle to reset cards was tested in TCC8 & BA80 on Friday 10 September – OK
 - Further enhancement planned 15 September to allow for even more straightforward patrol recovery
- **Should the situation further worsen, a proposal for masking the underground doors' PLC signals until the YETS is being analyzed**

North Area Operational Readiness Analysis

- 25 page document, first version released 30 April 2021, final version 08.07.2021
- *“The analysis demonstrates that while a large share of the commissioning progress is on time for the restart, several specific issues require explicit attention.”*
- Issues of concern:
 - Power converter and magnet tests on a critical path
 - A problem with COMPASS cryostat isolation vacuum
 - ATEX extraction for the flammable gases in EHN1 and EHN2
 - A vacuum leak downstream of M2 TAX
 - The surface crane refurbishment
 - COVID restrictions in the control rooms
 - Control system FESA3 classes upgrade
 - Availability of crucial personnel

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NA-ORA-2021

Date: 2021-07-09

OPERATIONAL READINESS ANALYSIS FOR THE 2021 RESTART OF THE NORTH AREA

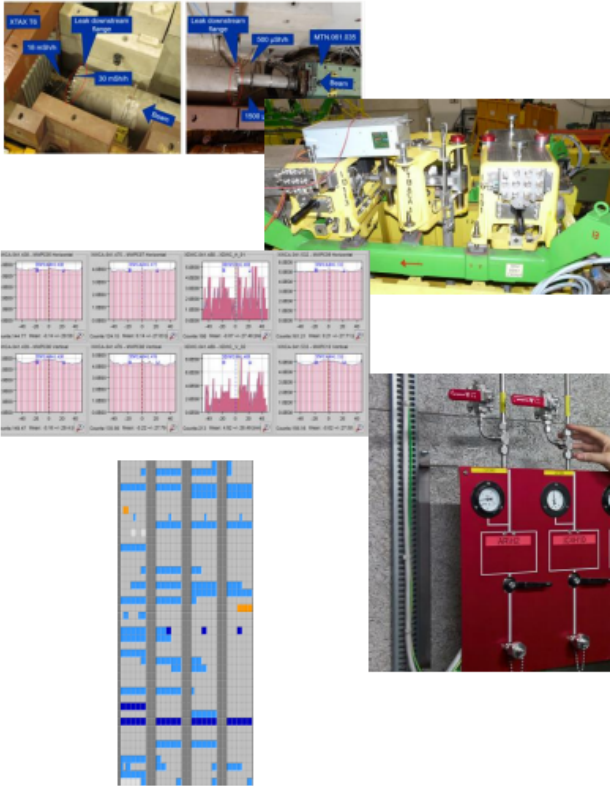
ABSTRACT:

The current document presents the evaluation of the readiness of the North Area for the restart of the operation of the beam lines and user facilities in the year 2021 and presents a snapshot of the status as of 22nd of June 2021, with the exception of section 4.1.2. [that](#) treat the delay due to TBIU and TBID vacuum issues. The analysis demonstrates that while a large share of the commissioning progress is on time for the restart, several specific issues (see the section on conclusions) require explicit attention. Consideration of the identified issues and the integration of possible solutions into the commissioning plan is necessary to avoid delays for the start date of the physics run in the North Area.

North Area Operational Readiness Analysis

Issues encountered

- Vacuum leaks in secondary beamlines, in particular in M2
 - Notable equipment deterioration
- TBIU/TBID vacuum and HT cables -> to be covered by V. Kain
 - Frequent updates, clear communication during the intervention.
- Coordination of the beam start between EA and BI for the monitor commissioning with the beam
- Flammable gas ATEX extraction installation takes place during the beam time
- Availability of personnel
 - Commissioning during the summer break, many absences and the remaining colleagues were frequently overbooked (thanks for their heroic effort!)



9/14/2021

First unstable beam delivered at COMPASS on 14 June
NA Commissioning - Post-mortem Analysis



28.09.2021

Joint COMPASS AMBER Technical Board | CERN September 28 2021 | S. Levorato

COMPASS, Helium recovery line problem 3rd of July

- Details in Michael talk.



COMPASS, Helium recovery line problem 3rd of July

- Details in Michael talk.



