

Accelerator Complex Status

End week 2 (Monday 18 January 2021)

Technical Infrastructure (C. Pruneaux):

- A week with increasing number of activities at CERN.
- Statistics:
 - About 7000 alarms
 - 1037 phone calls (662 incoming, 375 outgoing)
 - 156 ODM created
- Events worth mentioning:
 - Tue. 12.01: Trip of QURCA cryogenic plant during turning ON of SEQ8 harmonic filter.
 - Fri. 15.01: Loss of TI operation consoles (ARGOS) during almost 5 hours probably caused by web server error (still under investigations).
 - Sat. 16.01: Fire alarm in RR17 caused by a faulty sensor damaged by water infiltration to be fixed by ATLAS and SMB.
 - Sun. 17.01: High level in "boite à cable" BA5 sump pit. Emergency access and emptying of the pit by firebrigade and SPS CV expert.
- Details: <https://wikis.cern.ch/display/TIOP/2021/01/18/TI+Week+summary%2C+Week+2>

LINAC 4 (J.-B. Lallement):

The ion source gas injection valve was successfully replaced on Monday. The source had a smooth restart and recovered its original performances by Wednesday morning, in time for the beam restart. In parallel the RF team fixed some small issues and did restart all the RF systems. Few problems, that were not or could not be identified earlier, showed up when trying to restart the beam on Wednesday and did not ease to respect the tight planning (vacuum pump to replace in the LBE and vacuum interlocks on L4T valves, chopping pattern to reload, chopper trips...). On Thursday, few measurements and observations taken with beam led to the identification of two blocking issues: A degradation of an RF attenuator of a CCDTL1 pick-up entailed a drift in the cavity working point (amplitude was too high), and a bug was unfortunately introduced in the Time Of Flight routine (knowing that a working ToF was mandatory to find the new CCDTL1 working point...). In the end, the machine settings were validated on Thursday evening, and the beam was ready for the PSB restart on Friday morning.

During the weekend, the source showed instabilities and had to be tuned by ABP experts. An RF colleague came on site on Sunday morning to replace a faulty chopper pulser. These two issues had no impact as the PSB booster was in standby.

PS Booster (Bettina Mikulec):

We restarted the PSB beam commissioning on Friday with 1 day of delay with respect to the (very optimistic!) schedule, which had foreseen 1 day of restart with beam for Linac4. Due to the Linac4 CCDTL1 and TOF BPM FESA class issues, Linac4 required 2 days for the restart.

- Once Linac4 was ready Friday morning, beam was sent to the PSB and the remaining interlocks could be cleared. By the end of the day the following achievements could be made:
 - **All the 4 rings in the PSB with beam circulating at 160 MeV.** The issue from December with the BCT in Ring1 triggering the watchdog was solved.
 - Energy matching with the PSB repeated after the CCDTL1 changes; some small mismatch between calculations and calibration curves remains to be understood.

- PSB injection setup: **injection oscillations observed in December could nicely be improved by increasing the strength of the BSW1s (+1.5%) and reducing it for the BSW2/3/4s (-3%).** The injection of all 4 rings was optimised with the new currents of the injection chicane.
- **A possible polarity inversion has been identified in the painting kicker KSW1L4** (injection oscillations get smaller when reducing the current); **an access is being organised for beginning of the week.**
- A preliminary check on the orbit showed that the **magnet alignment performed last week helped reducing the rms orbit by the expected amount.**
- **RF commissioning ongoing on ring 3.**
- For the tune control, a coefficient was introduced to correct the magnetic length to compensate for the discrepancy between programmed and measured tune.
- New turn-by-turn optics tool tested.
- Saturday night another reliability run took place for the extraction kicker to test the failure rate when pulsing immediately after injection (necessary to use the new matching monitor); unfortunately a couple of failures were still present.
- In the night from Saturday to Sunday the Linac4 source got unstable and the pulser on chopper 2 broke down. Thanks to the interventions of Linac4 source and chopper specialists Sunday morning, beam commissioning activities could continue on Sunday.
- Improved version of the Cruise Control application released. New SIS version released. All SIS ring injection permits have been tested and are operational.

PS (K. Hanke):

- Last week high voltage test on the PS Main Units were done.
 - The tests have to be repeated Tuesday 19 January
 - Due to the high risk the PSR will be patrolled and access is CLOSED (SWY in BEAM).
 - After the test, SWY remains in BEAM whereas the PSR will be switched in Access RESTRICTED.
- Work on the magnet covers is completed.
- MSC have still confirmed a leak current, which does NOT come from the outside (cable passage via the green area outside) but somewhere else, investigations will continue this week.

SPS:

Hardware commissioning has resumed and all dipoles have been pulsing with operational cycles.

ISOLDE:

No report, as water cooling will be switched back on 8 February after which re-commissioning will start.

ELENA:

Preparatory work done for the new LN51 line to the potential PUIMA experimental zone, requiring dismantling part of the shielding for which the beam permit was suspended. The beam permit was resumed on Friday.

LINAC 3 (G. Bellodi):

Following a discussion last Monday on the beam measurements done before Christmas, it was decided to keep the source moveable puller in place for the time being, for possible additional investigations in the future.

On Tuesday OP carried out magnet polarity checks. One corrector (ITL.DVT02) was identified as not following the convention (a possible exchange will be discussed). Six correctors could not be accessed – to be checked in the future.

RF and controls are following up on some LLRF front end faults.

The new aluminum coated plasma chamber was installed last Wednesday. In oven 1 a crucible with beak filled with fresh lead was installed. In parallel a leaking valve on the turbo-pump on the extraction side and a damaged Penning gauge on the injection side were replaced. The source was closed on Thursday and put under vacuum. According to planning, plasma will be restarted this (Monday) afternoon and a first usable beam should be available in 7-10 days.

The new elogbook version was deployed last Friday.

[LHC \(J. Wenninger\):](#)

Mostly access to the machine in 7/8 points. Sector 81 repair completed.

First successful powering prototype tests in sector 45 on Friday.

Only sectors 67 and 81 are still at room temperature.

For this week phase 1 powering test will start, first in S45.