

# LS2 planning meeting

A.Tauro



# COVID-19 news

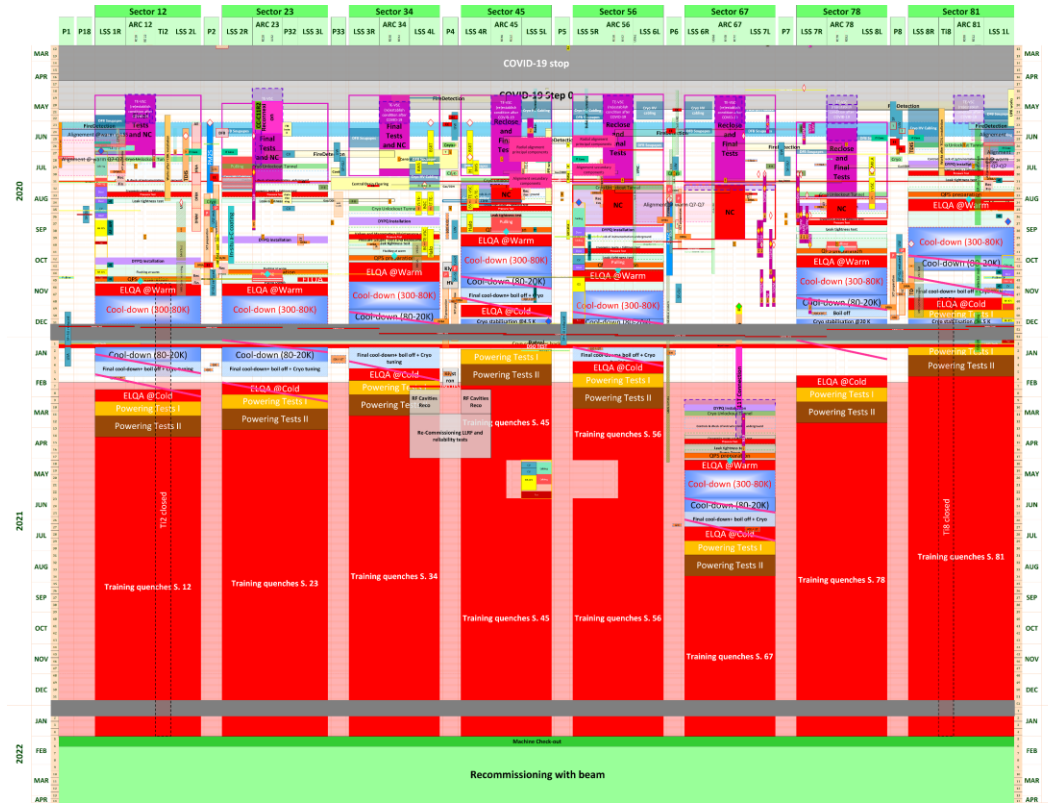
<https://hse.cern/covid-19-information>



- As of Monday 26 October 2020, all employed members of the personnel whose activity can be carried out remotely must **telework for 3 days per week** and be physically present for **work on the CERN site for 2 days per week**. This also applies to certain categories of associated members of the personnel (i.e. associated members of personnel for the purpose of training and project associates). It does not apply to those members of the personnel who cannot telework or whose presence on the site is essential for the needs of the Organization, as determined by their hierarchy. Users who are based in the local area and whose functions are compatible with telework should not come onto the site for more than two days per week.
- Default **age limit** for access to CERN site **returns to 65** (currently 70). Screening of all persons  $\geq 65$  to see if their presence on site is really required, exceptions for access will be allowed following the current procedure.
- **Access to CERN:** this Monday, 19 October, a new access system was introduced to replace the white-list. From now on, access to CERN is granted to all classes of personnel and visitors, with the exception of the following blocked categories:
  - People over the age of 65 years old,
  - Retired members of personnel,
  - Relatives of current or retired members of personnel,
  - CERN clubs' members,
  - HSE - Health and Safety restrictions.
- **Exceptions** will be possible through a standard EDH Access Request. **Badging** when entering the sites remains mandatory, allowing a monitoring of the number of people at CERN. Badging when leaving is abandoned.
- **Case declaration:** members of CERN personnel who have either tested positive for COVID-19 or are suspected cases (i.e. having possible COVID-19 symptoms but are untested or tested negative) are requested to inform the Medical Service (Tel: + 41 22 766 7777 or [medical.service@cern.ch](mailto:medical.service@cern.ch)) urgently. The same applies if any household members show symptoms associated with COVID-19.
- **Close contacts** ( $>15'$  at less than 2m without mask) shall not come on the CERN site for 14 days from their identification as a close contact. Contact tracing is done for 4 days prior to the onset of the symptoms.
- **Quarantine:** access to CERN sites is not allowed for 10 days after arrival from a country/area that features on at least one of the lists (Switzerland or France) of high risk countries and areas for COVID-19 infection  $\rightarrow$  latest information [here](#)
- For any question please refer to [Covid19.helpline@cern.ch](mailto:Covid19.helpline@cern.ch) or [ALICE-covid19-coordination@cern.ch](mailto:ALICE-covid19-coordination@cern.ch).

# LHC LS2 Baseline V3.0

LHC-PM-MS-0018 v.3.0

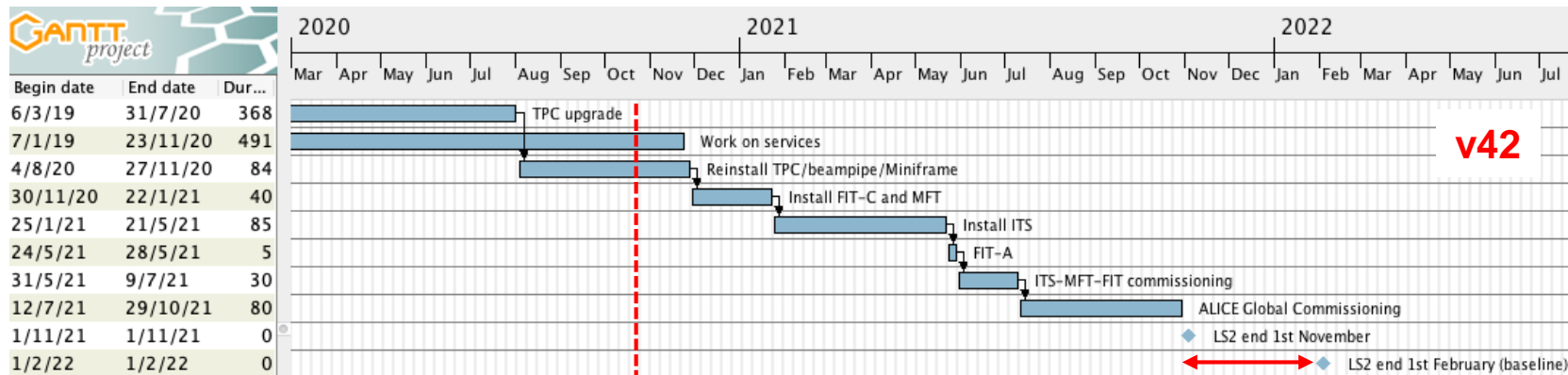


23.10.2020

LS2 planning meeting

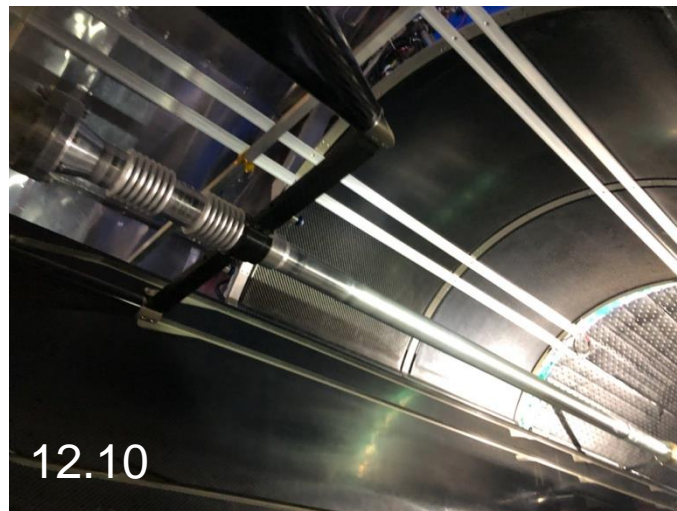
# Current master schedule (v42)

- **Schedule v42:**
  - Stop ITS operation on Mon Jan 4<sup>th</sup> 2021
  - Stop MFT operation on Mon Nov 12<sup>th</sup>
  - 16w global commissioning at the end
- **LS2 schedule review today → final decision on LS2 end date will be taken**
- ALICE vacuum closed by June 2021 → OK to inject low intensity beam by September 2021
- This plan foresees no contingency and **3 months contingency** with respect to the LS2 end date of 1<sup>st</sup> November 2021 and **1<sup>st</sup> February 2022** respectively

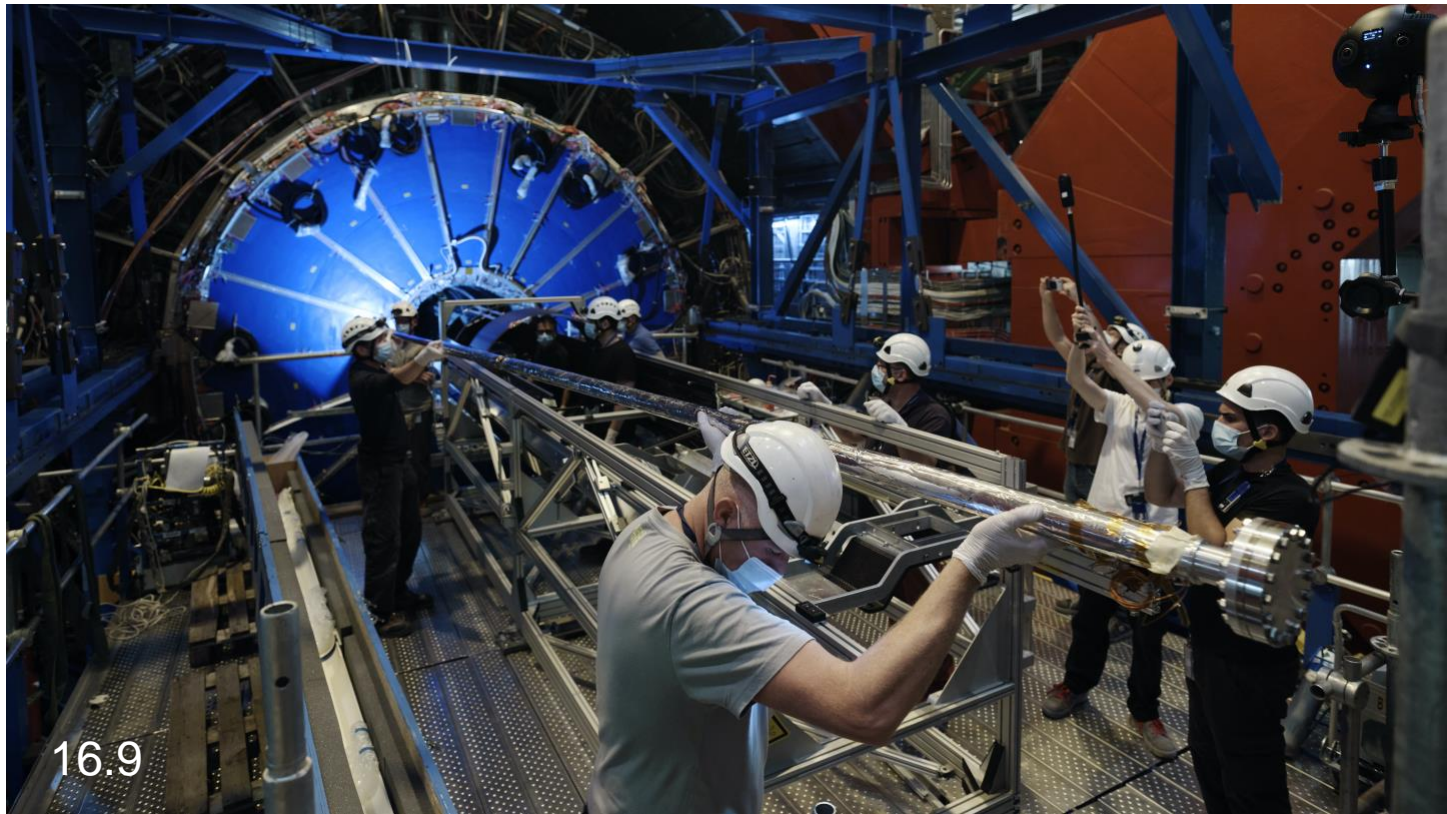


# New central beampipe installation completed !!!

- New central beampipe installed
- **Congratulations to the TE-VSC and ALICE teams for accomplishing this delicate intervention so swiftly!**
- It took 4 weeks to perform this intervention:
  - 16/9: install BP inside cage, put gate valve
  - 17-22/9: survey, pump-down, leak-test, vent to Ne
  - 23/9: push cage and BP to IP, connect to absorber flange
  - 24-25/9: pump-down, leak-test and install bakeout equipment
  - 28/9-5/10: bakeout (200°C)
  - 6-12/10: cool-down, NEG measurement, vent to Ne, remove bakeout equipment
- Transfer of A-side manual valve to TPC ongoing