First trial after unloading the material ~ 1 week after, just replacing the crashed part, unsuccessful → displacement occurred

COMPASS, PT

Two extra problems were faced by the PT group

- Difficulties in operating the dipole magnet due to large consumption of Helium: oxidation at contact of the aluminum summer shielding and the copper heat exchanger, most likely due to air exposure during the 2 to 3 cell change requested for SIDIS running → intervention foreseen via the magnet turret during YETS
- Difficulties in operating the EIO tubes, unstable in frequency and not enough powerful → switch to the only one Gunn Diode system, recently purchased: effective, work ongoing in order to optimize its operational parameters

In discussion with PT group the use of 3 Gunn Diode for 2022 (Yamagata support)

The group is working with no break, my deepest gratitude for the dedication and the effort, despite the hard time

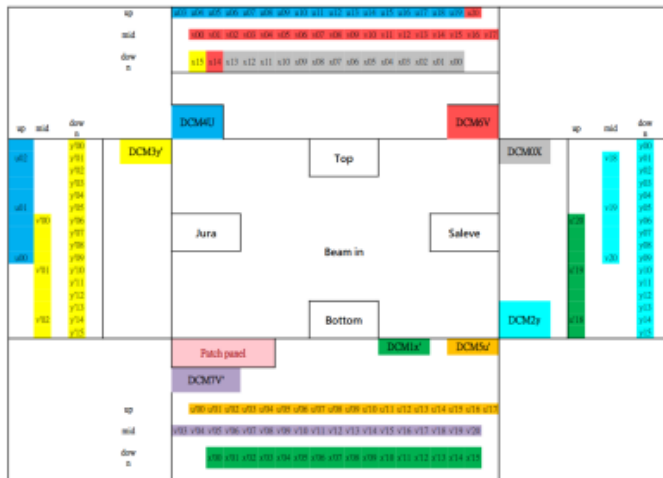
→Michael Talk



COMPASS, DC5

During the month of January 2021 DC5 y wire was found to be broken

Short preventing HV discovered on January 2021



(from V. Andrieux)

- Diagnosed to broken wire in region y07 and y08
→ Short to ground visible to BK, CY and CYY', and FW Y
- Further test to evaluate the possibility to work with partial RO:
 - Only 1 broken wire identified at the middle of the chamber: wire# 128
 - Check isolation resistance of sense wire
(to operate with HV and floating sense wires)
→ Several sense wires connected to ground through $\sim 10\text{ k}\Omega$
→ Default of isolation getting worse with time

→ Cannot operate even with floating sense wires, Y and Y' unavailable

The repair of the detector could not be performed and was scheduled for the 2021 YETS

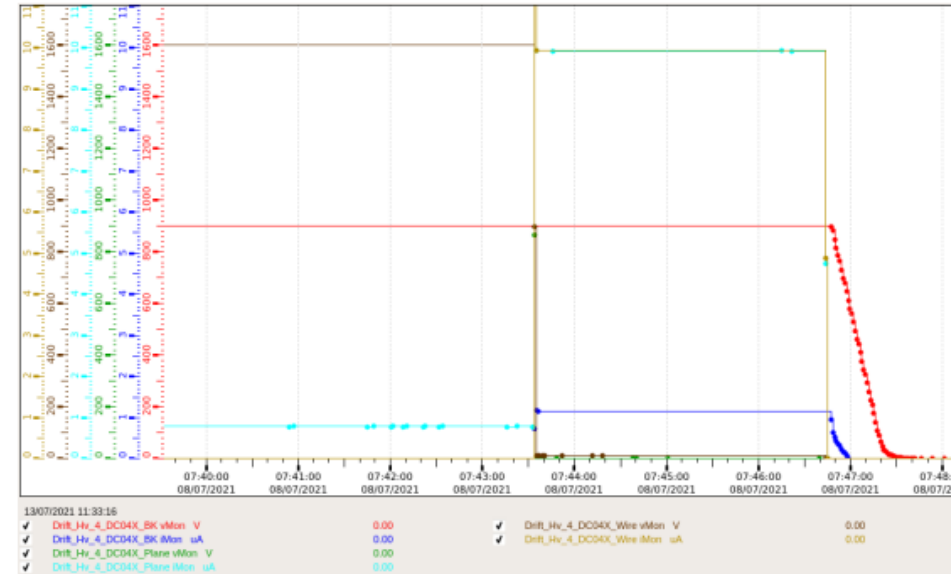
COMPASS, DC4

During Commissioning of the DC4 in view of the run a y' wire was suspected to be broken → lack of redundancy in y coordinate

