

End Week 35 (September 6th 2010) – Status of Accelerators

Linacs (F. Gerigk)

Linac2:

Monday/Tuesday installation of pepper pot device in LT line went well, Linac2 was back on Tuesday early evening, tests on the device are ongoing, other than that a quiet week.

Linac3:

Nothing to report.

PS Booster (J. Tan)

Tuesday 31st

End of technical stop: At 6:30PM the start-up has been delayed by a few magnet problems which needed a local intervention. Water flow interlock for some multipoles, MPS grounded, Trim, QFO +QDE have been reset locally by the operator. The PIPO helped also to reset BTP.DHZ10 and BTP.QNO30. At last the beam was back at 8PM.

Wednesday 1st

MD day. In the morning there was a PS access : no beam for all users for 30mn. In the afternoon, Isolde was affected by the same erratic beam losses at extraction , as the week before. It was spotted that these losses were linked to one period shift of the revolution train, although the RF loops were looking fine. Isolde has lost 3hours of physics. The PICO and our LLRF expert worked together on this issue for 2 days.

Thursday 2nd

Finally the problem came from the distribution BAX.TREV (in the BCER rack 369, Fan out unit) which was split by a "Y" Lemo connector. One cable was correctly terminated by 50Ohm, the other one was not matched. The solution consisted in giving a dedicated channel of the fan out per cable, with proper impedance matching. The beam had to be cut for all users during 5mn for this operation. At 11:10 the C16 cavity of ring 4 went on fault. The equipment specialist was called and could fix the problem in 35mn. In the afternoon, it was not possible to change the light filters of the FWS for couple of hours. It was operational after the intervention of the equipment specialist. At 7:15PM, the BI1.DIS was in fault. After intervention of the equipment specialist who changed a thyatron, the device was working again. Down time : 1h30.

Friday 3rd

Alan found that the C16 cavity voltage of ring 4 was limited to 1.6kV instead of 6kV. The equipment specialist went in the RF cage and replaced a module. But in the afternoon, they discovered a problem with the C16 on R4, where it will not produce more than 1.5kV before it drops out (no detail available yet). The LHC asked for a beam for 150ns bunch spacing and large (2.8 rms) transverse emittances. During the preparation, we could not use the SEM grid as half part of two

screens were out of order. The wire of the FWS ring4 is also suspected to be broken (fault description : wire resistance too high). Anyway we managed to produce a flat beam $E^*h/v(1s) = 5.6/0.9$, and the PS crew was asked to perform an emittance exchange with their skew quad.

Sunday 5th

In the morning, the beam was cut for 25mn for a PS access.

Monday 6th

At 5:20AM, there was a problem which affected only the CNGS beam during extraction. It seemed to be due to a synchronization issue from the PS, although there was no specific action at that time. Things went well after 20mn without really understanding the problem.

ISOLDE (E. Piselli)

HRS:

Beam to REX till Saturday without any major problem.

Stable beam to CRIS experiment from Saturday morning when I have been called in because users could not open a vacuum valve through PVSS. After sometime and after having verified the vacuum before and after that valve I have decided to open it manually. In the evening I have been called in because of a control problem. Many devices were not responding showing "No IP connection..." error. I have called CO piquet who has contacted D. Calcoen. Connecting from home, he found that the network on the PLS controlling these devices was unstable. Fortunately after a while we got all working again... many thanks. Nevertheless users told me they had this problem on Sunday as well...but they have managed to work.

GPS:

On Thursday BI experts has changed faraday cup GPS.FC490. In the same day we were suppose to change the extraction electrode tip...but GPS robot didn't start up. After a consultation with the company which has built it in the late evening Richard Catherall was able to restart it.

On Friday we finally change the extraction electrode tip.

Beam to users from the same day in the late afternoon. They are still running without any major problem.

PS (A. Grudiev)

Monday, Tuesday: 48 hours technical stop was finished as planned and after quick restart (several power supplies have been restarted manually by PIPO (PI.BSM44) and one vacuum valve in TT2 (F16.VVS10) had to be opened by PS operators) all beams for EAST zone, TOF and AD were back in operation between 20:00 and 21:00.

Wednesday, Thursday LHCINDIV for UA9 in SPS and if possible beams for physics. in the PS. On Wednesday one hour beam stop for C56 10 MHz cavity amplifier repair from 10:08-11:11 amplifier.

