

## End Week 5 (February 3rd 2013) – Status of Accelerators

### Statistics

nTOF: <https://espace.cern.ch/be-dep/OP/PS/default.aspx>

CNGS: [https://accstat.web.cern.ch/accstat/statistics/charts/2012/SPS/CNGS\\_Target\\_Cumul2012.jpeg](https://accstat.web.cern.ch/accstat/statistics/charts/2012/SPS/CNGS_Target_Cumul2012.jpeg)

LHC: <http://lhc-statistics.web.cern.ch/LHC-Statistics/index.php>

### LEIR (Django Manglunki)

Many thanks to Christophe Mutin, Magnus Bjork, Jean-Baptise Lallement, Richard Scrivens, Alan Findlay and Michael Bodendorfer for their help diagnosing the vicious fault on a Sunday.

The week did not start well as on Monday morning the beam stopped being injected around 9:30. At that time it seemed to be linked to a wrong field of the non laminated magnets at the exit of Linac3 (ITH.BHZ11-12-13-14) which had just been cycled OFF/ON, and were taking several minutes to stabilize. 2 hours downtime.

On Wednesday at 9:00 the source was stopped for oven refill. At 16:30 the Linac3 beam was available again; it was immediately injected, accelerated and extracted without any problem. Operation went fine until Saturday night.

On Sunday at 0:15, injection again became erratic. Cycling the ITH bendings this time did not help. After several hours of investigation (vacuum, electron cooler, linac3 RF and steering, stripper, ...), during which the situation continued degrading with more frequent bad shots, the problem disappeared at the same time as the transverse damper was being switched off and back on, in such a way the fault was first attributed to the damper. This allowed refilling the LHC and the problem seemed cured.

The same problem reappeared at 9:00. Alan Findlay was called on site; he determined that the damper was not the cause, and investigations went on during the day, until at 14:00 the power supply of ER.QDN1030 (main defocussing quads in odd straight sections) started to trip repeatedly. TE/EPC piquet called on site diagnosed a noisy reference sent from the function generator; BE/CO piquet found a faulty DAC card (attached picture) in the CVORB, and the problem disappeared after replacing it. Total down time about 12 hours.

It is now believed the same faulty card was the origin of the problem on Monday.

Since 15:30 on Sunday, LEIR is back in business with 1.4E10 charges extracted to PS on EARLY and 5.5E10 on NOMINAL.

To be followed-up:

- Main bending ER.BHN trips on a resettable fault several times a day;
- One semgrid in ETL needs an intervention inside the PS tunnel for a power supply repair.

### Booster (Klaus Hanke)

Apart from the usual resets and reboots, here are the main faults of the week:

- EPC and CO experts have been working throughout the week on MIL1553 problems
- A timing error on kicker BT2.KFA20 could be tracked down to a bad contact.
- Wednesday a planned stop to fix the water station and the Booster lift (is now operational again)

- Also Wednesday strange beam loss, could be fixed by spraying contact spray on some patch panels of the LL RF (!), god bless Alan Fine-Delay
- Thursday half an hour down time due to BT.QNO10 (fixed by EPC piquet)
- Saturday early morning (01h43) again problems with BT.QNO10 (pulsing at the wrong value), the EPC piquet had to come back. The power supply was put in local mode and forced to the right value in order for the LHC to be filled, once this was done investigations continued and the problem was permanently fixed 07h30.
- Later on Saturday the BCT of Ring4 failed, the equipment expert came in and did a demagnetization.

## PS (Rende Steerenberg)

The PS had a very good week for the delivery of the physics and the many MD beams.

the only planned stop was on Wednesday and started at 8:45. The stop was planned in order to repair the PSB-TT2 water cooling station, to change the KFA21 polarity in view of MTE tests and to repair the BPM20. The stop took longer than initially planned and the beams were stopped for 2 hours in total instead of 1 hour.

In the shadow of this stop a part of the CVORB + FESA test was made on the PFW's rather successfully. Nevertheless an issue was found with a asynchronous enabling and disabling of a function, which will be solved and tested after 13/02 (without beam).

The LHC 50 ns low emittance beam has been set up to make comparative measurement on cycles with the working point generated by PFW's only or by a combination of low energy quadrupoles and PFW's.

Otherwise there were only very minor interruptions that were solved by simply resetting the equipments.

## SPS (Karel Cornelis)

SPS continued with the heavy ion fixed target program in H2 and H8 and delivered ions and protons to the LHC. On Wednesday the ion source was refilled and during this time proton MD's took place (a.o. coasting protons for collimator studies).

On Thursday night several hours were lost due to a problem with the pre-pulse of the proton inflector. The diagnostic of this problem is always delicate. The expert on the emitting side (RF) and the receiving side (Kickers) had to be called in order to conclude that the problem was somewhere in the transmission. Finally a faulty repeater box in BA1 could be identified and rebooted.

Friday night we were informed about that water was again penetrating under the false floor of BA2. However, the pumping speed was high enough to keep things under control.

On Sunday, the SPS was unable to deliver ion beams for several hours, due to a problem in LEIR.

For the rest there were a lot of MD's going on in the SPS, mainly with single bunch protons, but also one cycle to study the de-bunching-re-bunching with ions for future fixed target physics

## LHC

Rocky week – main issue being beam losses during coggng and squeeze following direction change on Friday. This has necessitated the reduction in number of bunches and thus delivered luminosity.

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