

News from CERN

Manfred Krammer

Head of the Experimental Physics Department



CERN was founded 1954: 12 European States

“Science for Peace”

Today: 23 Member States

9 Associate Member States

NEW Estonia (since Feb. 1st) Associate Member in the prestage to Membership

Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland and the United Kingdom

Associate Member: Croatia, Cyprus, Estonia, India, Lithuania, Pakistan, Slovenia, Turkey, Ukraine

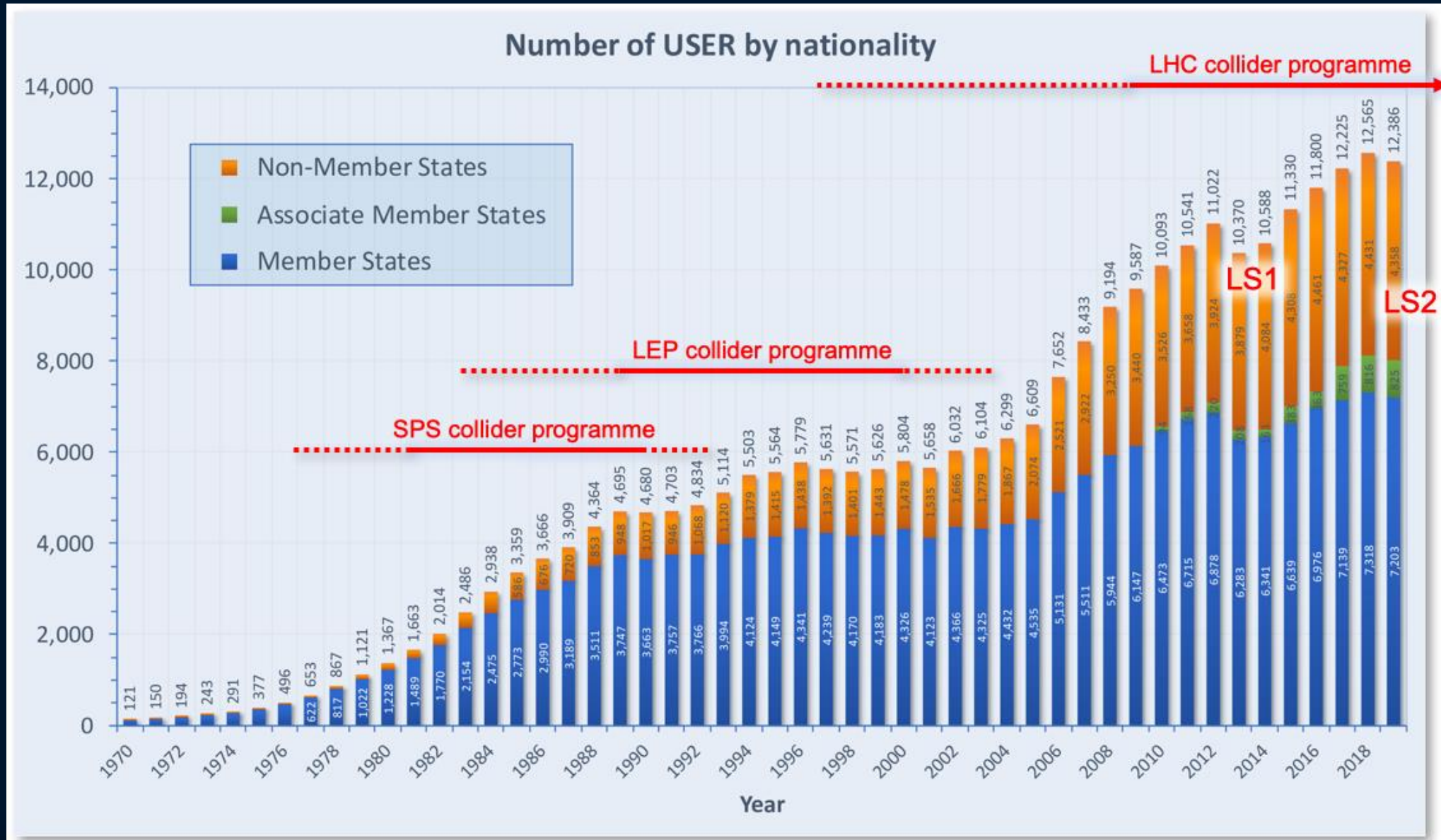
Observers to Council: Japan, Russia, United States of America; JINR, European Commission and UNESCO

