



Extraordinary TB meeting

Stefano Levorato

Thursday, 09.04.2020
COMPASS TB meeting



Motivation for the TB meeting

- Update the collaboration on the status of the COMPASS experiment
- Illustrate the action taken to guarantee COMPASS safe mode operation
- Illustrate our requests to CERN services in view of a restart (!!! Booking is fundamental)
- Illustrate the requests to us for the 2020
- Coordinate the preparation of the activities
- Present a possible scheduling scenario (Nothing decided yet, we have to agree on the actions keeping some flexibility)

----- Forwarded Message -----

Subject:Re: FW: COVID meeting this evening

Date:Wed, 18 Mar 2020 11:39:27 +0100

From:Stefano Levorato <stefano.levorato@cern.ch>

To:Augusto Ceccucci <Augusto.Ceccucci@cern.ch>

CC:oleg.denisov@to.infn.it <oleg.denisov@to.infn.it>, fulvio.tessarotto@ts.infn.it <fulvio.tessarotto@ts.infn.it>

Dear Augusto,

let me update you on the status of the COMPASS experiment towards the safe mode.

Few interventions are foreseen during today 18 March: fixing supports for some detector, delimitation of areas with red and white strip and labels.

Tomorrow the final controls will be performed and the detector safety check list to be performed will be written and distributed among a restricted number of people: (the list f COMPASS members you have authorized) .

We will schedule the checks during the week to be performed by only one member who is allowed to enter CERN and 888 hall.

We will limit at maximum the presence in the area.

The refilling of liquid nitrogen (weekly) and few checks on the gas system (weekly if no alarm from DCS will appear) are the only two operations that will require a short time physical presence in the HALL .

An e-group for emergency has been created including TSO, EP safety contact, and the Liaison Physicist: compass-onsite@cern.ch

From Friday COMPASS will be declared in safe mode.

I hope this will help you to provide the needed input.

Thanks,

Kindest regards

Stefano

Since Friday 20 March minimal activities in the hall

Facility: COMPASS	<i>Evaluation of Gas consumption for COMPASS during the shutdown</i>		
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	Modified:	Rev. No 1	

Gas consumption for COMPASS in shutdown mode

This document evaluates the gas consumption of COMPASS during the shutdown period. Two are the main gas needs for the COMPASS experiment. A regular delivery of liquid Nitrogen to refill the Dewars where the COMPASS target material is stocked and the standard gaseous Nitrogen supply used to flush experiment detector to avoid their deterioration or total loss of performance.

Prepared by: AIS member (Stefano Levorato)	Checked by: Requestor (TODO)	Approved by: <Steering C
Distribution List:	Acceptance to release: Requestor (TODO)	

Document prepared with Johannes Bernhard

- 1 Target Material
 - 1.1 Target Material needs

The COMPASS polarized target material, 1800 cm³ of NH₃, 400 cm³ of ⁶LiD, 800 cm³ of d- butanol is kept at liquid nitrogen temperature in a set of Dewars stoked in 888 R-413. Regular checks of the Liquid Nitrogen (LN) filling level are performed weekly and refilling if needed is performed. The presence of LN is mandatory to allow the material to be kept polarizable. The LN orders are performed every 3 to 4 weeks and the liquid gas amount requests is of about 200 l.
- 2 COMPASS detector requirements
 - 2.1 Detector gas flow

The COMPASS gaseous based detector (MicroMegas, GEM, MWPC, STRAW, MuonWall, DC, and others) as well as solid state ones (Silicon trackers) during the shutdown are kept under Nitrogen gas flow or in a inert atmosphere to avoid contamination from air and/or the accumulation of outgassing from the detector wall. If not avoided it will result in a loss of detector efficiency or to the complete damage of detector itself.

The total amount of Nitrogen usage at COMPASS has been evaluated by adding up the single detector gas consumption as measured from the gas distribution area at COMPASS 888 R-028.

Another source of consumption comes from the nitrogen needed to keep the 80 m³ RICH detector at a small overpressure of approximately 0.3 mbar, with respect to the environmental one via the use of a manual flowmeter located in 888 R-022.

Several detectors are fed via lines starting from different points than 888 R-028 and 888 R-022 they have been included in the final computation.

Finally several pneumatic valves are in use at the experiment, their consumption is hard to evaluate and a reasonable safety margin must be applied to the final estimate of gaseous Nitrogen use.

Overall the N₂ gas consumption is evaluated in 3 m³/h

+ procedure to extract the liquid nitrogen in case of non delivery of Liquid Nitrogen asked via Service Desk is issued to **EN-EA Gas Team**

Up to today no problem in delivery. Last delivery a couple of days ago

Email has been sent to all Detector Experts asking if any action extra to the “winter shutdown mode” should have been implemented



Daily check list

COMPASS: CERN services running

<https://cern.service-now.com/service-portal/covid-19-service-availability.do>

Most of the services are available, some degraded.

Running services must obey to all the prescriptions of the covid-19 emergency

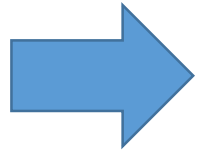
COVID-19 Service Availability Dashboard 08 Apr, 2020 15:00

Service Available (Show/Hide) Service Degraded (Show/Hide) Service Unavailable (Show/Hide) Minimal view | FAQ

