LS2 2015-2020

Coordination

LS2 Status of the accelerator

Consolidation of LHC diode insulations (DISMAC)

- Long Shutdown 2 (LS2) scope
- Safety Coordination
- Back to “new normality”
- Schedules & Milestones

August’20

June’20

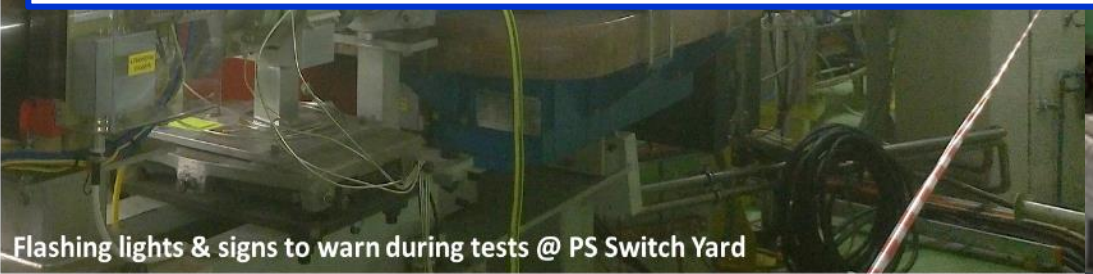
HL-LHC Civil Engineering
US/UW57 cavern with entrance to UR55 and UA57 galleries

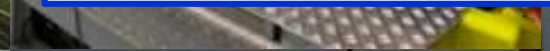
Safety Coordination

ISTs Period - Injectors

Network separation is lifted only for equipment needed for ISTs (Magnets, Kickers, Septa, RF

Very good collaboration with all grou
Special thanks to TE-EPC and EN-A





ISTs Period - Injectors

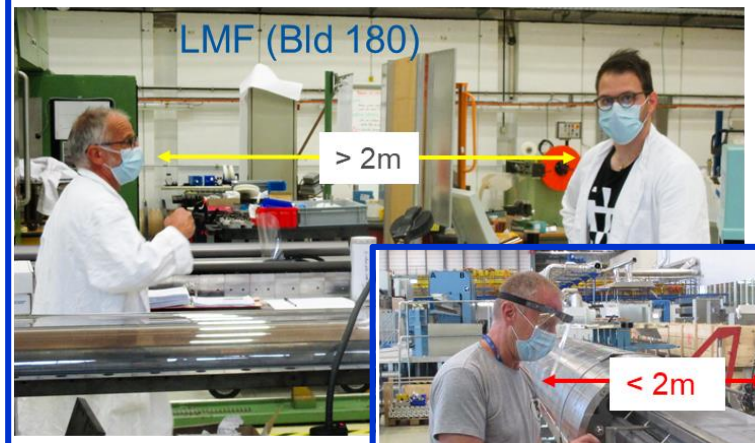
ISTs well identified on field by the groups
(Magnets, Kickers, Septa, RF cavities)

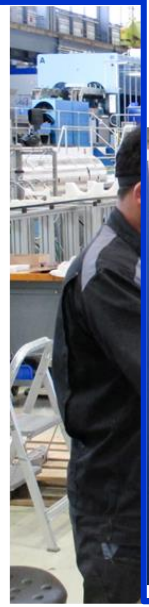
Pictures from PS SWY ISTperiod
Acknowledgements: A.Prost, M.Hourican TE-ABT, A.Jibar BE-RF, F.Baltasar, N.Mornand EN-ACE

Thank you very much to all groups!

Safety Coordination – COVID-19 measures

Physical Distancing and PPE

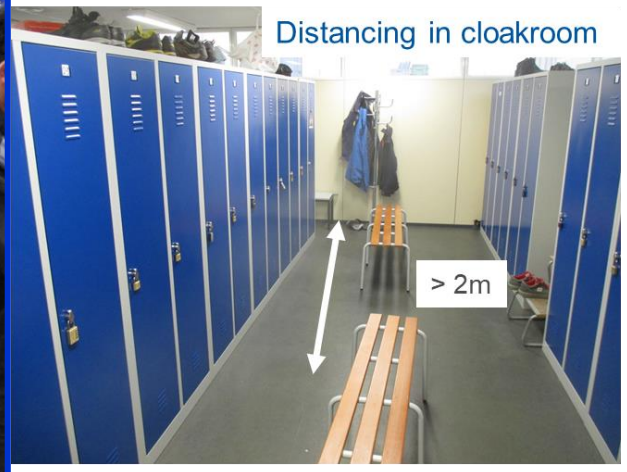




The obligation of we
masks is accepted a

PPE for work-related hazard and Covid-19

Preparation of Workplaces



Selection of individual tools

Situations of “working alone at isolated workplace” resolved in risk assessments

Safety – LS2 Accidents

June 2020

Facility	Total	Minor	With days of absence	Total days
PS	8	5	3	36
SPS	20	9	11	282
LHC inc. LEX	32	23	9	77
Surface	27	14	13	158
Total	87	51	36	553

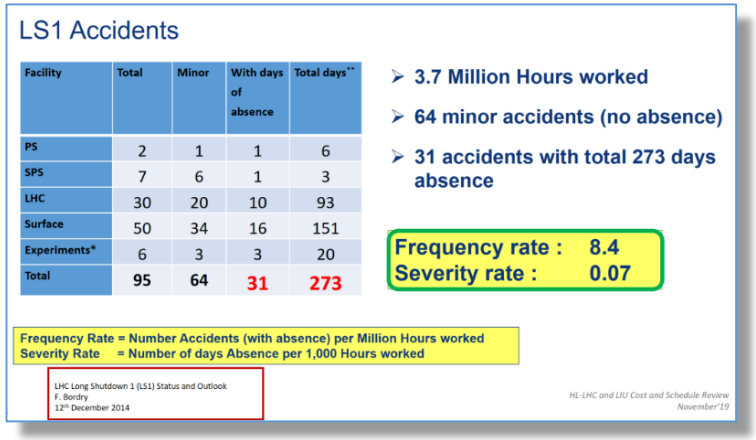
Facilities: **Frequency Rate:** **9.8**
Severity Rate: **0.15**

Description	All	Minor	With absence	Days of absence
Handling and Manipulation	25	9	14	298
Fall	7	2	5	92
Electricity	5	2	3	65
Collision, false movement	20	15	5	37
Hand tools and Power tools	14	11	3	26
Object in Movement	9	6	3	17
Machine tools	2	1	1	12
Divers (Insect bite)	1	0	1	4
Vehicles (cycle, Pefra)	3	2	1	2
Total	**87**	**51**	**36**	**553**

	LS2*	LS1	Industrie**		
			Fabrication de machines et equipement	Entreposage, auxiliare de transport	Travaux de Construction
Frequency	9.8	8.4	16.3	32.3	42.3
Severity	0.15	0.07	0.8	2.3	2.9

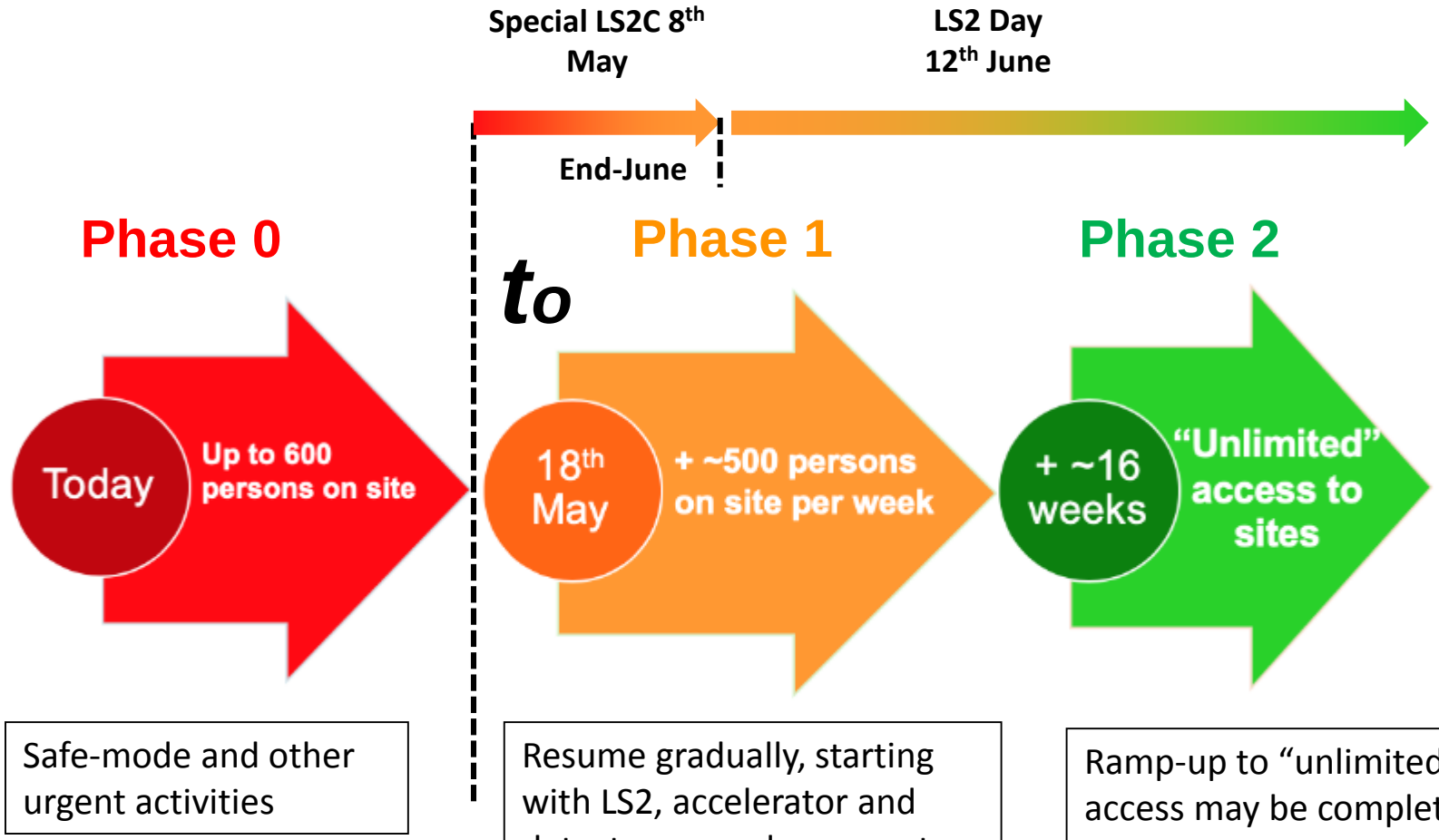
* Data incl. 8th June 2020 included,
** Source: France, Caisse nat'le d'assurance des travailleurs salaries, 2017