- Sudden raised of current in FW and Cathode: $10\mu A \rightarrow 3\text{min}$ before it trips

Note: HV mapping mistake, X and Y are swapped

- Not possible to raise the HV
- Measurement with Shuddha:
 - 1Ω to ground for Y' cathode and YY' cathode
 - Beyond accuracy of the device for BKs
 - Beyond accuracy of the device for FWs !?



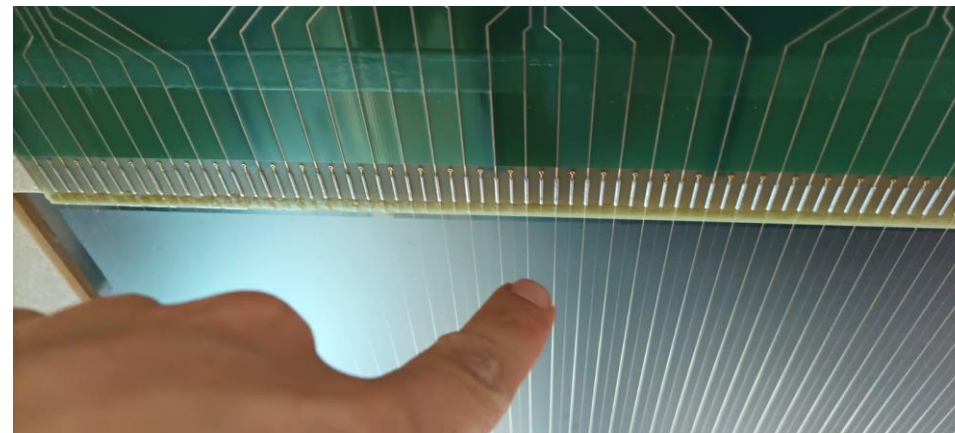
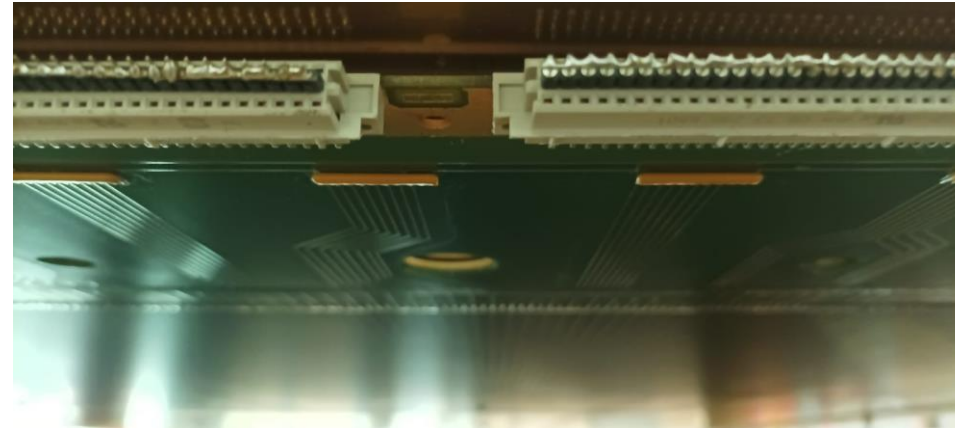
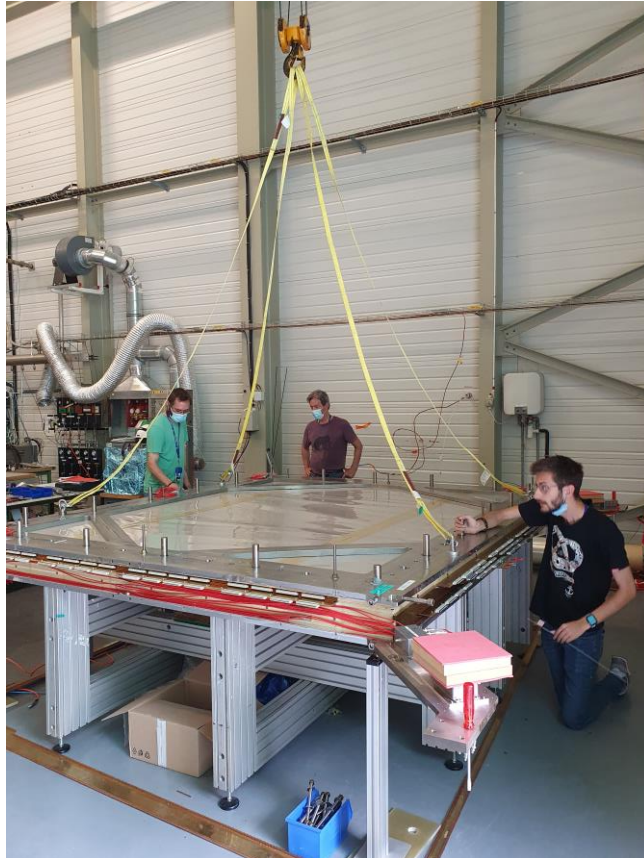
(from V. Andrieux)

