

## End Week 17 (May 1st 2011) – Status of Accelerators

### ISOLDE (Emiliano Piselli)

GPS: On Tuesday we put semgrid target on the front end and on Wednesday morning, after BTY line tuning done from PSB crew, we did semgrid test.

Separator stable beam tuning done on Friday.

HRS: On Wednesday semgrid target onto front end and semgrid test done in late afternoon. Some small tuning was done on Friday afternoon with stable beam.

Regarding semgrid tests: we have recorded beam position on the semgrid target and on the fix semgrid with different intensities and we're writing two documents (HRS + GPS) to publish soon on EDMS as reference for this year.

### TI (Peter Sollander)

- **Sunday, 24/4:** Electrical perturbation, 20% dip on 2 phases of EDF 400kV line for 60ms stop the machines at 06:22. No damage, but it takes most of the day to restart LHC.
- **Tuesday, 26/4:** SPS stopped for 31 minutes on what was initially thought to be an electrical perturbation. After investigation, it turned out to be the "BYPASS DOOR" in BA3 that was inadvertently opened by TE/EPC.
- **Friday, 29/4:** Electrical perturbation due to thunderstorms. -- Pending exact information from EL as to amplitudes and duration.

### Booster (Jocelyn Tan)

#### Tuesday 26th April

The Isolde beam permit was signed at 4:40PM, the first beam was sent towards GPS 30mn later.

The final steering could be done and the watchdog successfully tested.

At 3AM, all the kicker timings went in fault, but went back on their own without any action (it had happened last Saturday) night

At 5:20 there was a problem with the Linac vacuum sector valve LI.VVS10, which stayed in a closed position. The PIVAC was called and the beam was back after 30mn.

Alan has optimized the ISOHRS beam.

#### Wednesday 27th April

The Linac2 watchdog had triggered several times in the morning: it was due to the LA2.QDN20 which kept going on and off. The PIPO was called by noon and has fixed the problem: there was an hour down time.

In the afternoon the PIQUET First Line was called for the BTY.BVT101 which displayed a status "ON" but was off. He did a local reset of the power supply.

The initial settings of the HRS line were those of a 1GeV beam. By 6PM, ISOHRS has also seen its first beam. The final setting of the line was completed after an hour.

Both GPS and HRS lines are now equipped with an additional PU: the signal have been observed with the samplers, but have yet to be integrated into the trajectory's application (hopefully next technical stop).

### Thursday 28th April

At 8:45 the beam was cut for 25mn a PS access.

In the shadow of the stop, Alan did some essential work... as usual

"I re-installed the DDS used to generate the RF for the BBQ measurement in R2 (Rack 718).

I also took the time to check all the NIM power supplies in the R1 low level, and all seems well."

The SPS has often complained about un-even bunches: it looks like the phase offset between the 2 cavities jumps from time to time.

### Friday 29th April

In the afternoon, there were a series of glitches in the mains due to local thunders.

The PIPO was called for the MPS which stayed grounded. The cumulated down time was limited to ~40mn.

Very quiet WE, except the Linac2 watchdog which was reset twice.

But at 2:15AM, there were RF-LL instabilities on ring3 which affected the beam LHC\_B : the PIQUET RF was called, and he fine tuned the CO4 offset. The down time for this user was 2.30Hours.

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During the week, ISOHRS and LHC100ns bunch spacing have been prepared by Alan  
MD4 single bunch beam for SPS MD has been prepared by the supervisor of the Week.

### PS (Yannis Papaphilippou)

**Very smooth week for the PS** with only few issues worth mentioning:

- Since the beginning of the week, several radiation alarms were observed due to wrong pulsing of the ejection septum 16. The problem was followed up by PICO who suspected an overloading of the DSC, **especially due to several ejection equipment surveys. The problem was temporarily fixed by removing the surveys** and DSC clean-up and reboots, on Thursday and Friday but reappeared during the weekend, when equipment surveys were requested for diagnosing a radiation alarm.

Investigations should continue next week.

- During Wednesday night, a problem with ejection equipment (BFAs) appeared and specialists were called and intervened. They found a temporary fix for the night and solved definitely the problem during the next morning (~2h without CNGS beam).

- Early on Thursday morning, a 10MHz cavity (C51) was not pulsing correctly and was replaced by C11. The equipment specialist investigated and asked for an intervention in the PS tunnel to change a gap relay. The beam was back after 1h stop.
- The important electrical network glitch on Friday afternoon caused around 1h stop in the PS, the time needed to put equipments back on and do a local reset in some ejection kicker power supplies.
- During the whole week, a lot of effort was put in order to optimize the beam quality of LHC50ns (both 12 and 36 bunches), especially the issue of unbalanced bunch intensity (beam loading) and satellites. It should be noted, on the other hand, that the request from the LHC on rebalancing the bunch intensity by adjusting the number of ejected protons from selected PSB rings is not the preferred solution, as this definitely degrades the performance of the bunch splittings in the PS and causes the appearance of satellites.

## SPS (Elias Metral)

After careful re-calculation by EN, Edda informed us that the maximum temperature on CNGS TT01 was increased from 73 deg to 80 deg, which allows therefore putting more CNGS cycles. On Friday, we were ahead from schedule.

On Friday, Yannis and Hannes continued the setting-up of the Q20 cycle (LHCMD2 with 1 LHCINDIV). No significant losses observed along the cycle after adjustments of the chromaticities and the removal of the large radial steering. Around 17:00, due to an electrical glitch, several systems tripped. We had problems to restart as we had an interlock on BA5. It was due to a BIS interlock problem, which occurred on the UA9 collimator control system, and which was solved by J. Lendaro: it was due to a vertical roman pot from UA9 which was moved down by gravity due to the electrical cut. There was also a faulty message on the LSS6 ZS MD (it is a new ZS, same as the ZS4 in LSS2 but in position 61676, installed during this shutdown to perform ecloud studies etc.). Roger Barlow was on site in BA6 and reset the fault.

The beam was back at ~ 17:25. Later, Thomas informed us that the 800 MHz free running had gone off (again), but we had no alarm in Laser. From Timber, it could be seen that the free running was going away from the locked frequency (the correct frequency is set to 801.058000 MHz with a tolerance of 30 kHz before it trips out). When we checked it, it was at 801.0200 MHz, i.e. 38 kHz out.

Finally, Ilias informed us that no beam should be sent to the NA before the TAX are repaired, which could take few weeks.

The week-end was very quiet, sending a lot of beams to CNGS and filling the LHC.

## LHC

Not bad. Peak lumi up over  $8e32 \text{ cm}^{-2}\text{s}^{-1}$  with 768 bunches.  $130 \text{ pb}^{-1}$  accumulated in a week.

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