~ 2600 staff

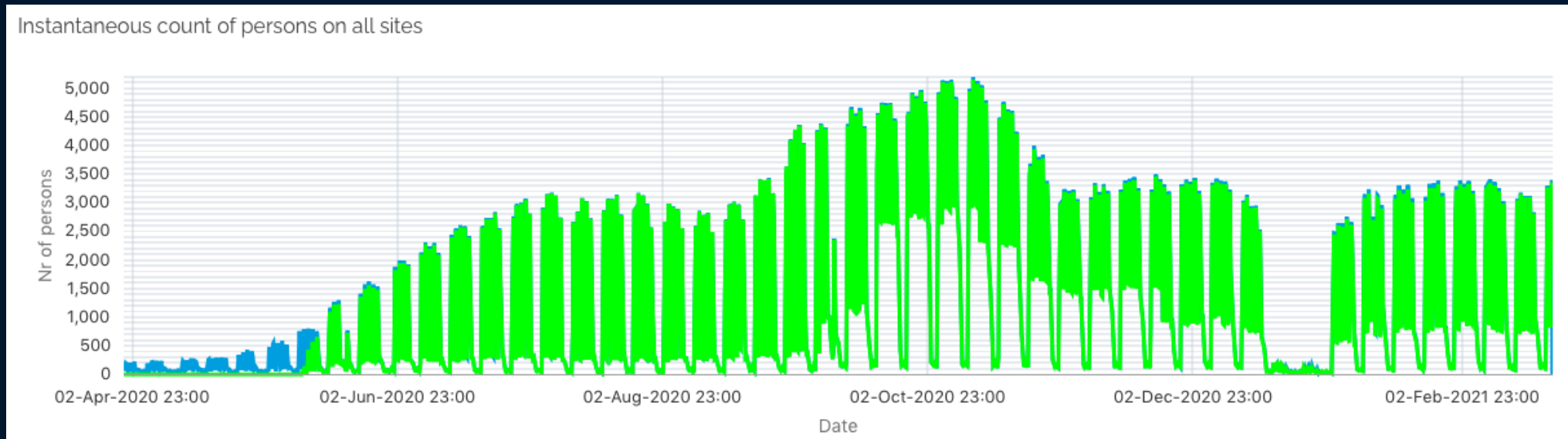
~ 1800 other paid personnel

~ 12500 scientific users

CERN attracts scientists from all over the world



CERN and Covid-19

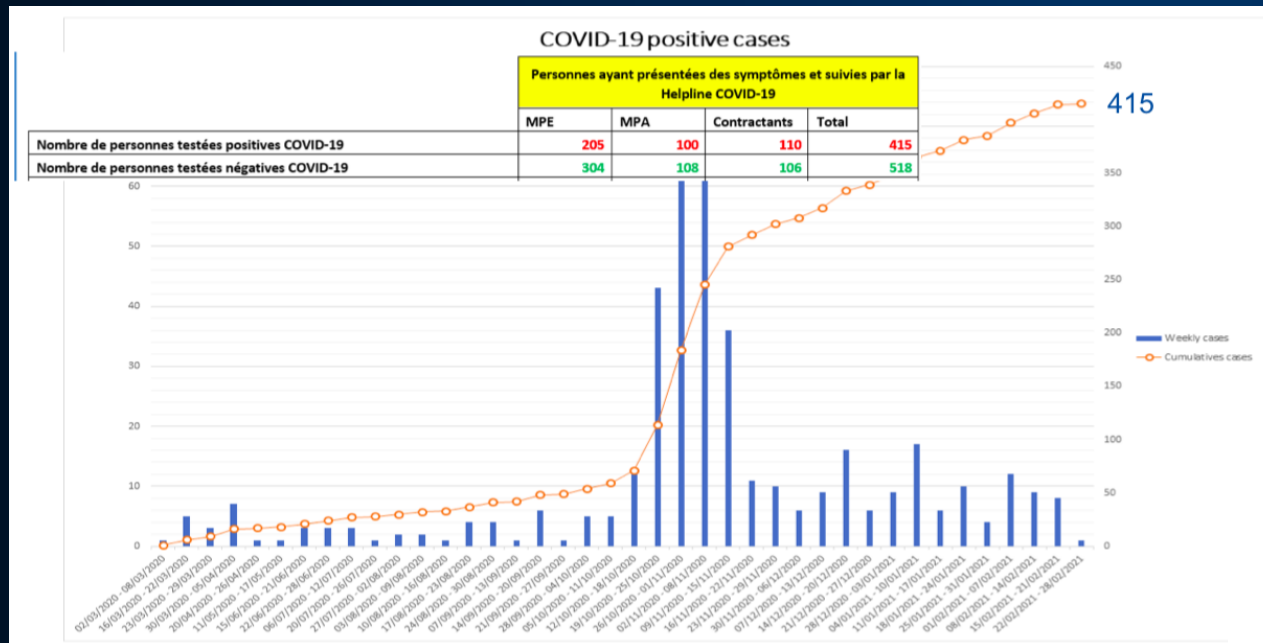


- Mid March 2020: CERN put in safe mode. Within a few days personnel at CERN reduced from ~6500 people to few hundreds
- End of April 2020: resume selected activities with small teams, priority given to time critical activities (e.g. warm up of CMS magnet, NSW construction ATLAS)
- Mid May 2020: controlled ramp up, bring back people activity based, increase people on-site by 1000 every two weeks
- September 2020: lift access restrictions
- Mid October 2020 since today: mandatory telework for all who can, on site presence for others

CERN Covid-19 Health and Safety Measures

Strict rules introduced with the first colleagues resuming work at CERN:

- Distance of >2 m
- Mask in all buildings, except when alone in an office
- Disinfection gels distributed and hand dispensers everywhere
- Additional measures for special activities and vulnerable people
- Access restriction for colleagues aged 65 and above
- Contact tracing of all cases and close contacts



No spread of infection on-site

