

## Accelerator complex status

### End week 28 (Sunday 24<sup>th</sup> July 2016)

#### TI (Ronan Ledru)

Here's the TI summary of the week:

<https://wikis.cern.ch/display/TIOP/2016/07/23/TI+summary+week+29%2C+2016>

#### AD (Lajos Bojtar)

- Wednesday night intervention, due to unstable beam. It was due to a power supply, which was cycling between standby and on.
- Thursday morning AEGIS ramped up their 5T solenoid, which effected the beam in all extraction lines. Re-steering ALPHA, ASQUA, ATRAP and AEGIS at some time during the week.
- Two times during the week the extracted beam became unstable. It turned out, the ejection kicker timing drifted, probably due to outside temperature changes. It was compensated by changing the kicker timing.
- Sunday morning intervention due to frequent beam losses after the injection flattop. By the time I arrived the beam was stable again, but it is likely that the C02 cavity has a problem, it doesn't drop, but at some cycles it gives no voltage. I saw this problem already earlier, it comes and goes.

#### Booster (Alan Findlay)

Another good week for the PSB, we're enjoying the summer season!

Only one real issue to report this week, as after the L2 source intervention on Wednesday afternoon, we noted that the beam was no longer kicked out of the machine for the PS or PSB MD beams, but was still extracted correctly for ISOLDE. Thankfully Bettina suggested checking the BIS, and Nicolas could see that the status for BHZ10 was not correct, so he switched it off again, reset it and all returned to normal. We did lose about 1H15 for this, however.

There was the regular MD program but otherwise it was business as usual.

#### PS (Guido Sterbini)

It was a good week for the PS with only minor hardware problems that could be solved with the help and the fast intervention of the piquet teams.

On Monday afternoon POPS tripped. The system went down for 1 h due to a too conservative setting of one alert threshold. The specialist reset and re-adjust it to avoid similar hiccups in future. Wednesday was dominated by the activities related to the RP MD. The goal was to assess the machine radiation level in presence of a high proton flux on the extraction region ( $1000e10$  p/s). Unfortunately the MD was hampered by several faults and interventions and could not be completed (change of the thyratrons on BFA9 and KFA21, intervention on Linac2, problem with the

h8 beam control, problem with the BIS of the PSB, fire brigade intervention in B151 due to a smoke detection). Operational beams were back at 20h30.  
The rest of the week was very calm with no major downtime.

The ion lifetime is measured during each shift as agreed: no degradation is visible at the moment. As requested, last week the BCMS beam was sent to LHC without emittance blow-up. All other operational beams are regularly delivered.

## SPS (Verena Kain)

Week 29 was another very good week for the SPS with more than 90 % availability for fixed target.

With the QS instead of the QF converter the noise spectrum of the slow extracted spill changed. Frequencies of either 10 Hz or  $\sim 30$  Hz are now occasionally present. We noticed that 10/30 Hz lines completely disappeared on the weekend.

The main source of downtime this week was a transformer trip in BA3 and its consequences on cooling and ventilation which took roughly 8 h to recover from.

The issue of the TIDVG dumped intensity spurious SIS trigger is understood and is linked to the multiple publication of the time of beam dump during a cycle. A fix has been prepared by ABT as well as by us within SIS. ABT will only be able to deploy during a 45 min beam stop.

With the blow-up in the PS switched off, the emittances of the LHC BCMS beams are 1.3  $\mu\text{m}$  in V and 1.7 in H. Leading to a new record luminosity of  $1.2 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$  in the LHC. Since Wednesday after the dedicated MD the bunch spacing is 250 ns. The re-validation of the 225 ns started on Friday but needs another session together with the PS as the PS extraction kicker does not seem to be perfectly adjusted and the analysis of the effect of the SPS injection kicker is then not straightforward. The switches have however been adjusted again in BA1. Switch 7 (MKP4) had to be moved by 20 ns.

Over the weekend the LHC has started to fill first beam 1 and then beam 2 to mitigate the issue with electron cloud and vacuum at MKI8. Beam 1 is injected with the nominal bunch intensity ( $1.2 \times 10^{11}$ ). To reduce the intensity slightly for beam 2, the scraping is increased to 6 %. The vacuum limitation came with the batch spacing reduction.

A 24h UA9 run took place on Tuesday followed by an MD to prepare a future MD on crystal enhanced slow extraction. The UA9 run as well as the MD were very successful. Note that the LHC transfer line TI 8 needs to be switched off during COAST. The created field from the line magnets at minimum current perturbs the coasting beam.

## LEIR (Steen Jensen)

### Tuesday, July 19th 2016

- 13h56, ½h - ER.QFN2344 and ER.QFT23 down again. C. Mutin changed auxiliary contacts => OK.
- 17h06, ½h – Problem with function generators for the transverse feedback, no connection to the FEC. Solved by J. Betz (CGAFG expert)
- Further progress on new LLRF, in particular integration, samplers and alignment of the accelerating voltage in the 2 cavities.
- Activities: LLRF commissioning, impedance and e-cooler > 400mA

### Wednesday

- No issues.
- Activities: YASP@extraction lines, LLRF, Impedance and e-cooler > 400 mA

### Thursday

- No issues
- Activities: LLRF commissioning, dedicated LN3 MD in the morning, LLRF, Resonance exploration with IPM and e-cooler > 400 mA

### Friday

- 11h03 - Jitter problem in OASIS multi-trigger system. Solved by A. Radeva (OASIS expert) by changing a certain signal from being TTL\_BAR to being TTL.
- 14h30, 15m - E-cooler problem with gun cathode filament heating. Short access by G. Tranquille to increase limit. Gerard will investigate further on Monday during the LN3 oven refill.
- 17h04, ½h – Both RF cavities (CRF41 & CRF43) tripped, and subsequently unable to restart. Solved by Matthias, who changed the medium power supply for CRF41, and verified also CRF43.
- Activities: LLRF commissioning, Resonance exploration with IPM, e-cooler > 400 mA

### Saturday

- Nothing to report

### Sunday

- Nothing to report

### Monday

- LN3 oven refill
- E-cooler filament inspection by G. Tranquille