Friday: sending LHC beams with different bunch separation for MD in SPS: LHC25, LHC50, LHC75(which 150 ns beam) LHCINDIV. Also setting up 150 ns beam since unexpectedly the

transverse emittance blow up is to be done not in SPS but before. No solution has been found on Friday Since for different beam instrumentation items were not working (tune measurement, SEMwires in TT2) or were giving unreliable measurements (FWS in PS shows up to 2 times lower emittance than in PSB on LHC75).

Saturday LHS75(150ns) setting up continued and some setting were found to blow up transverse emittance in PS. It has been measured $\epsilon_{h\sim ev} \sim 2.3$ (Almost what is required) on the high energy flat-top in the SPS using their FWS.

Also 1.5 hour no beams from 21:26 to 22:58 due to problem on Cooling Station in Central building: PFW , cavities, dumps et other equipment localized in b.359 were down.

Sunday Setting up LHC75(150ns) continued since Transverse emittance blow up was not sufficient: new setting were found in the PS: Emittance measurement is done in the SPS after scraping: blow up from $E_h = 1.6$ $E_v = 1.4$ up to: $E_h = 2.5$ $E_v = 2.6$

Also 1 hour beam stop was necessary to exchange gap-relay on C10-66 from 11:10 to 12:20.

LEIR (S. Pasinelli)

Calm week and without main issues. Beams send to PS on request.

- 1) For several weeks, we have had a problem with the control of the GAIN on a semgrid. This problem of GAIN prevents us to measure the emittance of the beam which is sent to the PS. To repair the semgrid, it is necessary to make an access in the PS because it is in the line of transfer ETL. An intervention was requested from the beginning of August, but was delayed to the technical stop. Unfortunately, the intervention did not take place, because the specialists were not informed of the technical stop! A new request for access will be ask at the FOM.
- 2) Problem controls during acquisition on a loop 1553. (not solved)

AD (P. Belochitskii)

It was another good week for AD.

We had some repairs and intervention during technical stop.

We worked at low energy beam transport to focus beam at the ASACUSA detector after dogleg. This was done both with single and 6 bunch extraction mode.

PS came back with excellent intensity after stop and we had a year record with 4 E7 in ejection line. Minimal downtime, mainly due to PS.

SPS (E. Metral)

As foreseen, the first two days of the week were devoted to the technical stop, the following two days to the UA9 experiment, and the day after to a parallel (with LHC) MD on electron cloud with newly installed coated magnets. Indeed, 3 new carbon-coated MBB magnets have been installed in the machine in positions 51470, 51490 and 51530. A fourth MBB magnet, without carbon coating,

was moved from position 51490 to position 51550. Beam-based measurements were performed afterwards to check the horizontal orbit at top energy and it was decided to remove some shims of the magnet MBB.51470, which was too strong by $\sim 0.28\%$ (the too long magnetic length was converted to a mechanical length to be removed). Note that during the stop, 2 water leaks were indentified on the MBA magnets 10570 and 10650, which will necessitate the exchange of these two magnets, either during the next technical stop in week 44 or during the shutdown 2010-2011. Finally, a follow-up of the radiation in TT10 at the position 102459 was performed and revealed ~ 9.3 mSv/h at the wall side and ~ 2.3 mSv/h at the passage side.

On Thursday afternoon some DSO tests had to be done in BA7, which cut the beam for UA9, and a LHC beam was then sent to TI2/8 TEDs to check the trajectories (and in particular the horizontal one after the SPS magnets change), which looked fine. The extraction did basically not change (no trims done), but there were some changes in TI2/8 in horizontal at the top of the lines. UA9 was stopped during several hours but the studies could be resumed around 20:00 and continued until Friday 08:00 as foreseen.

On Saturday morning the SFTPRO and CNGS beams could be delivered just before 08:00 as no major orbit effect was observed due to the SPS magnets change.

The week-end was devoted to the setting-up of the multi-batch 150ns beam on LHC3 and the continuation of steering studies with the MTE beam in TT2/TT10.

TI (P. Sollander)

- Thursday 2/9: UPS problem in UJ76. Not the same type of problem seen the week before. This time it was an internal communication problem between UPS and EN/EL front-end computer. Intervention by EN/EL solved the problem.
- Saturday 4/9: PS stopped for approximately an hour and a half due to a cooling problem. Intervention by EN/CV.

Otherwise, busy week for TI with all interventions during the technical stop.

LHC (G. Arduini)

Full details under "coordination" at

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