CERN remained a very safe place!

CERN Covid-19 Health and Safety Measures

Now Covid-19 testing on-site (Antigen and RT-PCR tests):

- personnel on duty travel (staff and users)
- vulnerable people
- stratified testing, e.g. shift personnel

Proximeter:

Device records close contacts, <2 m for >30 sec, Vibration alarm, data stored for 2 weeks, already >3500 devices distributed, mandatory as of March 1st



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Telework mandatory until end of March

- Hostel open for Users (if required on-site)
- Mandatory on-line course (Covid Health and Safety)

Regular updated information at:

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



Help trace COVID-19: act early - self-declare/self-evaluate on [Tramed](#)

Introduction

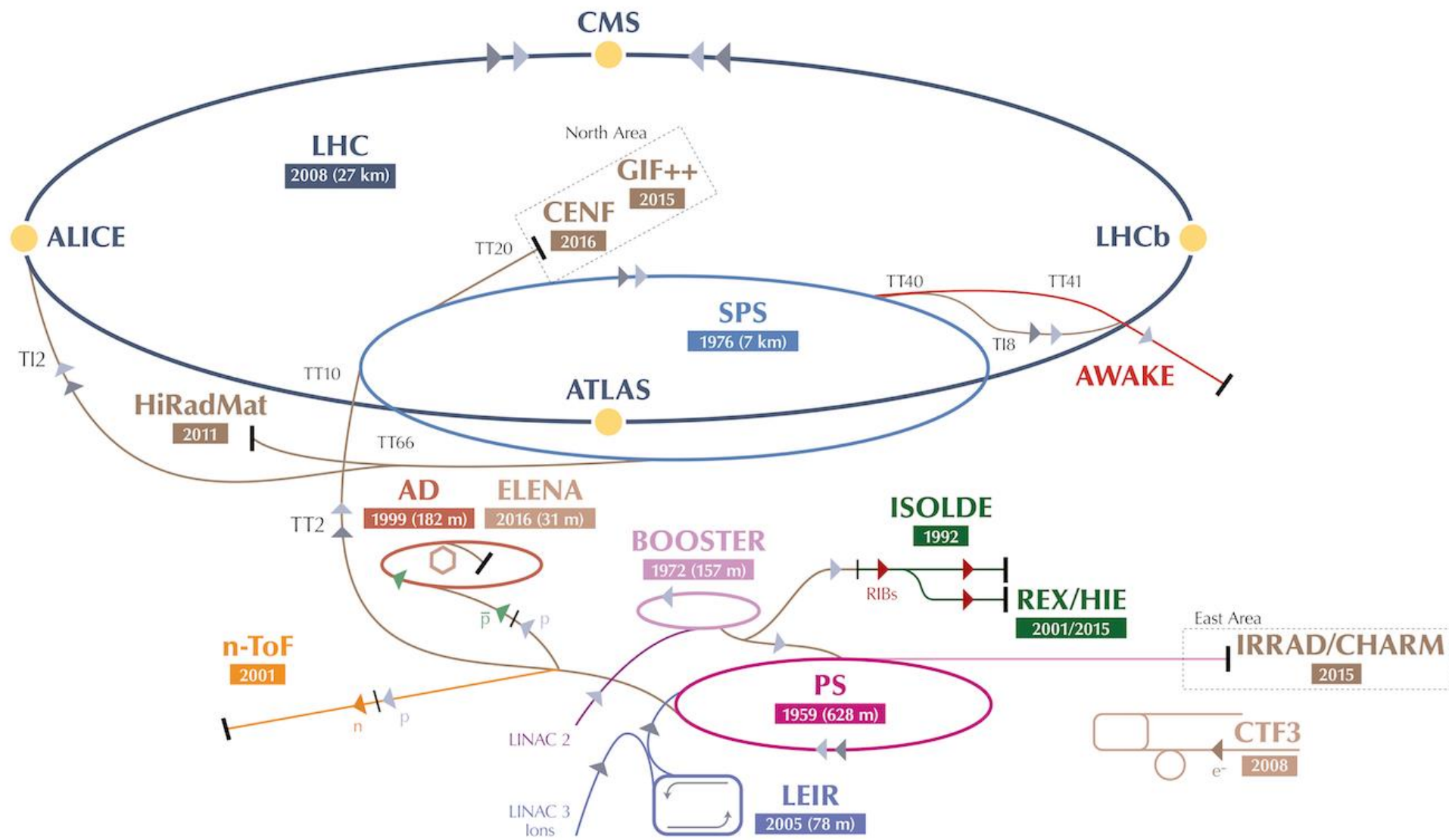
In light of the stricter measures announced by CERN's Host States ([France](#) and [Switzerland](#)) to confront the escalating number of infections in their countries, CERN is adapting its framework for on-site activities and telework. The overarching objective remains to safeguard the health and safety of everybody on the CERN sites while enabling continued effective operation of the Laboratory, as far as feasible.