- Accelerator and Experiments Technologies**
 - Accelerator Controls Applications
 - Accelerator Controls Computing Infrastructure
 - Accelerator Controls Framework and Technologies
 - Accelerator Controls Hardware Installation
 - LS2 Storage
- Application Services**
 - Accelerator Operations Applications
 - Accelerators Naming service
 - Administrative Data Reporting Application Support
 - ALICE Fence Framework
 - AMS Computing
 - APT Activity Planning Application Support
 - ATLAS Central Computing
 - ATLAS Fence Framework
 - Automatic Message Application Support
 - BI Reporting Application Support
 - CAD
 - CERES - Chemical Register for the Environment, Health and Safety Support
 - CERN Phonebook Application Support
 - CERN Users Administration Application Support
 - CET Financial Reporting Application Support
 - CFU Contract Management Application Support
 - Checkout Application Support
 - Claims and Indemnities Application Support
 - CMMS Asset Management
 - Dashboard and KPI Application Support
 - Departmental Storage Application Support
 - Detector Technologies Software
 - Developer Productivity Application Support
 - DocLeg Legal Document Application Support
 - Dosimetry Applications and Databases Support
 - E-groups and Roles Application Support
 - EDH Workflow Application Support
- Human Resources Services**
 - Arrival and Integration
 - Attestation
 - CERN Clubs
 - CERN Unemployment Insurance Scheme
 - Claims and Indemnities
 - Classification, Remuneration and Recognition of Merit
 - Competency Model (CCM)
 - Diversity and Inclusion at CERN
 - External Activities
 - Family Benefits
 - Fitness Club
 - Frontline Support for Career Management for Employed
 - Members of Personnel
 - Indefinite Contract process
 - Internal Mobility
 - Internal Tax
 - Librarian Apprenticeships at CERN
 - Life Insurance
 - Martial Arts Club
 - Personnel Accounting
 - Personnel Reccords
 - Petanque Club
 - Recruitment
 - Ski Club
 - Social Affairs
 - Staff Association Administrative
 - Swiss and French Cards and Visa
 - Telework
 - Working hours, Pre-retirement and Leave
- Occupational Health, Safety and Environment Services**
 - ALICE Safety
 - ATLAS Safety
 - BE Safety Unit
 - CMS Safety
 - Dosimetry
 - Emergency
 - EN Safety
 - EP and TH Safety (DSO)
 - First Aid
 - LHCb Safety Office
 - Medical
 - Non-Emergency Intervention Support
 - Professional visit to Beam Facilities
 - Psychologist Consultation
 - Radioactive Shipping
 - Radioactive Source Management
 - Radioactive Waste Management
 - Radioanalytical Laboratory
 - Safety Deviation Management
 - Safety Reporting and Consultancy
 - Safety Training
 - Traceability of Radioactive Equipment at CERN
 - Water Release
- Out of scope services**
 - Cooling and Ventilation
- Service, Organization and Process Management**
 - Data Privacy Protection
 - Procedures Documentation and Review
 - Management Service
- Site Infrastructure Services (Hard)**
 - Buildings Repair And Maintenance
 - Catering And Kitchen Equipment
 - DICT Response
 - Electrical Installations
- Suppliers and Clients Relationship Services**
 - Accounts Payable
 - Accounts Receivable
 - Field Support Units (FSU) Contracts
 - Globe events
 - Procurement of Supplies and
 - Suppliers Management
 - Temporary Labour
- Technical Infrastructure Services**
 - DC Cabling
 - Electrical Power Distribution
 - Fibre Optics
 - High Voltage Cables and accessories
 - Lighting
 - Machine Tools Repair and Maintenance
 - Rack Installation
 - Signal Cabling
- E-groups and Roles Application Support**
- EDH Workflow Application Support**
- EDMS Engineering and Equipment Document Management**
- Electronics Pool Application Support**
- EVM Project Planning and Control Application Support**
- GAD Standard Document Application Support**
- General Accounting and Invoice Application Support**
- General Data Provisioning Application Support**
- Health Insurance Application Support**
- Housing Application Support**
- HR e-files Application Support**
- HRT Personnel Reporting Application Support**
- iLDirac**
- IMPACT Intervention Scheduling Application Support**
- Industrial Control Applications**
- Industrial Control Frameworks and Technologies**
- Internal Distribution Application Support**
- Inventory and Equipment Sales Application Support**
- JMT Job Management Application Support**
- KITRY Medical Application Support**
- LHCb Dirac**
- LHCb Fence framework**
- LHCb Offline**
- LHCb Online**
- Locks and Keys Application Support**
- Mail Application Support**
- Material Request Application Support**
- MDL Management Data Application Support**
- MERIT Career and Reward Planning Application Support**
- Milestone Tracking Application Support**
- NA61/SHINE Central Computing**
- Official Travel Application Support**
- OTP Shift Planning Application Support**
- Panoramas**
- Payment and Treasury Management Application Support**
- Pension Fund Administration Application Support**
- PIE Experiments and Persons Information Application Support**
- PPT/EU Funded Project Tracking and Reporting Application Support**
- Fundraising**
- Member State Relations**
- Relations with International Organizations**

- IT Services**
- AFS
- Backup and Restore
- Campus Network
- CASTOR
- Ceph
- CERNBox
- Computer Security
- CTA
- CVMFS
- Data integration and reporting / Pentaho
- Database on Demand
- Datcenter Network
- E-Mail
- EOS for Physics
- File Transfer
- FILER
- Fixed Line Phone
- GRID Development
- HADOOP
- Installation
- IT Consulting
- Load Balancing
- LXPLUS
- Mobile Phone
- Network Database and Registration
- Network for Projects and Experiments
- Oracle Database
- Skype for Business
- Streaming Data
- Technical Network
- TETRA Radio Communication
- Video Conferencing
- Weblogic, Tomcat Java application servers and 3rd party packages
- WLCG Network
- AMS Website Support
- Site Infrastructure Services (Soft)**
- Car Rental
- Car Sharing
- Catering
- Cleaning
- Gas support and delivery service
- Goods and Material
- Guards
- Housing
- Installation
- Locks and Keys
- Load Balancing
- Lost and Found
- Mail and Internal Distribution
- Onsite Removal
- Person and Vehicle Registration
- Person Transportation
- Shipping
- Site Security
- Storage
- Waste Management
- Specialized Support for Projects Experiments and Engineering**
- Automation Technologies
- Industrial Control Monitoring
- Safety and Access Engineering
- Knowledge, Scientific Information, Text and Media**
- AMS Website Support

Most of the core services available, → grants reasonable safety for the experiment needs



EN-EL still confirms activities during the month of September

However, please take note that considering the backlog of activities EN-EL will have to recover due to the exceptional closure and the actual situation which evolves continuously in *CERN host states and member states*, I cannot confirm that what stated above will be kept as is. I invite you to consider this uncertainty while reporting to concerned bodies.