Frequency Rate:
Accidents with absence per million hours worked
Severity Rate:
Days of absence per thousand hours worked



Phase 2 Ramping-up

A gradual and cautious re-start plan



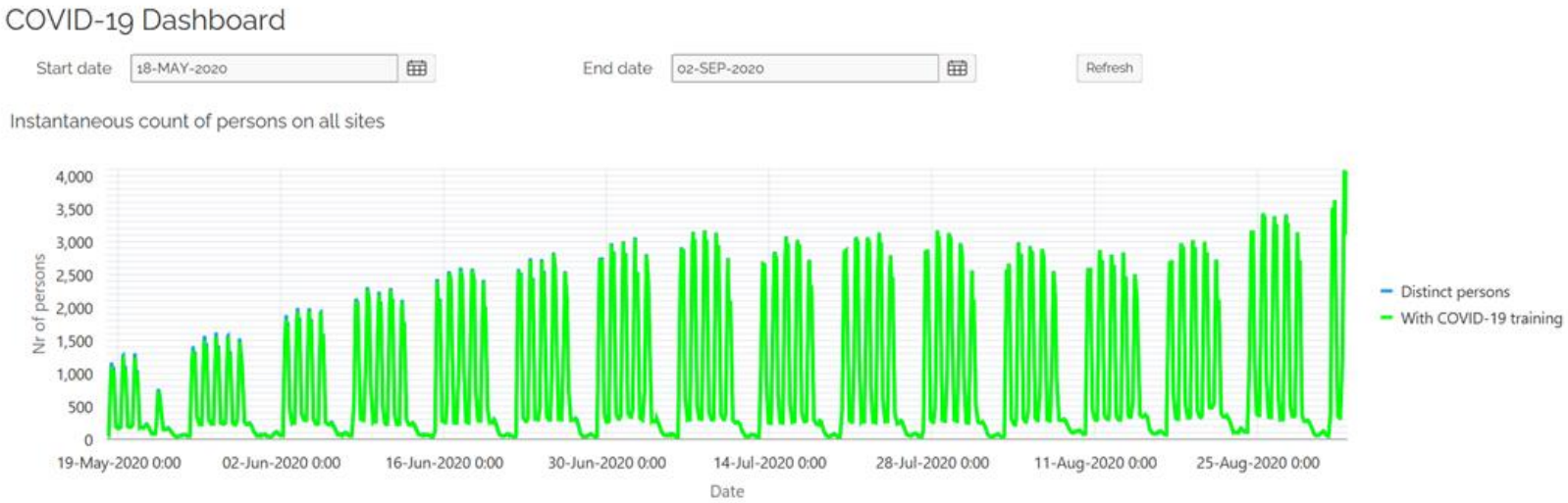
Safe-mode and other urgent activities

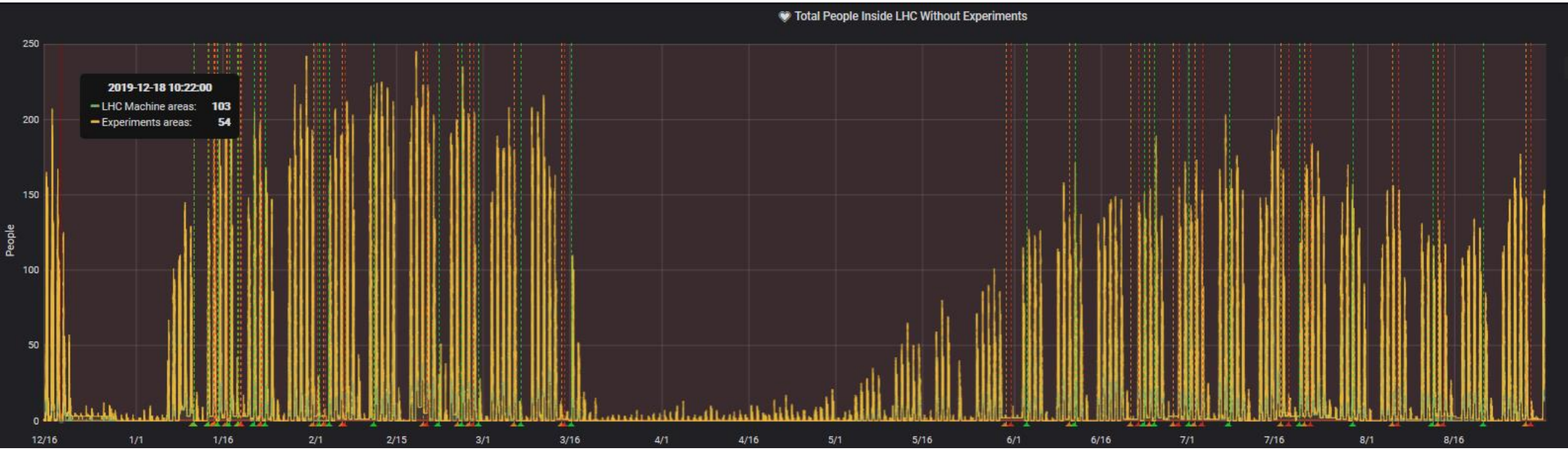
Resume gradually, starting with LS2, accelerator and detector upgrades, urgent site and building work

Ramp-up to "unlimited" access may be completed by mid-September

- Number of people on sites includes CERN's personnel as well as contractors.
- **Personnel involved in LS2, accelerator and detector upgrades, urgent site and building work will come back to site gradually as of 18 May.**
- **The rest of personnel will come back gradually as of 2nd week of June.**
- Personnel will be called back by supervisors.

Phase 2 Ramping-up



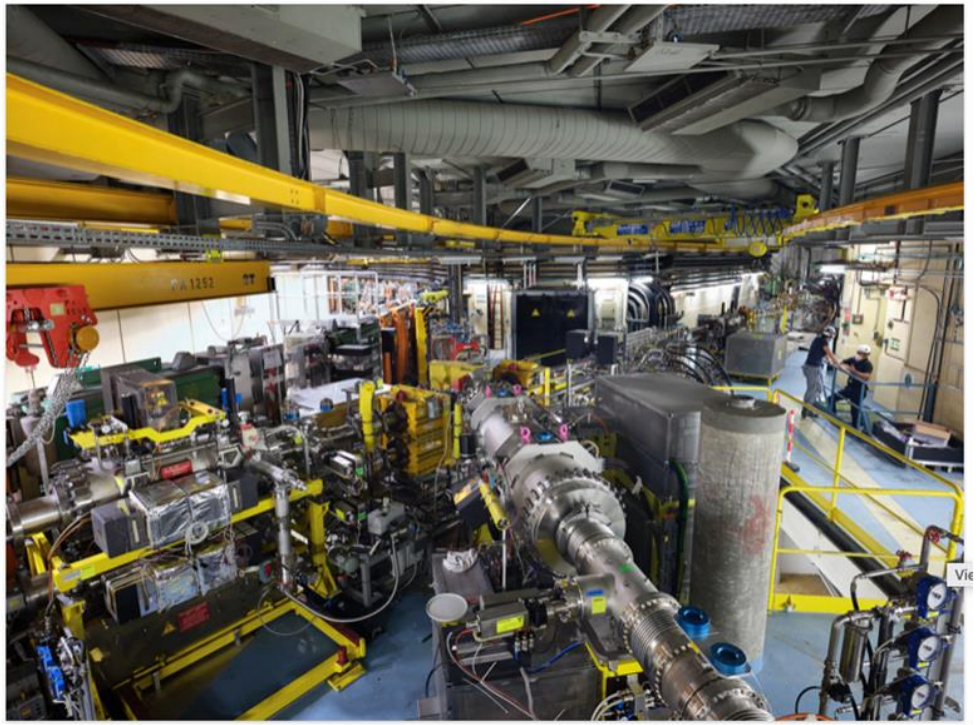


LS2 for PSB has been completed

The first accelerators are back in action

It's the end of Long Shutdown 2 for the PS Booster, the first accelerator to be recommissioned, alongside Linac 4