# Central beampipe installation – putting pipe inside cage



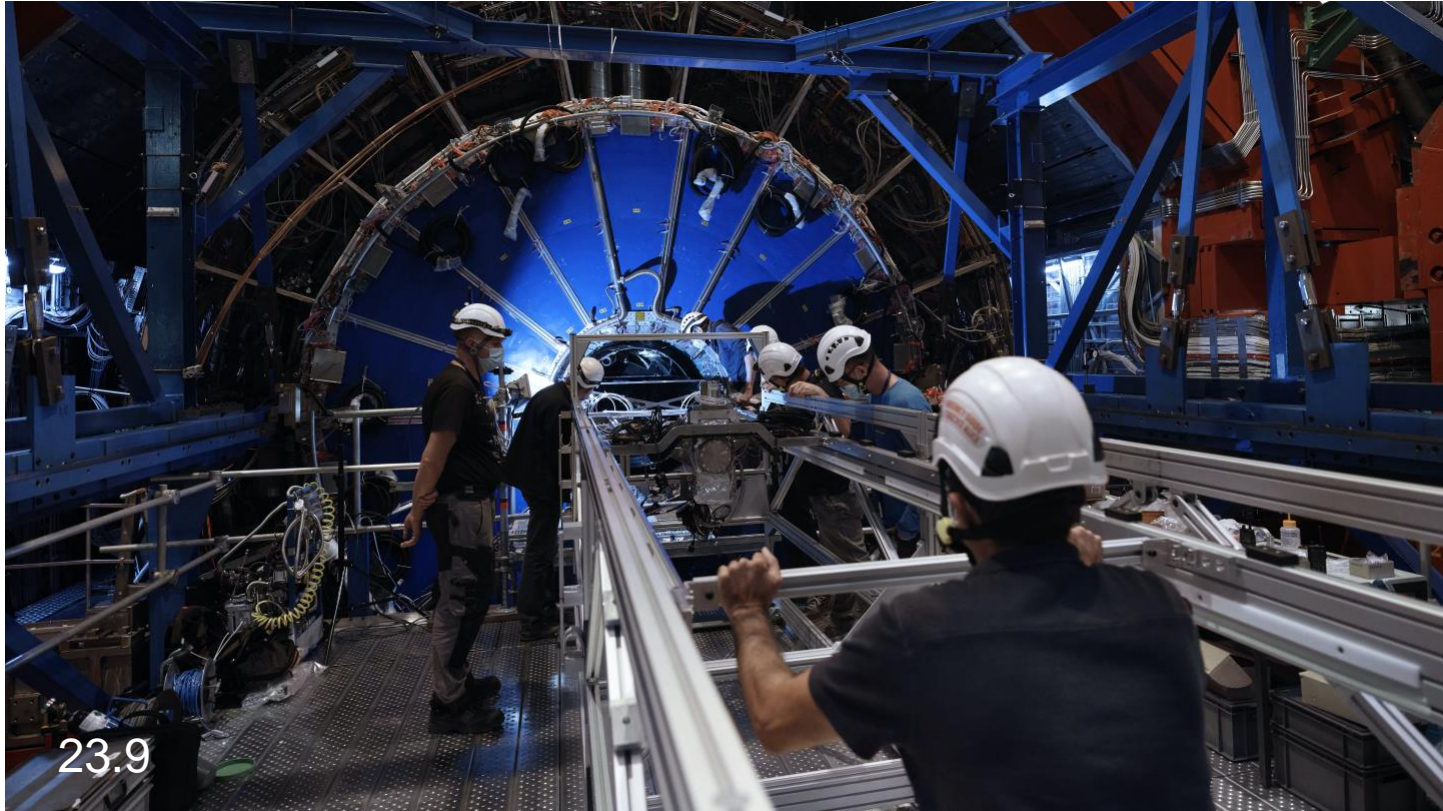
16.9



# Central beampipe installation – central support



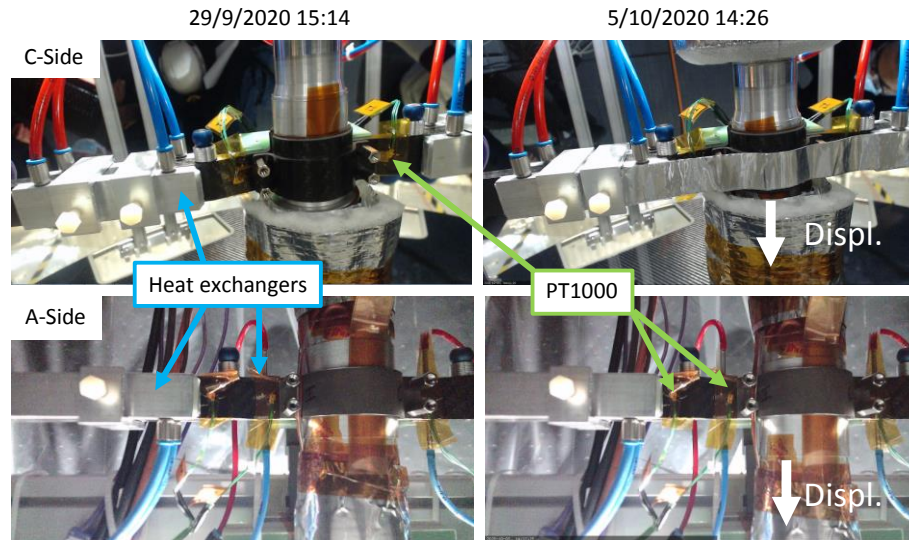
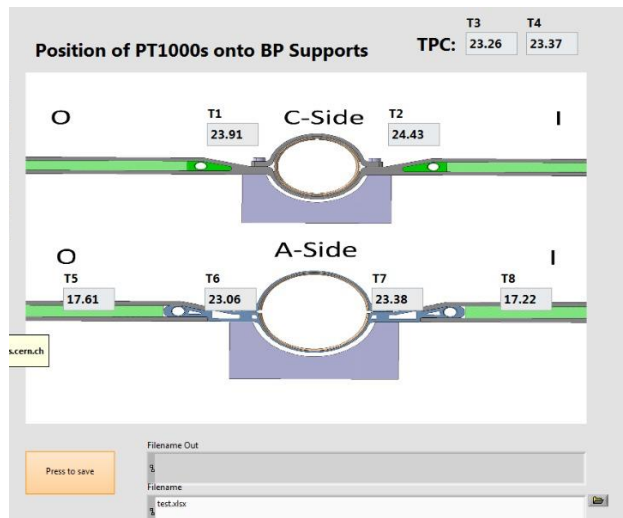
# Central beampipe installation – push cage to IP



23.9



# Beampipe online monitoring during bakeout



- Cooling system for the BP supports (A-side and C-side) (water  $T=18^{\circ}\text{C}$ )
- Camera for BP support remotely monitoring (auto-save pictures)
- DAQ system to remotely control the temperatures of BP supports and TPC (automatic phone call if  $T>26^{\circ}\text{C}$ )
  - The temperatures of the TPC didn't exceed  $23.5^{\circ}\text{C}$
  - The temperatures of the BP supports didn't exceed  $25^{\circ}\text{C}$

BP  $T = 20^{\circ}\text{C}$

BP displacement\* = 0mm



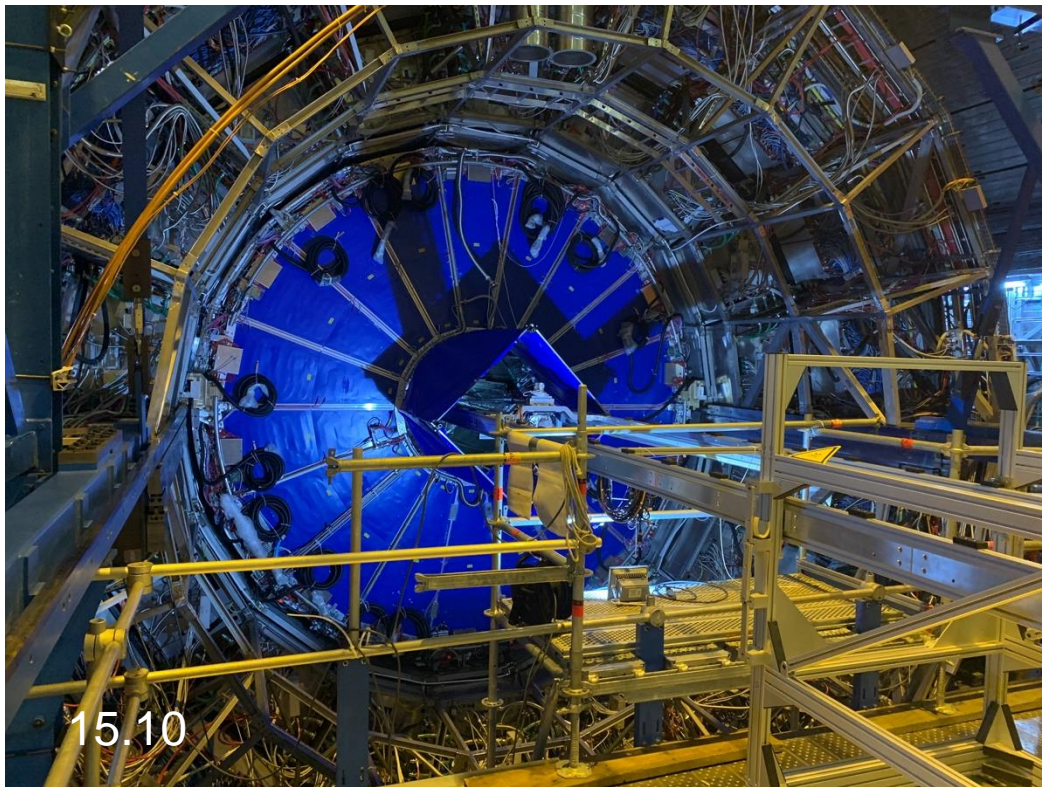
BP  $T = 200^{\circ}\text{C}$

BP displacement\* = 18mm

BP displacement rate =  $0.1\text{mm}/^{\circ}\text{C}$

\*measured close to the C-Side support

# TPC moved to IP last Thursday, Oct 15<sup>th</sup>



15.10

# TPC survey, Oct 16<sup>th</sup>

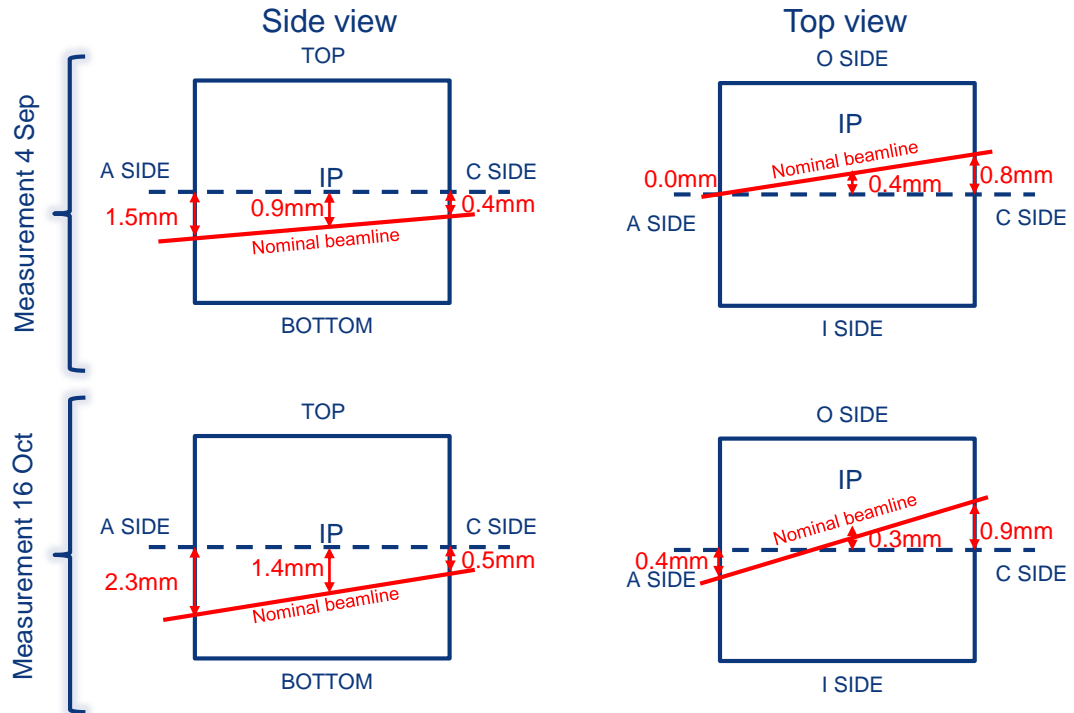


TPC survey done last Friday, October 16th

Accuracy 0.5mm

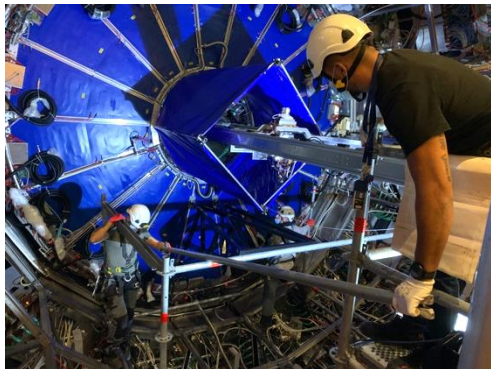
Survey results in line with measurements in September (when the TPC was at the IP)

The cage and beampipe will be measured next week, after removing the temporary rails

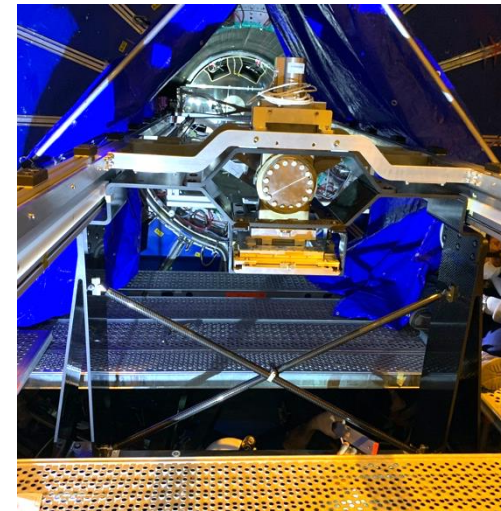




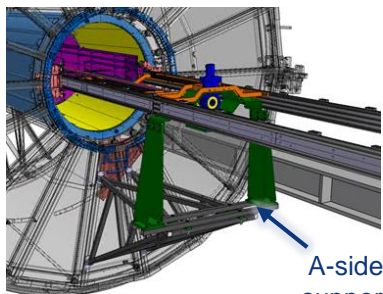
# Manual valve transfer to A-side support (this week)



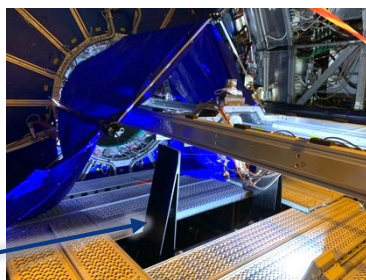
Installation scaffolding (Mon)



Install micrometric adjusting tables (Tue-Wed)



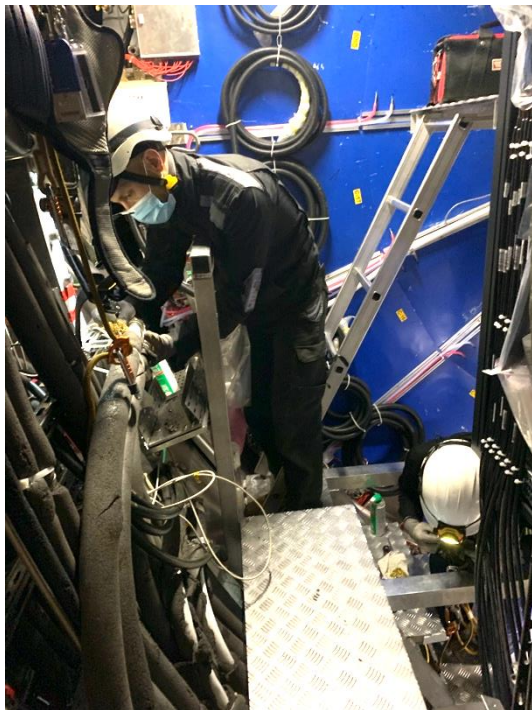
A-side support



Next steps (by end of next week):

- Transfer cage to TPC and remove ITS rails
- Lower cage / BP / Manual valve to nominal position
- Finalise A-side BP support inside the cage
- Cage / BP supports / TPC survey
- Adjustment if needed

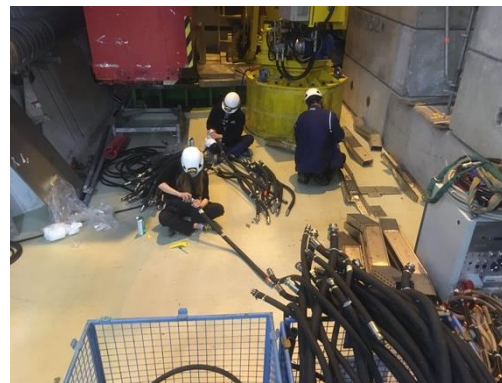
# TPC C-side connection



C-side connection work

Connection work started this week  
Work done by EN-EA because of travel restrictions from Germany  
3 to 5 people (EN-EA) plus TPC experts – 2 to 4 weeks to complete