The return on site of all categories of personnel is supported by COVID-19-specific health and safety measures and recommendations, which are collated and regularly updated on this webpage.



Status of LS2 works and baseline schedule for accelerator operation and experiments

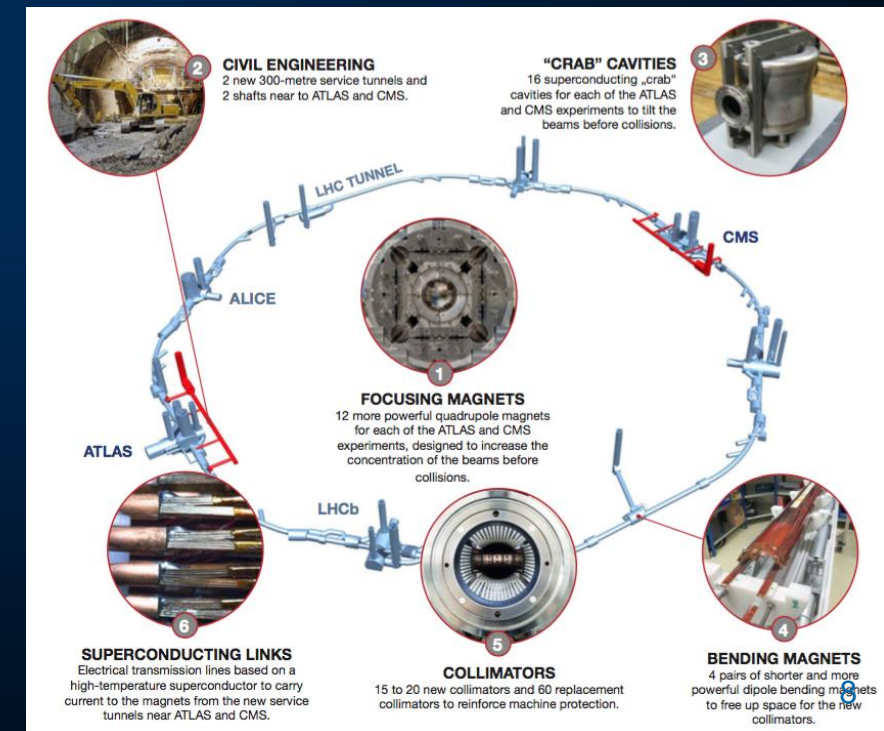
CERN Accelerators



Finishing LS2 – Accelerator Complex

LHC Run 2 ended end of 2018, LS2 activities for the accelerators started in 2015, activities cover all injectors

- LHC Injector Upgrade (LIU) project completed, all consolidations and maintenances on time
- LINAC4: ready to inject beam into the booster, excellent source stability
- Booster-PSB: almost rebuilt during LS2, commissioning started Dec. 7
- PS: Final hardware tests in February, first beam injection March
- SPS: All six reconfigured RF cavities connected to new solid state amplifiers, new beam dump system installed, fire doors and new sprinkler system, beam commissioning will start in April
- LHC: Diode box consolidation completed (1232 dipoles)
19 dipoles exchanged
- HL-LHC activities followed the expected milestones
Civil engineering (2 shafts, 2 x 300 m service tunnel)
Issue with 11T short dipoles under investigation
- ISOLDE: New front end installed, beam instrumentation consolidation, repair of cryomodule CM4 for HIE-ISOLDE
- AD/ELENA: All AD users connected to ELENA, transfer lines commissioning ongoing