8 JULY, 2020 | By Corinne Pralavorio



Article from in the CERN Bulletin

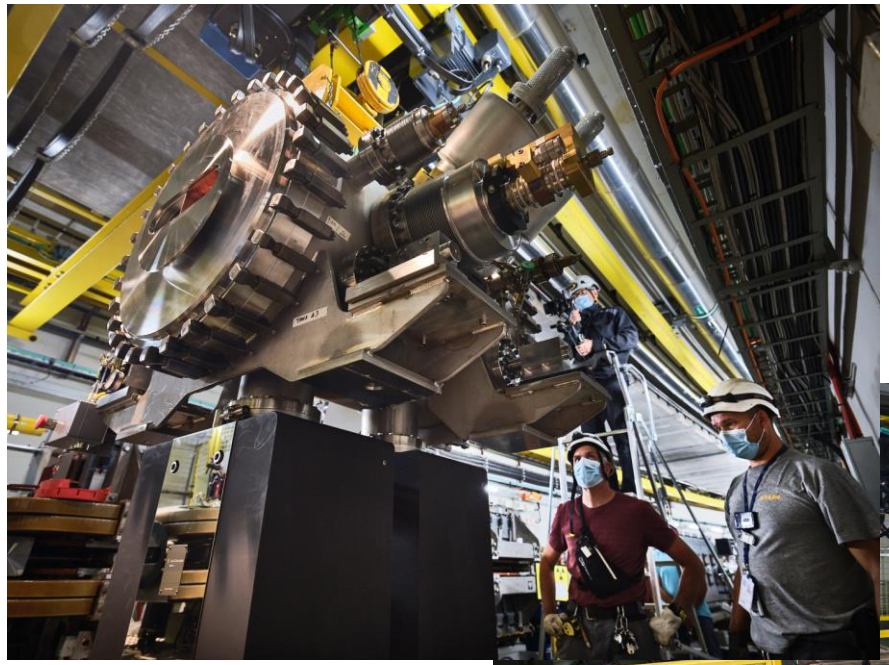
- PSB is in a hardware commissioning period

David Hay, who is responsible for LS2 coordination at the PS Booster, hands over a symbolic key to Bettina Mikulec, who leads the operations team for the PS Booster and Linac 4 (BE-OP-PSB). On the left, Julie Coupard, who is in charge of LS2 coordination for the injectors, and on the right, Gian Piero Di Giovanni, LIU project leader for the PS Booster, and Rende Steerenberg, Operations group leader (BE-OP) (Image: Maximilien Brice/CERN)

PS Broken Line (27/08/2020) – 8 weeks left before HC!

8 wks!

PS Injection Septum SMH42

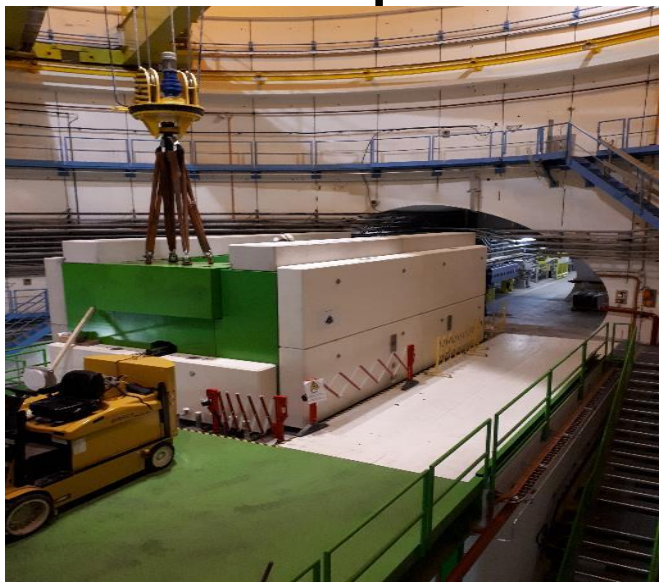


- New PS Injection Septum (SMH42) (LIU) was installed, and followed by
  - Vacuum sector closure
  - Bake-out
- All above mentioned steps performed within a 2 weeks slot

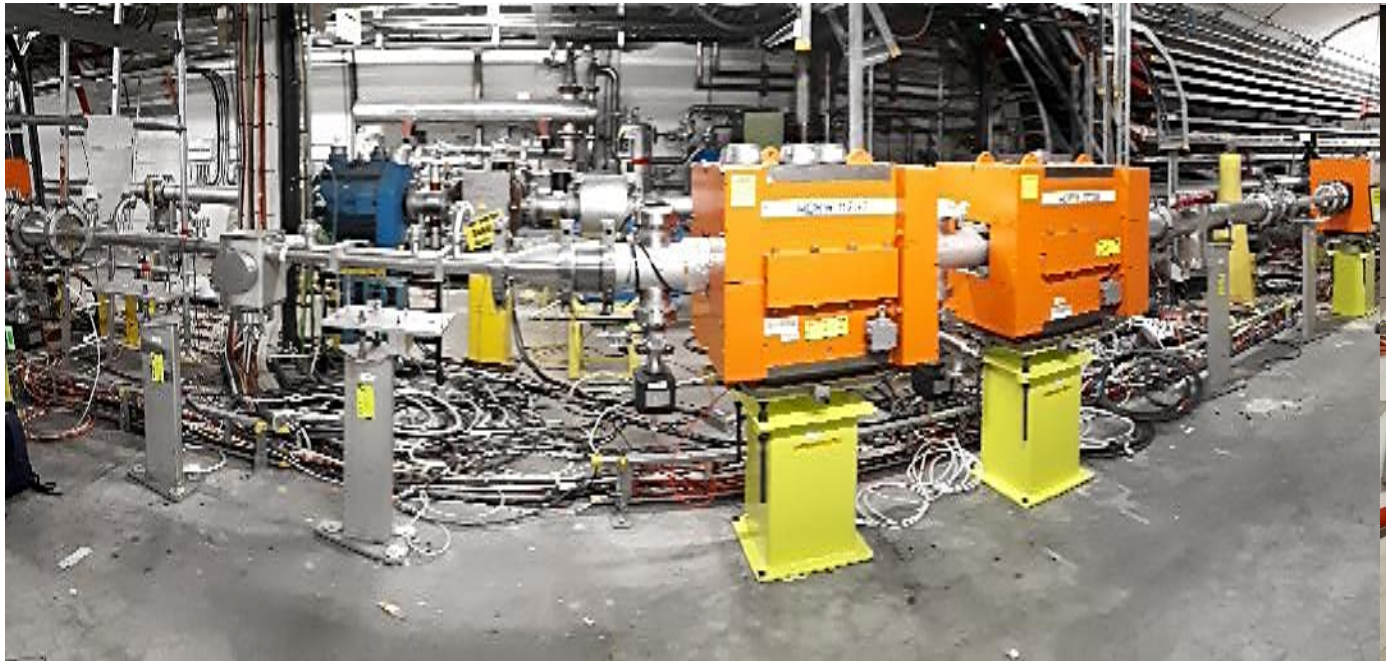
PS internal dumps

- Installation completed successfully and vacuum sector closed following the Septum SMH42 installation
- ISTs performed from the PLC directly
- Internal dumps are cycling at the moment and weekly verifications will be performed by EN-STI up to the end of LS2

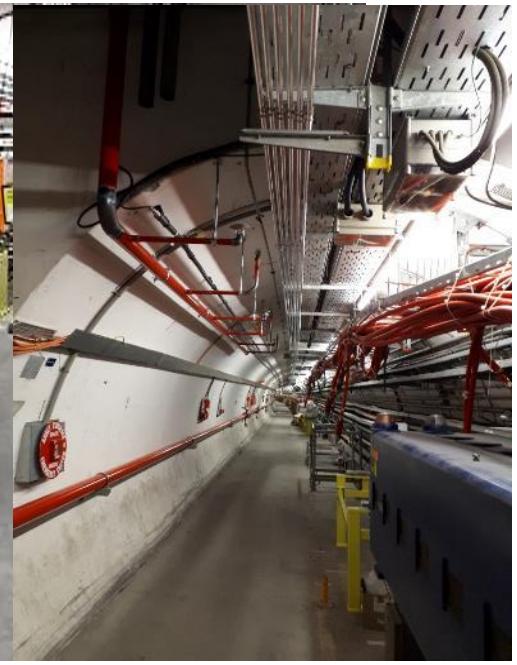
SPS Update



CE works in ECX5 complete on time.