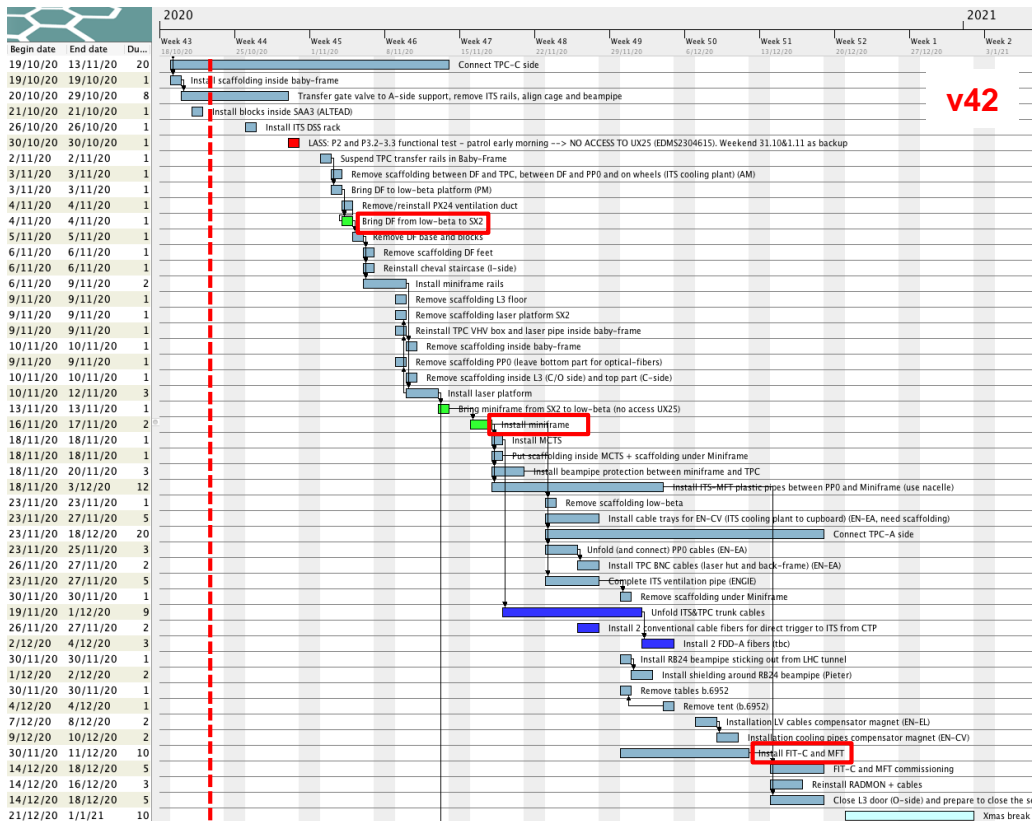
A-side will be done in December (w48-51)



Cleaning TPC cooling hoses



# Detailed plan until end of year



Oct 19<sup>th</sup> – Nov 13<sup>th</sup>: connect TPC C-side

Oct 19<sup>th</sup> – 29<sup>th</sup>: transfer gate valve to A-side support, remove ITS rails, final survey and adjustment of cage (and beampipe)

Nov 2<sup>nd</sup> – 18<sup>th</sup>: remove DF, install Miniframe and MCTS

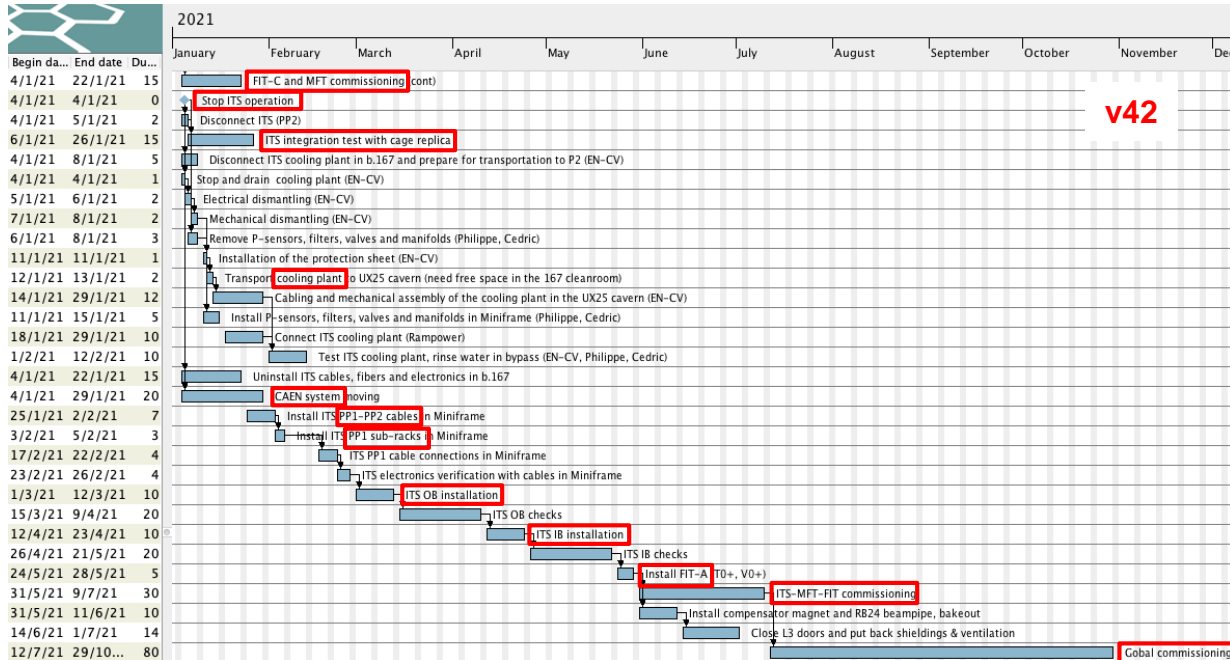
Nov 19<sup>th</sup> – Dec 9<sup>th</sup>: connect Miniframe

Nov 23<sup>rd</sup> – Dec 18<sup>th</sup>: connect TPC A-side

Nov 30<sup>th</sup> – Dec 18<sup>th</sup>: FIT-C and MFT installation + commissioning

Dec 14<sup>th</sup> – Dec 18<sup>th</sup>: close L3 O-side door

# Detailed plan 2021



v42

Jan 4<sup>th</sup> : stop ITS operation in b.167

Jan 5<sup>th</sup> – Feb 26<sup>th</sup>: transfer ITS services from b.167 to P2

Mar 1<sup>st</sup> – May 21<sup>st</sup>: ITS installation

May 24<sup>th</sup> – 28<sup>th</sup>: FIT-A installation

May 31<sup>st</sup> – Oct 29<sup>th</sup>: ITS-MFT-FIT commissioning / global commissioning / close Experiment

# Key dates

Activity	v42
Install central beampipe	16 Sep – 12 Oct
Move TPC to IP	13 – 16 Oct
Install Miniframe	16 – 17 Nov
MFT & FIT-C installation and checks	30 Nov – 22 Jan 2021 Disconnect MFT 12 Nov
ITS installation and checks	25 Jan – 21 May Disconnect ITS 4 Jan
FDD (A&C) installation	8 Feb – 5 Mar
FIT-A installation	24 – 28 May
ITS & MFT commissioning time	1 ½ months (6w)
ALICE global commissioning time	3.5 months (16w)
<b>End of LS2 – stop UX25 access - baseline (contingency baseline option)</b>	<b>1 Feb 2022 (3 months)</b>
<b>End of LS2 – stop UX25 access - option 1 (contingency option 1)</b>	<b>1 Nov 2021 (0 months)</b>

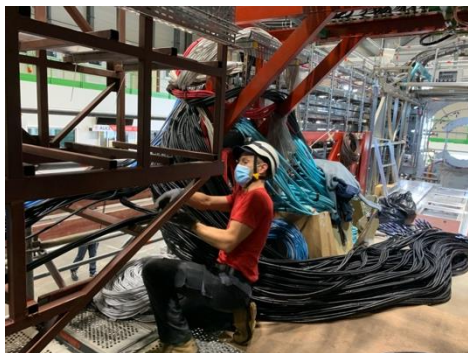
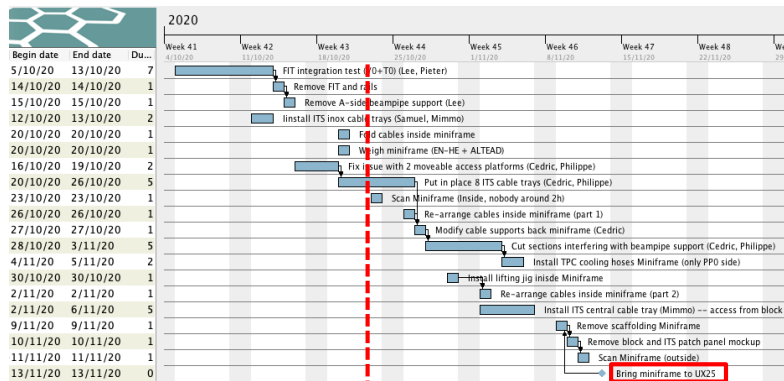
# Miniframe

3 more weeks before Miniframe installation in UX25 cavern

Reimaining work:

- Fixation ITS cable trays
- Mechanical modifications front side of Miniframe
- Removal scaffoldings, installation lifting jig, 3D scans

Miniframe weight: **13.8t** (measured Thursday). By coincidence, same weight of last year (measured during extraction)



Fold cables inside Miniframe



ITS IB installation test



Weighing Miniframe

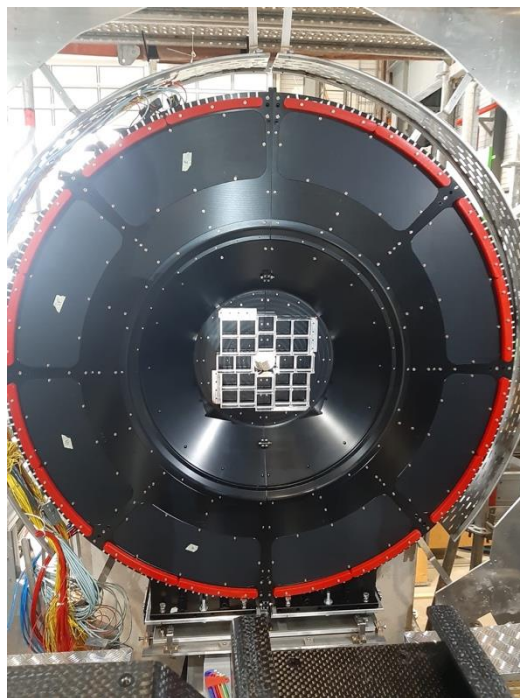
# FIT-A dry installation inside Miniframe



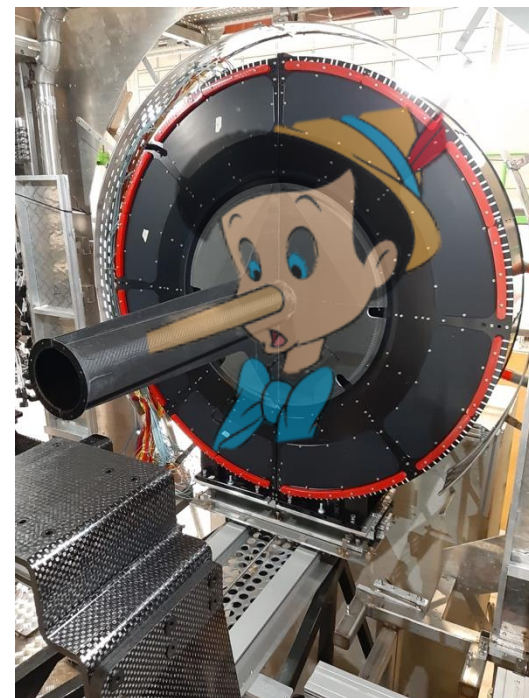
V0+ installed inside Miniframe

Integration test with also T0+ support structure and beampipe protection

After test, V0+ put in a box at P2



V0+ and T0+ (support only)



Beampipe “Pinocchio” protection



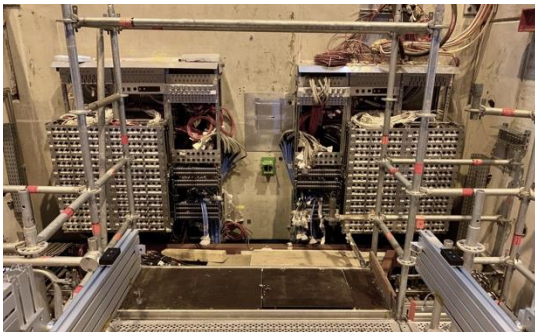
# L3 doors closure, magnet test

- We foresee to close the magnet doors in order to:
  - Verify no mechanical interference with Miniframe
  - Powering test (test transformers, new PC cooling system)
- Plan:
  - W51 2020 (14-18 Dec):
    - Close O-side door. L3 access possible during CERN closure
  - W3 2021 (11-15 Jan):
    - Tue-Wed: close I-side door (no access L3 on 13 Jan)
    - **Thu 14 Jan: ramp up L3 at 30kA (4h) – no ventilation (no access L3)**
    - Fri-Sat: reopen both doors
- Clearly, we have to do a thorough cleaning inside the magnets before powering on
- Infrastructure needed: primary cooling and new PC cooling (EN-CV), PC (TE-EPC), MCS-MSS (EP-DT), L3 cooling (EP-DT), power (EN-EL)
- This plan has been discussed with TE-EPC and the other concerned groups

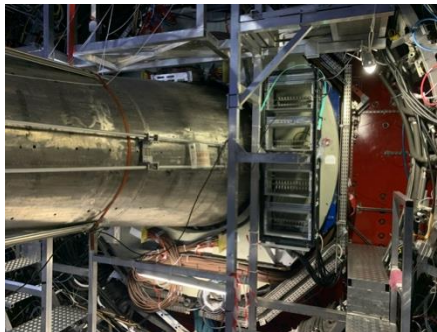


# Services status

- **Cables (EN-EA):**
  - **All cables installed and tested!**
  - Unfold **Miniframe** cables: 23-25 Nov
  - Complete **TPC BNC** (laser) cables (back-frame and laser-hut): 26-27 Nov
  - Install cable trays for ITS cooling plant: 24-27 Nov
  - Cut and put connectors on **FIT-A** signal cables in Miniframe: 18-21 Jan
  - Complete **FDD-A** connectors: 22 Jan
- **Optical fibers (EN-EL):**
  - Installation 6 trunk cables between **IT1-IT2 (CR0)** → w46 (requires to open 2 blocks)
  - Unfold and connect **ITS** and **TPC** trunk cables and install 2 conventional cables for direct trigger **CTP-ITS** → w47-48 (19-27 Nov)
  - Installation 2 **FDD** optical cables → w49
- **Cooling:**
  - **MFT:** ready to send water to RU cooling loops
  - **ITS/MFT/TPC:** connections between Miniframe and PP0 → w48-49
  - Connection of **ITS** and inox pipes to ITS cooling plant (Rampower) → w4
- **Wiener LVPS consolidation (EN-EA):**
  - 193 water cooled power supplies in total (LV and VME)
  - Rework in batches (~16 units/week), was started in week 32
  - **146 have been processed (75%)**
- **Rack turbines replacement:**
  - 80 units in total, the first batch (19 units) will arrive next week
  - Replacement without cutting the power in the rack



PP0 complete



MFT RU crates on the C-side



Wiener LVPS rework (EN-EA)



1) Replacement **4.5km LV cables** back-frame

March – September 2019

Cost: 280kCHF

2) Installation **78km** cables

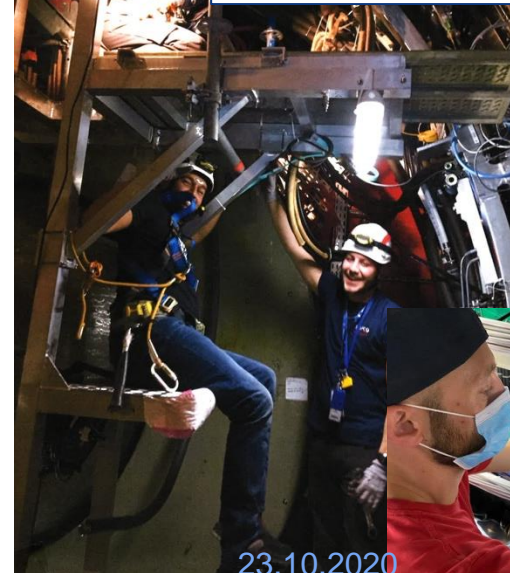
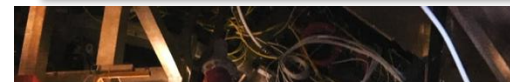
January 2019 – October 2020

**3120** cables, **10'000** hours of work (60% pull./30% connect./10% test)

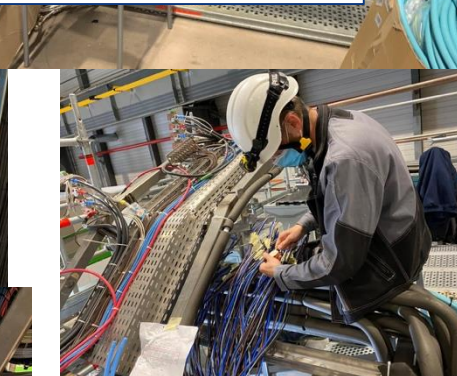
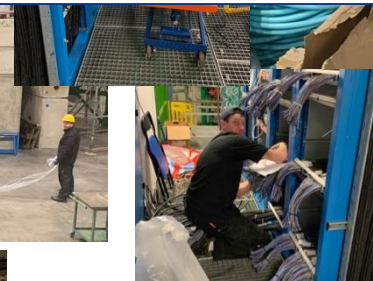
Cost: 600kCHF



A big THANK to **EN-EA-AS** for upgrading the ALICE services in LS2 !