september-2020							October-2020						
Tu	1	LHC-19 2020					Th	1	BAR2 (NA) EN-EL				
We	2						Fr	1	maintenance week				
Th	3						Sa	3					
Fr	4						Su	4					
Sa	5						Mo	5			AUG-2020 BAR0		
Su	6						Tu	6			AUG-2020 BAR1		
Mo	7						We	7			AUG-2020 BAR2		
Tu	8						Th	8					
We	9	BAR0 (NA) EN-EL maintenance week					Fr	9					
Th	10			Geneva fact			Sa	10					
Fr	11						Su	11					
Sa	12						Mo	12					
Su	13						Tu	13					
Mo	14						We	14					
Tu	15						Th	15					
We	16	BAR1 (NA) EN-EL maintenance week					Fr	16					
Th	17						Sa	17					
Fr	18						Su	18					
Sa	19						Mo	19					
Su	20						Tu	20					
Mo	21						We	21					
Tu	22	BAR1 (NA) EN-EL maintenance week					Th	22					
We	23						Fr	23					
Th	24						Sa	24					
Fr	25						Su	25					
Sa	26						Mo	26					
Su	27						Tu	27					
Mo	28						We	28					
Tu	29	BAR2 (NA) EN-EL maintenance week					Th	29					
We	30						Fr	30					
							Sa	31					

Chilled water, status

Dear Stefano,
We are doing a general planning to all machines and users according priorities and resources available (including works on certain equipment still needing to be finished) that *will be communicated shortly*.
At the moment all cooling is stopped at NA.
Best Regards,
Jani Lehtinen

EP-DT Group

No Answer yet

GAS Barrack renovation (flammable gas 908)
→ No flammable gas available

Mandatory, should be done this year, could be done during the month of September, can be done in parallel with EN-EL renovation, discussed with David Jaillet, waiting for our input

Rail renovation for the crane

Must be done in 2020, budget is allocated, contractor company has been identified. Meeting with company representative and Bastien Rae (TSO) They are waiting for our input, major impact on our activities, but can be minimized.

Two cranes in operation since 1976-1977

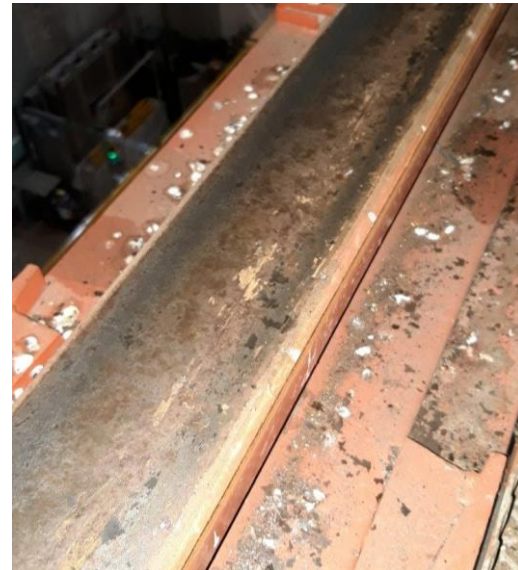
Rail type: burback A100

Junction type: straight cut, induces peak loads!

No elastomer pad

Signs of damages along the rails

Remarkable noise during crane travelling, especially across junctions



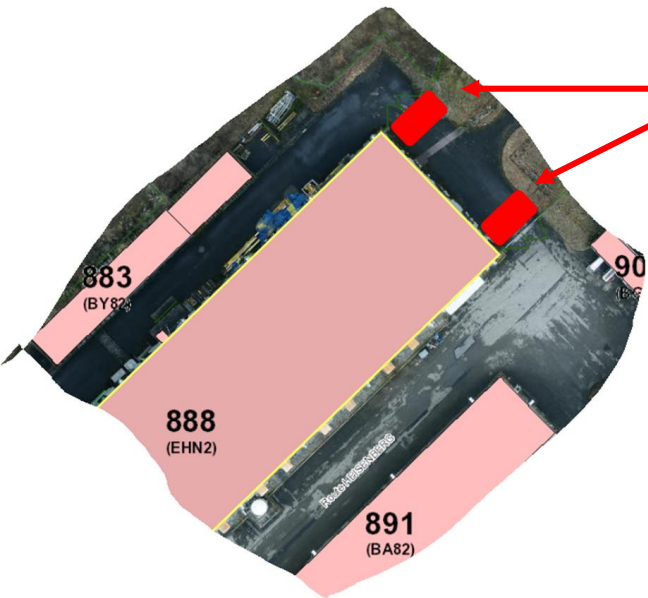
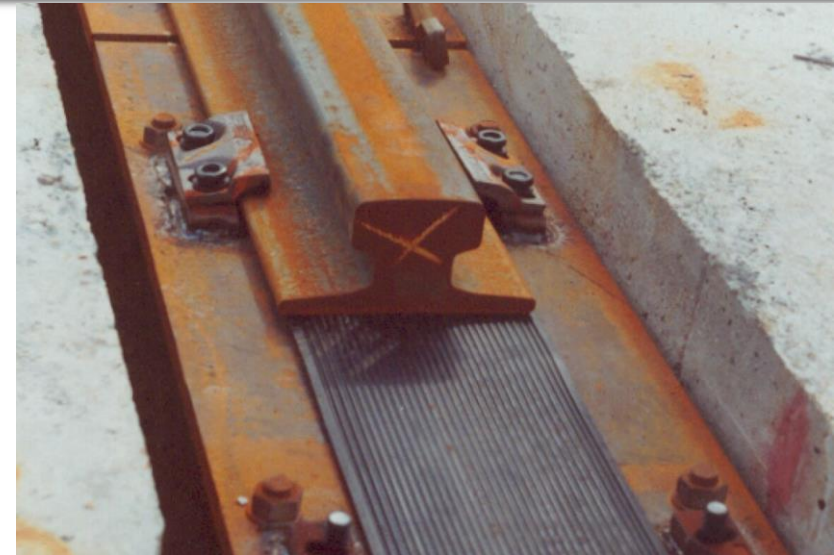
COMPASS: Rail renovation → replacement