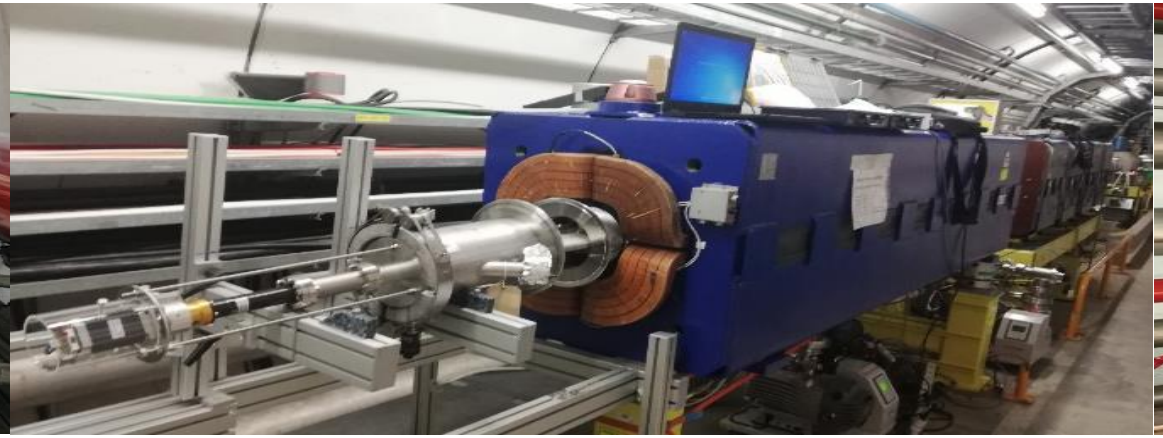


LSS1 Re-installed



Fire Safety being completed

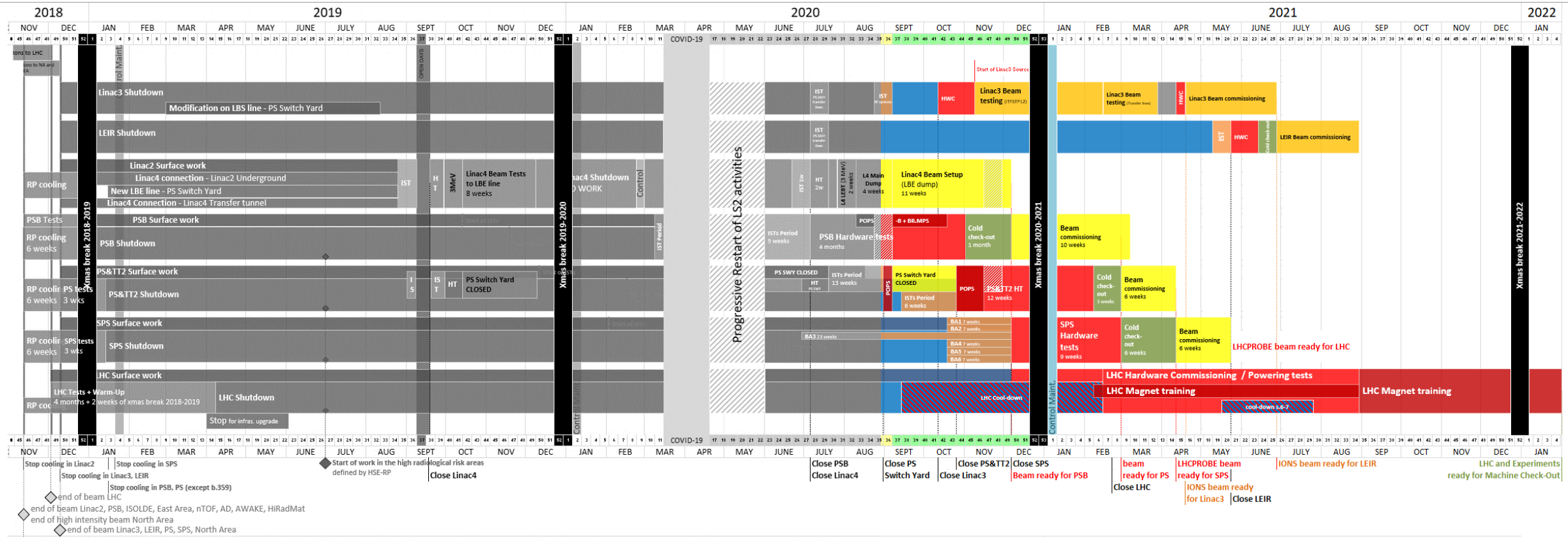
Magnets and RF cavities in LSS3 installed, commissioning to start shortly



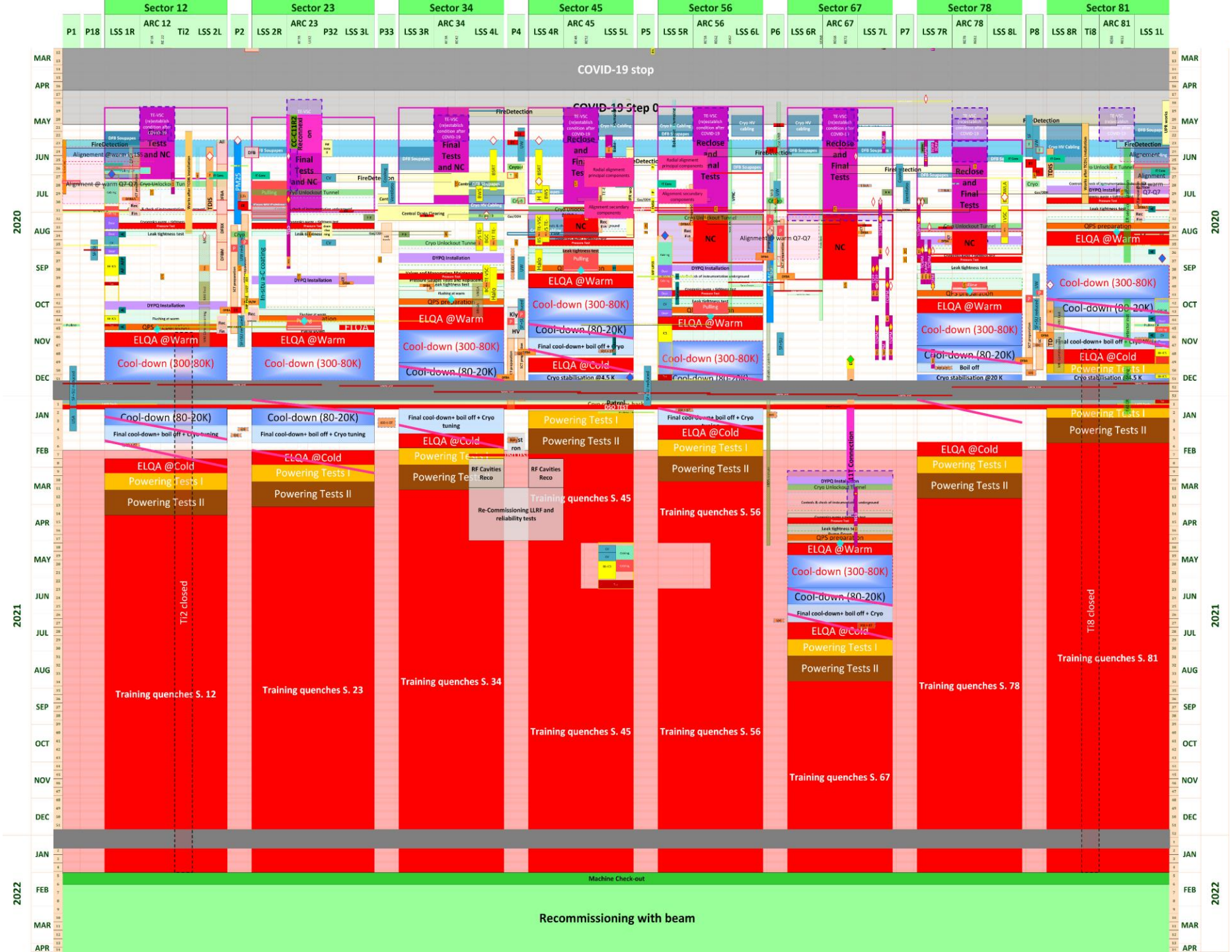
aC coating about to start its final sector

Fire Safety doors being finalised

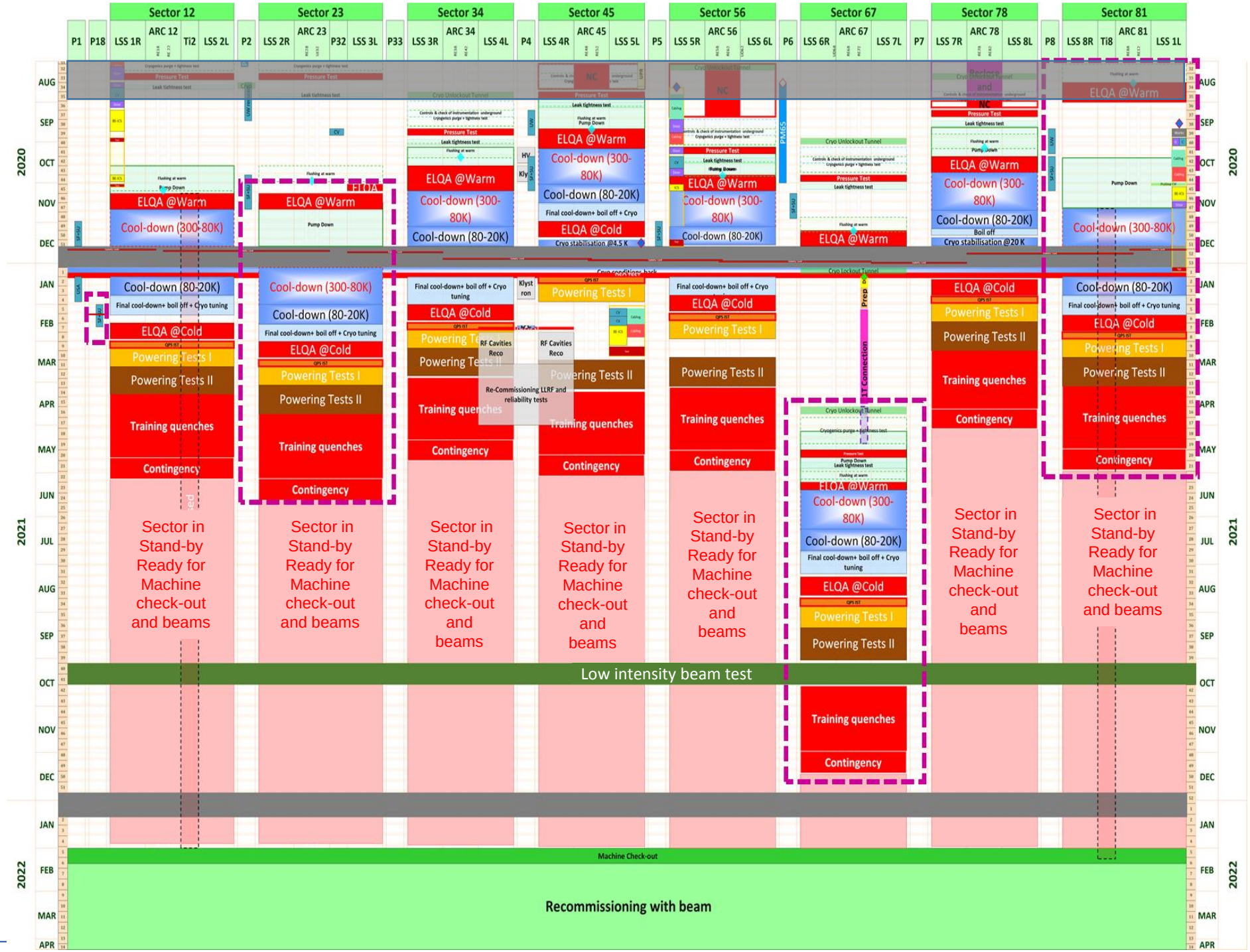
Master Schedule LS2 V3.0 EDMS ACC-PM-MS-0002 v.3.0