2021 Schedule for Injectors and non-LHC Experiments

Experimental facility	2021			2018	2017
	Start Physics	End Physics	Duration [days]	Duration [days]	Duration [days]
ISOLDE	21.06.2021	15.11.2021	147	217	224
SPS North Area p ⁺	12.07.2021	15.11.2021	125	217	168
AD/ELENA	23.08.2021	15.11.2021	84	189	231
nTOF	27.09.2021	15.11.2021	49	224	217
PS East Area	18.10.2021	15.11.2021	26	252	217
SPS North area Pb ions	-	-	0	28	42
AWAKE	-	-	51	91	83
HiRadMat	-	-	21	20	35

Finishing LS2 – LHC Experiments

Major upgrades of ALICE and LHCb during LS2 (Phase 1 upgrades)

ALICE

- New TPC readout, new Silicon Tracker, new readout for almost all detectors, continuous readout, new datacenter
- 3 month contingency wrt. cavern closure

LHCb

- Almost completely new detector (except calorimeter, muon detector), new electronics for all detectors, new data center
- Schedule critical, necessary personnel cannot come to CERN due to Covid crisis

CMS

- Maintenance of all detectors and magnet, new Barrel Pixel layer 1, new GE1/1 GEM chambers, hadron calorimeter upgrade with SiPMs, additional shielding as preparation for HL-LHC

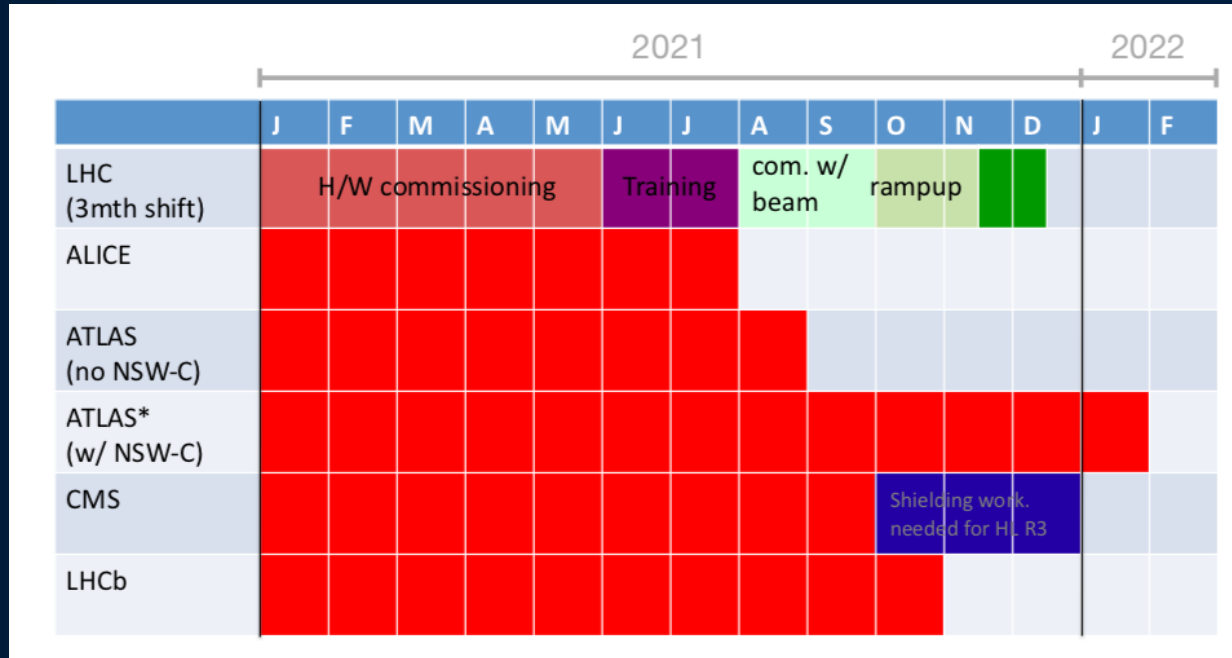
ATLAS

- New Small Wheel: NSW-A completion April/May 2021, NSW-C completion mid-September, very little contingency