Replacement of ~ 110 m of rails

Elastomer pad to reduce vibration transmitted to the structure

Welded junctions between sections to avoid stress concentration points

Existing clips are in good condition and will be reused: reduction of worksite duration



Two platforms (scaffolding) will be installed outside the building (“Lausanne side”); floor at the same height of the rails

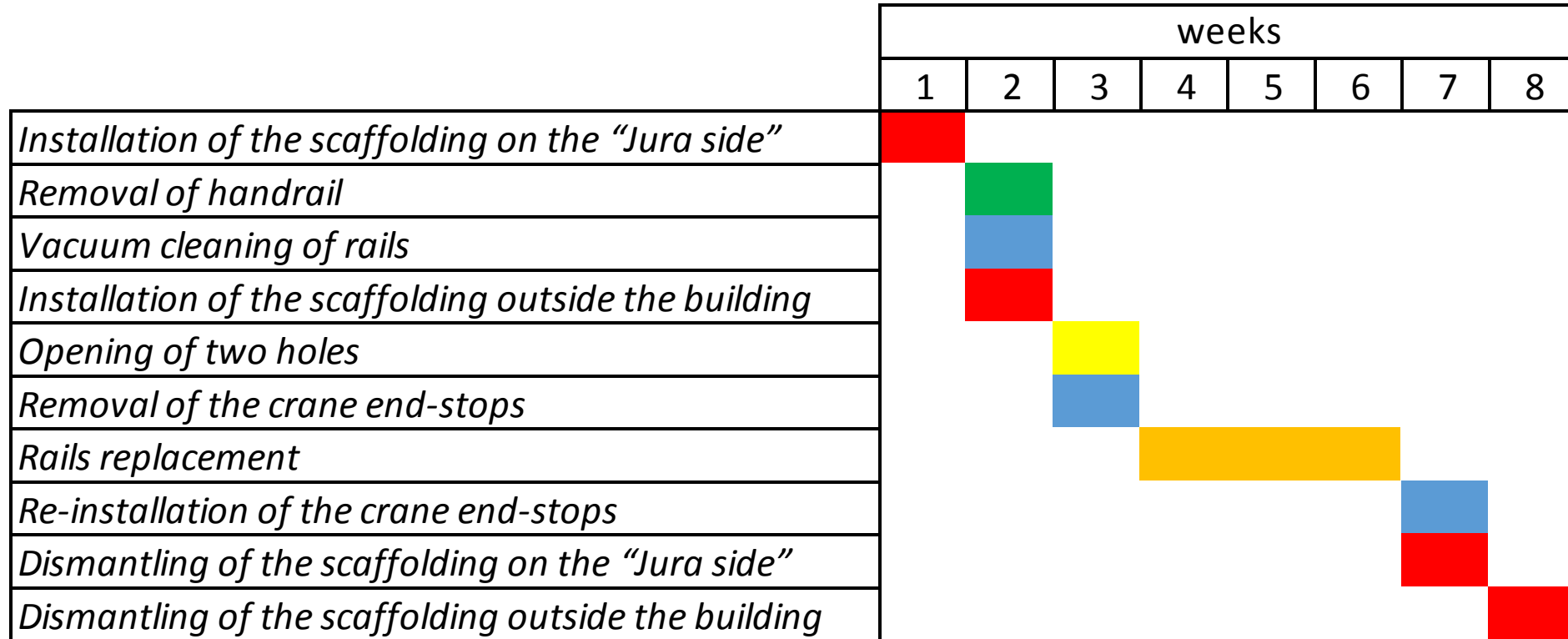




“Bellegarde side” entrance door; available area shown in the picture is sufficient



“Lausanne side” entrance door; some material needs to be removed



- Totale 8 semaines à de la semaine 3 à 7 pas de pont roulant.
- Mois de septembre pas d'électricité car rénovation de GAS à à voir avec David Jaillet si compatible ?
- La décisions doit être prise avant mi-Avril au plus tard.
- Proposition de commencer le 24 août 2020. Pour maximiser le temps sans pont roulant durant les travaux Gas (jusqu'au 12 Octobre 2020)

Action :

- Bastien Vérifier la compatibilité avec David Jaillet.
 - Puis Roberto confirme les dates avec le contractant.
 - Puis Stefano doit propose les dates au expérience.

An SPS RUN in 2021 is considered highly probable, the starting date could be delayed
M2 Beamline is nearly ready.. no major issues there

- Target
- Micromegas
- APV – LV
- H1
- RICH-WALL
- Cold Silicon
- GEM → talk
- RICH→ talk
- DC4→talk
- Planning

	SEP	SEP	SEP	SEP	OCT	OCT	OCT	OCT	NOV	NOV	NOV	NOV
	Precooling with LN2		He cooling	MSS Tests	Sol. Dip. Test	Stabili ty Test	Field Rotat. Test	Warm up				

- Planning without DR and material tests
- Liquid helium and cooling water required

COMPASS: Micromegas Hardware Missing – and LV for APV

LV power supplies:

Equipment	LV channels / unit	Number of units	Power supplies employed in 2015-2018
LV for MM APV cards	2 channels (+6V, -6V) / doublet, 5 A/ch max	2 doublets x 3 stations	3 Wiener PS of 8 channels (1 for each station)
LV for MM ADC cards	2 channels (+6V, -6V) / doublet, 5 A/ch max	2 doublets x 3 stations	for both APV and ADC
LV for DC F1 cards	2 channels (both +8V) / DC, 30A/ch max	3 DCs	1 Wiener for F1 (4 channels) for DCO-1 (Salève side)
LV for DC ASD8 cards	4 channels (2 x +6V and -6V) / DC, 10A/ch max	3 DCs	1 Wiener for ASD8 (8 channels) for DCO-1 (Salève side)
			+ 1 Wiener PS common for F1 and ASD8 (4+2 channels) for DC4 (Jura side)

HV power supplies:

Equipment	HV channels / unit	Number of units	Power supplies employed in 2015-2018
HV for MM	4 HV channel/plane, -1,8kV 20µA max, ~1 nA resolution needed	4 planes x 3 stations	4 modules CAEN A1821N (12 ch) for the 3 stations (Salève side)
HV for DC	3 HV channels/doublet (like X + X'), -3kV 200µA max, ~100nA resolution	4 doublets x 3 DCs	3 modules CAEN A1821N (12 ch) for the 3 DCs
			1 CAEN crate SY2527 for MM and DC1 (Salève side)
			CAEN crate SY1527 for DCO and 4, shared by several detectors (Jura side)

Hardware presently in hand:

- 3 Wiener LV PS 8 channels (from pool but rented for free due to long term rental rules, very old material)
 - 1 Wiener LV PS 4 channels (Saclay property, very old material)
 - 3 spares Wiener LV PS 4 channels Saclay properties, former F1 electronics LV PS for MM, very old material)
 - 1 spare Wiener LV PS 8 channels, under repair at Wiener (Saclay property)
 - 3 CAEN A1821HN modules (Saclay properties)
- We also assume that the CAEN crate SY1527 shared by several detectors is still available

Hardware needed in 2021:

- 1 Wiener LV PS 8 channels
- 1 CAEN crate SY2527
- 4 modules CAEN A1821N

But Damien communicated me he is missing 3 Saclay CAEN modules A1821N
Do we buy them ?

Not to forget the purchase also of the LV for the APV (GEM)

Magnet test commissioning is mandatory this year, must be scheduled it is our priority

Possibility of having a full commissioning with target material loading is probably not an option for 2020

We have on hold

- the maintenance of two He pumps in the pump room, order has been sent, CERN waiting the covid-19 situation to improve to allow the external company to enter the Preveessin site
- one broken He root pump near the target platform (repaired several time ... buy new one ~ 10KCHF)

This does not prevent to perform at least the MSS @ room temperature → Requires EP-DT support

Crain Rail renovation is possible with some early start in August, Crane available back in October, should be compatible with the MSS test,

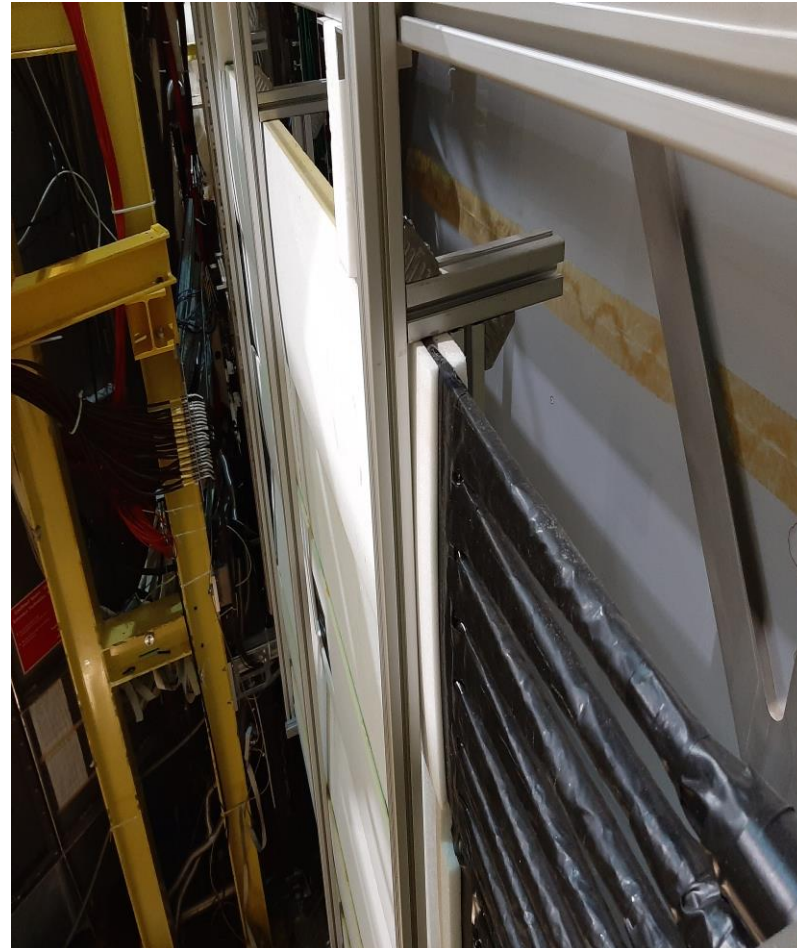
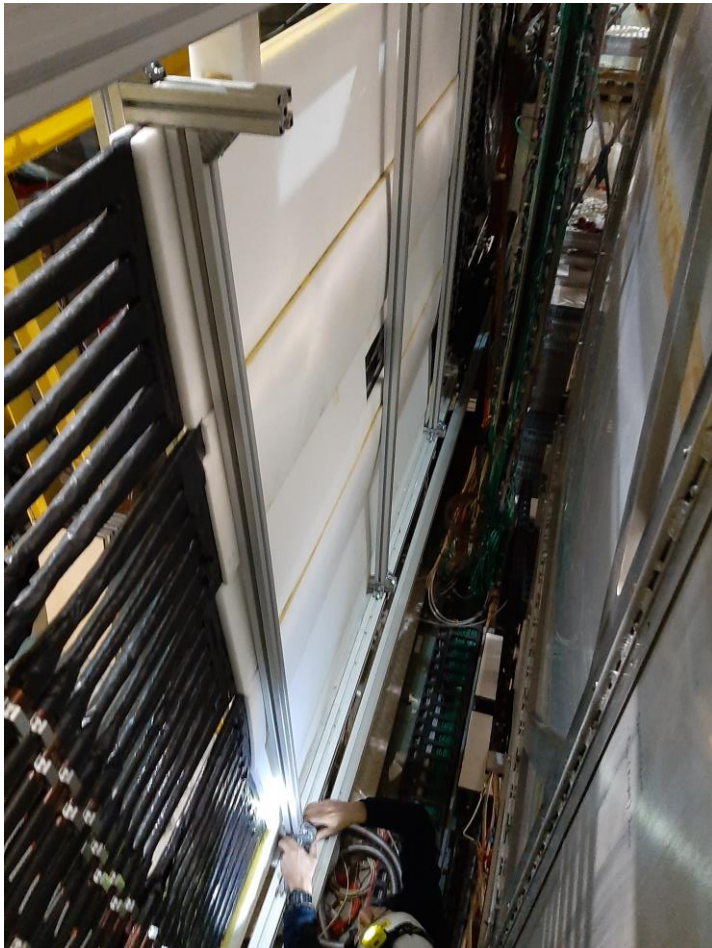
Detector repairing and maintenance activities can be performed during the month of September while the rail exchange is ongoing (crane may be available for some operation not for sure from week 3 to 7)

