

# Accelerator Complex Status

## End week 13 (Tuesday 3 April 2018)

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### TI (Jesper Nielsen)

The main topics were:

Details: <https://wikis.cern.ch/display/TIOP/2018/03/26/TI+Summary+Week+13>

### LINAC2 (Francesco Di Lorenzo):

Availability of 99.5 % due to a problem with a several vacuum interlocks on the Tank1, that has stopped the RF, on Tuesday at 12 o'clock, Thursday around 5 o'clock in the morning, Friday at 1 o'clock in the afternoon that has stopped the Linac2 for 1 hour and 30 minutes , and on Sunday in the afternoon around 5 o'clock. These vacuum fault have been solved by the operator with the reset.

### LINAC3 (Francesco Di Lorenzo):

- On Tuesday the ovens on the source have been refilled by Detlef .
- On Wednesday in the morning the BI Group has installed the SEM grids (the new one in ITL and old one on the ITM , the one which was there before). In the afternoon they started with the vacuum pumping.
- On Thursday morning (Nicolas Thaus) , started the leak detection on both SEM grids, no leaks found , but with difficulties with the ITM ion pump, the pressure first dropped and then raised quickly (not understood), but it is stable now.

In the afternoon the RF has been switched on by Cristiano Gagliardi and Giampaolo Piccinini. During the restarting they found a security switch with a bad contact on the door of the of the high voltage for the final tube amplifier of the Tank2 , and they found a direction coupler for the (RF breakdown) damaged that Giampaolo has changed. The RF has been on during the Easter.

### PSB (Bettina Mikulec):

For the PSB, the main activity this week was centered on the BTY line steering and ISOLDE Semgrid tests. The beam permit of ISOLDE was signed Monday afternoon, after which BTY.BVT101 could be locked in. Unfortunately we couldn't send any beam down the line due to a FALSE External condition of this EIS. After investigations it was found that a cable was cut by mistake, and also a spare cable of BE.SMH15L1 (that was proposed to be used instead as quick fix). Finally on Tuesday BE-CO found the location of the cut cable and could repair it. As follow-ups, EN-EL will investigate the reason for these 2 wrongly cut cables and BE-OP will work on a procedure to enable testing EIS during HW commissioning. Tuesday evening/night steering was done to the HRS Semgrid target. On Wednesday the ISOLDE team informed us that the vertical beam distribution was too wide, in particular for the converter optics. Therefore the optics were modified (experimentally), after which the Semgrid target measurements and adjustments had to be redone. It is indeed **important that we obtain an optics model for the BTY line this year** (BE-ABP). In the afternoon the

Semgrid target was exchanged to GPS and during the night the steering and reference measurements performed for GPS.

### **PS (Ana Guerrero):**

The week was busy preparing beams, LHC25 72 bunches for SPS scrubbing, then EAST and AD beams too.

The beam permit was signed for nTOF and EAST area on Thursday and beams were already sent as requested. The steering towards Irrad was done during the week-end. Some radiation alarms were generated during this set-up.

On Friday the probe beam was sent to LHC as foreseen.

Two main beam stops during the week. On Tuesday morning an access was organized for an amplifier exchange on 10MHz cavity C96. Several other interventions were done in the shadow. Repair of relay gap of C81, work on the 40 and 80 MHz cavity power supplies, inspection of BLM135 cable, FEC reboots, SHM16 power supply. The stop lasted 2h40m.

On Friday a problem of F16.QFO165 stopped beams sent to TT2 for 1h45min (Intervention from PIPO and the expert)

On Saturday a power glitch brought down all cavities in the PS.

### **SPS (Hannes Bartosik)**

The SPS beam commissioning is progressing well. After the DSO test on Monday, the slow extraction has been setup on the SFTPRO cycle with low intensity beam.

Abnormally high losses at the ZS extraction septa encountered in the beginning of the week could be traced back to a faulty BLM card. The card has been replaced and ZS alignment scans were performed for minimising losses during extraction.

Everything is ready for steering the transfer lines to the targets next week.

The LHC pilot cycle and the LHCindiv cycle with the long injection plateau have been setup including extraction. First beam was injected into the LHC on Friday morning, ahead of schedule. Over the weekend issues were encountered with the WIC causing frequent trips of the transfer line magnets and LHC injection septum. The expert thinks that the source of the problem is linked to the Profibus repeater in Point 2. This needs to be sorted out next week. On Saturday the beam was not available for about an hour due to a low level RF problem. It seems a spurious pulse stop signal from the main power supply was triggering a local LLRF veto. Another curious fault occurred on Sunday. Various BI equipment lost subscription to the SIS, which in the end was found to be caused by the post mortem server that crashed because of a full hard disc. It took about 3 hours until the beam was back.

The setting up of the 25 ns LHC beams is on track. Golden trajectories in TT10 and a golden orbit have been established (this year corrections during the run will be done towards the golden references). The 800 MHz RF as well as the one turn delay feedback and the feed forward on the 200 MHz RF have been setup. The transverse damper is also adjusted. Up to 4 batches of the nominal 25 ns beam could be injected on the LHC25ns cycle and up to 3 batches were accelerated to flat top

during the weekend for scrubbing. The new diffuser installed in 216 (for testing the shadowing of the ZS during slow extraction) still needs further conditioning.

### **LHC (Jorg Wenninger):**

Thanks to a special effort by CMS, the machine could be closed and the vacuum valves opened already Monday evening. The beam permit loop and the LBDS were armed for the first time shortly after, all BIS and LBDS checks without beam could be completed during the same evening. Tuesday evening beams were brought down to the TI2/8 downstream TEDs, the synchronization of the MKIs could be checked. Wednesday and Thursday checkout interleaved with daytime access continued. Friday morning both beams were injected and circulated by midday. All essential instruments were available and well tuned within less than 2 hours. The RF was setup, the corrections were minor. Overnight kick response in TI2 and TI8. Saturday morning the TCPs were aligned and a new automated alignment algorithm (loss psike recognition) was tested. A nominal bunch was injected into B2 and the RF loop gains adusted (B1 not available from SPS). The first PPLP ramp in 2018 was performed in the early afternoon, directly followed by the vdm ramp. The chromaticity was measured in the ramp overnight. Most of Easter Sunday was devoted to the ADT setup (nominal & up to 10 probes), interupted by SPS controls / PM and cryo T sensor issues. The reference orbit was defined for a nominal bunch, and a first ramp was made with crossing, separation and ip angle bumps.