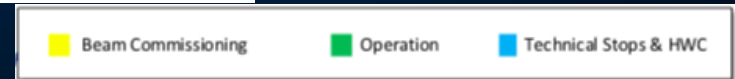
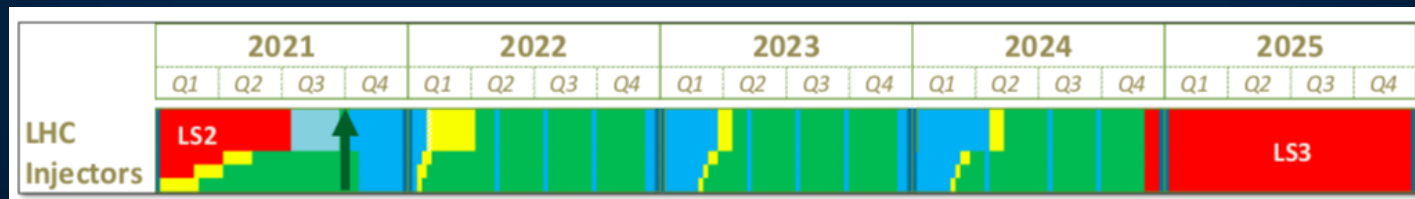
Major upgrades of ATLAS and CMS for HL-LHC in LS3 (Phase 2 upgrades)

LHC Schedule for Run 3

Discussion June 8/ October 23, machines and experiments, assess delays due to Covid crisis



Baseline schedule:



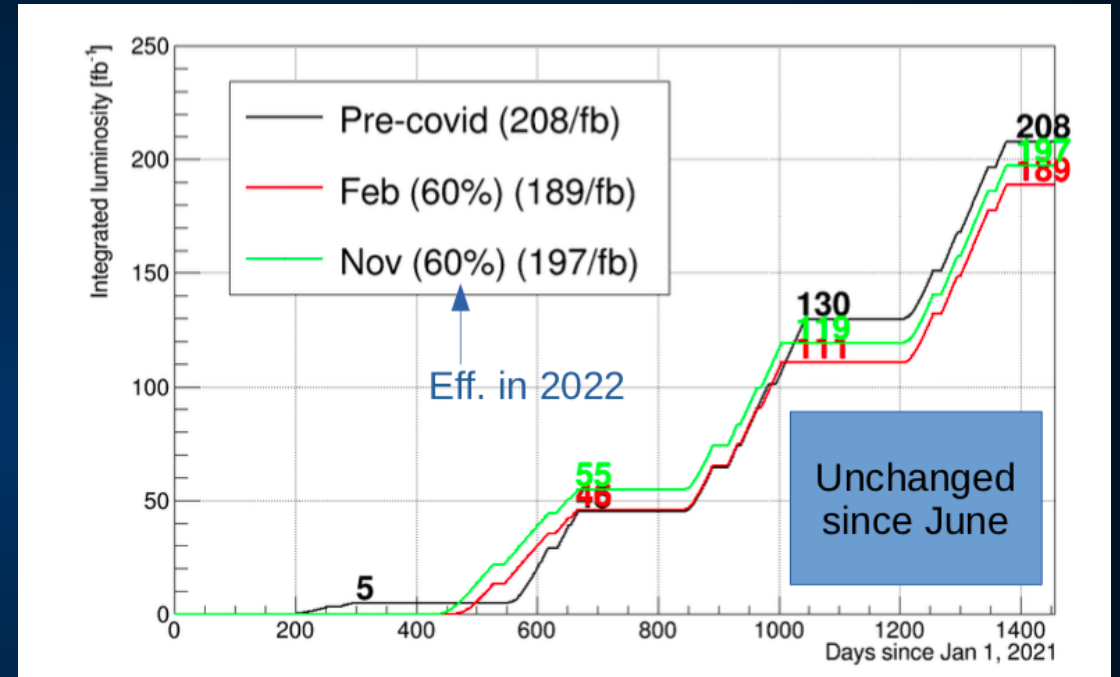
Next meeting to assess the situation March 15, 2021



LHC New Baseline Schedule Run 3

- ATLAS installs both sides of NSW
- CMS installs new shielding on both sides
- ALICE and LHCb complete their phase 1 upgrades
- **Close experimental caverns February 1st, 2022**
- Beam test in weeks 39-40 (Sept. 27 – Oct. 10)
- 11T magnets will not be installed
- Injectors will have YETS starting in week 46
No ion beams for fixed target in 2021

Assumption for integrated luminosity:

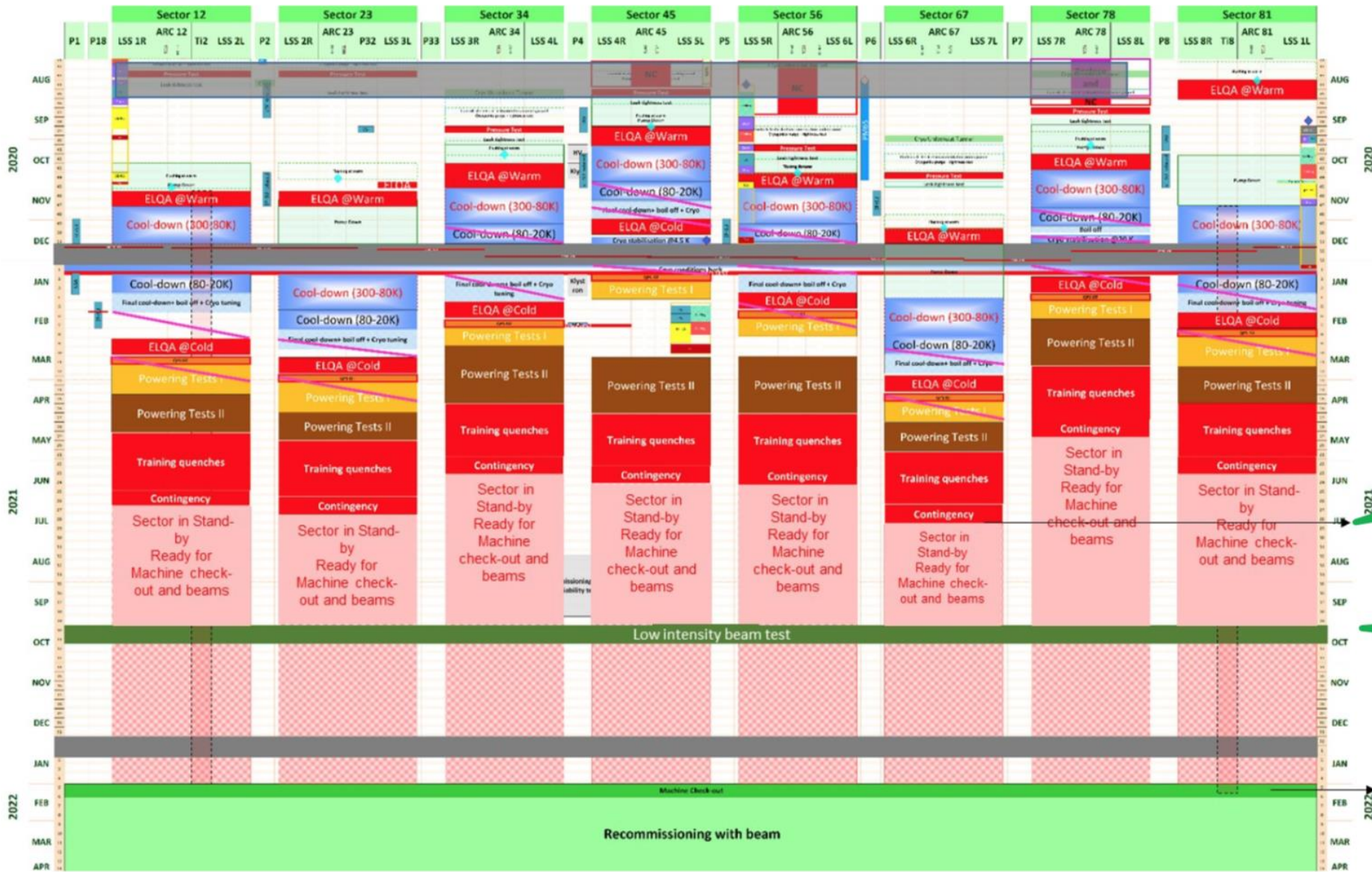


Depends crucially on assumption of efficiency in 2022

Beam energy for run 3: Decide energy after magnet training. If collision energy exceeding 13.5 TeV will be achievable with high availability than that energy will be chosen, otherwise Run 3 will be operated at 13 TeV.

Magnet training with prudence. Avoid too many quenches.

