

End Week 27 (July 10th 2011) – Status of Accelerators

Major loss of power ~11:30 Sunday July 10th with serious knock-on effects.

TI Summary (Eric Lienard)

<http://wikis.cern.ch/display/TIOP/2011/07/04/TI+summary+week+27%2C+2011>

LINAC (Giulia Bellodi)

On Monday, a coordinated Linac2-PSB MD took place to explore max current limits out of the Linac with newly installed RF tubes.

With the source arc current increased to 55A and RFQ amplitude at 3.8V, 177mA current was measured on TRA60 at PSB injection, but tanks 2 and 3 were operating very close to saturation.

Beam was cut on Tuesday at 5am for the start of the Injector's technical stop (until Wednesday afternoon). In the list of interventions carried out were beam stopper tests, SIS watchdog checks and cooling tests.

Source dips have been reappearing on and off all week, with varying patterns of length and periodicity, sometimes short (1-2min), sometimes long (5-10min). No variation in the logged source parameters has been observed in correspondence to these dips. Some investigations were carried out to test current paths with a Pearson transformer.

The situation is being monitored but as yet no clear understanding of the source of this phenomenon has been reached.

On Sunday morning, Linac2 went down at 11h30 with a site-wide power glitch. Vacuum and source were restored around lunchtime. A full restart of Linac2 could only take place in the evening after all services had been brought back up. There were no major problems in the restart. Total beam downtime was about 7hrs.

ISOLDE (Miguel Luis Lozano Benito)

Very good week at Isolde until Sunday afternoon.

Double target change on Monday (HRS and GPS).

We could not install the target that was planned for GPS because it had a problem on the valve.

We installed another one that had already been used in HRS.

The GPS robot is now working fine after being repaired.

GPS-As it was in the schedule we gave stable beam to users on Wednesday night and radioactive beam on Thursday, Friday, Saturday and Sunday (until the power cut).

HRS-Proton scan and set up during the week. We have also used it for REX setup.

Users called me this morning at around 11.30 because of the powercut. They were supposed to end at 13.00 so not a big deal for them.

When I arrived everything was down (vacuum , target heating).

I have restarted most of the vacuum system and tomorrow we will continue...

AD (Bernard Dupuy)

It was a “nasty week”...

Monday 04 –

Recovery of the 100Mev extraction after a week at 500Mev for ACE.

We receive the beam from the PS around of 12:30. A. Findlay finished the RF settings to 15H00

We continue to MD program shifted by 4~5 hours.

MD Program.

We made scan of H and V beam position versus current in DHZ7042 and DVT7043.

Testing blow-up from vacuum window in front of mobile GEM on DEM line.

19:30 . Start the installation of a new experience ASACUSA zone (without RFQD).

The DE0 area was not closed (not use during previous week). We closed the area, but we cannot open BEAM STOPPER DE0.BSTP16. The safety specialist diagnostic a malfunctioning with the valve in ring. We expect the next day to access into machine (during technical stop).

Tuesday 05 – Wednesday 06.

Technical stop.

- OP9 Exceptional procedure in ADE target area, to change a water pump into the tunnel TT6 blind access.
- OP7 Exceptional procedure for the repair of the valve vacuum DE0.BSTP16.
- Moving a radiation monitor in ADE Ring, (studies losses beam in TT2).
- Specialists RF, test the ion pumping equipment into ring (spare).
- Replacement of air valve on DE.MW7046.
- Discovered water leak in the AD sector 12.
- Installing a magnetic shield around the vacuum chamber of BHZ8000
- Several switches (three) between the primary pumping station and the spare.

Many problems for the restart in the evening.

- Alarms water pressure on all ADE magnets.

- First-Line intervention for many power-supplies DE0.BHZ12 DE0.BHZ10 DE2.QN20 DE3.BVT25 .
Noted a temporary repair on DR.QUAD.

The beam was available for ATRAP to 01:00 am

ALPHA does not take the beam this week a new schedule is made between ATRAP and ASACUSA.

Thursday 07

- Rehabilitation of DR.QUAD after last night.

- First steering of ASACUSA line (without RFQD). The beam is not received correctly by ASACUSA.

Friday 08

- New steering of the line with ASACUSA team. The beam is visible on their detectors.

Saturday 09

- 13:00. ASACUSA does not receiving beam. We find DE0.BHZ12 down. First-Line is called by CCC, he diagnoses a control problem. The PICO is called, and he diagnosed a problem with the power-supply. I go there and call the both. CO and FL. this is a power-supply malfunctioning.

- The timing of S-Cooling does not work properly, CO + Bruno local intervention.

- At 0:00 BHZ12 is still not in working order, despite the work of two specialists First-Line. We stop the work for today.

Sunday 10

General power failure at 11h15. All facilities of ADE have failed. we let the CPS team manage the vacuum teams. I try to restart ADE Sunday afternoon, the E-Cooler filament is down. I restart the maximum of equipment (piquet was too busy by CPS & PSB). The specialist E-COOLER goes locally to start an heating filament. I leave the ADE as safe as possible.

Monday 11

Restarting ADE from scratch (With some help I hope...).

Booster (Jocelyn Tan)

A busy week...

Tuesday

First technical stop day. Smooth.

Wednesday

Last technical stop day : the PSB door was closed at 5:30PM and Linac2 was ready at 6PM.

The machine start-up was delayed due to

1/ magnet power supply issues : the PIPO was called for the MPS and many dipoles, the bending BT.BVT20, the quad BTM.QNO10.

2/timing issues : the PICO was called for DPSBTSM which did not generate an essential extraction timing : BEX.SSYNCFD. The latter is used for generating BEX.MW8RF and 2RF. The PICO has replaced power supplies of DPSBTSM and DPSBINST.