Next: Localise the potential broken wire (most likely on top)

Isolate the region and check whether HV cannot be operated with partial RO

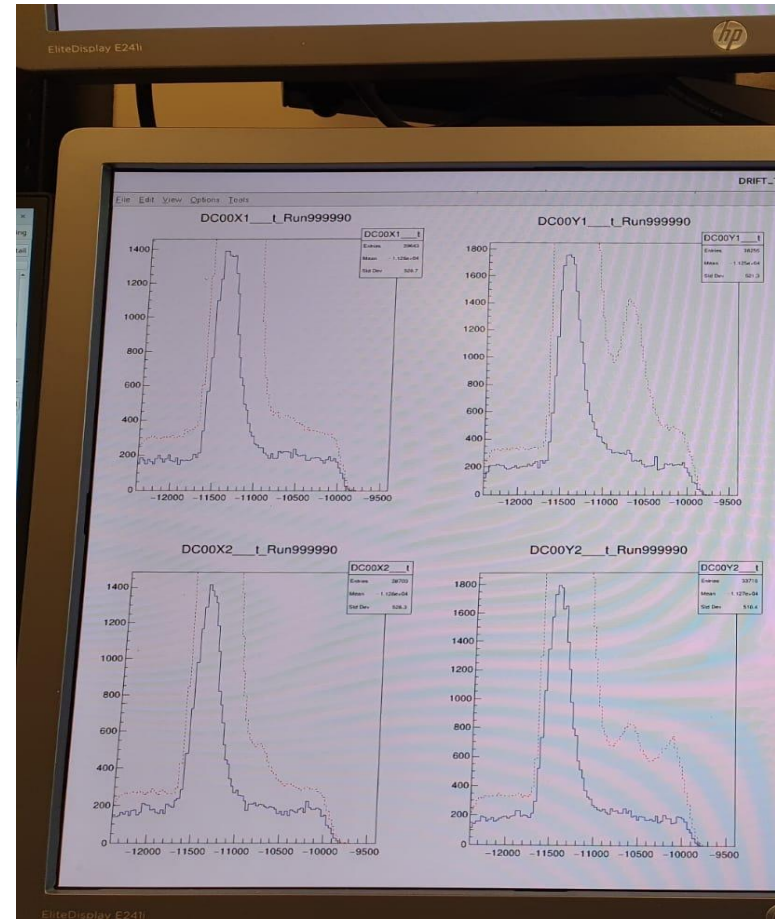
COMPASS, DC4

Decision to go for the repair, Saclay group agreed for the fixation by a local team under the supervision of Vincent
The detector was moved into the clean room on 22nd of July