I have discussed with David Jaillet, the renovation of the Gas 908 barrack is compatible with the rail exchange, work can be parallelized

Chilled water return is still unclear, if back we may have a DRY run starting after the 9th of November (reduced configuration, Most probably no flammable gases, not all detectors → Dry run till middle December then again technical stop

H1 intervention most probably has to be postponed to winter 2020, here two possibilities

- Move it to the Clean Room before the intervention for the rail renovation (End of August/September)
- Move it to the Clean room after the rail exchange



RICH-WALL support structure mounted on Lausanna side of HN2, can it be moved in the Clean area ? If yes I can slowly take care... it complicates a little the detector test operation since all the RW detector layers are stored there if we want to test em in Clean area, or it can be moved back in October, I need input from Torino/Dubna



Thanks to the work already done by Anosov cold silicon platform is already in place, I may start to contact Laura S. for the nitrogen line cooling exhaust to be reinstalled in September, should not interfere with PT operation

Saclay: what is the status of the cable rebuilding ? PC purchase and OS/SW installation ?
Are these operation possible now in Saclay? Do you need material we can provide you ?



I will ask for EN/EL tests to be postponed and try to minimize the impact on our activities (first we have to agree upon)

Full commissioning of the PT should be foreseen at the beginning of 2021, we may even think to commission it and keep it running to give some time to the microwave responsible to gain experience in polarizing the target material.

Do you consider this option reasonable ?

In 2021 early restart of all the other detector related activities to be ready for April 2021, to try to fix all the issues not possible to study due to the unforeseen situation, HV, noise studies, etc, “*Dry run with flammable gases*” since as said most probably beam will not be back at the beginning of April

I would like to receive permission from those detector experts who consider this option feasible the permission
To replace the HV mainframe and modules → please contact me and/or Cristophe

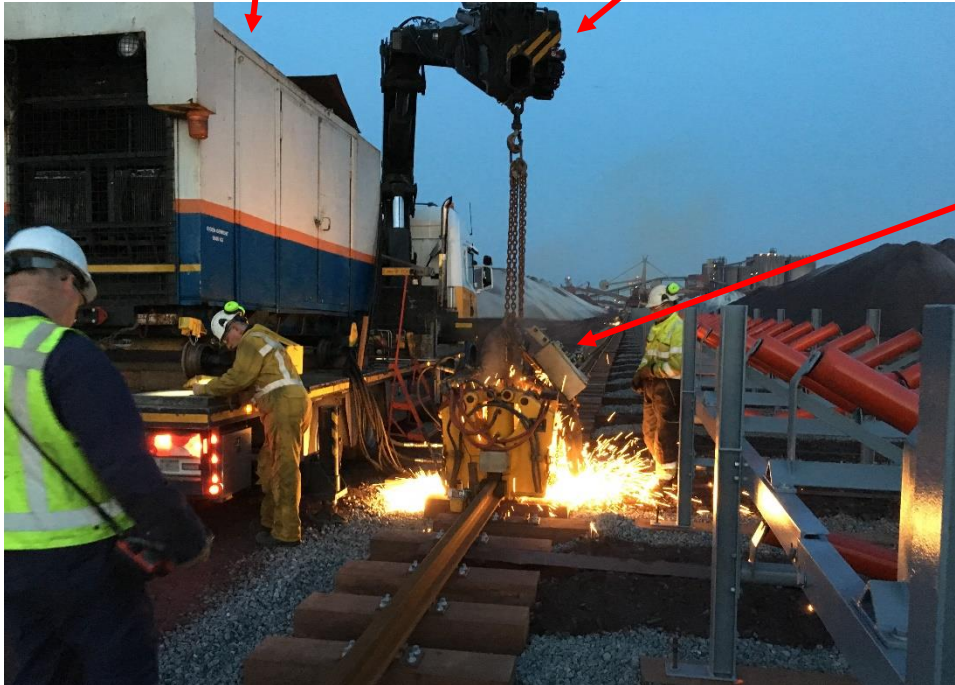
Aggressive restart scenario, needs presence of people on site, experts and in particular Vladimir Anosov

All this holds if the beam schedule is kept...not totally obvious...

