

Accelerator Complex Status

End week 34 (Monday 28 August 2017)

TI (Jesper Nielsen)

A busy week for the TI team with, particular with the 18 kV transformer failure in US85 that impacted heavily the cryogenics for sectors 7-8 and 8-1.

Details: <https://wikis.cern.ch/display/TIOP/2017/08/28/TI+Summary+Week+34>

LINAC2 (Richard Scrivens):

Trips of the buncher RF system on Monday night, lead to an intervention on the system on Tuesday, which also uncovered a timing issue (on the RF side) that was fixed, and there have been no RF issues since.

The source sparks have returned to more normal values of 2 per day, without any specific intervention.

LINAC3 (Richard Scrivens):

Smooth running, a quadrupole needed resetting on Sunday, and an intervention on an RF tube will be needed in the next couple of weeks.

The Linac will be stopped during the full technical stop week for the mid-term source maintenance.

LEIR (Nicolo Biancacci):

Monday:

- ER.DWH11 and ER.DEH21 in fault, needed piquet to reset who advised he must replace the screen on ER.DEH21 as well.
- Few minutes of RF intervention on CRF41.

Tuesday:

- ER.QFN2040 and QFT20 trip quickly recovered with reset.
- Activity devoted to restore high intensity in NOMINAL for the Wednesday RF tests for capture optimisation.

Wednesday:

- LLRF tests for RF capture optimisation by means of second harmonic. The phase variation from shot to shot made impossible to optimise the capture. The beam longitudinal emittance seems too small. RF modulation can help in making a blow up to control better the phase.
- The local LEIR control room air conditioning seems to malfunction: the air is polluted by dust, to be fixed asap.
- ETL.QNN10 trip fixed with a reset.
- ETL.BHN10 current at extraction from LEIR changed sign: the NOMINAL ejected beam was therefore lost and the large current excursion posed problems to all subsequent cycles (EARLY, NOMINAL or MD cycles). The reason is still not completely clear. It seems that trimming the injection function of ETL.BHN10 in the NOMINAL cycle, somehow affected the extraction function flipping its sign. The K values were reloaded and the issue corrected.

- E-cooler MD studies with H/V bumps in the cooler.

Thursday:

- Again change in sign for ETL.BHN10 function at extraction, corrected with same procedure as Wednesday.
- Additional LIN3MEAS cycle from 11:00 to 13:00.
- First RF tests with modulation.
- Removed bump in sector 4 as the vacuum issue of last year seems no more to be there.
- E-cooler MD studies during the night.
- CRF41 dropped: quickly fixed with reset.

Friday:

- Continuation of RF modulation studies.

Saturday/Sunday:

- Smooth operation. Removed NOMINAL and clones to save beam and reduce losses.

PSB (Jean-Francois Comblin):

We had a good week for the Booster: The only 2 problems worth to mention are: Sunday, a problem with a recombination kicker that costs 2h30 of beam, and Tuesday, the change of the Dressler amplifier of the Linac 2 buncher that took 1h10. Since then, we recover stable intensity from the Linac 2.

The week was also busy, with the set-up of several MD beams for the PS and SPS, like MTE very low intensity ($2.5E10$ per ring!), parasitic TOF beam with high emittance, Montague resonance or several variants of LHCINDIV.

On the Booster MD side, we had MTE optimizations, emittance measurements along the cycle, Finemet studies and the start the TMS commissioning with new electronics.

Otherwise, the LHC25ns 8b4e beam was tested and ready for the LHC, and improvements of radial steering and tune reduced losses at ejection for high intensity beam like MTE or ISOLDE.

ISOLDE (Miguel Lozano Benito):

It has been a pretty complicated and long week at ISOLDE.

First experiment taking beam in XT03 after the commissioning of the line. ^{15}C at 4.3 MeV extracted from the primary target in molecular form (CO) and molecule broken at the REX low energy part.

