

## End Week 34 (August 27<sup>th</sup> 2012) – Status of Accelerators

### Statistics

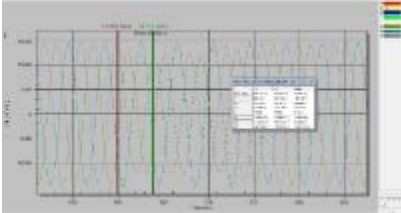

nTOF: <https://espace.cern.ch/be-dep/OP/PS/default.aspx>

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>

### TI (Peter Sollander)

<http://wikis/display/TIOP/2012/08/20/TI+summary%2C+week+34+2012>

Tuesday, August 21	<ul style="list-style-type: none"><li>• 14:00 -- SH5 UPS ESS114 fails and cuts CMS cryogenics. Only one alarm with TI, a communication fault on the UPS. EN-EL on site to manually switch the power on again (UPS did not automatically go to by-pass mode). Specialists on site could not find any problem with the UPS and said it looked as if the UPS had been stopped manually. This is however not very likely. This is an old unit that was scheduled to be replaced during LS1.</li><li>• 23:05 -- Thunderstorm brings down all the machines. The accelerators restart quickly without any problem. LHC has beam again at around 5am.</li></ul> 
Thursday, August 23	<ul style="list-style-type: none"><li>• 20:09 -- Electrical glitch stops the LHC. A mono phase fault on the 400kV line between Genissiat and Vielmoulin. LHC back in stable beams at 22:45.</li></ul> 

### Linacs (M. O'Neil)

#### Linac 2:

A fault in a pirani gauge on the source caused an interlock that stopped the source for three hours.

Problems with the Linac watchdog (Controls) caused a further one hour downtime. Otherwise a quiet week.

**Linac 3:** No detailed report.

## **PS Booster (A. Findlay)**

It was very acceptable week for the PSB, with no major faults to report.

The highs for the week were a significant number of MD's carried out in parallel with normal operation, including a 2-3% gain for the injected beam for the ISOLDE users after work done by Richard and Jose, and the trial of a low emittance beam (LHC\_low\_EI\_H9\_A & B ) which was successfully sent through the injectors & injected into the LHC with little or no transverse blow up until acceleration in the LHC.

The lows were not very low, but included a couple of PS interventions requiring the PSB to cut the beam in sympathy. Thursday morning around 04H20 the PiVAC was called to to restart LP.VGP1 but it would not stay on, so the specialist J. Hansen was called in as well as the LINAC supervisor to solve the problem(~3.5 hours beam lost). The PiPO was called Thursday evening when the MPS would not behave it's self, and an hour was required to bring it back in order. Following up the ejection kicker timing jitter suffered the previous week, the PiCO changed a pulse repeater Friday morning which only took about 30 minutes without beam, but then each beam had to be adjusted to compensate for the change in delay which took a little longer once the beam was back. Sunday morning a problem on the Linac needed the PiCO intervention after an hour of beam time was lost, but the problem seemed to resolve it's self almost as soon as the PiCO was contacted.

Overall, nothing much to worry us, leaving us plenty time to get on with the never ending work on our small, but perfectly formed machine.

## **ISOLDE (D. Voulot)**

### **GPS:**

From Tuesday till Friday afternoon we have setup GPS and REX with 6He beam. Users got beam accordingly to schedule and they are still taking data.

This setting up was difficult due to the very high contamination of similar beam coming from REX-Ebis. The beam in REX-Linac was not visible with our beam diagnostic, but only at the users detector.

Two interventions:

- on Saturday morning at 1h00 because 2 control in EBIS were off, due most probably to a vacuum interlock.

- on Sunday evening at 20h30 because the HT front end was off.

### **HRS:**

Beam to CRIS experiment on Tuesday, Wednesday and Thursday night. Everything went very smoothly, except an intervention necessary on Tuesday evening, because of a control problem with the separator magnets.

## PS (A. Grudiev)

First half of the week there were number of downtimes related to failures of different equipment. Second half PS run smoothly.

Monday 19:30-21:30 no beam to EAST due to ARCON problem fixed by the PIRP.

Tuesday 15:00-16:30 no beam to TT2 except for LHC beams due to bump16-14 bumper magnet pulsing always with LHC value. It went on and off several times without giving PICO enough time to intervene. Finally, it lasted longer and PICO fixed it by replacing Carte RTI.