23.10.2020



LS2 planning meeting

Other areas of contribution:

- Installation 2384 MID FEERIC cards
- TPC services connections
- Installation fiber-optics cable trays
- Wiener LVPS repair
- Scaffoldings

# EN-CV interventions

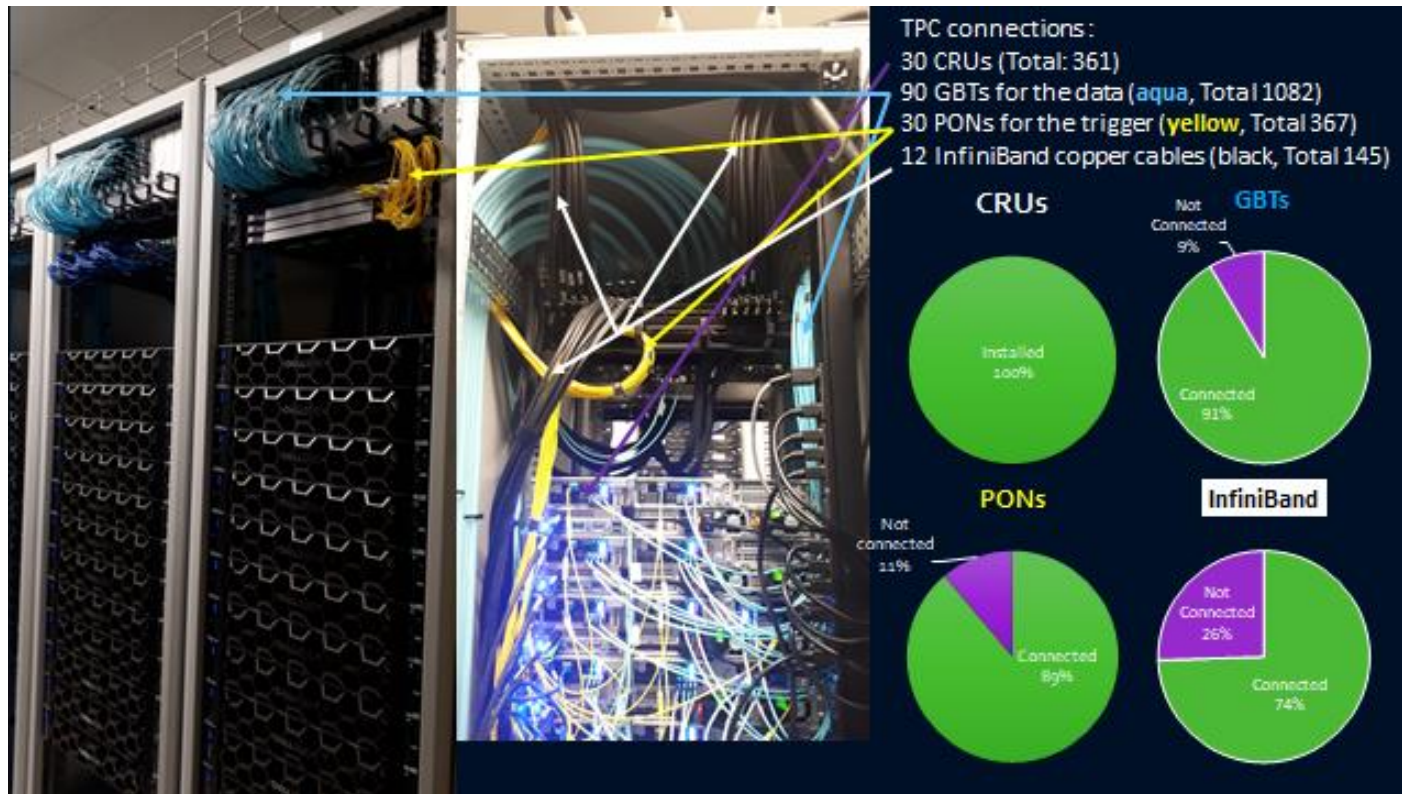
- **Big maintenance:**
  - SF: from Nov 2019 to mid Jan 2020. NO impact on ALICE as both magnets will be OFF – done
  - UW: **stop UX mixed water** for 2 days in week 41/2019 (October) – Tue 8 and Wed 9 Oct – done
  - SU: various small perturbations + 1 day **stop all cooling UX** + 1 day **stop all cooling SXL2** in week 16/2020 (April)
- **Small maintenance:**
  - UW: from w34 to w37 2020. Stop UX mixed water on Monday 7 September 2020 – done
  - SF+SU: weeks 44-47/2020: cleaning towers (stop SF w44-15, no impact) + 1 day **stop all cooling UX (9 Nov)** + 1 day **stop SXL2 cleanroom ventilation (9 Nov)**
- **Ventilation:**
  - ARC: done
  - SXL2 CLR: w43 (19-21 Oct) – stop ventilation for 3 days
  - SG2:
  - UX25 cavern: done
  - MCH and MTG: done
  - L3: replace extractor → done
  - ITS: → done

# EN-EL interventions

- **UPS maintenance:**
- Battery replacement on ALICE UPSes
  - Intervention without power interruption, but no battery backup during replacement (UPS bypassed, no protection for glitches)
  - **19 – 21/10: UPS for CR0, CR1, ARC – done**
  - **22 – 23/10: UPS for CR3, CR4 – ongoing**
  - **05 – 06/11: Diesel UPS**
- Annual on ALICE UPSes
  - Intervention without power interruption, no battery backup during 30 minutes for each UPS
  - **Week 46**



# CR1 status



# CR3 status (A.Augustinus)

- **October**
  - Installation of network infrastructure (some short network interruptions to be foreseen (details will be seen directly with detectors))
  - Cabling up of new servers
  - Start commissioning of new servers
- **November – December - January**
  - Migration from old servers to new servers (first central systems, then detector systems) from November
  - Removal of old servers and last old racks

# Racks status

- Racks currently powered on:
  - HMPID: I01, I02
  - PHOS-CPV: A16, A17
  - CTP: C21, C22, C24, C25, C26, C27 (CTP) (and VME crates on)
  - MCH: C08, C09, C10, C11, C36, C37, C38, C39
  - TOF: O03, O04, O05, O30, O31, O32, I03, I04, I05, I30, I31, I32
  - TRD: O06, O08, O26-29, I06, I08, I26-29, C16-19, C29
  - Dcal, EMcal: A14, O12
- Detectors can be powered, compatible with current activities inside L3

# Other activities

## 2020:

- Renovation PX24 access system (PAD-MAD): w33-34 (10-21 Aug) → done
- Maintenance PX24 access system (8-11 Sep) → done
- Renovation PM25 access system (PAD-MAD): w41-43 (5-23 Oct) → ongoing
- LASS contractor test (26-28 Oct): short access perturbations
- **LASS functional test: no access to UX25 on Friday 30 Oct 2020 (weekend 31 Oct /1 Nov as contingency)**
- LASS global verification of entire LHC: 1 day no access to UX25 (date tbd)

## 2021:

- DSO test for powering permit: w1 2021 (date tbd) (needed to start LHC powering test)
- DSO test for RF recommissioning LSS4: w7 2021
- DSO test for powering permit, following UPR53 installation: date tbd
- DSO test for beam permit: date tbd
- LHC sector test (beam through ALICE): ~~no access to UX25 from 26 to 29 March 2021~~ (date tbd)



# Scaffoldings

- Sem.43, Lun 19 Oct (7:30): installation échafaudage dans le Baby-Frame + enlever liaison Miniframe
- Sem.45, Tue 3 Nov (AM): dépose liaison entre Delphi-Frame et la partie devant la TPC + dépose liaison entre Delphi-Frame et PP0 + dépose roulant devant cooling plant ITS
- Sem.45, Ven 6 Nov: dépose de l'accès aux blocs du Delphi-Frame
- Sem.46, Lun 9 Nov: dépose échafaudages Miniframe en SX2 + dépose échafaudage devant la tour laser en SX2 + dépose plancher L3 + dépose échafaudage PP0
- Sem.46, Mar 10 Nov: dépose échafaudage dans le baby-frame + dépose échafaudage dans L3 (cote C/O) + dépose jonction au fond de L3 (coté C)
- Sem.47, Mer 18 Nov: installation petit échafaudage dans Miniframe en UX25 (deuxième rampe escalier) + échafaudage sous Miniframe
- Sem.48, Lun 23 Nov: dépose échafaudage Low-Beta (coté I)
- Sem.49, Lun 30 Nov: dépose échafaudage sous Miniframe

# Day-by-day sequence w43

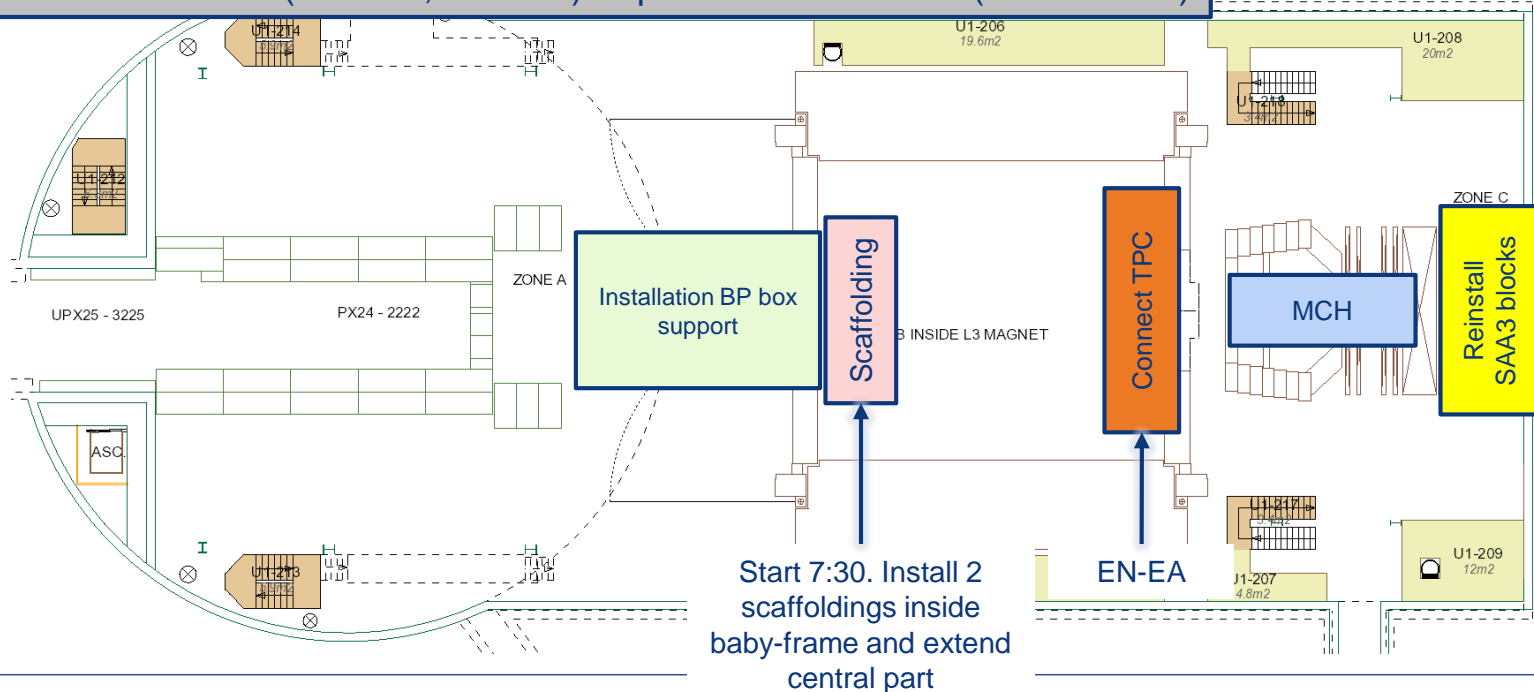


# UX25 activities w43 – Mon 19 Oct 2020

Renovation PM25 access system (PAD-MAD) – w41-43 → tunnel access via PX24

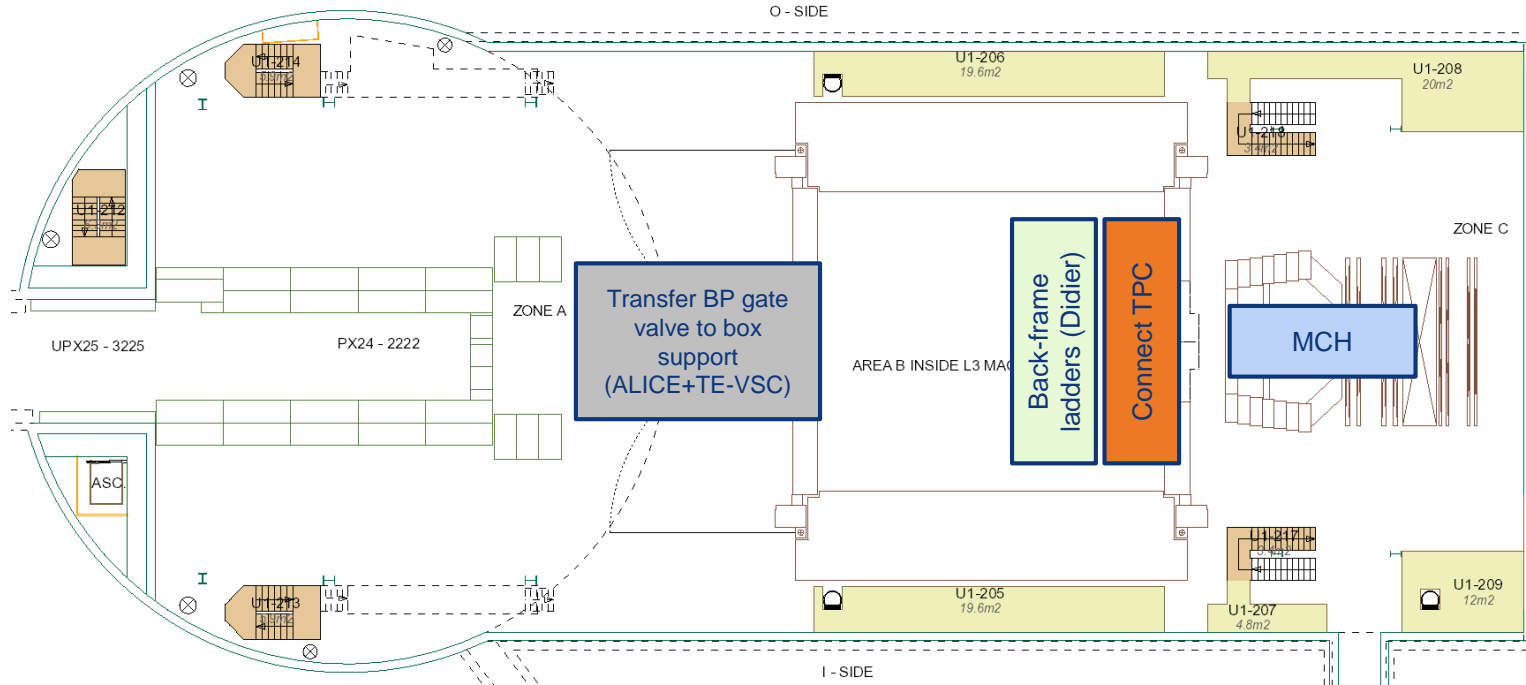
Maintenance SXL2 cleanroom ventilation (EN-CV): stop ventilation for 3 days (Mon-Wed)