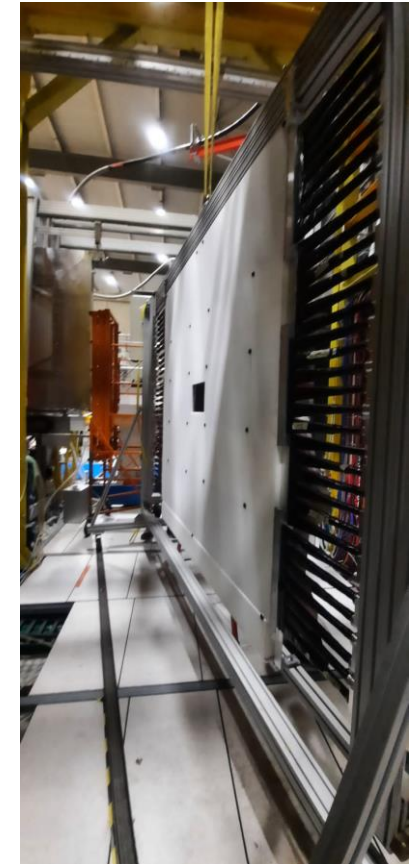
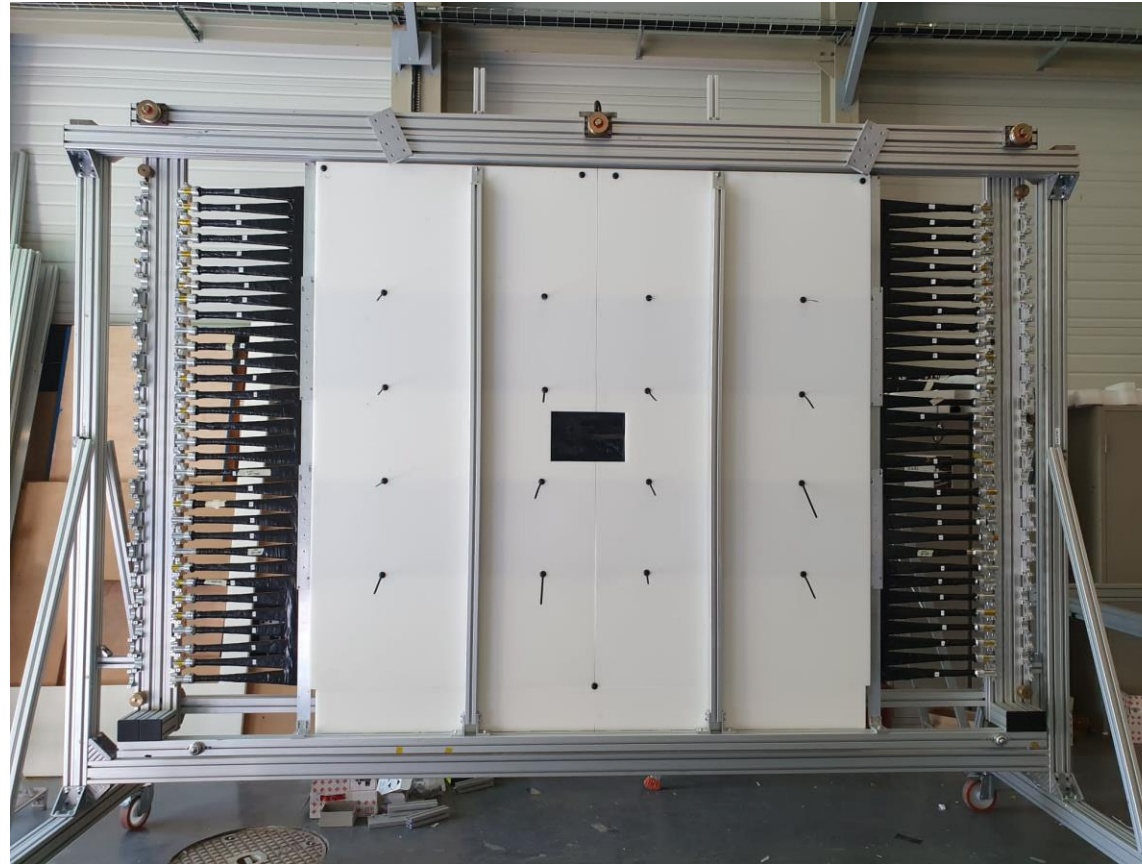
COMPASS, DC4

