

## Accelerator Complex Status

### End week 27 (Monday 10 July 2017)

#### TI (Jesper Nielsen)

The TS went good, very good feedback from the operators for being 2 during the day shifts! There was double up on number of alarms seen in TI and same for the phone calls in the week with regards to the previous week.

#### LINAC2 (Richard Scrivens):

Both linacs had an excellent week (Linac2 100% uptime, Linac3 some resets). TS2 was finished without problems in time.

#### LINAC3 (Richard Scrivens):

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#### LEIR (Marie-Elena Angoletta):

Monday 3 July: The week starts well with 2E10 charges extracted from LEIR. Studies on LINAC3-LEIR with Ecooler ON/OFF, Schottky measurements, various debuncher and ramping cavity settings. The LLRF was setup to work with the newly repaired CRF43 but after setting everything up it was discovered that the CRF43 cavity had in the meantime gone out of service again.

Tue 4: cavity CRF43 is back to operational state. As the CRF43 is the operational cavity for this run, we'll move to it after the technical stop.

Wed 5 – Thu 6: technical stop. After the end of the technical stop the element EI.BHN10 would not restart and remained in ERROR.

Friday 6: EI.BHN10 quickly fixed by EPC piquet. The electronics was stuck and did not get any command through, so a reset "sur place" was needed. The LLRF was once more setup to work with the CRF43 cavity. Beam was successfully captured and accelerated with the CRF43 but this cavity went STANDBY when the unused CRF41 was switched OFF. It was not possible anymore to switch the CRF43 ON. So the LLRF was once more set to work with the CRF41 and the CRF43 was switched OFF (no problems for it with the OFF command, it's to get it to work that's difficult. Ah, so human of it!). The HLRF experts are informed and will keep working on Monday to understand and solve the problem.

#### PSB (Bettina Mikulec):

The week was characterized by the Technical Stop.

After providing beam to COLDEX on Monday the high-intensity, high-loss cycles were stopped on Tuesday at 4pm and all remaining beams on Wednesday at 5am.

Main interventions in the PSB: Repair of ring3 C16 cavity, exchange of ring3 vertical wire scanner, powering test of a repaired BI.DIS10 module and repair of a vacuum leak in the BT line. All interventions were successful.

Concerning the main issue this week:

- Monday evening no more beam from ring 1 due to a broken CPU of the RF frontend cfv-361-allr1bc → 2h30 repair time.
- A long-lasting INCA/LSA issues where the settings were not propagated correctly to certain equipment after cycle mapping could be solved.
- At beam restart after ITS2 Thursday afternoon several problems occurred with synchronization and later on with dying RF processes, related to LL-RF SW changes deployed during the TS (migration of ALLPSBDSPA, ALLPSBDSPB and ALLPSBDSPC to FESA 3). In addition the blow-up of all rings had to be adjusted after the recalibration of all C16 cavities. Calm from around 4am Friday after interventions from the RF team, the LL-RF piquet and M. Jaussi – thanks a lot!

### **ISOLDE (Alberto Rodrigiez):**

It has been a very busy week at ISOLDE. We spent most of it preparing and delivering the first HIE-ISOLDE beam of the year ( $^{72}\text{Se}$  at 4.4 MeV/u).

We generated a complicated radioactive molecular beam ( $^{72}\text{SeCO}$ ) in the GPS target, transported it to the REX-TRAP and the REX-EBIS where we broke the molecule and boosted the charge state of the Selenium to  $^{72}\text{Se}^{19+}$  before accelerating it to 4.4 MeV/u. We spent most of the week (other than during parts of the technical stop) setting up the accelerators. On Friday evening, we were able to send the radioactive beam to the Miniball users for the first time.

The machine (specially the REX-TRAP, REX-EBIS and the REX/HIE-ISOLDE linac) has been very stable during the whole week. Unfortunately, the target production rate of the molecular beam has been steadily decreasing since Friday (~a factor 2 every 12 hours) and today it was too low for the users. We will have a meeting tomorrow morning to decide how to proceed (most likely using the lasers for the ionization or waiting until Tuesday until a new target is ready to install it). I will keep you informed on how things go.