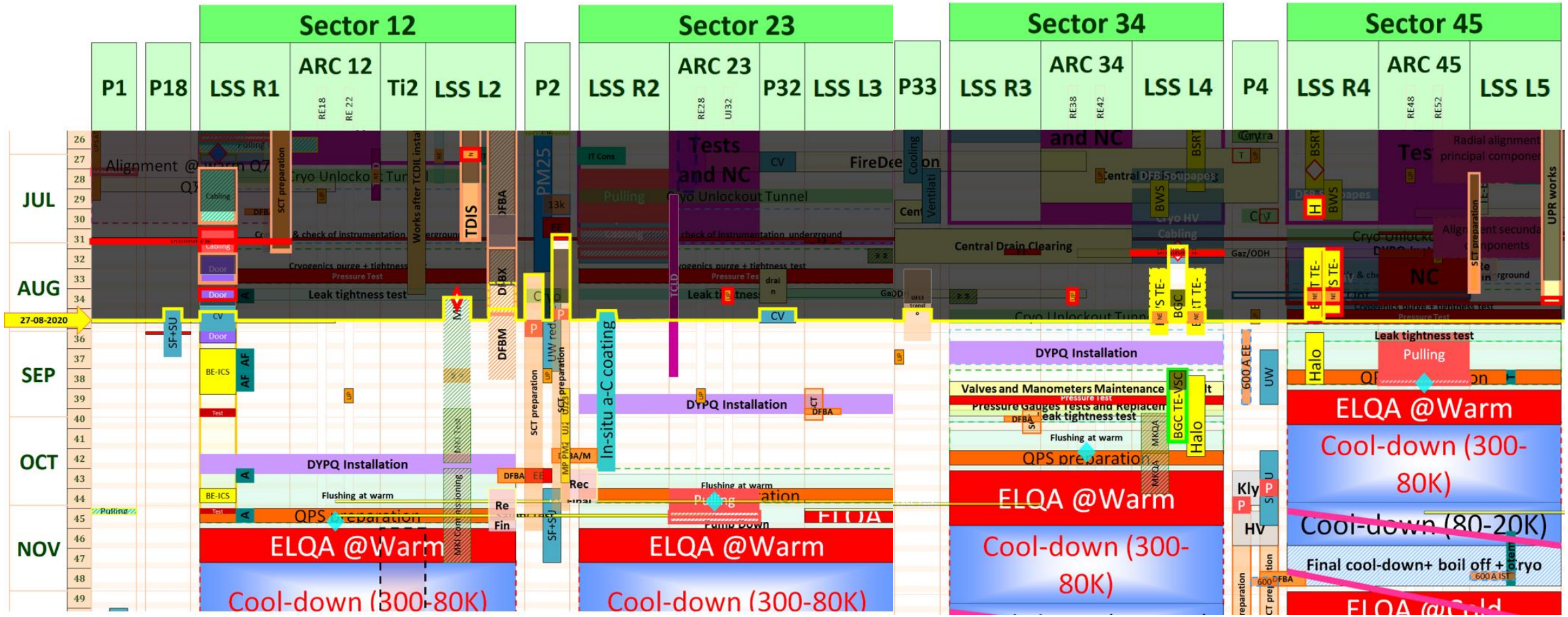
LHC-LS2 Baseline 3.0



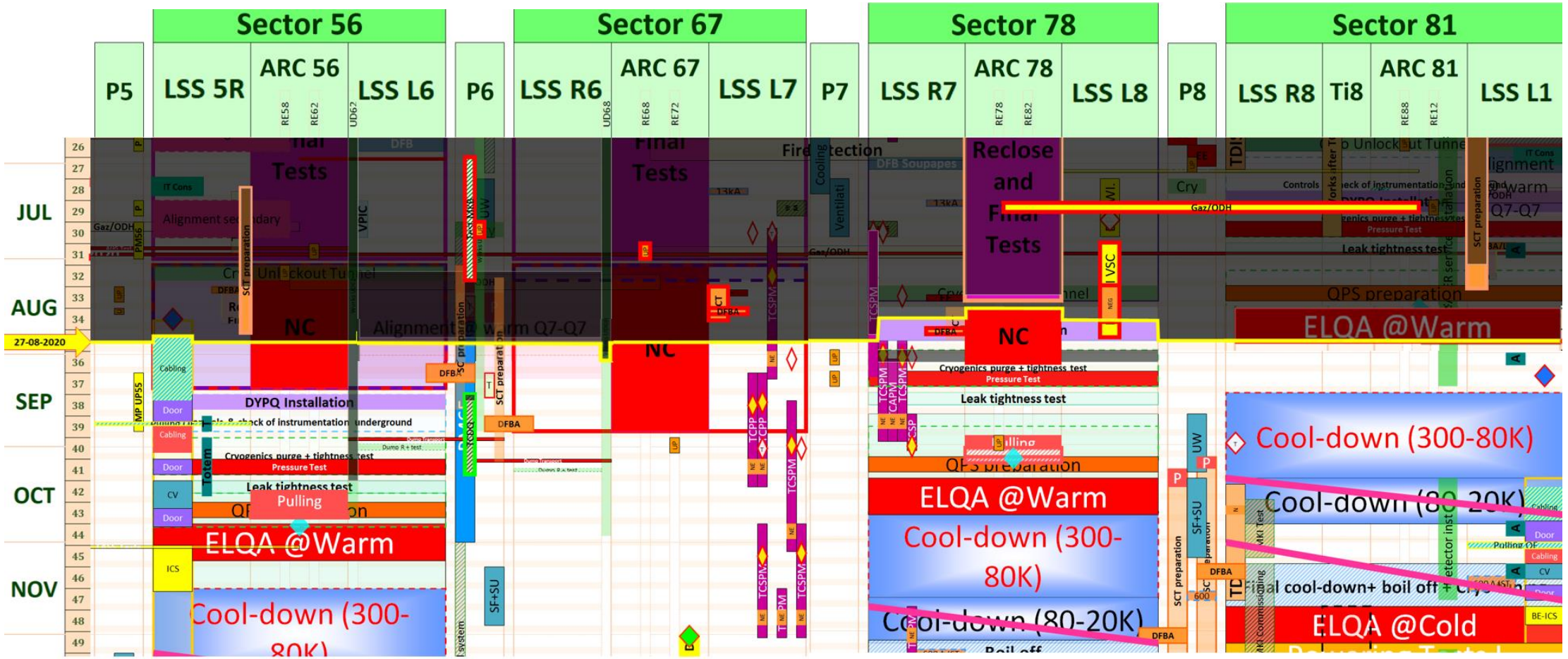
LHC-LS2 Baseline 3.1 in work



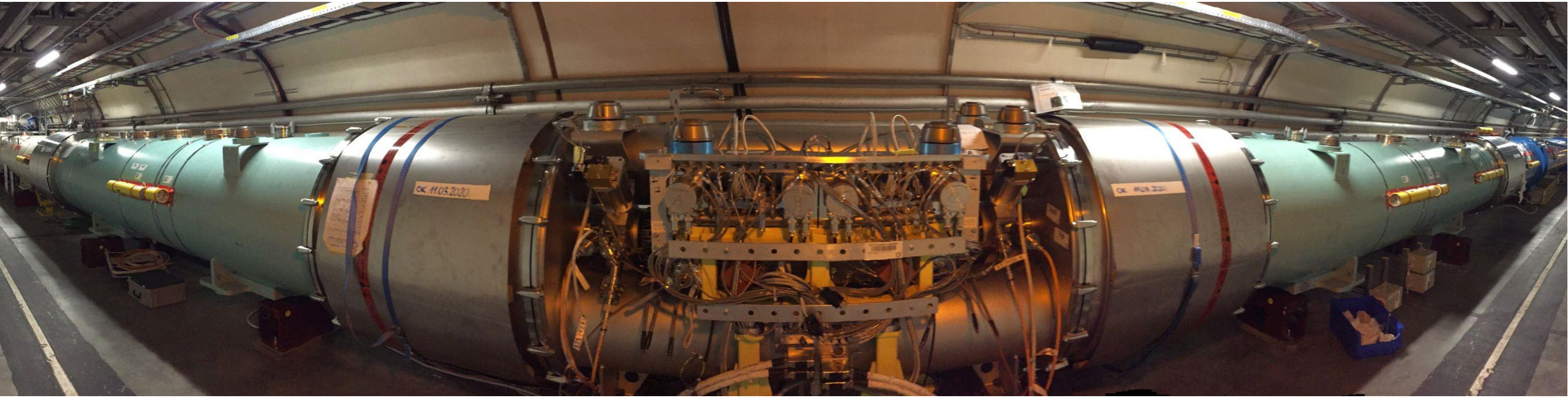
LHC LS2 Broken line 27th August 2020



LHC LS2 Broken line 27th August 2020



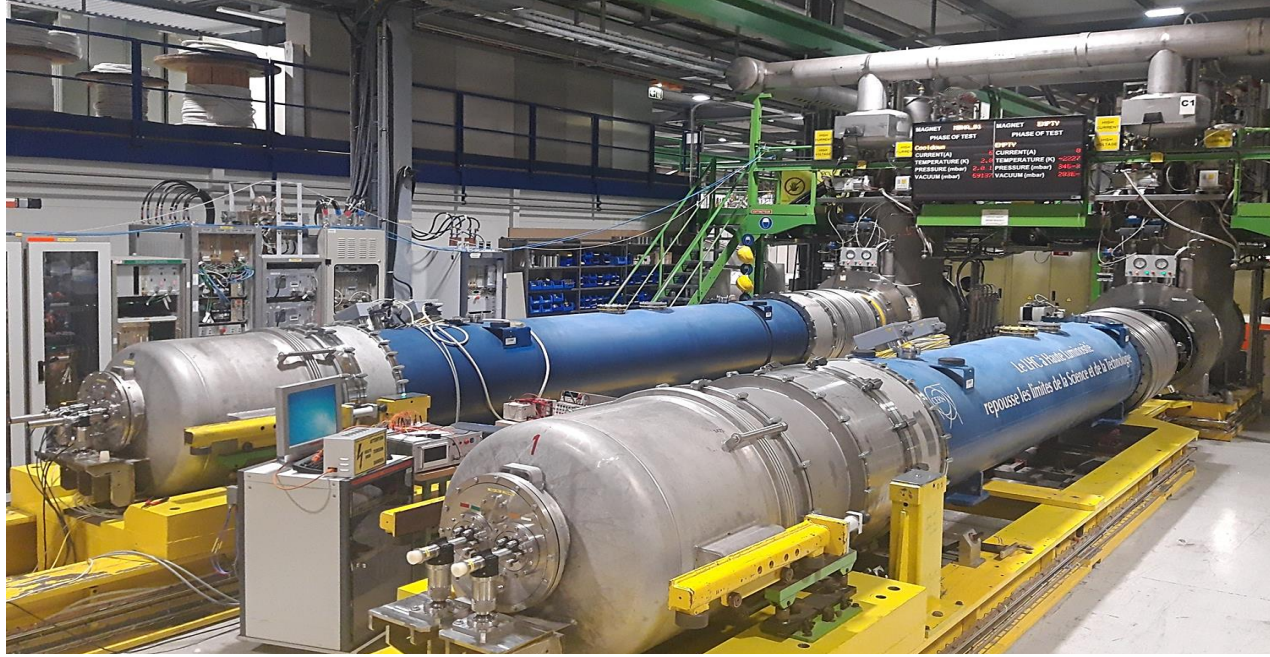
WP11 : Cryoassemblies @ P2 : Connection and bypass cryostats



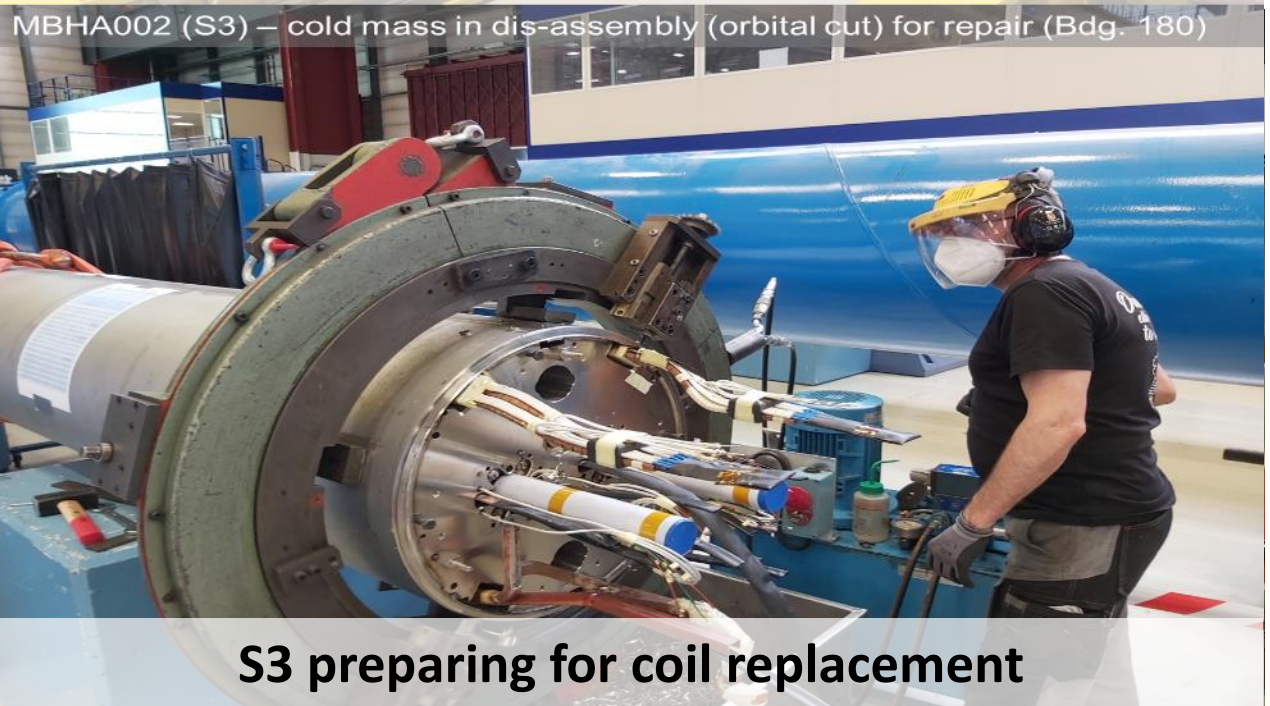
The 8 ICs of the 4 assemblies have been successfully leak tested.

Sectors 12 & 23 have been successfully pressure tested, validating the design and the execution of the IC between the WP11 assemblies at P2.

S1 successfully qualified



S2 & S4 @ SM18, cool down, being tested