Flash butt welding

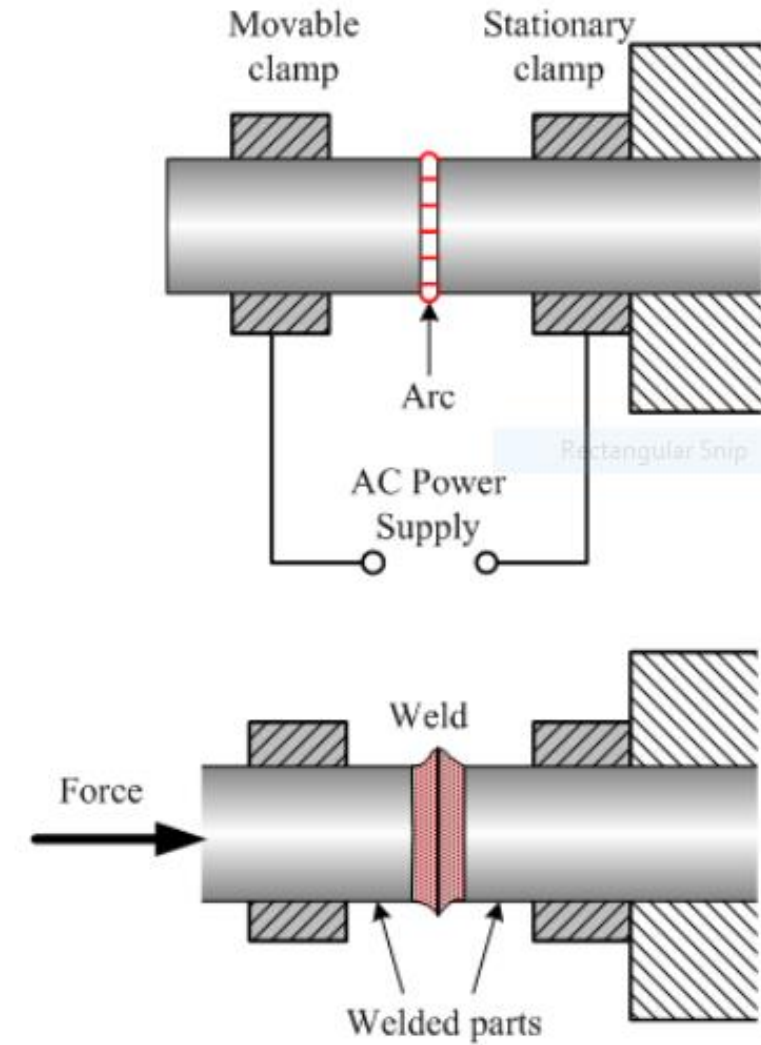
Power and control equipment

Crane truck

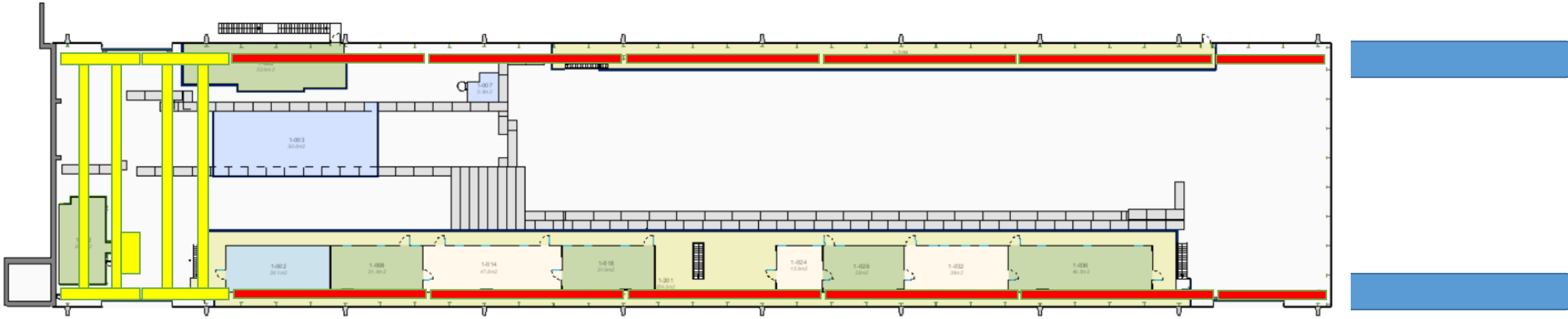


Welding machine

Flash Welding (FW)

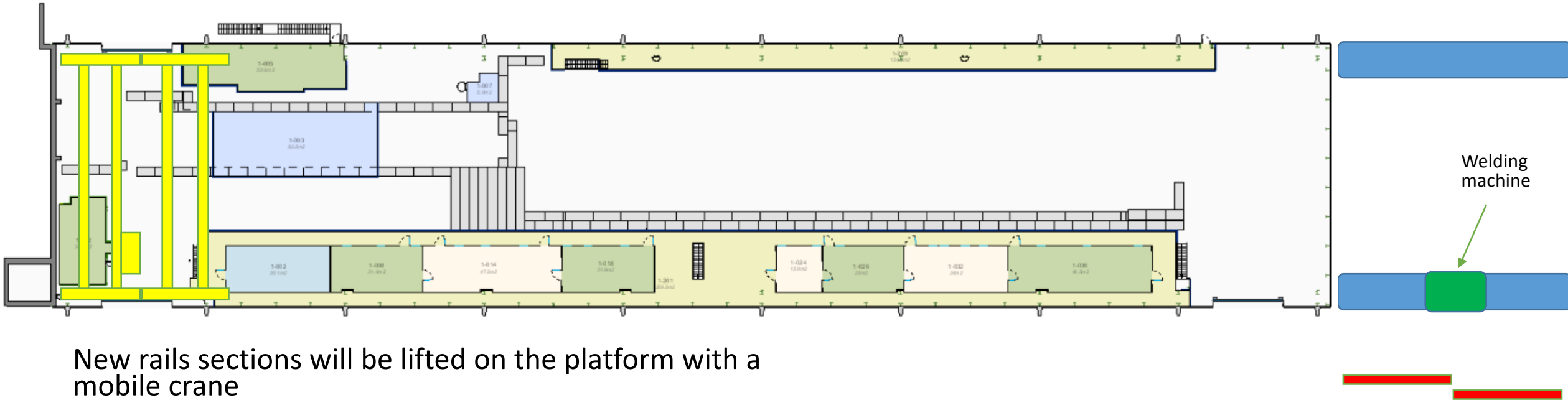


Working procedure - dismantling



The two cranes will be parked on the “Bellegarde side”
Rails sections will be pulled outside one at a time with a winch and rollers
They will be then lowered to the ground with a mobile crane

