

End Week 16 (April 25th 2011) – Status of Accelerators

LINAC 2

No major problems reported.

Booster (Giovanni Rumolo)

This has been a good week at the PSB:

The instabilities of Ring 1, which affected the Booster for several days before suddenly disappearing already last week, haven't come back. Now we can accelerate up to $3700e10$ p in the PSB and we are ready to give beam to ISOLDE. However, Ring 1 keeps underperforming, as it has higher capture losses and can deliver $850e10$ p in a stable way, i.e. ~10-15% lower than the almost 1000 that can be accelerated in the other three rings. We will keep investigating on that.

On Tuesday/Wednesday some problems appeared when loading back archives for the LHC50 double batch beam requested by the SPS, because the timing of the MPS GFAs has changed according to the new InCA rules, while the settings in the archives still contained the old values.

Over the next couple of days all the functioning archives were updated to correct for this.

Since Thursday the 75ns beam has been archived and the user LHC_B has been devoted to the LHC operational beam with 12 bunches at PS extraction, routinely used for the first injection into LHC (at the PSB, it is just like LHC_A, but with the RF off in rings 2 and 4) On Friday morning, losses happened on some TOF shots with a certain frequency and could be avoided by decreasing the attenuation of the feedback system, which was found set at an unusually high value.

Several adjustments were applied to the LHC beams in the last few days to deliver beams to LHC with more equalized intensities and transverse emittances across trains of bunches.

However, as a general consideration beside the summary of the week, please note that not all the bunch-to-bunch differences observed in LHC can be tracked back to the different Booster rings, as many plots in the LHC logbook seem to suggest. Furthermore, differences of 10-20% in transverse emittances can be quite difficult to detect at the PSB level, as measurements with different instruments (or even with the wire scanners but with different wire speeds, for instance) already produce values within these spreads.

PS (Alexej Grudiev)

Week of smooth running. Steady providing beams for LHC: LHC50ns 36 and 12 bunches. Two different users: LHC and MD5 for 36 and 12 bunches, respectively, are used in the same super-cycle to speed up the switching from one to another. TOF and CNGS operation continued at nominal intensities. AD beam provided during working hours for AD setting up.

Still some issues to report:

Tuesday morning 2.5 hours beam stop in PS for intervention on the SEH23. Cable was exchanged.

Tuesday morning 1 hour Beam stop in PS in agreement with SPS/LHC for deconsignation

F61.STP01/02. The same day in the evening 0.5 hour s beam stop in PS for gap relay exchange on C36.

Sunday morning at 6:30 we've had a small glitch. All machine have lost parts of their RF. The PS MPS tripped as well. PS: MPS, C86, C96. Everything was back in 10 minutes after a reset.

Monday morning there was a series of bad pulsing of the DFA kicker for CT extraction to CNGS. Typically couple of resets were necessary to get back to nominal operation.

SPS (Django Manglunki)

A good week for the SPS which continued with CNGS production and the 50nsec beam for LHC physics.

Since the CNGS target temperature threshold was increased to 80 degrees on Thursday morning, allowing to run for longer times, the production rate has increased to above 4E17pot/day and the watermark of 1E19pot has been reached during this Easter week-end.

On Tuesday E.Carlier gained another 15ns on the rise time of the MKP.

During the night from Tuesday to Wednesday a BIC intelock was created by the breakdown of frontends (cfv-ba6-cibtt60 and cfv-ba6-cibext1) power supply.

On Wednesday and Thursday, in order to adapt to new values after RF changes in the PS, the SPS MMI settings of Injection Bucket Selector and Injection Pulses have been modified on the 75ns, 50ns and 25ns beams for the LHC.

Since Thursday evening the 12 and 36 bunches beams are produced using two different users in the PS complex; the new beams, BCD and sequences have been created accordingly.

On Sunday, the low level RF piquet was called to retune the 800MHz freerunning frequency which had drifted due to temperature, and in the night a trip of TRX7 needed the RF power piquet intervention.

LHC

Completely brilliant. Peak lumi up to $5e32 \text{ cm}^{-2}\text{s}^{-1}$ with 480 bunches. 107 pb^{-1} accumulated in a week.

<http://lhc-commissioning.web.cern.ch/lhc-commissioning/>