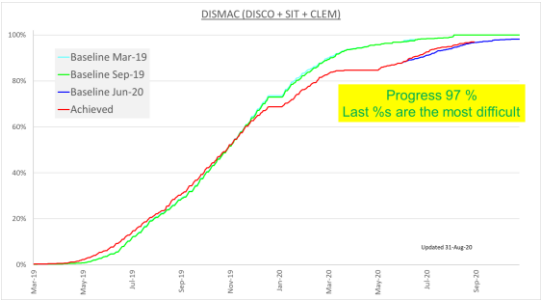
S3 preparing for coil replacement

S5 in construction in LMF

Main work on the LHC superconducting magnets during LS2 (2019-20)

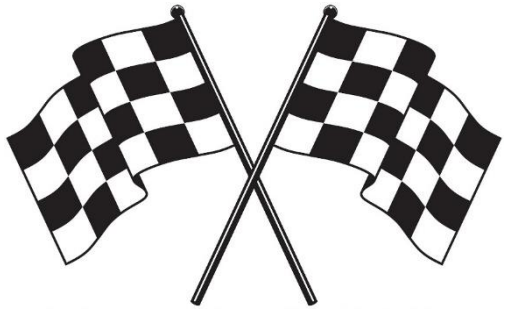
Courtesy of J-P. Tock

LS2 - DISMAC PROJECT
OPCLIC team

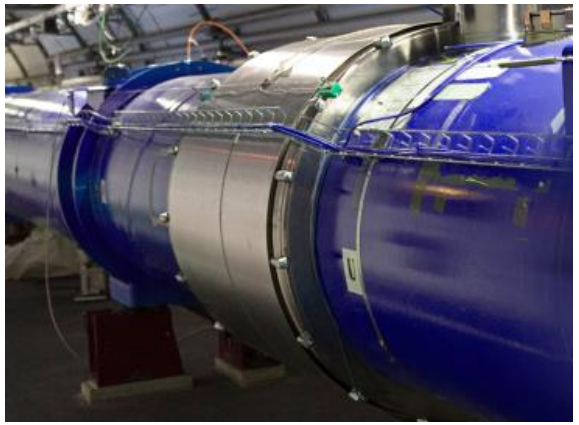


1st March 2019:
First Interconnection opening
QBBI.A30L8 sector 78

Participation of several teams (OPCLIC [TE-MSC], BLM [BE-BI], CRIM [TE-CRG], PO [BE-OP]) including collaborators from NTUA (National Technical University of Athens) and WUST (Wroclaw University of Science and Technology)



3 August 2020:
Last Interconnection Closure
QBBI.8L8 sector 78



1360 closures FINISH!