The setup of the beam was quite complicated and it took a couple of days to inject properly the beam into the experimental setup due to a big discrepancy between the number of particles per second sent and the experiment estimations.

Once this was solved, Saturday afternoon, users started taking beam and since then they have been running with minor issues as line heating drop and some RF amplifiers trips.

This experiment will continue all this week and run until next Tuesday.

PS (Klaus Hanke):

All in all good week with only minor down time on the PS side itself. Most resets were for the KFA71 and for the PR.WFW. The ABT expert looked into the KFA and changed a thyatron. The trips, which had increased towards the end of the week, were reduced but there were still a few over the weekend. The rest of the down time was caused by the injectors: On Monday problems with the Linac de-bucher (37 min integrated down time), a Linac intervention on Tuesday (1:17) and on Sunday 2:37 due to a PSB kicker problem.

On the beam side, IRRAD took for the first time a very low intensity EAST beam; this was very successful. For the LHC we checked the 8b4e beam, and for TOF we ensure logging of the beam position in TT2.

AD (Pierre Freyermuth):

Very few significant events this week for AD, other than the nominal running and MD for ELENA.

It starts Monday with a time alignment of our injection kicker. Resulting in a slightly better and more stable injection. A 3KA power supply for the injection line quadrupole has a random behaviour, which can be solved temporarily with an On-Off sequence. However our EPC specialist is on the problem. We saw once again a trajectory jump in the ATRAP line, requiring a new steering. It may be due to magnets that started in one of the neighbouring experiments.

SPS (Karel Cornelis):

Monday and Tuesday HiRadMat was operated with quiet stressful beams (144 and 288 bunches of $1.2 \text{ e}11$). In fact on Monday evening HiRadMat was interrupted in order to let MKP cool down. On Tuesday the experiment resumed late in the evening and the pulses were completed at around 4:00 Wednesday morning. ZS suffered an increased spark rate during HiRadMat operation. Tuesday afternoon we suffered a 4h stop due the the electronics of the beam dump kicker where a whole rack was replaced. This was the only important stop of the week besides the injectors which had an accumulated down time of almost 7h. The overall availability of the SPS was 92%.

On the fixed target side, the intensity was increased last Thursday, to 3500 $\text{e}13$ at injection. It was a long struggle with damper, orbit, tune and chromaticity to obtain a transmission above 90%, but things look good now.

We continued filling the LHC with the BCMS beams, without problems. On Friday we checked the 8b4e in the SPS (2×56 bunches, $1.2 \text{ e}11$, 2.8 microrad.). The BQM is all green, but this does not guaranty the losses that may occur during LHC transfer. The beam is bigger transversely and also satellites may be present. It also increases the spark rate on the ZS. The 50nsec was tested on Sunday with BQM ok, but with the same caution on possible satellites and ZS sparking. AWAKE resumed operation last Friday and they had a good run during the weekend. A parasitic influence from the first vertical corrector in TT40 was observed on the FT low energy orbit. The corrector was programmed in DC, but it was put back to pulsed in order to avoid the problem.

LHC (Stefano Redaelli and Enrico Bravin):

At the beginning of the week the bunch intensity had to be dropped below $1E11$ to be able to bring some fills to stable beams with 1700 bunches.

A test to force through ramp and squeeze with 2200 bunches (max with 96b trains) started Wednesday night and was stopped Saturday morning. One cycle out of 6 made it to stable beams for around 30 minutes, 4 cycles were lost below 1 [TeV](#). Thursday night a transformer broke in point 8, cutting off cryo and many service. The transformer was exchanged overnight, and cryo recovered during Friday. Physics operation restarted Saturday with a 985b fill, but was interrupted by a problem on a dilution kicker GTO stack that had to be exchanged. Sunday morning a 1200b fill went into stable beams and later also a 1500b fill.

An important leak has developed since ~ August 18th on the B2 dump requiring large amounts of Nitrogen gas to maintain the over-pressure inside the dump.