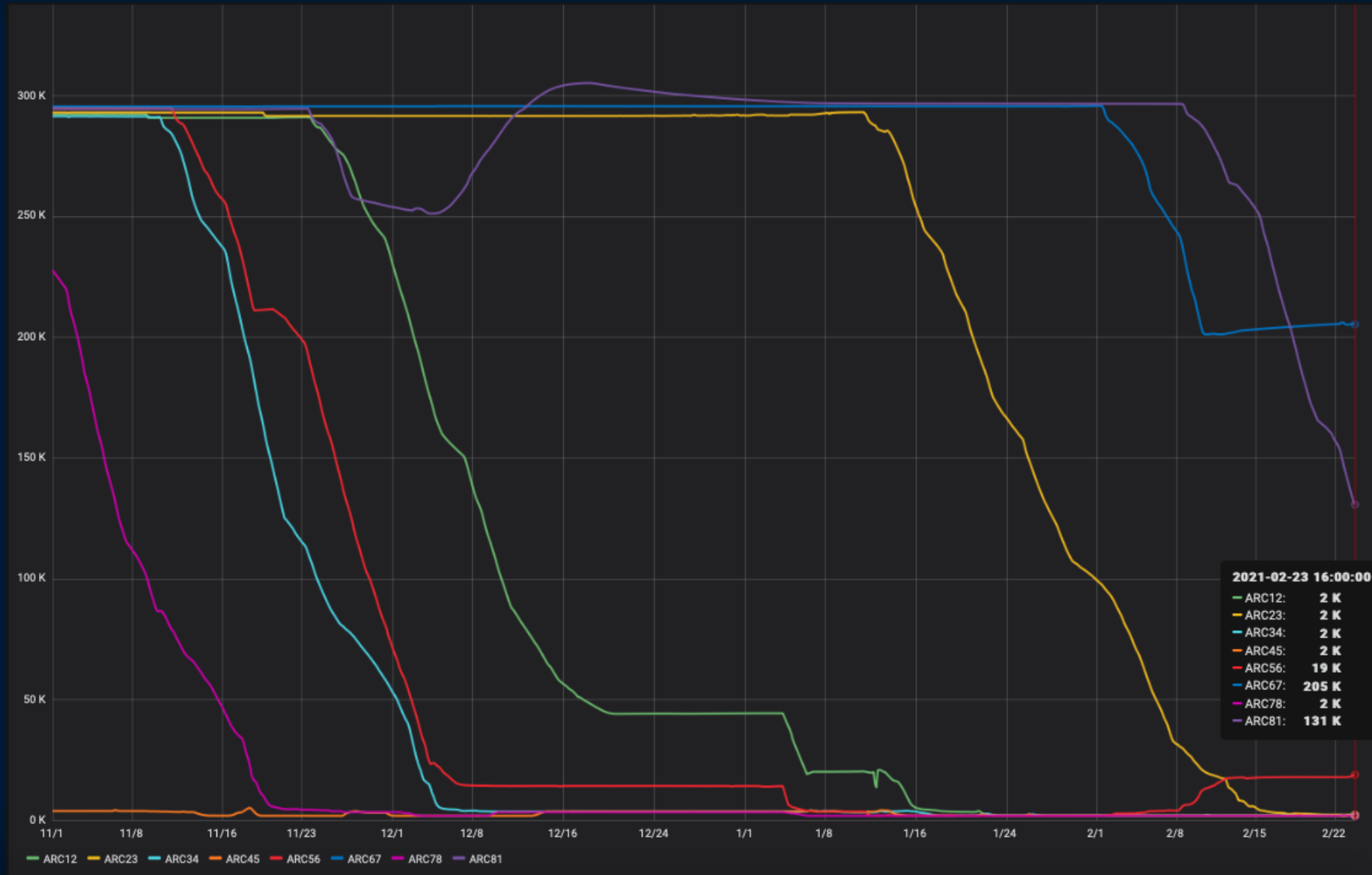
LHC-LS2 Baseline 3.1



End of Magnet Trainings

Low intensity beam test (1 week)

LHC cool down status – all sectors



Implementation of the Update of the European Strategy

European Strategy for Particle Physics (ESPPU) updated at the CERN Council June 2020
2 year process, involvement of PP community worldwide, 20 recommendations

First implementation in the Medium Term Plan (MTP) of CERN
Rolling budget plan for next 5 years (2021-2025)

Main points in respect to the ESPPU:

- Feasibility study for a Future Circular Collider (FCC)
100 km tunnel, technical and financial study
- Reinforced magnet R&D programme
Low- and high temperature superconducting materials
- Continue R&D on key technologies for the Compact Linear Collider (CLIC) and establishment of an international design study for a muon collider
Accelerator studies
- Detector R&D and new quantum technology initiative
- Increased resources for the CERN hosted Physics Beyond Collider study (PBC)
Study to explore possibilities using the non-collider part of the CERN accelerator complex
- Continue investment in long-baseline neutrino experiments in the US and Japan





Thank you for your attention !