Wrocław University of Science and Technology

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

Henryk Niedwodiczanski Institute for Nucclear Physics

Major achievements

TE-CRG consolidation COMPLETED

Courtesy TE-CRG Nikolaos Trikoupis

- Reparat
- QRL val
- DFB "PS

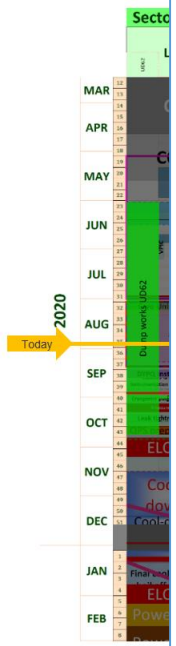
Tests of LHC SVCs during LS2

Static Var Compe

LHC point	Activities
LHC6	Powering tests of T
LHC2	Powering tests of T
LHC4	Powering tests of T

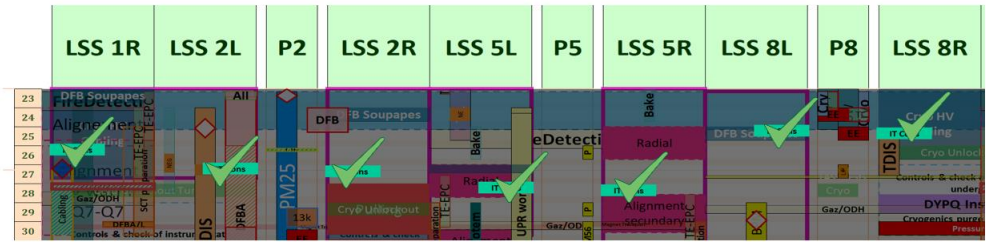
Request from:
Charles Genton, TE-EPC
Christian Bernard, EN-EL

LHC Dump Activities



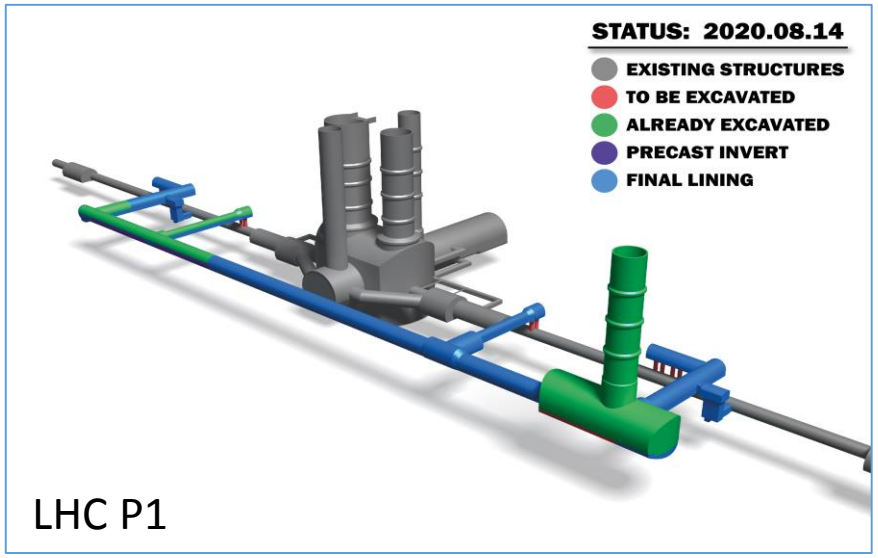
Consolidation of the LHC Triplets Alignment System

- LHC-G-EC-0012
- Activity performed in the frame of DISMAC project by SIT team, Survey and Vacuum teams
- On all 8 triplets

