

# Accelerator Complex Status

## End week 26 (Monday 3 July 2017)

### TI (Jesper Nielsen)

Apart from the electrical perturbation on Thursday there were only a few minor water leaks, some ph warnings and other smaller issues, but nothing really worth mentioning.

Started TS this morning, all IMPACTS were paused last night.

Details: <https://wikis.cern.ch/display/TIOP/2017/07/03/TI+Summary+Week+26>

### LINAC2 (Francesco Di Lorenzo):

Linac2 is running very well, 100% availability.

In the last week the current's intensity has been very stable with an average of 250mA from the source and 150 mA on bct20.

### LINAC3 (Francesco Di Lorenzo):

Linac3 is running quite well an availability 99.4%

The RF Thomson generator of the source tripped one time on Wednesday in the morning and two times on Thursday . In fact on Thursday in the afternoon we had a power glitch that has caused the trip of ht thompson, solenoid injection and itf.qdn02 ,everything has been solved by restart , and in the same day around the 18 o'clock the RF Thomson has tripped again and always the problem has been solved by reset.

The beam intensity is between 30 and 36 uA.

### LEIR (Sergio Pasinelli):

Week main tasks:

- Studies on the ITE BPM (Calibration & Control debugging)
- Setting up of Xe39 NOMINAL cycle (Orbit & E Cooler)
- LLRF setting up on the cycle EARLY & NOMINAL
- EARLY beam sent to SPS for setting up
- NOMINAL beam sent to PS and extracted to the PS dump

We have had some faults during the week:

- CRF43 went in fault and we were not able to switch ON the cavity. We have switched ON the spare cavity CRF41. Specialists found a problem on an electronic module and with 2 power supplies in the PLC. We plan to go back on CRF43 today or during the TS.
- Electrical glitch (Linac 3 and CRF41 were down)
- No kick on the vertical plane for the tune measurement. The kicker is not pulsing. Until the return of the specialist, the beam can be only excited with the damper(Chirp excitation)

### **PSB (Jean-Francois Comblin):**

The main problem for the Booster this week was the issue with the C16 cavity of ring 3. An access was required Monday and lasted longer than estimated. This generated a downtime of 6 hours for the Booster, and delayed the LHC fill by 2h30. The investigation continued on the surface, but the problem is not yet understood. As the operational beams were not too much impacted, It was agreed during the FOM that further investigation in the ring could take place during the technical stop of Wednesday 5<sup>th</sup> July. For the LHC and SPS MDs of the week-end, LHCINDIV type beams were switched from ring 3 to ring 2 to use the longitudinal shaving as usual.

Otherwise, the week was busy with lots of MDs: Finemet studies, phase noise blow-up, tunes shift vs chromaticity, wirescanner prototype tests, just to name a few.

### **ISOLDE (Eleftherios Fadakis):**

It has been a very smooth week at ISOLDE.

#### **For GPS**

New target(#605) installed on Friday. This will be the target to deliver first RIB to Miniball.

#### **For HRS**

ISOLTRAP is happily taking beam(114, 126, 128, 129Cd) since Tuesday afternoon.

Only issue was Sunday noon when HT FEC and a few power supplies in CA0 tripped at the same time. After a reset things went back to normal

#### **For HIE-ISOLDE**

We successfully phased all 15 SRF cavities on Wednesday with a beam of  $A/q=3.5$  and  $E=6.62\text{MeV/u}$ . Then scaled to  $22\text{Ne}^{6+}$  and  $39\text{K}^{10+}$  (In preparation for the first RIB run).

Did a Beam set-up for  $A/q = 4.0$ ,  $E=6.6\text{ MeV/u}$ .

On Friday we delivered stable beam,  $A/q=4.0$  and  $E=5.5\text{ MeV/u}$ , to users(Miniball).

A few SRF trips during each night throughout the week. Easily restored by turning them back on.

### **PS (Ilias Efthymiopoulos):**

Smooth running for the PS with excellent overall 97.1% availability as of this morning!

PS delivered beams to East Area (including IRRAD), nTOF (6.8 Tp/pulse, 5.86 E18 pot cumulated over the year, corresponding to approx 32% of the yearly planed), AD, SPS (15.7 Tp/pulse) and all varieties of LHC beams including those for the MDs since Friday 30.06. The Xenon beams from LEIR were also prepared at early ( $1.6e10$ ) and nominal intensities and send to SPS. On the problems side,

the major events were on Thursday afternoon where due to a power glitch we lost the machine that fortunately was restarted fast (~15min), but in the same afternoon soon after filling LHC we had to access to repair cavity C51 (~1.5h downtime). The few remaining faults during the week are below the 15min threshold, and a transient problem with one ws stuck in the beam.

On the MD side we had a full program throughout the week, with 6 MDs planned each of several sessions in particular that of studying the machine behaviour and instabilities when approaching the integer tune. Work also continued on the MTE extraction trying to optimise the imbalances between the island to improve the capture at the SPS in view of the later operation at higher intensities. This needs to be further looked at.

### **AD (Pierre Freyermuth):**

The overall week was good for AD with no major failure. Few night interventions by the PS team to solve experimental lines power supply faults (first line called). The MTG fail the PS-AD synchronization when a new super-cycle is uploaded, resulting an empty AD cycle. While it's a known and reported issue (and hard to solve), it can represent more than 5% of the AD cycles the days with a lot of changes performed.

### **SPS (Karel Cornelis):**

The week started with a pretty poor Monday having no beam for about 7 hours due to an intervention on the ring 3 cavity of PSB and some trouble with septum 16 in the PS. The rest of the week was rather positive. HiramMat was finally finished on Tuesday. No MD on Wednesday so good production for FT with a slightly improved MTE. The cathodes of the north extraction were all retraced a bit more in order to improve the losses, especially for high duty cycle. Xe-ions were injected for the first time in the SPS on Thursday. They could be captured and accelerated on the MD cycle. During the weekend different beams were produced for the LHC MD. A big effort was made by the CPS to reduce the emittance on the high brightness bunch. 1.5 $\mu$ m for 2e11 protons was the best that could be achieved.

### **LHC (Markus Zerlauth and Jorg Wenninger):**

The intensity ramp up was completed, following the change of the AGK to 144b. Several long fills done at 2460b, suffering from several recurring dumps due to due loss of communication with EPC gateways. The issue with the (non triggering of) longitudinal blow-up was identified and fixed with a new release of the FESA class. Following a spurious dump by TOTEM over the week-end, we refrain from inserting the pots until TS#1, putting TOTEM into bypass mode. On Wednesday, a first fill with 2556b was completed. A first setup for the [VdM](#) cycle was done successfully to be completed just ahead of the [VdM](#) scan planned for mid July. Continued physics with 2556b until the start of MD#1 on Friday morning, achieving the current luminosity record of 1.58E34cm-2s-1 and accumulating until TS#1 6.4 fb-1. First investigations to mitigate the observed blow-ups (by increasing the Chroma to 20 units at injection) did not yield any obvious improvements. Successfully performed a first length calibration scan for CMS during one of the last physics fills.

The week was completed with the first MD block of 2017, lasting from FRI till MON morning. A re-occurring fault on RF module 7B2 required several interventions, in light of a spurious trip of the RF system when using the full-detuning scheme during the LLRB MD (using 48b trains) the planned reduction of the RF power during TS#1 might have to be re-addressed to exclude any potential limitations for the use of INDIVs of short bunch trains post TS#1.