

Accelerator complex status

End week 45 (Sunday 8th November 2015)

TI (Peter Sollander)

TI summary:

<https://wikis.cern.ch/display/TIOP/2015/11/08/TI+summary+week+45,+2015>

Linacs (Rolf Wegner)

Linac2 is running quite nicely. A few smaller interventions last week:

- Monday 2 hours intervention to re-activate power converters LBE.KHZ10 and LBE.KVT10. This had no influence on the beam operation for the other machines as only Linac2's LBE measurement line was concerned. The setting of the local timing in both converters was lost (probably during one of the recent software updates). Once adjusted again, the converters work well.
- Tuesday morning Linac2 stopped for replacing a pump in a cooling water station. A number of power converters had to be reset after the stop. On converter LA1.QFN6 the front display died and had to be replaced by the PiPo before a reset could be made locally. In total 1h 30 min down time.
- Thursday early morning the BCT service went down and had to be restarted.
- Sunday morning a reset of the buncher amplifier (LI.CBU02) was needed.

Intensity at BCT60 is typically 140 mA.

Linac3 is running quite well. A few interruptions seen last week:

- Monday morning ITH.BHZ11 tripped. The repair was more difficult, 2h 30 min downtime.
- Tuesday morning Linac3 stopped for replacing a pump in a cooling water station. The restart of the source was difficult, 1h 30 min down time.
- Thursday early morning the BCT service went down (at the same time as in Linac2) and had to be restarted.
- Friday early morning the intensity from the source decreased quite rapidly. The lead of the first oven seems to be exhausted quicker than expected. The second oven was ramped up and the intensity came back.
- The high voltage supply of the source had to be reset a few times: Tuesday morning, Friday midi Saturday morning and Sunday night.

Intensity at BCT41 has been typically between 20 and 25 uA.

LEIR (Steen Jensen)

Tuesday 03 November

- Cooling fan motor of cavity CRF43 failed to restart after cooling pump intervention => switch to CRF41s => OK

- cfv-363-all1 in fault => hard reset of crate => OK
- A. Blas ran tests and found 1) an asymmetry in the radial position and 2) a difference between positions as measured by the RF radial loop (PUs) and that of YASP (BPMs). Investigation ongoing.
- Transfer line studies

Wednesday 04 November

- ~2h Access to repair CRF43 cooling fan motor => OK
- Crash program studies (transfer line matching). Confusion about BTV device mapping

Thursday 05 November

- Problem with central timing (DTM blocked)
- No acquisition in working set due to blocked INCA/JMS
- Access for vacuum tests => vacuum leak excluded as cause of measured pressure rise
- BTV confusion solved: BTVI upgrade on Tuesday introduced erroneous mapping
- Verification of radial loop behaviour and revolution frequency correction => OK
- Suspicion that IPMs may cause pressure rise

Friday 06 November

- Little beam from LN3 => supervisor called => improvement
- ETL.BHN10 tripped => remote reset not working => hard reset => OK
- 1h standalone for investigating pressure rise
- PLC CPU switch of collimators found to be set to "Stop" – unknown why and by whom

Saturday 07 November

- ETL.BHN10 tripped again => reset => OK
- Kick response measurements.

Problems with OASIS for extraction signals => being investigated

Sunday 08 November

- Nothing to report (so far)

ISOLDE (Eleftherios Fadakis)

With winter shutdown approaching we are giving our final sprint till the finish line.

During the past weeks ISOLDE has been very busy. One can have a look in the logbook to see the time of first and last entries.

The commissioning and daily use of HIE takes a lot of time. This time will be reduced once we have fully commissioned the machine and are given time to prepare set ups beforehand. We were asked to provide the first users of HIE, Miniball with accelerated beam ($^{76}\text{Zn}^{22+}$ at 4MeV/u) for 6 hours (limited by the super conducting cavities) during day. During the run they requested to have less energy ($^{76}\text{Zn}^{22+}$ at 2.85MeV/u) during night since they cannot get 4MeV/u for more than 6 hours. The change of one beam to another takes us in best case almost 3 hours. When they asked us to go to a different mass and different A/q, it took us 2 days.

Miniball users are very happy with the data they are getting.

On HRS this was not a good week.

On Wednesday (4/10) a successful intervention to change the piston of the front end of the target took place. The Pb target #511 that was put in place was broken. On Thursday, target #463 replaced the broken target. We managed on the same day to pump down, heat up, perform some stable beam tuning and a proton scan. This was done so that the users could gain some lost time with beam. Unfortunately the beam arriving to their experiment was not a lot. Friday the target experts tried to further optimise the yields of the target and we tried to increase transmission. On Friday night the situation looked promising but as it turns out they are getting much less beam than expected.

AD (Bruno Dupuy)

Week 45 was conducted without any intervention... that smells like the end of the run...