At 10:20PM the beam was back but for a short while (30mn).

3/The fast extraction kicker BE.KFA14L1 was not pulsing : the specialist was called, and fixed the problem : a defective cable.

4/BI.4DHZ70 yielding a poor injection in Ring4, the PIPO was called at 2:35AM and fixed it.

In addition to this, an important consolidation task on the acquisition chain of the PSB extraction line pick-ups was undertaken during the TS. Unfortunately, the work was not completed in due time. This prevented the PS to optimise their injection trajectory for the users TOF and AD. A temporary fix was available for the operators only on Saturday afternoon, after 5 days of hard work.

Thursday

In the morning the PIPO has fixed the the quad BTM.QNO10, but also BTY.BVT101 as a Piquet First Line back-up.

A CO issue was sent as it was not possible to compare working set values with those in the archive.

The PSB was back on its feet only at 10:30.

In the afternoon, when ISOHRS didn't get the beam as requested. The problem was due to the bending magnet BTY.BHZ301. Piquet First Line was called and fixed the problem : a reset of a the CPU board. Down time : 1h15'.

Friday

Before noon, there were beam losses in the ring, but they disappeared in a couple of mn so that their cause was unknown. In fact, our RF colleagues have swapped the Ejection Sync units between ring 1 and 2. It is worth noting that they have been investigating after the ring 2 extraction phase jitter problem for the whole week, checking the beam control and many other elements, but without success.

At 4:30PM, there was a Security chain issue : Safety conditions were lost in TT70, during the SPS patrol of BA7. The beam was shortly cut for all users. After 5mn we could send the beams to all users but ISOLDE. After patrol completion, the beam was back for Isolde. Down time for Isolde : 1h.

Saturday

At 6:40AM, the Piquet Vac was called for an alarm from an ion pump BI.VRPA14, an confirmed by a local pressure rise.

The pump could be restarted remotely by the piquet.

Sunday

At 11:10AM, there was a storm induced electrical glitch. All piquets and supervisors were called. The longest issue was the connection to the french electrical network.

The beam was back in the PSB at 7PM.

But the cavity BR4.C04 dropped at C650ms. The piquet LLRF and the specialist came and fixed the problem. the beam was cut for 2h35'.

At last all the controls alarms turned to green at 10:20PM.

Monday morning's run seems to be smooth.

PS (Alexej Grudiev)

Two major interruptions of the week were technical stop on Tuesday and Wednesday and the thunderstorm on Sunday. Otherwise smooth running providing beams for MD on Monday and Thursday and for the users on Friday and Saturday. LHC_50ns double batch 36 and 12 bunches are ready in PS. AD, EASTA EASTB, TOF, SFTPRO and CNGS operation continued at nominal intensities.

Problems:

During the Technical stop there were several problems: access system video on several ports was blocked so that the Patrol of the PS and TT2 had to be done on Tuesday afternoon. In addition, Door 111 shielding block had to be repaired in order to set up security chain.

Restart after the technical stop on Wednesday started at 17:00: after the beam was available from PSB at 23:00 it took couple of hours to adjust beams in PS. This was difficult to do at injection due to problems with PU in BTP line failure and YASP malfunctioning. PI-INCA came in to fix YASP problem. In addition PIPO had to fix QFN.

Restart of the PS after the thunderstorm power glitch on Sunday noon was very difficult. Many equipment items had to be restarted by the PIVAC, PIPO, PICO, Equipment specialists for kickers and 10 MHz cavities.

Finally As I am writing this report now, the PFWs (FW & DW) do not pulse correctly. PIPO is working on it. This prevents us to make the high intensity beams. The EAST beams are ready in the PS, but EASTA users are not ready to take it and for EASTB one magnet is still missing ZT8.SPECTRO, PI MAGNET were not able to restart this magnet. No beam for DIRAC till this morning.

SPS (Django Manglunki)

Not a great week for the SPS users. CNGS had less than 40 hours of beam, and the North Area about 15. Over the week-end the LHC only asked for the pilot beam.

The SPS was on MD on Monday until Tuesday morning to try the 50ns LHC beam on the low tune cycle (Q20).

During the technical stop, on Tuesday and Wednesday, five water leaks got fixed; MBB1390 needed to be changed, but the other four could be repaired in situ (MSI in TT10, MBA11230, QF62010, and busbar next to QF11610).

Thursday was devoted to a 24h dedicated MD for UA9.

Friday morning, the CNGS cycle was restored at 8:00, and beam started to be delivered by 11:00 after an access to remove a collimator stuck in

BA5 after the MD. The CNGS beam had to be stopped again for one hour between 16:00 and 17:00 during an intervention on chain 6. Then during the night, at 2:30, the power supply for the horn broke down and was only fixed the next afternoon at 13:15.

The double-batch 50ns beam for the LHC was prepared on Friday, with blow-up in the SPS to obtain transverse emittances close to 2.5 μ m.

The intervention to replace a corroded vacuum chamber in TT20 started at 9:00 on Friday and was finished around 12:00 as anticipated, but the vacuum conditions were not restored until Saturday afternoon. Physics in the North Area only restarted on Saturday evening.

On Sunday morning at 11:35, a violent thunderstorm caused a power outage on the whole CERN site. At the time of writing this the SPS looks in good shape, but the PS is still not supplying beam.

LHC

Technical stop Monday – Friday unfolded according to plan. Major intervention on cryo compressor point 8 – cryogenics back around 08:00 Saturday morning. Re-commissioning with beam – usual halting progress following technical stop – various issues.

LHC hit hard by power outage Sunday afternoon. Atlas and CMS will not be back in business before Thursday.

<http://lhc-commissioning.web.cern.ch/lhc-commissioning/>