### **PS (Klaus Hanke):**

All in all good week with only a few faults. The first part of the week before the technical stop was extremely quiet. On Tuesday beams were stopped for the 36 h technical stop. Access started on Wednesday with the RP survey followed by the various interventions. All planned interventions were completed timely. The PS was closed on Thursday 15:00, followed by the 'patrouilles'. The Power and Kicker piquets were needed to start some of the equipment. Beam was taken as from 19:00 slightly ahead of schedule but the PSB had still some RF problems. The only major fault of the week was a stop of the EAST beams for more than 6 h on Friday due to a faulty power supply, fixed by First Line. The PS was not affected by the power glitches during the weekend. However there was a fire alarm in b.151 on Sunday (some electronics burnt in the power rack of the 24 kV final amplifier for PR.C40-77). On the beam preparation side, a 12b BCMS with 160E10 ppp was set up for the LHC on Sunday morning.

### **AD (Lajos Bojtár):**

The AD was running this week quite well, although the start up was a bit

problematic after the technical stop. Beam came from PS 10 pm as was planned, but it was delivered to AD experiments only at 2 am, due to 3 different problems.

- The injection kicker timing had to be adjusted , because of some HW change during the TS (this was expected).
- Ejection timings were missing due to a modification made for Elena during the TS.
- There was an orbit jump, we have that sometimes after the e-cooler drops or we access the ring. Due to that Base and Aegis asked to re-steer their beam line.

### **SPS (Hannes Bartosik):**

The week was rather smooth with excellent beam availability. The North Area beam was stopped as planned on Monday evening for a 24 h dedicated run for COLDEX. The cool down time before the technical stop was used for MDs with low intensity single bunch coasts (crystal assisted slow extraction and emittance growth studies in Q20 optics).

Some issues were encountered after the 36h Technical Stop on Thursday evening. About 1 h downtime was caused by a problem on a few TT10 magnets which tripped and could eventually only be restarted by the Picquet. Furthermore, there was a problem with the intensity on the T2 target despite the fact that the transfer line trajectory had not changed as compared to before the Technical Stop. Eventually it was found on Friday morning that the target intensity monitor TBIU had lost its reference position in the FESA class and therefore was offset by 25 mm. Until that moment the North Area beam was delivered with reduced intensity to the other targets.

An aperture scan performed on Friday confirmed that the exchange of the dipole MBA13370 during the Technical Stop indeed resolved the aperture bottle-neck in location 133.

### **LHC (M. Giovannozzi and M. Zerlauth):**

The week was TS1, with handover to operation on Friday 7th of July at 5 pm. Issues with the LL software of the RF cavities delayed the conditioning of the cavities, which were back in operation only at 10 pm on Friday. Overall the week end was not particularly efficient, with only pilot fill and loss maps successfully accomplished. The pilot fill was used to measure the Beam 2 optics, which turned out to be in the same good condition of the last measurement. The main issues were

- RF problem for Beam1, due to a faulty module installed during TS1. This prevented measuring the optics and linear coupling of Beam 1

- Trip of the orbit corrector **R8B1** that dumped a fill for loss maps. It was decided to carry on and to repair the power converter on Monday
- Trip of RB.A12 due to electrical perturbation that dumped a fill for loss maps
- Loss of cryogeny in Pt 8 that dumped a fill for loss maps

Few additional activities could be carried out, like SIS test of collimators BPMs interlock at injection, asynchronous beam dump with tighter TCT settings, and 1 h of stable beam with 2x2 nominal within a fill for loss maps. On Monday morning the loss maps should be finished and after the repairing of the faulty power converter of **R8B1** a fill with 10 bunches for BSRT calibration will be performed, including also tests for **VdM**, and yet another asynchronous beam dump test with tight TCT settings. After all that, intensity ramp-up will be resumed. The need to re-measure the optics of Beam 1 is under consideration, given some instabilities observed only in Beam 1.