Wednesday 00:30-3:00 No SFTPRO and CNGS due to QKE16CT is on fault fixed by PICO and then PR.QTRJ-TR-A is down, fixed by PIPO.

Same day 15:00 -16:40 access to PS to fixed 10 MHz cavity C10-96 by RF specialist combined with an access to BTP zone by vacuum specialist to verify why one of the two ion pumps does not work. C10-96 was fixed but ion pump could not be repaired. It needs longer access for about 1.5 hour to be done at latest during the next technical stop.

Thursday 1:00 – 2:17 PE.SMH57 went down with un-resettable fault. Specialist had to come to fix it during the night. Then at 6:00 it went down again and since there was no beam from the linac2 at that moment the specialist was called only at 7:00. He came and asked for an access. It took some time to organize it with RP since it is a radiation hot area near the extraction septum. Finally access took place between 9:45 and 10:15. Septum was fixed by replacing the coil of the electric valve for cooling circuit.

Immediately after another intervention started at 10:30 to switch back to POPS. It has been successfully finished at 11:50.

Since then there were no more downtimes and PS runs smoothly over the weekend.

We have since a few week a vacuum leak in the BTP line (towards the end of the line), but this was varnished and seemed to be ok. In addition, about a week ago one of the ion pumps in the BTP line broke, but all seemed still to hold with the varnish.

However, since Saturday the pressure is increasing and is now slightly higher than  $1E-7$ . A leak detection is being organised. If this is the same leak then adding varnish does not seem to be a solution. In that case we will have to re-discuss, but most likely a change of the bellow will be required, meaning that a magnet has to be taken out. This is being looked at, but might mean a 24 hour beam stop (remains to be confirmed).

## LEIR (C. Carli)

No significant downtimes due to equipment failures (several resets of the RF cavity, again modified timings on ZERO such that the ejection septum pulsed every 1.2 s - to be followed up by LEIR supervisors), but the the machine performance was quite poor for both the EARLY and the NOMINAL beam.

At the very beginning of the week, after the Linac3 source refill and LEIR restart, the intensity available on EARLY had dropped to very low values. Since losses along the injection line were seen for the beginning and the end of the Linac3 pulse (where there is a momentum offset created for the special injection process), we suspected problems with this line. After re-steering and some empirical adjustments, the injection efficiency was excellent, but followed by strong losses at the beginning of the cooling plateau (still it seems that the SPS RF team was satisfied with the intensity). With periods of low beam current from Linac3, periods for SPS setting up and various meetings, I did not find much time to further investigate, but hope to find some time today.

The first three or four Linac3 pulses on NOMINAL are injected and accumulated well, but then there are significant losses between injections such that, at the end, only around  $3.5E10$  charges (instead of  $5E10$ ) are ejected.

### **AD (B. Lefort)**

Good week for the AD, no specific points to be mentioned.

### **SPS (K. Cornelis)**

We had a rather smooth week for the SPS, without major faults. On Monday morning, in the shadow of a PS intervention, the SPS was stopped, to put SMD10 back into service after an 18kV cable repair.

Tuesday afternoon a series of Hirammat shots were taken for RP calibration purposes.

On Wednesday there was a 24h MD, during which, amongst others, the Q20 cycle was studied. A big part of the MD was lost, due to a vacuum problem in the LINAC.

On Friday evening, the Q20 was used to measure the extraction channel apertures, as function of bump amplitudes.

The RF commissioning on the early ion beam was completed and we switched to the nominal beam.

We are sending now  $1.6 \cdot 10^{11}$  protons/bunch to the LHC. The beams are less stable at these intensities, but we managed to give record to the LHC.

### **LHC (B. Holzer, J. Wenninger)**

- 14 fills in total during the week, integral luminosity  $1.3 \text{ fb}^{-1}$
- Total integrated luminosity this year  $12.6 \dots 12.8 \text{ fb}^{-1}$
- Total intensity per ring  $2E14$ , bunch intensity  $1.6E11$  at injection
- Inst. luminosity in ATLAS and CMS beyond  $7 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$

More details under:

<http://lhc-commissioning.web.cern.ch/lhc-commissioning/news-2012/LHC-latest-news.html>