Only a few restarts on DR.BHZ and DR.QUAD equipment.

The extracted beam is recorded between $3.1E7$ $3.3E7$ and depending of the quality of the beams delivered by the AD injectors, LN2, PSB, CPS.

This morning Monday, we have beginning the last MD season aimed at the implementation of multi-extraction.

Start	End	System	Comment
Tu 05/11 14H58	16H01	DR.BHZTR17.18	Local reset DR.BHZ by FirstLine
Fr 06/11 12H42	13H05	DR.QUAD	Reset

Booster (Bettina Mikulec)

We're in the end spurt for this year's run, with loads of MDs and last minute tests. The PSB was sympathetic with us running very smoothly last week.

Only a couple of issues to mention:

- Last Tuesday, just after 10am, all beams were cut; the SPS was down due to a vacuum leak, the PS due to TT2 and there was an urgent intervention for a pump for the demineralized water linacs+LEIR circuit. In the shadow of this M. Haase repaired the C16 gap relay. The PSB was ready for beam at 11:42, but it took 1h more to repair a Linac2 quadrupole.
- Early Thursday at 5:10am BI1.DIS tripped. The piquet was informed, but couldn't reset it remotely. Beam inhibit in ring 1. Finally the piquet had to exchange a thyatron and a HV cable, for which he also had to switch of the ring 2 distributor for 20 minutes. 3.5 h downtime for ring 1.

PS (Ana Guerrero Ollacarizqueta)

All operational beams were delivered as requested. All beams for LHC MDs were also delivered as requested, i.e, nominal LHC25ns, INDIV & PROBE together with 48 and 12 bunch BCMS and LHC50ns 36 bunch with large emittance.

Since Monday the SMH16 shadowing is in operation and the MTE beam has achieved CT performance for some periods though this beam remains instable from time to time (under investigation).

On Tuesday FGC software upgrade to support white rabbit B train transmission had to be revisited during the evening after the dedicated MD on the new Btrain POPS FGC2 regulation. Some cycles stayed at 50Gauss. The intervention was done in the shadow of SPS MST2177M problem, but the beam was down for all other users during 2h1/2. The issue was coming from a protection for train counter values outside a range around the expected 498dGauss. In fact each cycle adapts the train counter of the following cycle at the picking strip passage to correct for the difference in B-field between the focusing and defocusing side of the magnet. The upgrade allowed the MD on the new B-train to take place on Thursday.

Following the problems detected in the cycling of several TT2 correctors and quads, several interventions were done, notably on F16.QFO225S where a problem with the thyristor was solved and the current overshoot corrected. On the software side a new version of the FESA class Pow1553 was deployed solving partly the issue on the cycling length. F16.QFO225S cycling is still slightly too long though and will need further interventions.

SPS (Verena Kain)

The week started with the UA9 run from Monday to Tuesday morning. Stable UA9 operation could only be established Monday evening due to LHC filling and initial issues with the new coastable cycle. This new cycle includes the extraction devices in LSS2 to allow for a crystal enhanced slow extraction test at a later stage. The DC operation of the extraction devices was successfully demonstrated (at least for a short time).

The dedicated MD on Tuesday was shortened due to an access required in LSS4 from 9:00 to 12:00 to investigate a vacuum leak in TT40 at the exit from the SPS at QDA419. A weld on the extracted beam vacuum chamber that passes through the coil of QDA419 had started leaking. It was temporarily fixed with varnish and will be repaired before the COLDEX run in the coming week.

In the afternoon of the same day the commissioning of the fixed target and LHC nominal ion cycles continued in dedicated MD.

A significant amount of downtime was accumulated over the week. Almost 6h downtime for the North Area physics were caused by a power supply problem of the MST extraction septum in LSS2 when switching from MD back to physics. The PS main power supply problem at the same time was in the shadow of the MST issue. Another three hours were lost due to a problem with the PSB distributor this week and 4 h this weekend because of a COLDEX vacuum interlock (not fully understood yet). Various other problems occurred and caused in total another 6 h of downtime:

water cooling problem in BA81, timing system problem Wednesday night, power supply problem on MDSH2106 and injection kicker anode heater issue.

The SPS prepared various flavors of LHC beams for the LHC MDs from Wednesday. During an MD with BCMS 25 ns beams a wrong manipulation by the SPS crew to solve a re-phasing problem caused 12 bunches to be injected into the LHC asynchronously and hence onto the TDI in point 2. The problem is fully understood and will be covered in the interlock system in the future. TI 2 could not be run from early Saturday morning to about 7 o'clock in the evening due to a problem of the Warm magnet Interlock System and most probably its repeaters. Another access will be required to fully understand the issue.

Logging data has shown that the QF glitches also occur on LHC cycles and not only fixed target cycles.