Successfully fixed and brought back to the hall on 4th of August



COMPASS, H1

Successfully reinstalled on 11 July with its new Rohacell holding structure, despite a minor issue with the gluing of the last slab of the hodoscope ... a double success



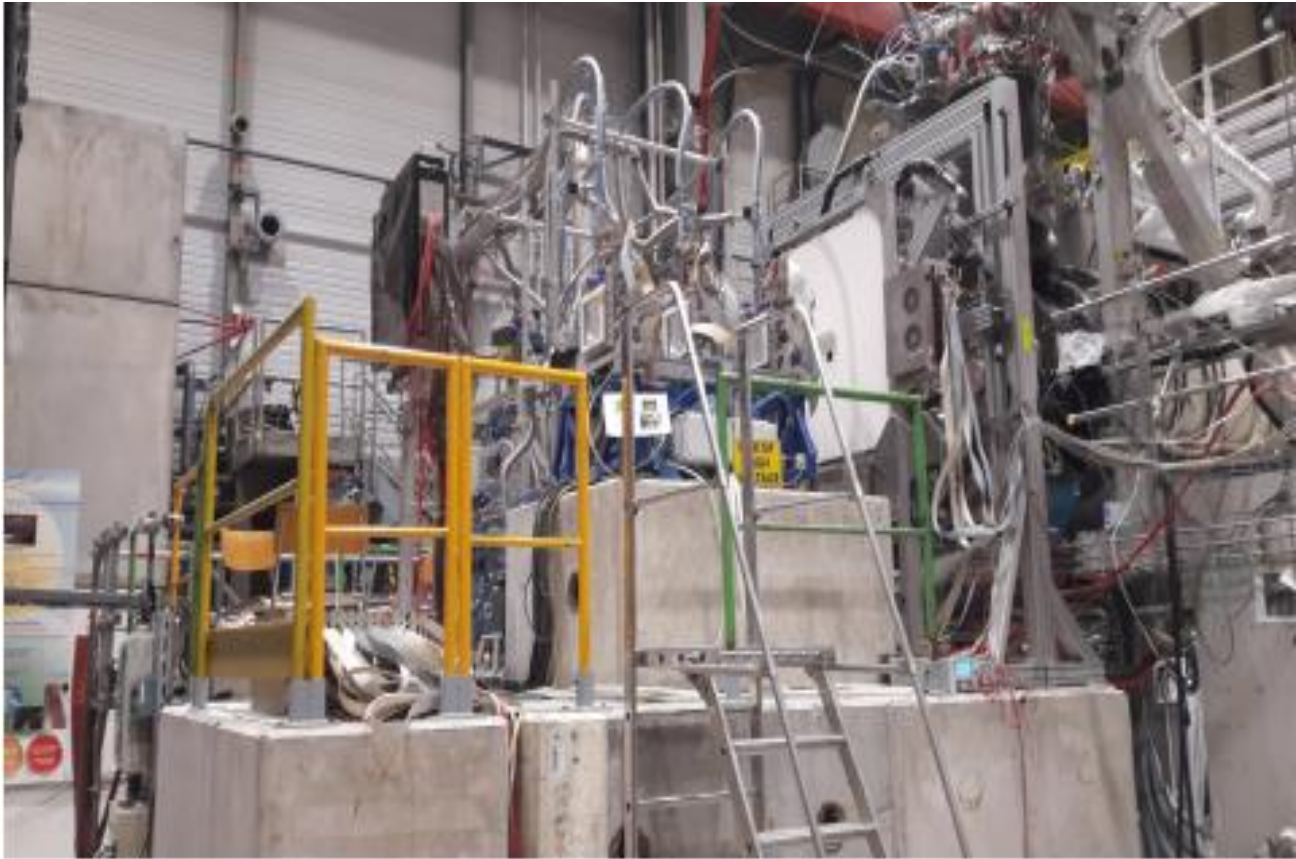
RICH WALL re installation

Successfully reinstalled on 11 July after full MDT system refurbishment



Bram Tracker telescope re installation

Reinstallation started on 13th of August



Beam Telescope (SciFis & Silicons) + Trigger Veto Inner 2: installed and commissioned in one week