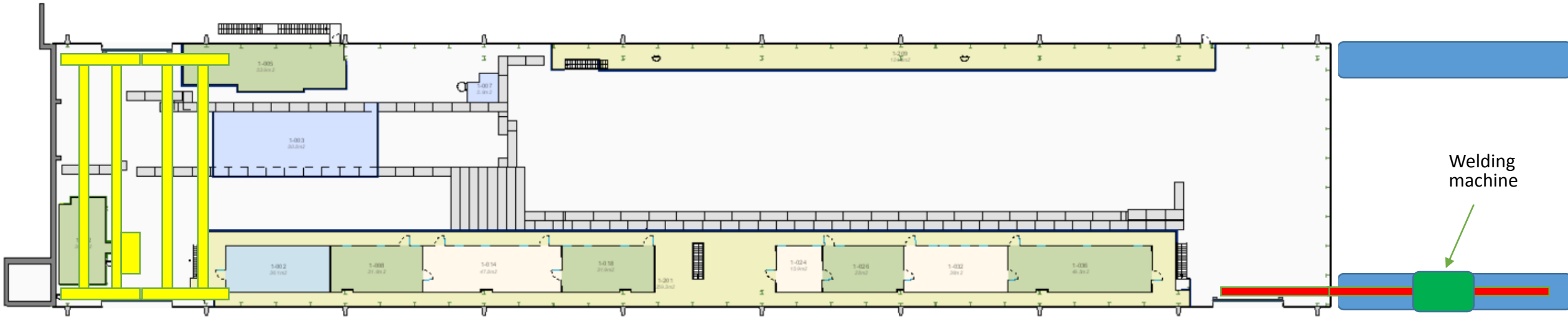
Working procedure – welding and installation



New rails sections will be lifted on the platform with a mobile crane

Sections will then be welded together

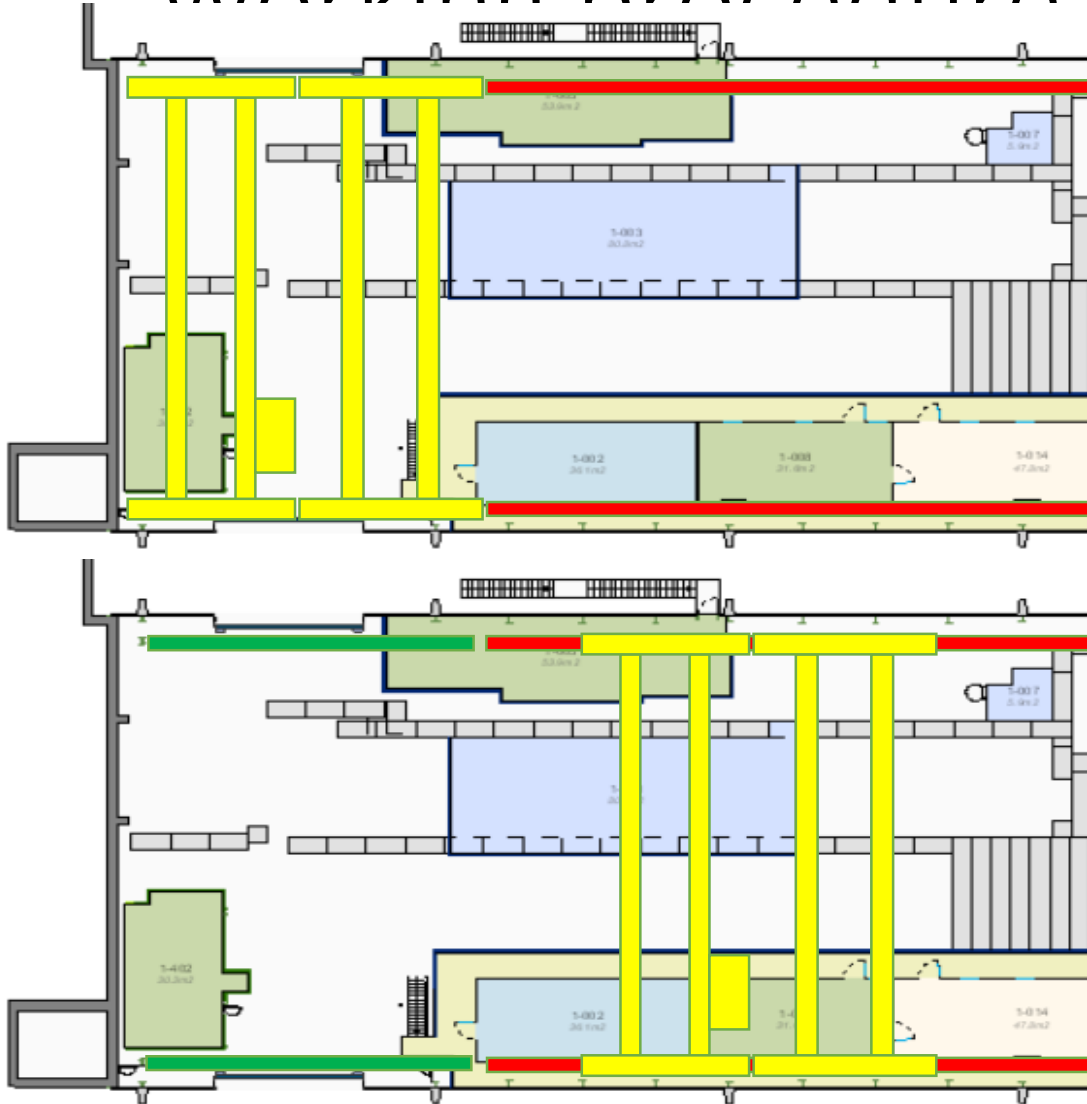
Working procedure – welding and installation



After each welding, the rail will be pulled inside the building with a winch and rollers

Another section will be lifted on the platform and welded

Working procedure – welding and installation



The rail sections corresponding to the parking position will be replaced for last

The cranes will be moved on the new rails
Both sections will be handled with a mobile crane inside the building
Junctions will be welded via the puddle arc method (electrodes); specific protections will be put in place to contains sparks

Preliminary activities

- Installation of a scaffolding on the “Jura side” of the building to guarantee a safe access / EN-EA
- Removal of handrail / EN-EA
- Vacuum cleaning of rails to avoid dust falling on the experimental area / EN-HE
- Installation of a scaffolding outside the building (“Lausanne side”) / EN-EA
- Opening of two holes (~ 50cm x 50 cm) on the façade to allow rail passage / SMB-SE
- Temporary removal of the crane end-stops (“Lausanne side”) / EN-HE