Maintenance UPSes (500kVA, 300kVA): replacement batteries (whole week)



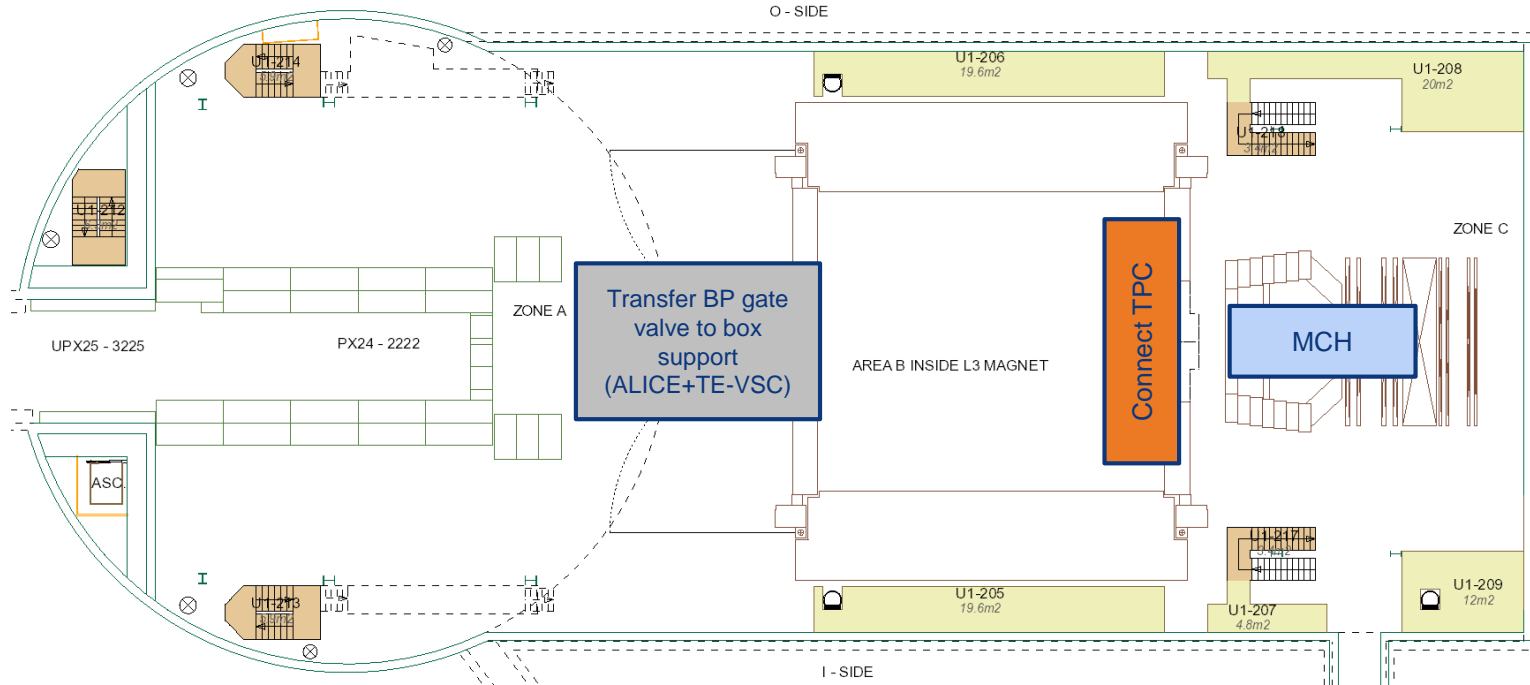
# UX25 activities w43 – Tue 20 Oct 2020

Cleaning cavern (Topnet): 13:00 to 15:00



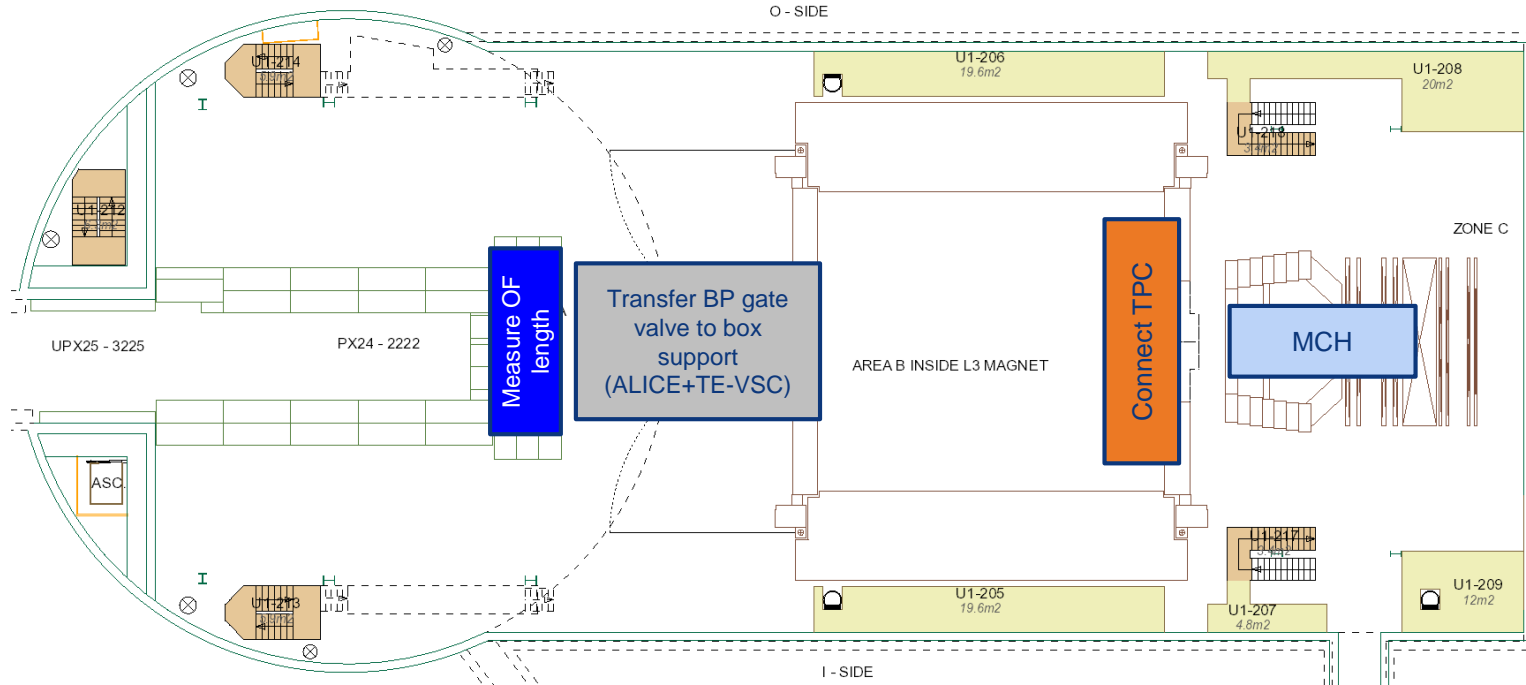


# UX25 activities w43 – Wed 21 Oct 2020

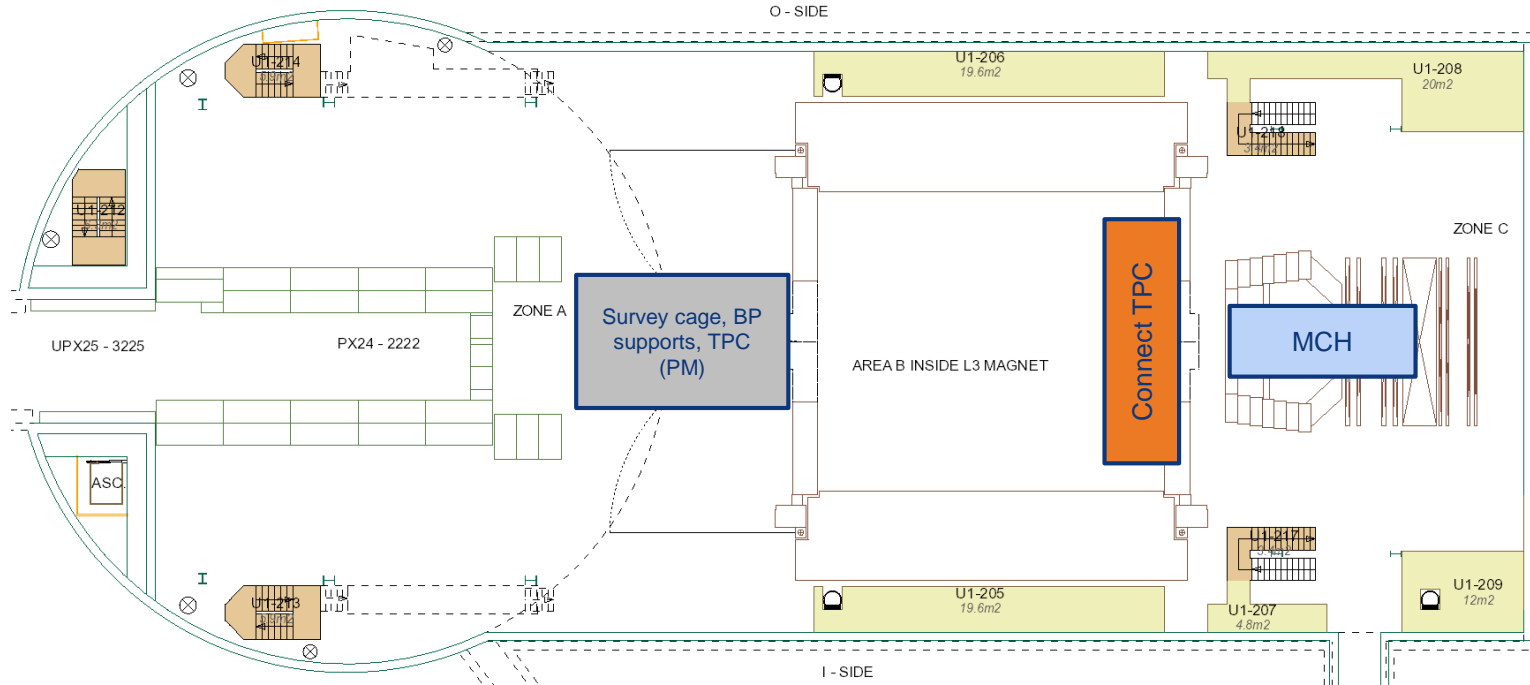


# UX25 activities w43 – Thu 22 Oct 2020

Maintenance SG2, CR5 and UX25 gas detection system (BE-ICS)