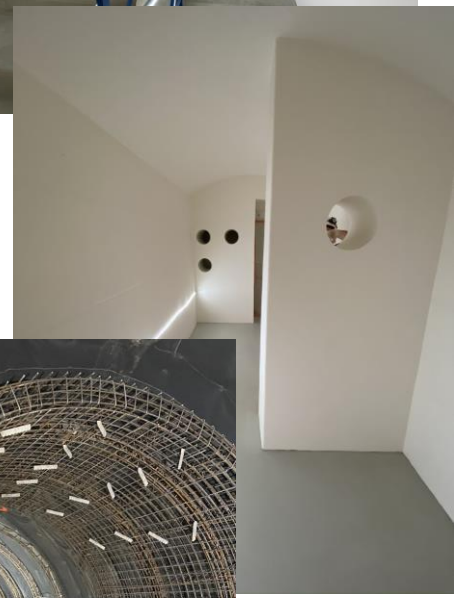


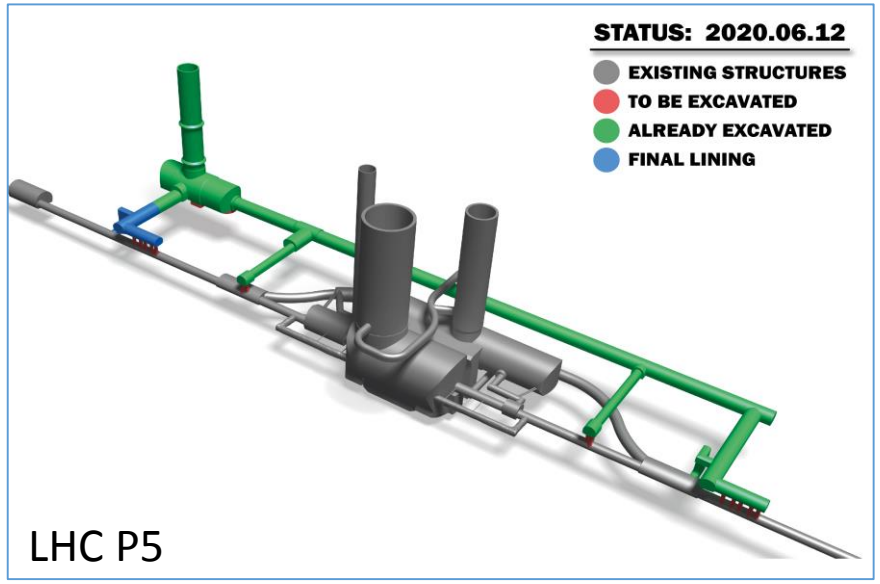
Tied-rod installation at IT2

HL-LHC civil engineering



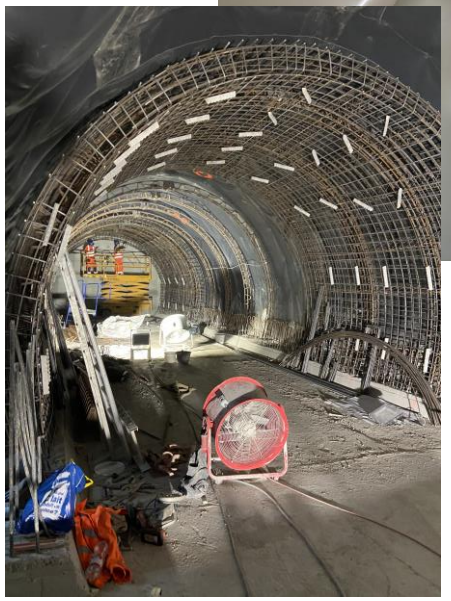
LHC P1

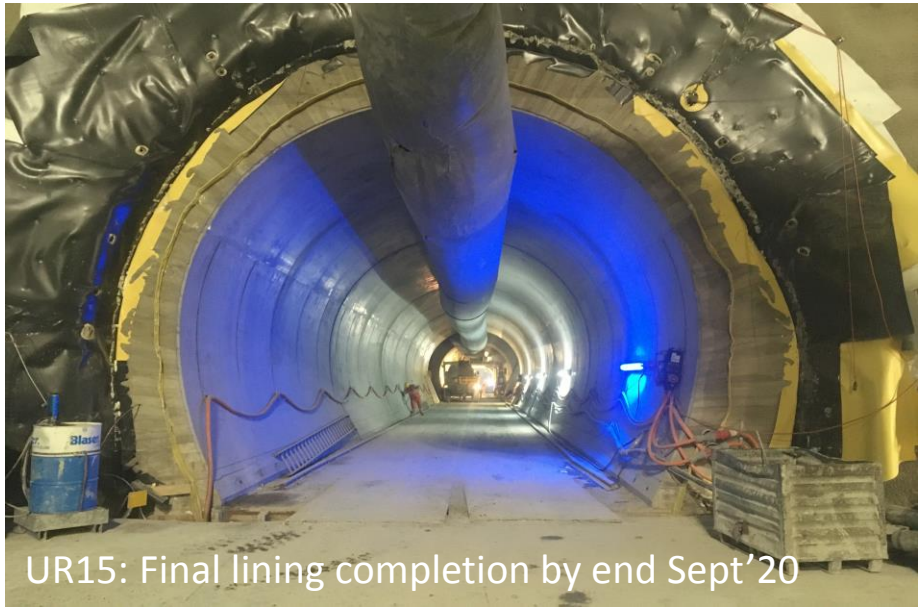

UPR57



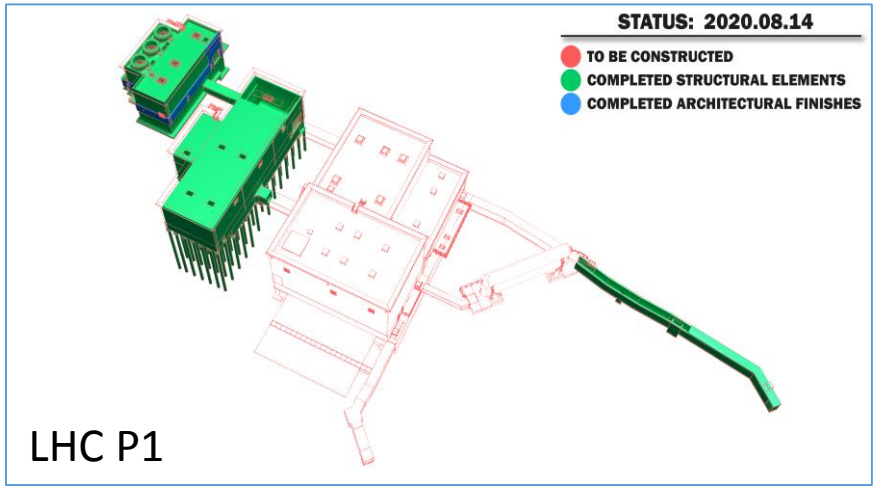
LHC P5


UPR17

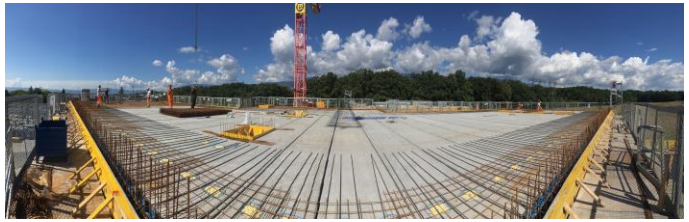



UR15: Final lining completion by end Sept'20

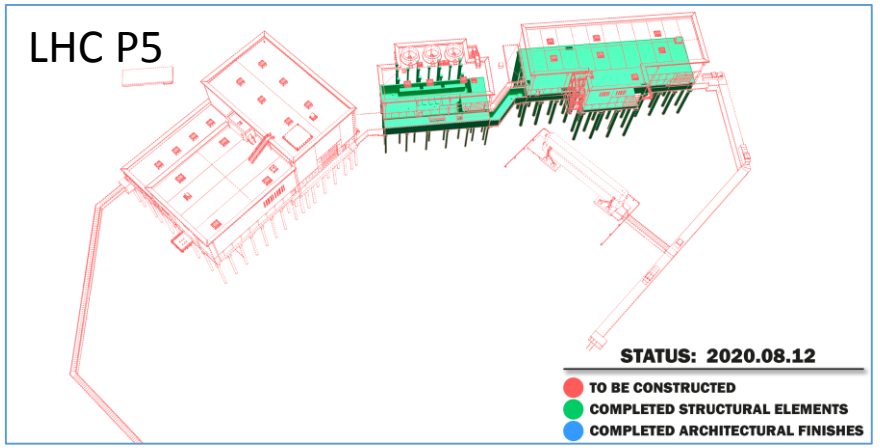
HL-LHC civil engineering on surface



SF17: Delivery expected on time



SHM17: Roof casting on-going. Delivery expected on time



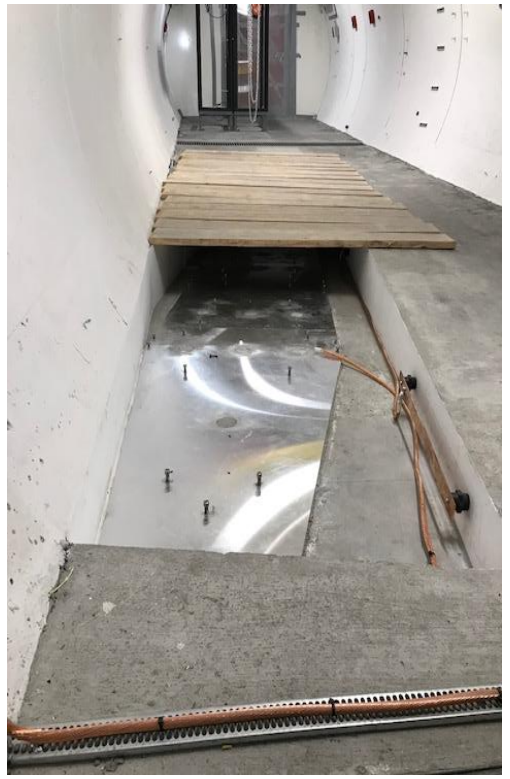
SF57: Wall casting

SHM57: Ground slab casting

FASER in TI12 (Sector 81)

Works update

- Crane installed and tested
- TI12 ready for infrastructure installation
  - EN-EL works will run until week 31
  - CV ventilation unit removal in UJ12 week 32 & 33
  - Optical fiber blowing, from RE12 to TI12 and cable trays installation in progress
  - EN-HE (load tests for rails) week 37 (tbc this week)
  - Handrail installation week 37 (to confirm whether manufacturing on time is possible)

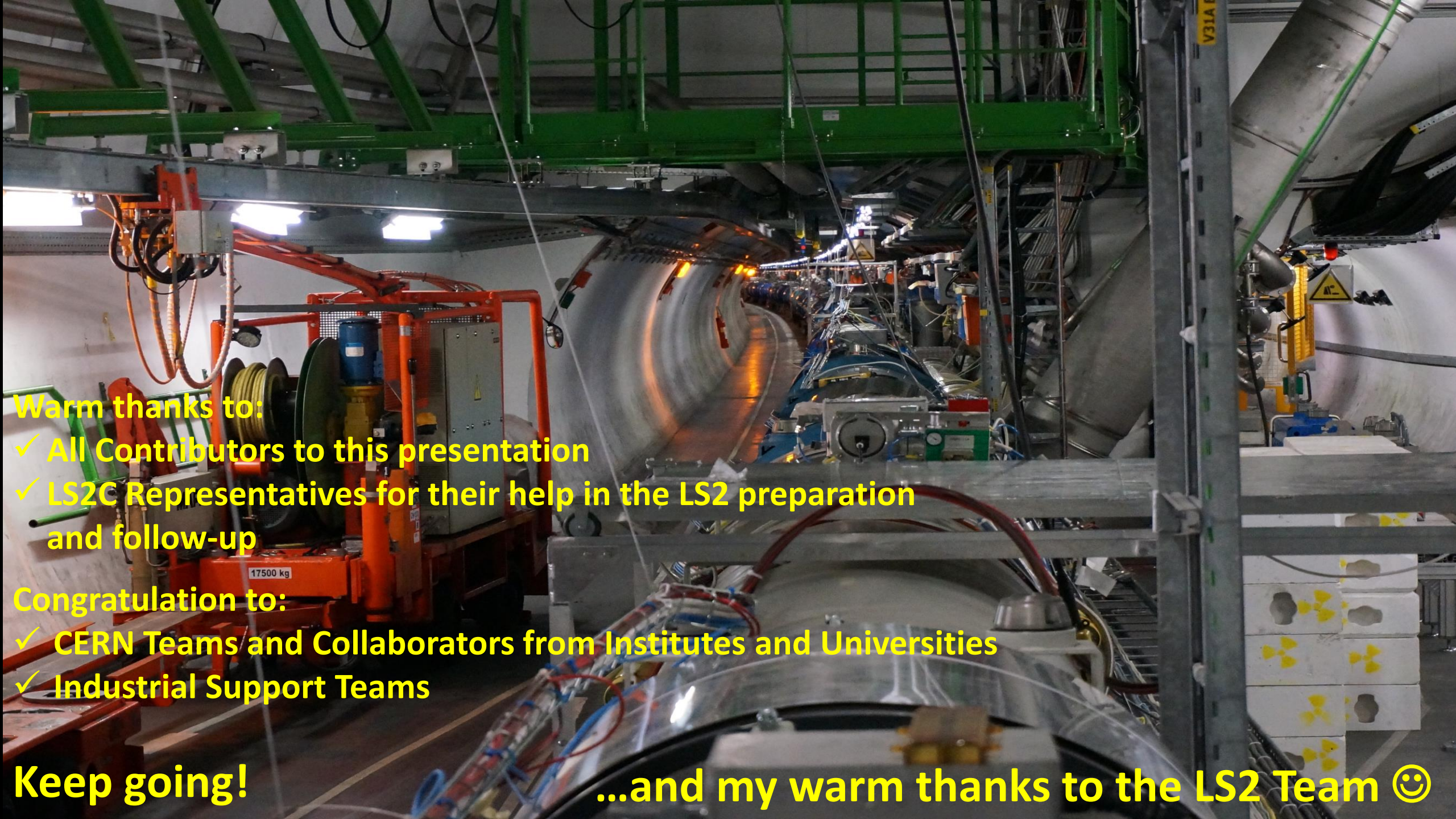


Closing remarks

Injectors & LHC follow post-COVID Master Schedule…

- ✓Ramping-up is going as expected.
- ✓No showstopper identified, some NCs need to be fixed.
- ✓Hardware Commissioning & Magnet training are getting implemented in linear schedules to see potential for operation @ higher energy.

New version 3.1 being prepared for next meeting with LHC Experiments on 23rd October 2020



Warm thanks to:

- ✓ All Contributors to this presentation
- ✓ LS2C Representatives for their help in the LS2 preparation and follow-up

Congratulation to:

- ✓ CERN Teams and Collaborators from Institutes and Universities
- ✓ Industrial Support Teams

Keep going!

…and my warm thanks to the LS2 Team ☺


CERN
LS2
Coordination