

Accelerator Complex Status

End week 23 (Monday 12 June 2017)

TI (Jesper Nielsen)

Rather quiet week, busy weekend with a lot of interventions on temperature alarms all over the site.

Details: <https://wikis.cern.ch/display/TIOP/2017/06/12/TI+Summary+Week%2C+23>

LINAC2 (Rolf Wegner):

Linac2 is running very well. No major problems to report. Intensities at the end of Linac2: 140-150 mA (T60).

LINAC3 (Rolf Wegner):

Linac3 is running very well. No major problems to report. Intensities at the end of Linac3: ~35 uA (T41).

LEIR (Reyes Alemany):

RF PS beam set up:

Wednesday 07.06.2017 afternoon: ions synchronized and ejected with the desired 4 ns bunch length from PS.

In principle the "official" date to send the EARLY to PS is 12.06.2017, but the work is already practically done.

MDs:

Tuesday 06.06.2017 afternoon LINAC3 MD

Friday 09.06.2017 morning LINAC3 Pepper Pot

ITE BPMs studies:

Wednesday 07.06.2017 morning: continued studies on the first ITE BPM (the one closest to ITH) but not conclusive. The BPM is still highly saturated and special beam steering needed, which is not compatible with the desired trajectory to inject into LEIR, in order to see some non-saturated signal.

Xe NOMINAL 3 BP:

The Xe NOMINAL 3 BP is injected and circulates in LEIR. It does not survive the start of the ramp, but all the RF LL settings need to be copied to the NOMINAL cycle.

FAULTS:

Tuesday 06.06.2017: **ER.QFN2040 & ER.QFT20** tripped.

Thursday 08.06.2017: **ER.QFN2040 & ER.QFT20** tripped two times during the day.

Friday 09.06.2017 afternoon: **ITH.QDN08** had a blown up fuse. EPC piquet had to replace the power converter by the spare one.

Sunday 11.06.2017: **ER.QFN2040 & ER.QFT20** tripped. **ETL.BHN10** trip twice.

Preliminary plan for next week:

Monday 12.06.2017 morning: ITE BPM studies continuation: objective è see if there are other charges present together with the main beam. Measurement program:
Pick up 1 – Sum+Delta
Beam onto center of ITE.BTV01 – using dipoles
Scale Dipoles to 40 and 38+ Is there any signal of a beam with other charges?.
If we see secondary beam on the BVT10, close down the slits in steps on each charge state, and plot the “decay” to determine if the secondary beam comes from the source or from recombination in the line towards ITE.
If we do not see secondary beam: scale down the intensity of primary beam with slits, measure the transformers, and the BTV10 and determine the intensity threshold below which if there is any secondary beam present, we cannot see with the screen.

Tuesday 13.06.2017 whole day: LINAC3 MD by Giulia

Wednesday 14.06.2017 afternoon: Maria Elena & Alan James: removal of splitters and switches in the LEIR LLRF and LLRF setup. No beam to PS.

To be scheduled with RF LL team the setting up of the Xe NOMINAL cycle.

To be improved: injection of the Xe NOMINAL, measurement and correction of tune, chromaticity & orbit.

Once the NOMINAL is fine in LEIR, try to extract to PS.

PSB (Klaus Hanke):

All in all a good week for the Booster.

The RF specialist investigated throughout the week on the R2 C02 cavity which needed a beam stop on Thursday. All problems could be understood and fixed (several actions taken, in the end the problem was related to faulty insulation on a few cables which was difficult to find as it was hidden). In this context the Finement cavity was also revived in order to be put in operation (was in the end not done, but it is good to have it up and running).

The only other real issue of the week was a fault of BE4.DHZ11L1, the piquet was called but the power supply came back by itself before the piquet arrived.

Marek et al fixed the tune measurement, and systematic measurements were done with the wire scanners (R3 vertical shows jitter), and the BI team worked on a noisy pick up (BTP.BPM20-H)

On Sunday evening there were a few resettable trips of the extraction kickers. Only a few minutes down time.

All our beams were delivered in specs, and we started to look into the LHC50 in view of the LHC MDs.