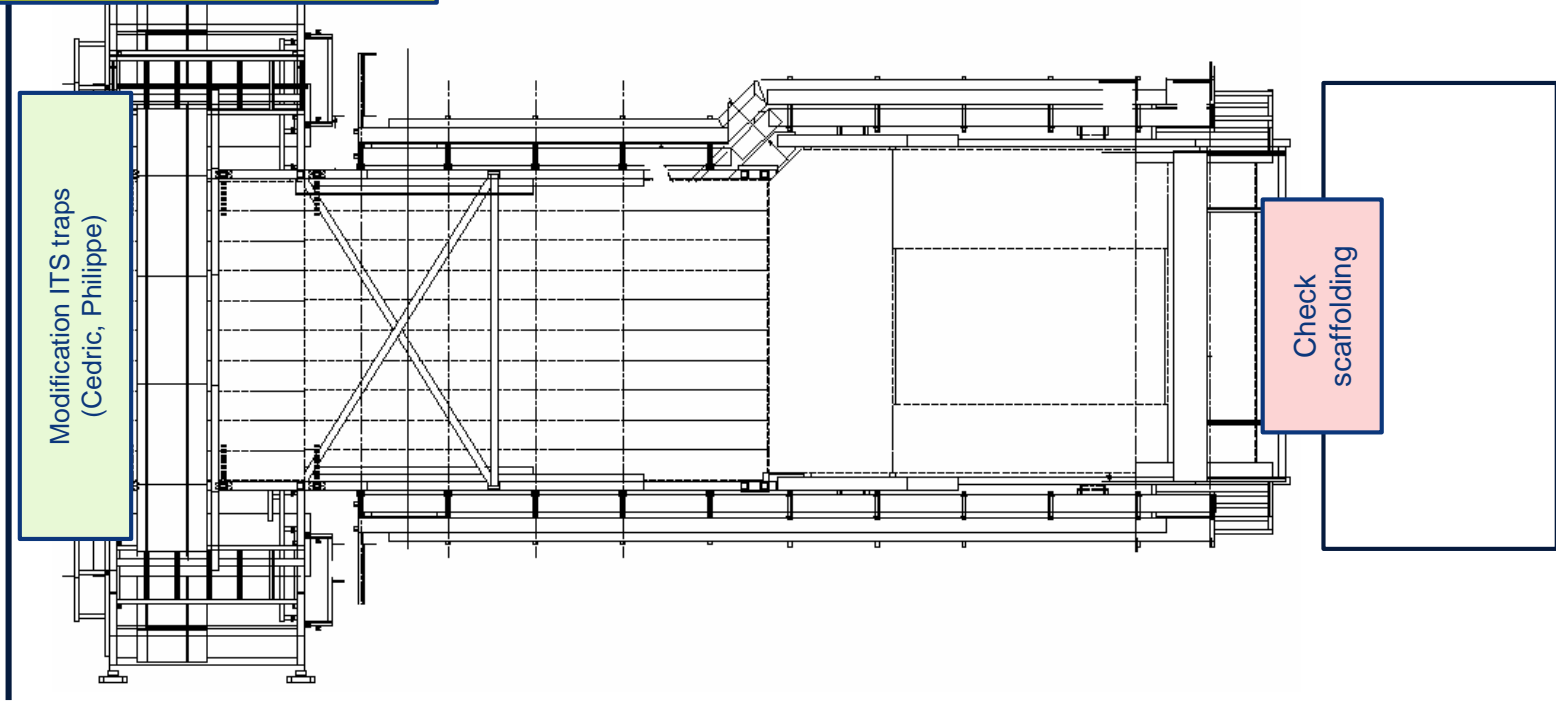
# UX25 activities w43 – Fri 23 Oct 2020



# Miniframe activities w43 – Mon 19 Oct 2020

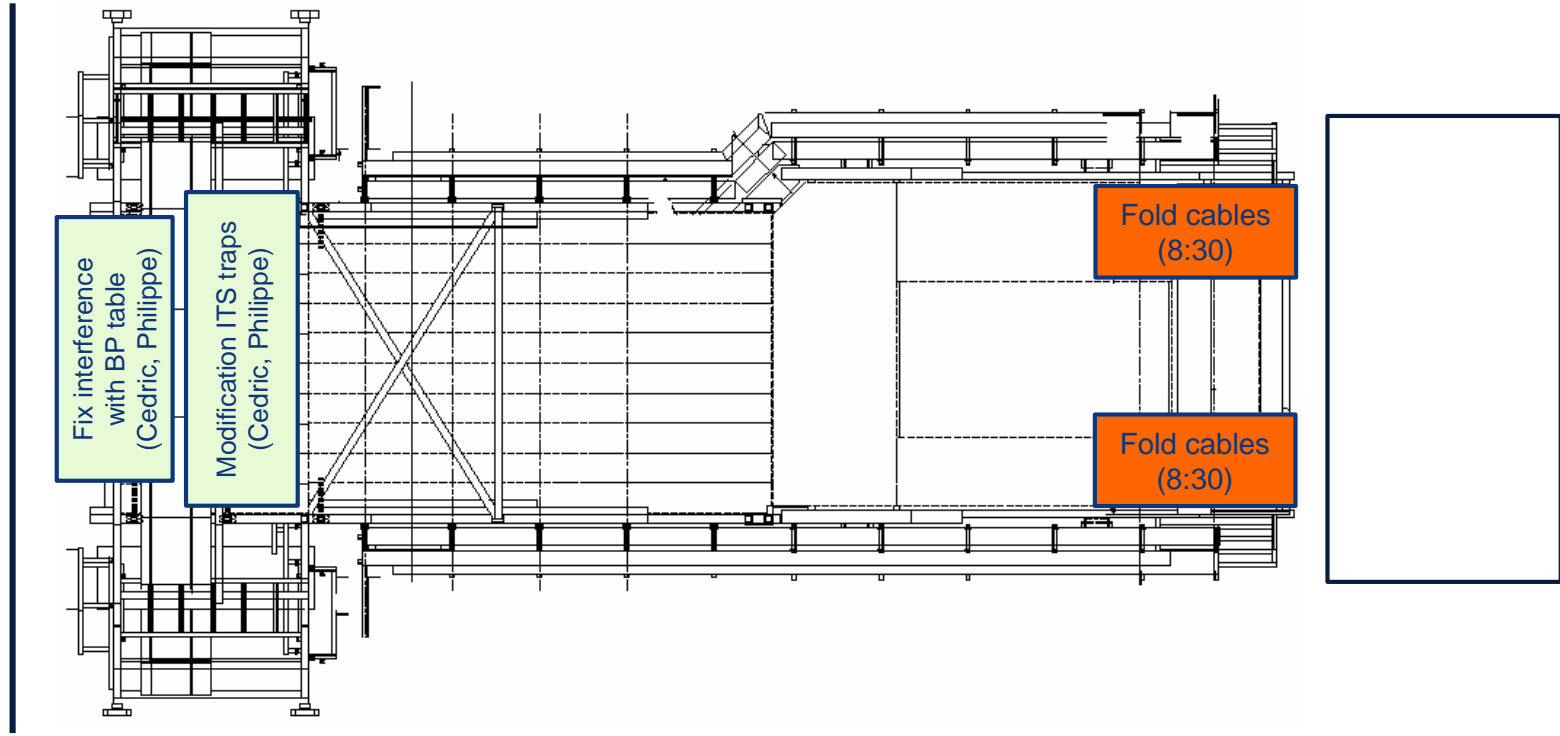
Cleaning Miniframe (Elior)

Delivery MFT handling tools



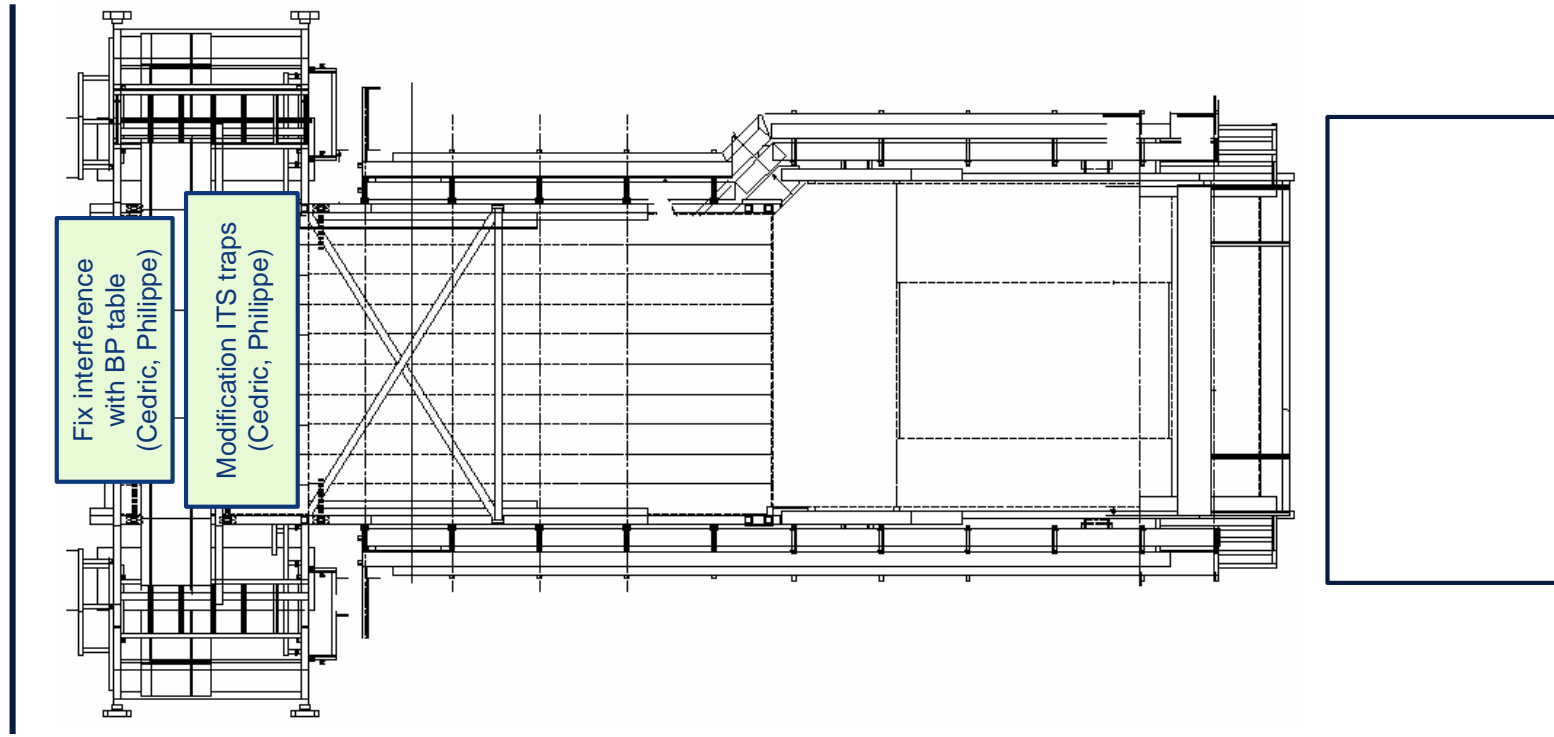


# Miniframe activities w43 – Tue 20 Oct 2020

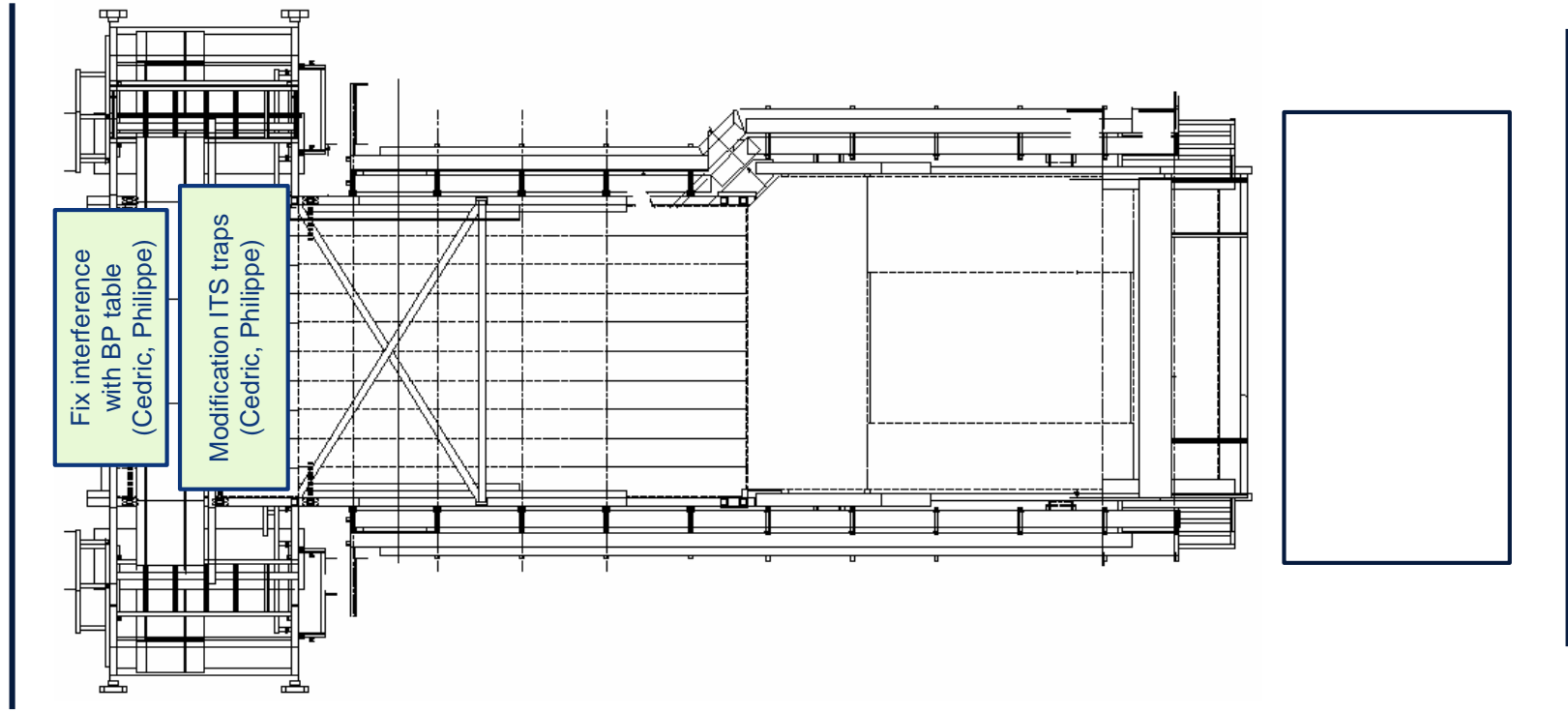


# Miniframe activities w43 – Wed 21 Oct 2020

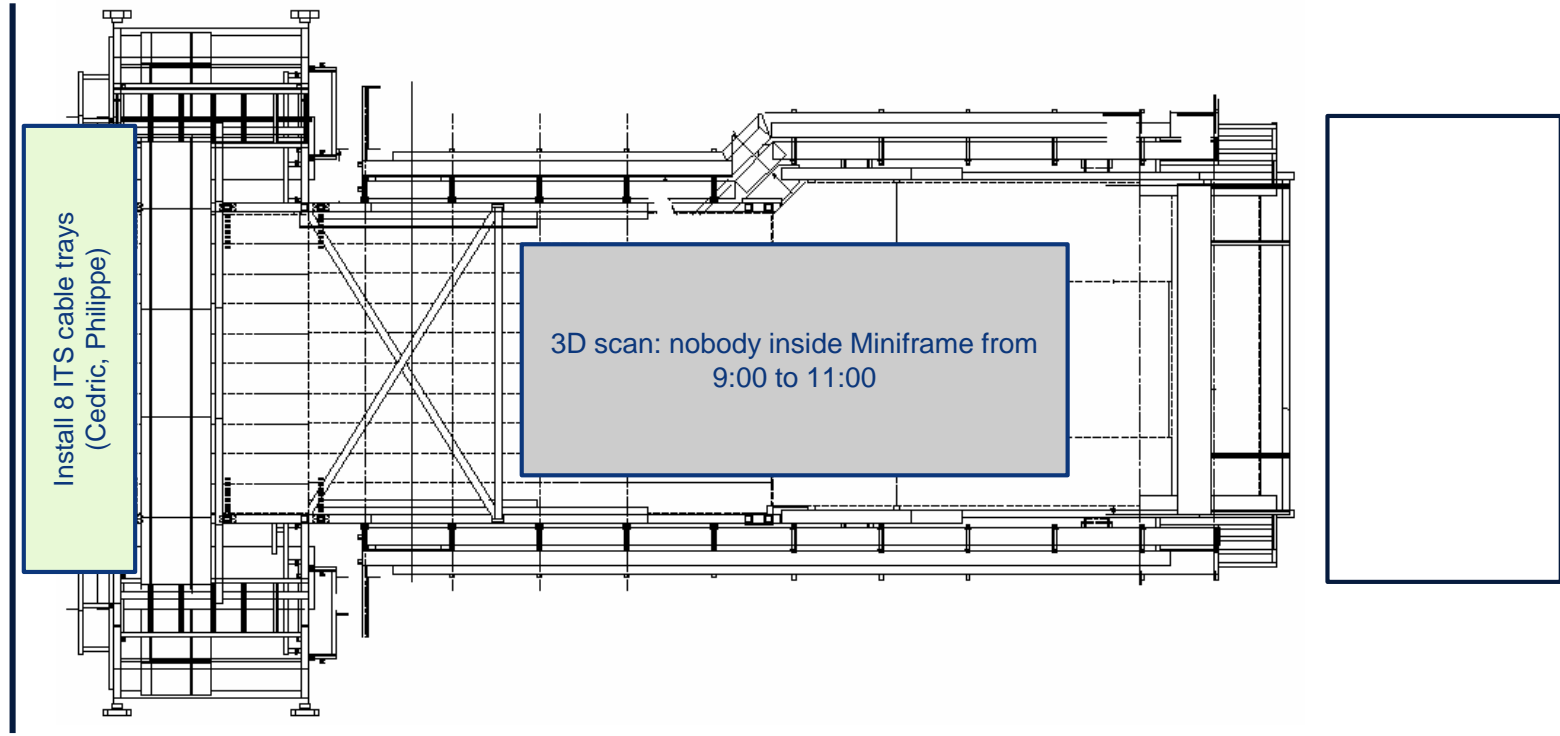
Weigh Miniframe and find center of gravity (14:00) → nobody inside Miniframe



