

Accelerator complex status

End week 29 (Sunday 19th July 2015)

TI (Jesper Nielsen)

Here's the summary of the week for TI:

<https://wikis.cern.ch/display/TIOP/2015/07/13/TI+summary+week+29%2C+2015>

Linacs (Giulia Bellodi)

It was a very quiet week for Linac2, with only a 5 minutes beam interruption due to a cavity trip over the weekend.

The average intensity currently provided at PSB injection is just short of 145mA (BCT60).

Linac3 also had a fairly quiet week. The first part of the week was dedicated to beam measurements and source tuning.

The oven refill was advanced from Friday to Wednesday evening on LEIR request and typical operation and beam intensity were recovered by Friday evening.

Some source instability problems developed during on Sunday night and are currently being investigated.

LEIR (Steen Jensen)

This week has offered the following events:

1) Tuesday 14/7

a) It was found that from time to time the Start pulse was not produced for the bumpers (ER.DFH). More precisely, it was found to happen every 16 minutes and only on the 7th injection in the NOMINAL cycle...

After some investigation (thanks to Jean-Claude Bau) the cause seems to be a race condition in software at the heart of the central timing system, causing an event which triggers the bumper Start pulse to be omitted. A fix will be ready next week.

b) A problem with the MTV application prevented us from capturing images on anything but NOMINAL user. Ana Guerrero re-initialized the application with the default configuration, solving the problem

2) Wednesday

a) The LN3 oven was changed. The new oven is behaving somewhat differently and seems to require more power than usual to produce beam.

3) Friday

a) The oven produces beam again, but only at some 50% of usual intensity. Monday, Richard Scrivens and Michael O'Neil will continue to optimize.

4) Over the weekend

Jerome Axensalva has continued to work on optimizing the beam transfer. Some effects influencing the beam position remain to be understood - Jerome will continue this work on his night-shift tonight.

AD (Bruno Dupuy)

This week is the second week for the experimental areas of AD. The intensity of the beams, and their quality is excellent.

The extraction intensity was upper than $3.2E7$ anti-proton (maximum $3.8E7 \rightarrow 1.4$ Volt peak), and the bunch length is around 110 ns.

It should be noted that there is some instability in horizontal position during extraction. Several actions are and will be undertaken to reduce these instabilities.

Consequence of these good performances: We are at the limit of 3.0 mSv in some experimental area. Similarly, for the ring, the ejection from the PS was reduced from 200E10 (1200E10).

Booster (Gian Piero Di Giovanni)

A week without major issues for the PSB, besides several resets, mostly caused by the increasing temperature during the week. All together, the resets did not cost much downtime, but when their rate in frequency increased, the solution was to run with a lighter version of the supercycle, mostly affecting the number of ISOLDE users.

The highlights of the week were:

- A dedicated MD by the RF group to test the reliability run of the Finemet cavities.
- An MD to test the new turn-by-turn BLMs monitors. Very useful information was gained which could help resolving the long-standing issue with the hotspot in PSB section 4L1. There is an ongoing discussion with the RP group to review the results of the MD.

On Friday the replacement of the power supply of BTY.QFO119 cost a bit more than an hour downtime, but only for ISOLDE.

Generally several pending issues from last week (about timing, proper alarm reporting) were fixed during the week. Only one pending issue to mention:

- Problem with MIL1553 power supply control for the quadrupoles in the BT line, which follows the control value one cycle too late. We are in contact with EPC-CO to solve the issue. Recently we noticed a similar problem for the correctors used for the stray field compensation from the PS.

Finally the LHCINDIV_HI_INT requested for the LHC MD of next week was prepared in the PSB and successfully tested in the PS during the week.

PS (Ana Guerrero Ollacarizqueta)

PS had a fairly good week till Sunday evening when the vertical WS85 did not finish a movement and stayed in the middle of the vacuum chamber perturbing all beams. An intervention had to be organized to bring the wire out by hand to avoid breaking the wire. The total downtime was of 3h45. The problem is under investigation and the wire-scanner has been disabled.

On Saturday PIPO intervened due to an extraction bump power supply failure, the beams were down during 50mins.

LHC beams were also affected twice by 20/40/80MHz cavities issues with a total downtime of 1h1/2.

Work on LHCINDIV high intensity ($I = 20e10p$), low emittance (Emittance H = 1.1-1.3 μm , E V=1.1 – 1.3 μm) has been done along the week.

Following the works on Irrad area ceiling, several RP tests were performed along the week.

All operational beams were delivered as usual.

SPS (Verena Kain)

Week 29 was another good week for the SPS. Bumps at the aperture bottlenecks that had been measured last weekend were introduced for the SFTPRO CT and MTE beam. A transmission of up to 97.1 % could be achieved as a result on the SFTPRO cycle. The losses at injection with the MTE cycle could be reduced to 5 % with the improved aperture in the SPS, better optics matching and better adjusted trajectories of the 5 islands.

A few beam quality issues had been reported by the LHC, such as large satellite bunches on the indiv beam and large emittances of the bunches neighboring the SPS injection kicker gap in H and in V. Both issues are now understood and resolved. The first one was due to the fact that the satellite check was not enabled on the SPS BQM. The problem of the larger emittances was finally cured by using again the 2012 MKP generator synchronization instead of the one established in spring 2015.

The 6 bunch doublet beam has been tested this week. It is ready for the LHC with $1.6e+11$ per doublet and $< 3 \mu m$ emittances.

Downtime:

Due to the hot weather the north area was confronted with many issues on the cooling circuits, especially Friday evening. K12 was particularly affected where not only magnets showed insufficient cooling, but also the TAX. CV could finally solve the issues by adjusting i.e. valves.

On Saturday morning 1 ½ h beam time were lost after the thunderstorm where the piquet had to intervene to reset several SPS cavities. Another hour was lost due to a badly adjusted extraction bump in the PS and subsequent losses on the PS to SPS transfer.

The longest downtime this week was due to a wire scanner blocked in beam in the PS Sunday evening. It caused 3 h 50 minutes of downtime.

Miscellaneous:

On Monday RP informed us about an elevated radiation level in a water station in BA80 on surface. It was finally traced back to a wrong wobbling file for target T2, which had been loaded before lunch time. The wobbling file had too low current settings for bend 3 and the main secondary flux was dumped too close to the TAX hole. The wobbling file has been removed from the system.