ISOLDE (Eleftherios Fadakis):

ISOLDE low energy:

- Regarding HRS: Last Wednesday COLLAPS finished their run on 27A1.
- Regarding GPS: Delivered radioactive beam (51 to 61Mn) on Thursday to users(both GLM and GHM lines).

A few issues:

- Issue with the high tension which tripping above 30kV on Tuesday. By careful conditioning it, we managed to make it hold 40kV which was acceptable by the users, although they had requested 50kV for this run. Investigation on site by experts ruled out some possibilities but could not identify the issue.
- Suffering from RILIS instabilities, mainly due to issue with the AC in the lab that causes temperatures fluctuations which in turn cause wavelength fluctuations. This lowers the efficiency.
- Target front end PLC malfunctioned. It is responsible for all interlocks and it caused the interlock for vacuum to not be sent. It led to target and line heating to drop and the HT to trip. After a power cycle the expert needed to manually load the configuration values as they got lost.
 - GLM deflectors got stuck and their stepper counter needed to be restarted in order to move them again.

REX/HIE-ISOLDE:

- First beam through CM3. $E=1.88$ MeV/u (7gap2 energy) $A/q=3.5$.

PS (Heiko Damerau):

Despite the stop for the final amplifier exchange of one 40 MHz cavity the user beams have been provided smoothly with an availability of about 93%. On Thursday afternoon a short-circuit of the grid voltage to the final amplifier of the 40 MHz cavity in straight section 77 was diagnosed, requiring access to the PS ring. Since the scrubbing beam for the LHC was produced with satisfactory quality using the remaining 40 MHz, the access was postponed to Friday morning. Finally the complete final amplifier needed to be exchanged causing about 5h30 downtime in total and beams were back on Friday around 15h30.

Earlier that week (unrelated) difficulties to produce LHC-type beams during 1h40 were due to tuning issues of the 40 MHz cavity in straight section 78. A circuit breaker of the 10 MHz cavity in straight section 76 brought down all beams during 40 minutes on Saturday. Remaining downtime due to power converters affected only the EAST_Irrad (2h25) and the TOF (0h55) beams.

A basic longitudinal setting-up of the xenon beam has been completed on Wednesday yielding to the expected bunch length of about 4 ns at extraction. The intensity of the MTE beam delivered to the SPS has been increase as planned to $1.7-1.8E13$ ppp on Thursday. In view of MDs, tests of the 8b4e variant have started.

AD (Lajos bojtar):

Good week for the AD again. The only problem causing some downtime Friday afternoon was a power supply failure. There was also some progress with the commissioning of the ELENA with pbars, the beam went through the new AD->Elena line.

SPS (Karel Cornelis):

Three major activities were taking place in the SPS during the past week: filling the LHC for scrubbing with up to 288 bunches 25nsec beam, increasing the intensity on the fixed target cycle by 50% and continue the AWAKE operation. In the beginning of the week there were some difficulties filling the LHC cycle with 288 bunches. Low thresholds on BLM's, difficulties with the 40MHz in the PS and occasional transverse instabilities in the SPS were at the origin of these trouble. By the end of the week the situation got better and LHC filling went much smoother. On Friday morning access was needed for an intervention on the TI2 beam loss monitors while the PS was off for the repair of a 40MHz amplifier. Fixed Target intensity was increased Thursday morning to $3 \cdot 10^{13}$. It took until Friday to come to good transmission by carefully trimming both CPS and SPS. During the LHC filling we suffered sometimes from a vacuum interlock and high spark rates on the ZS. On Wednesday we had a successful MD using the SHIP cycle for short slow extraction studies.

LHC (Enrico Bravin & Massimo Giovannozzi):

The entire week was dedicated to beam scrubbing. The train length was increased to 288b for both beams by Thursday evening once a beam instability issue was identified and cured on the SPS flat top. The total number of bunches reached 2820 in each beam, a new record for injection. S12 initially showed higher heat load, but by the end of the week this sector had reached similar levels to the other ones. With the improved vacuum pumping next to MKID, no severe vacuum limitation were encountered. It was however frequently necessary to fill B1 before B2 to avoid hitting a vacuum threshold of MKI2. Even after curing the instability on the SPS flat top, injection of B1 remained more delicate, with frequent dumps during filling of 288b over the weekend.