# Miniframe activities w43 – Thu 22 Oct 2020



# Miniframe activities w43 – Fri 23 Oct 2020



# Day-by-day sequence w44

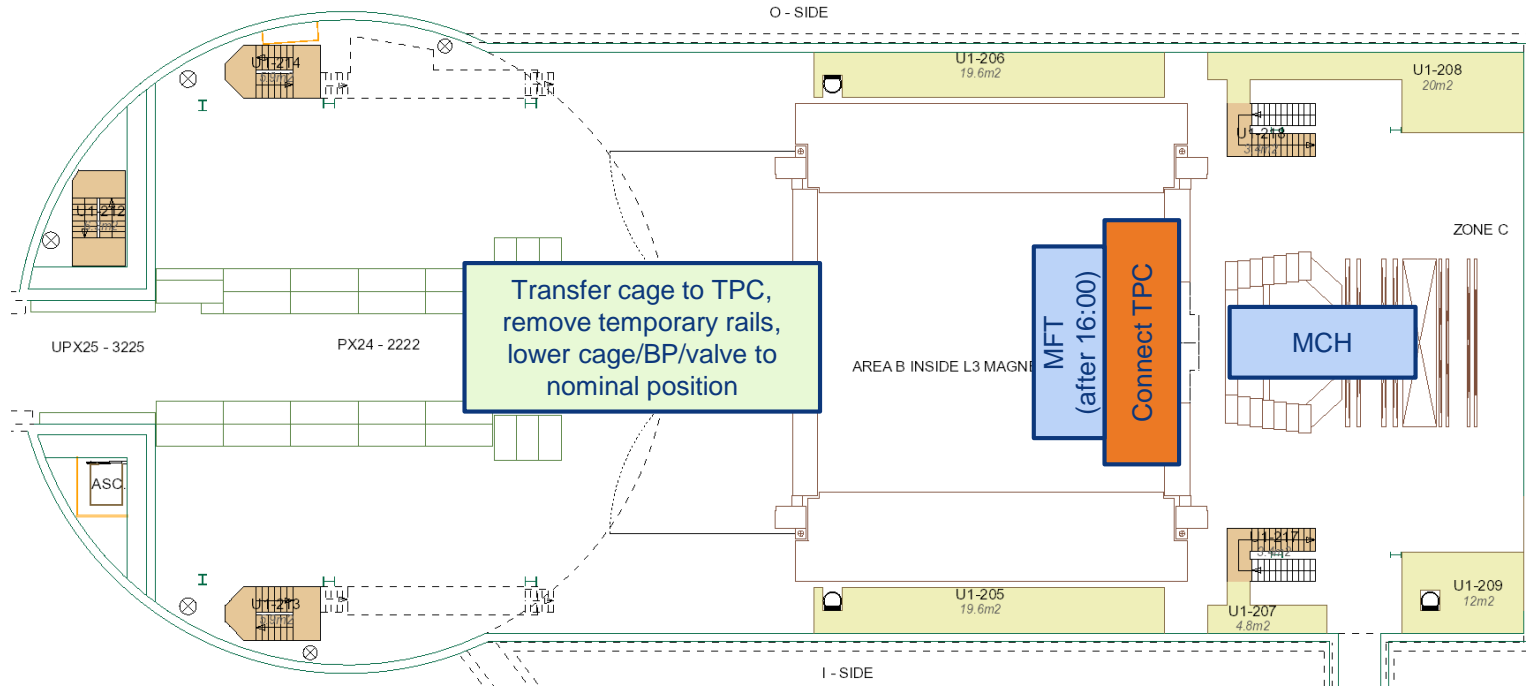




# UX25 activities w44 – Mon 26 Oct 2020

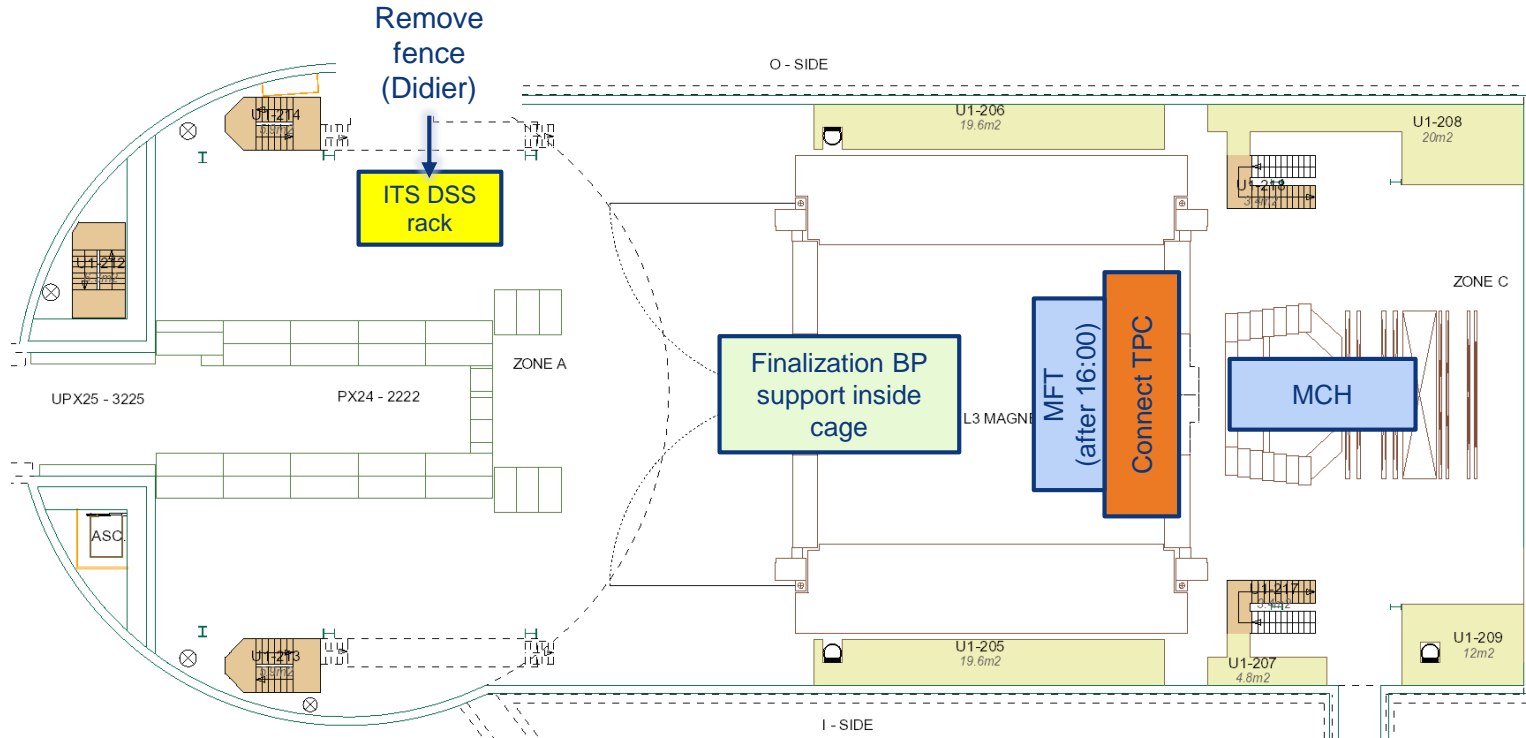
Maintenance SF + SU (EN-CV) (w44-47)

Maintenance SG2 ventilation (EN-CV). Switch to Arcal10 (Mon-Wed)

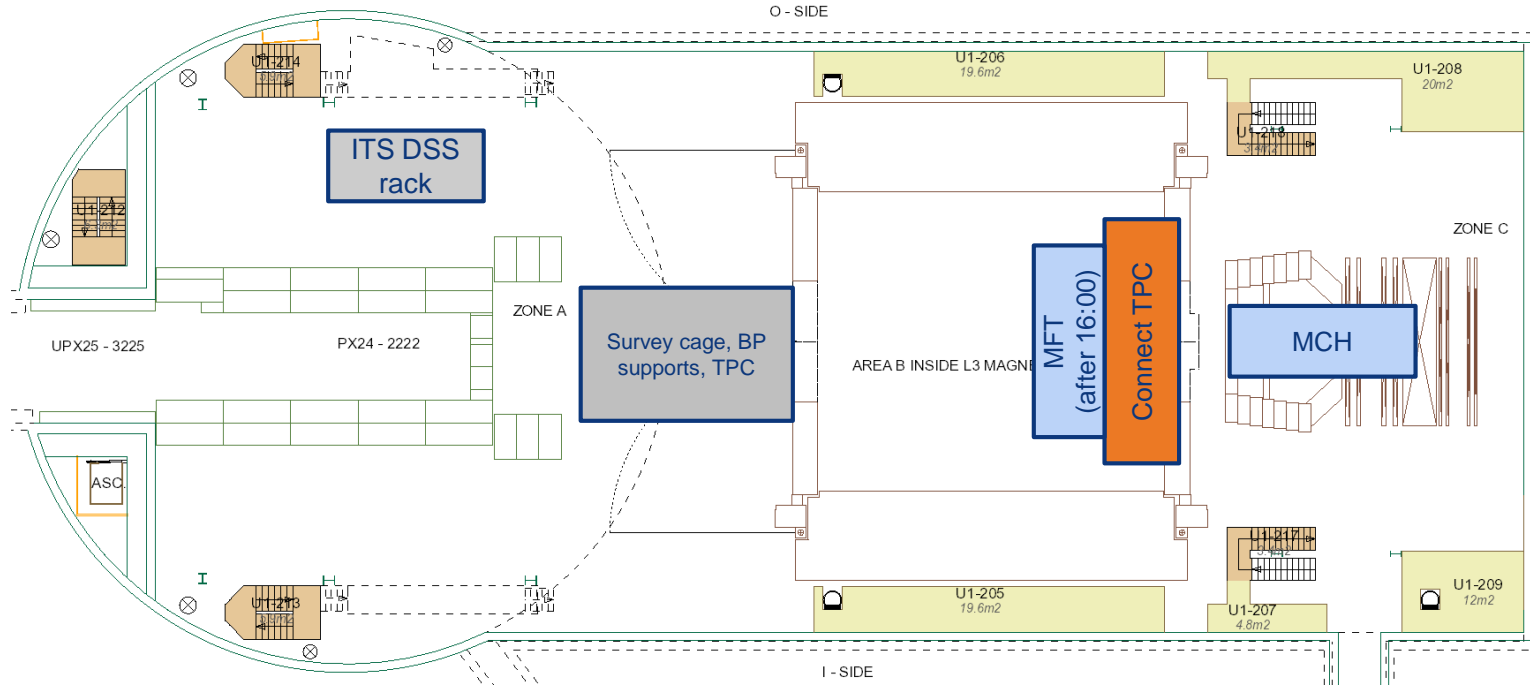


# UX25 activities w44 – Tue 27 Oct 2020

Cleaning cavern (Topnet): 13:00 to 15:00

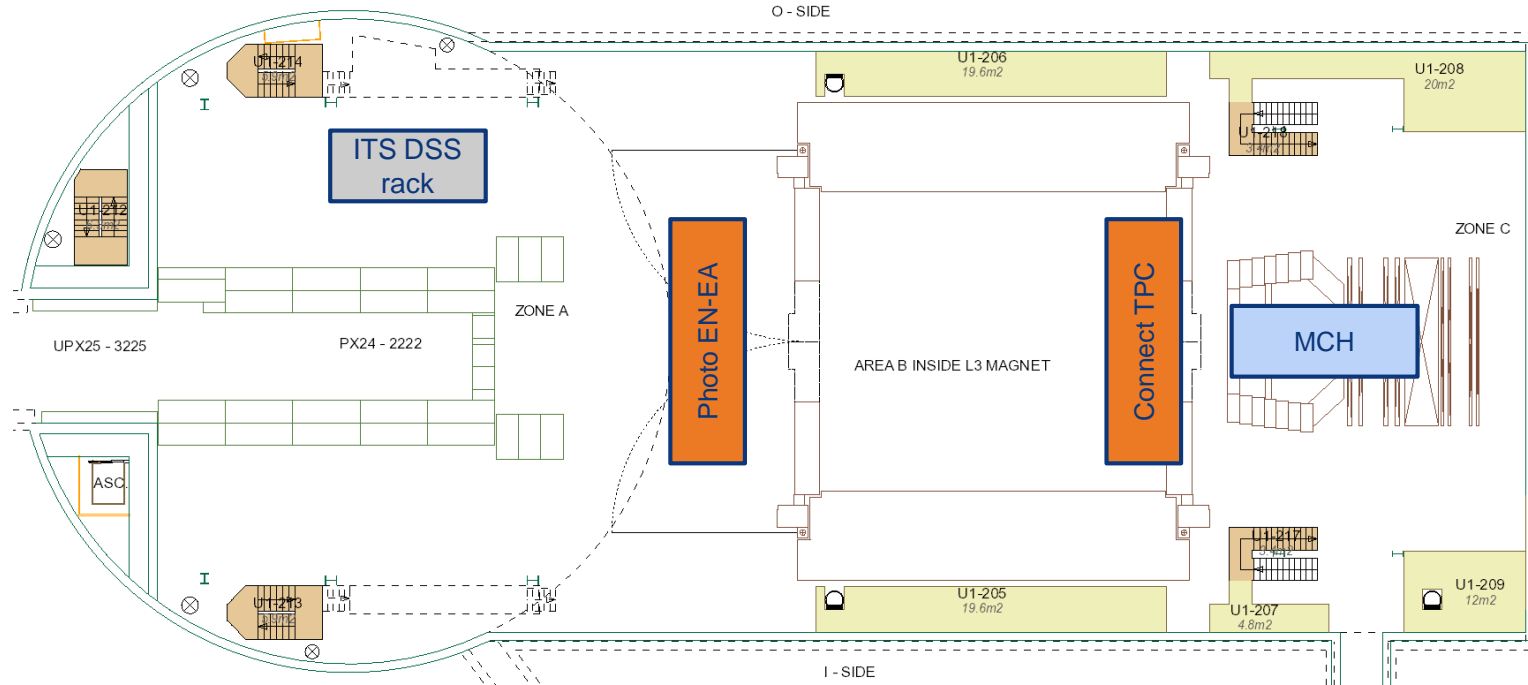


# UX25 activities w44 – Wed 28 Oct 2020



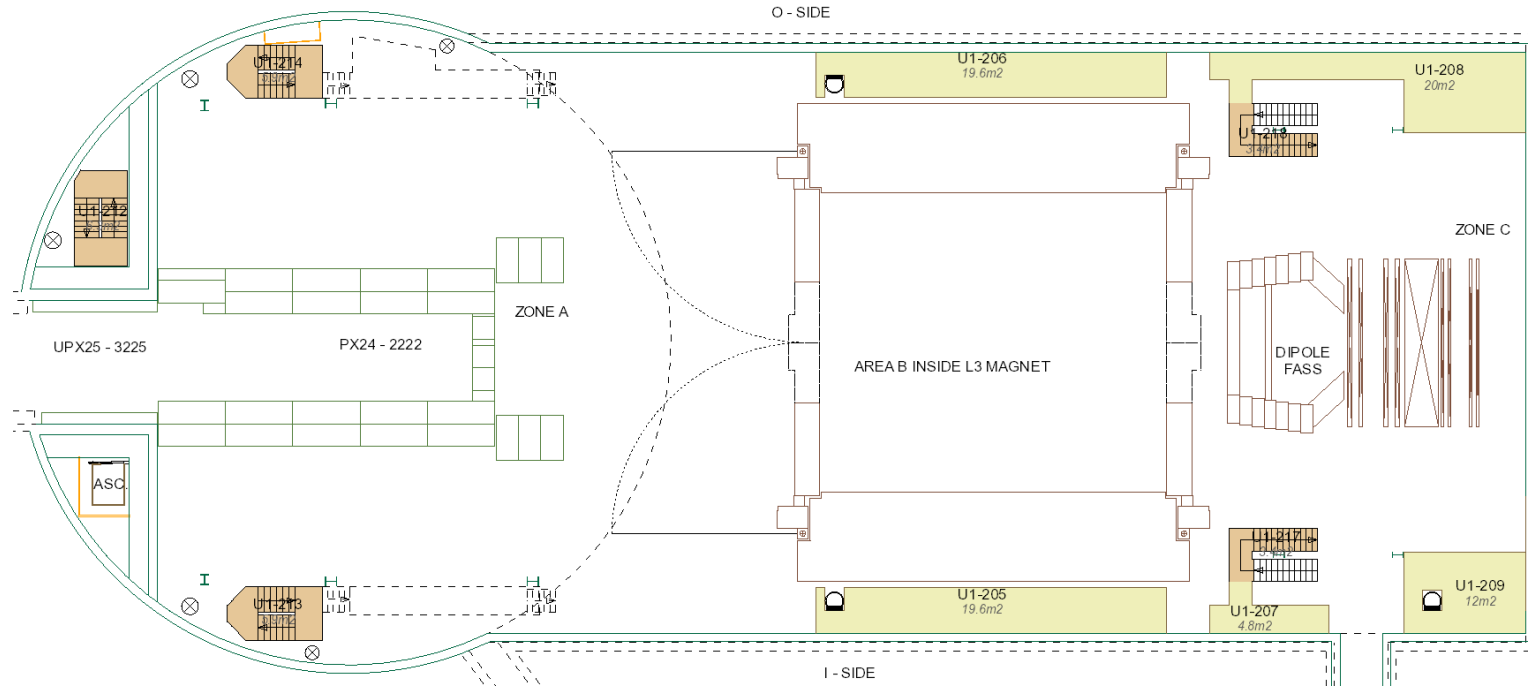
# UX25 activities w44 – Thu 29 Oct 2020

Cavern patrol at 18:00 + interrupt all IMPACTs (Klaus)



# UX25 activities w44 – Fri 30 Oct 2020

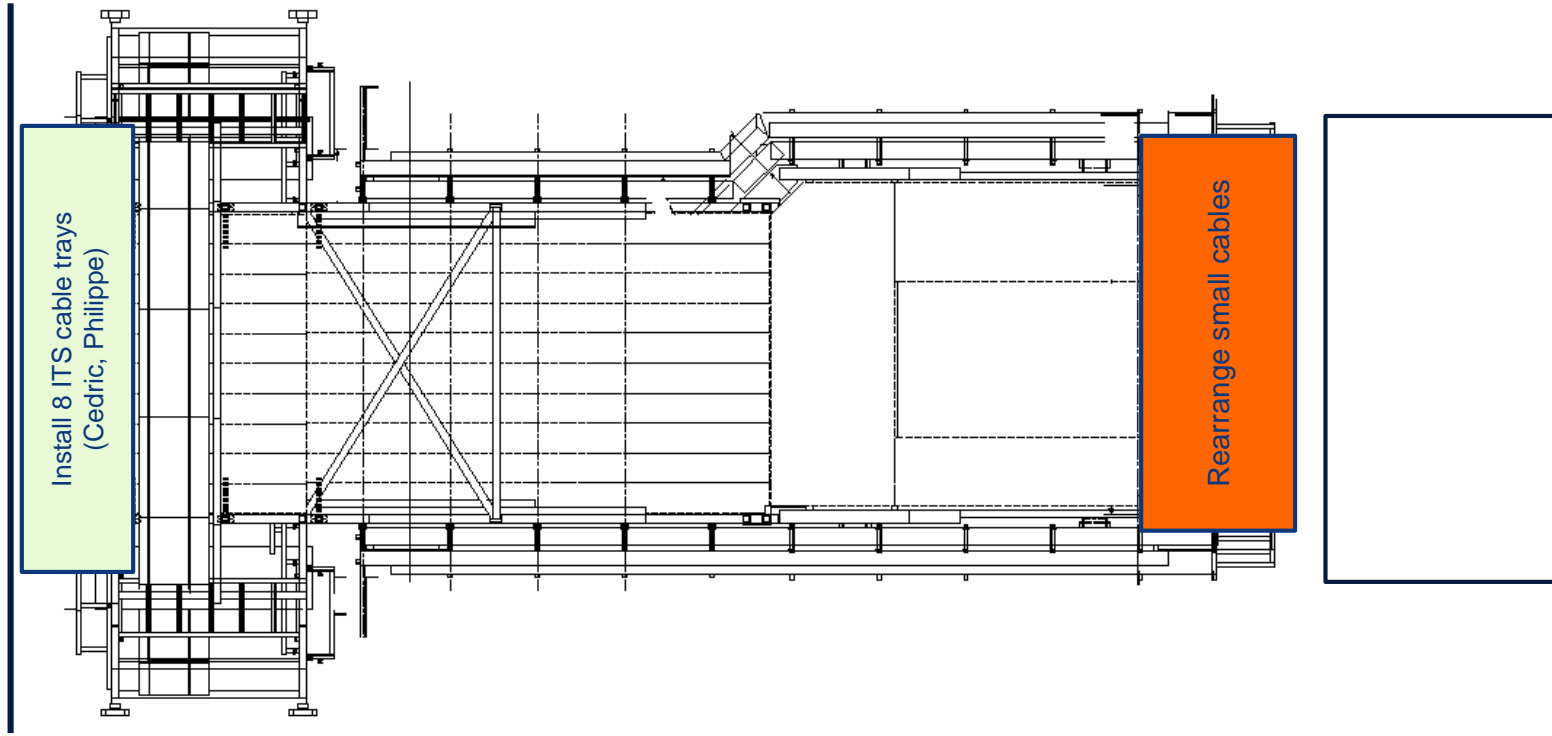
LASS functional test: no access to UX25 whole day (weekend as contingency)



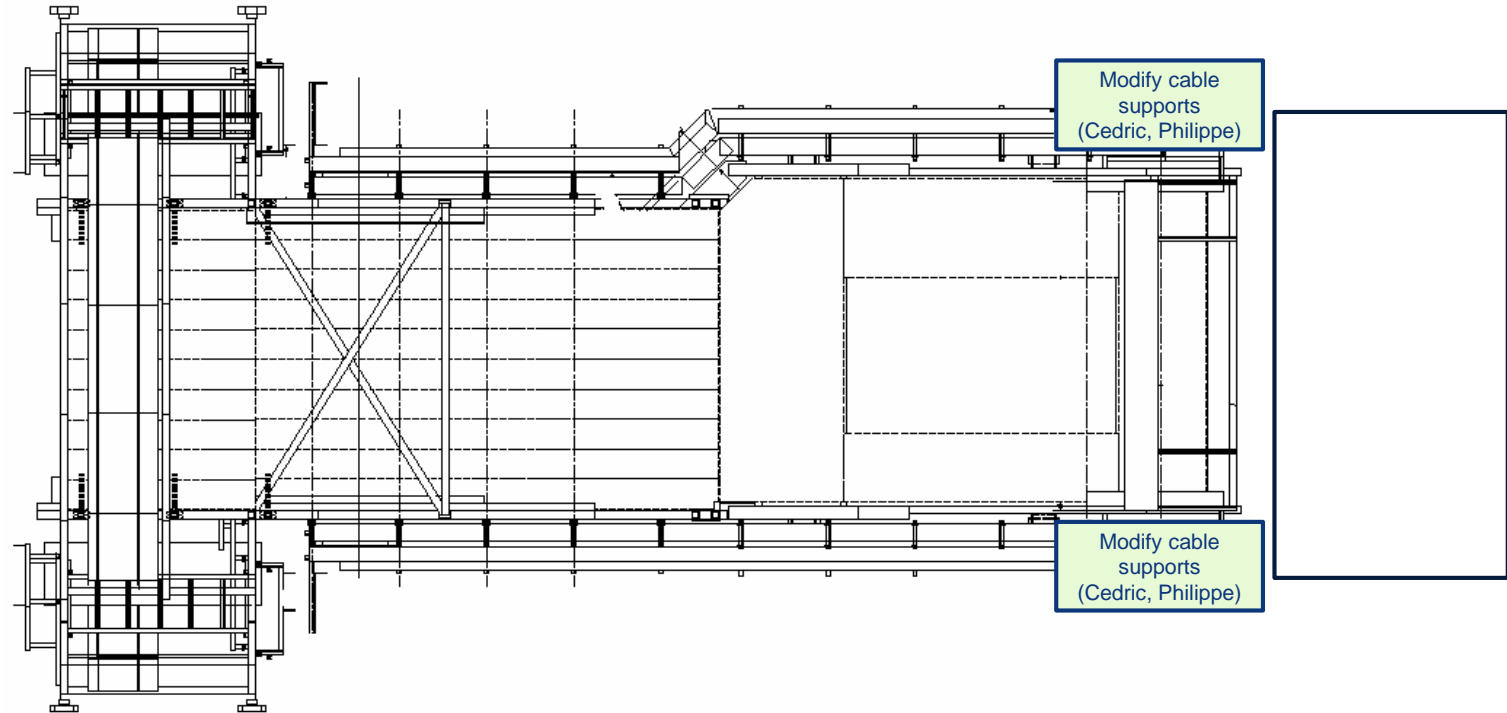


# Miniframe activities w44 – Mon 26 Oct 2020

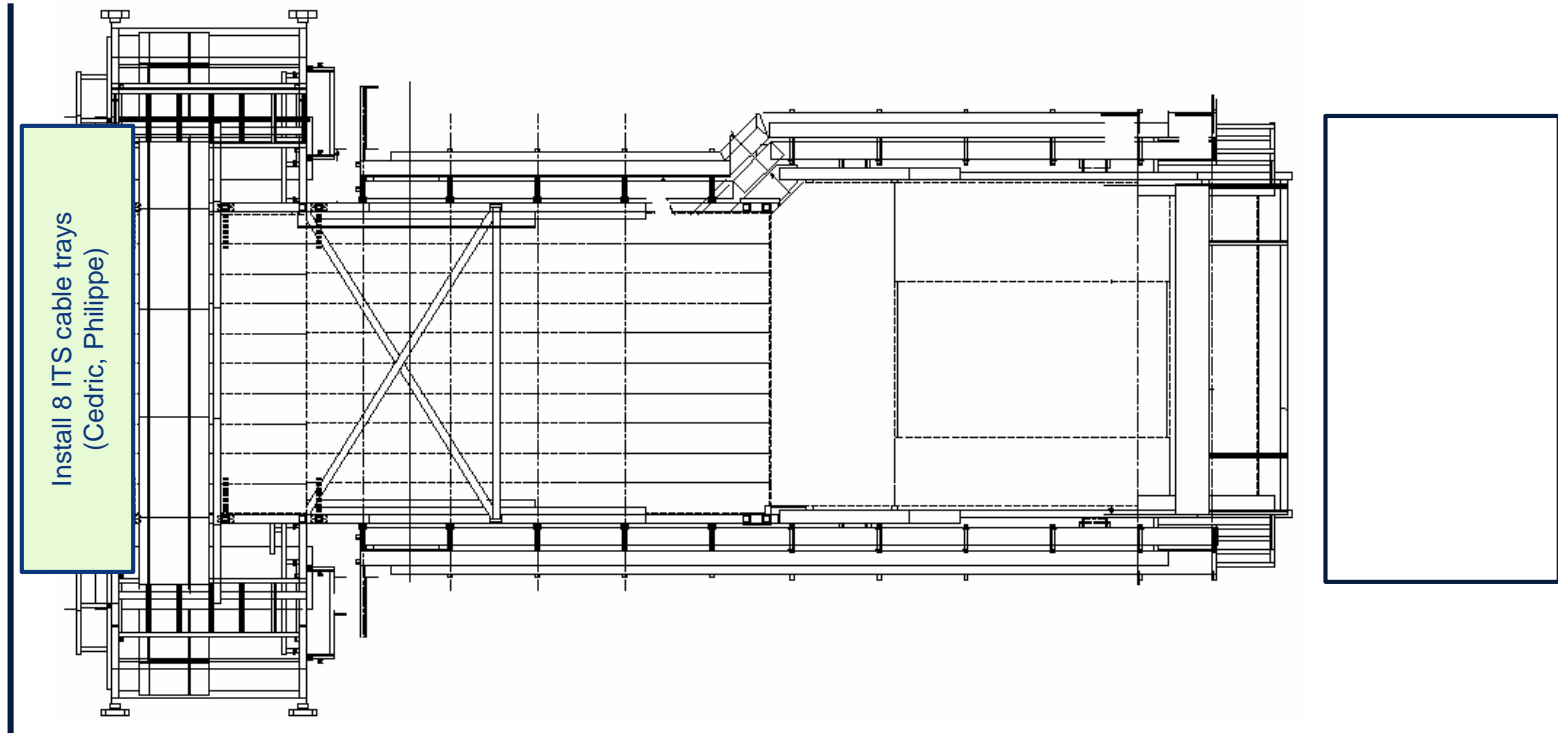
## Cleaning Miniframe (Elior)



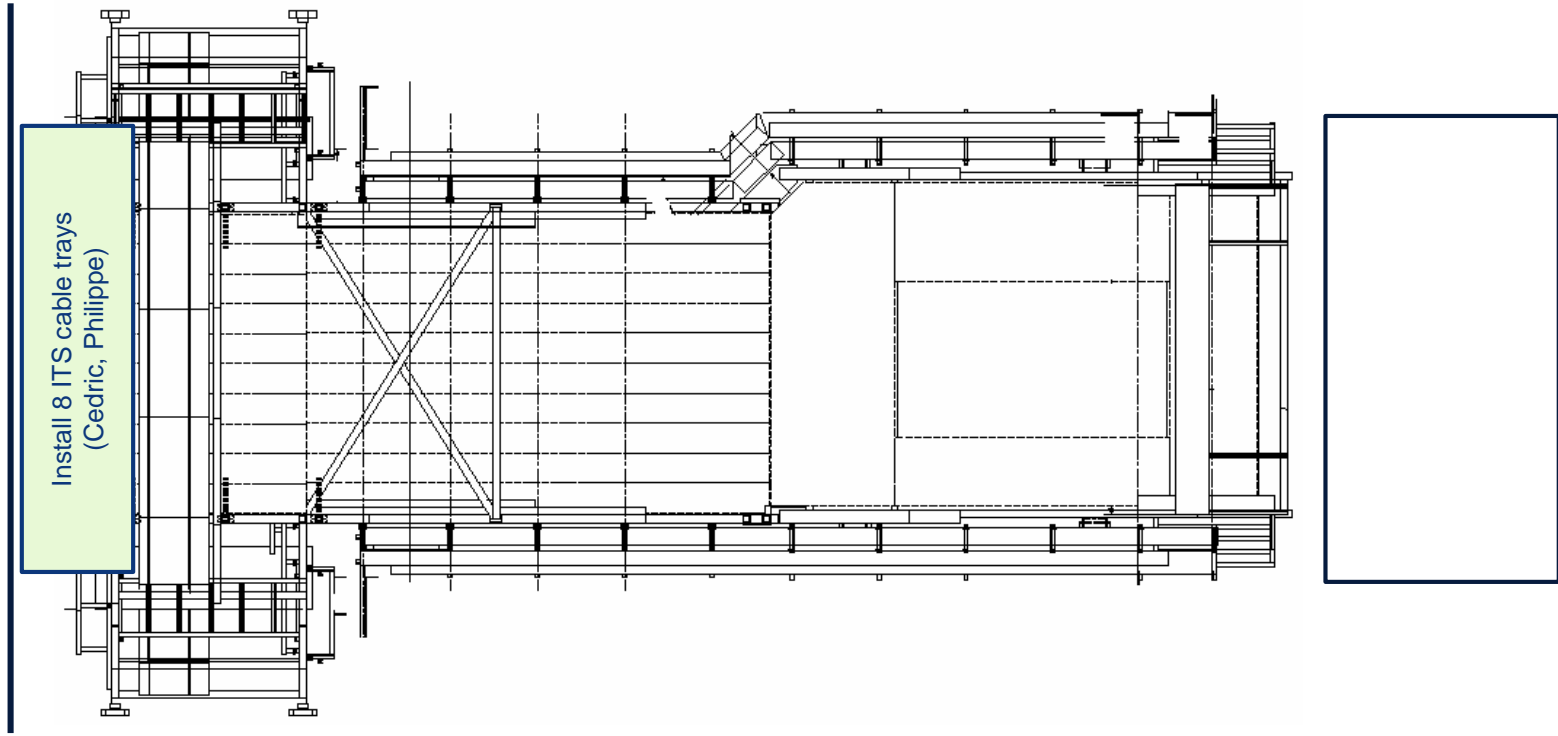
# Miniframe activities w44 – Tue 27 Oct 2020



# Miniframe activities w44 – Wed 28 Oct 2020



# Miniframe activities w44 – Thu 29 Oct 2020



# Miniframe activities w44 – Fri 30 Oct 2020

