Accelerator Complex Status

End week 37 (Monday 18 September 2017)

TI (Jesper Nielsen)

Friday 08:09, No beam imminent warning at point 3 (after 3 attempts), piquet investigated on-site and found there was a problem with a relay switch. A new relay switch was installed, which solved the problem.
Saturday 07:14, Beam lost in LHC, some faults detected on the RF of the PS, and at the same time a double quench of a dipole in point 6 and 8. EDF/RTE informs of no events on the network. SIG informs later that a 220kV line has indeed been off for 500ms, which is most likely the cause of the event.
Details: https://wikis.cern.ch/display/TIOP/2017/09/18/TI+Summary+Week+37

LINAC2 (Richard Scrivens):

A quiet week, two repairs needed to power converters (one in the measurement line, one after the source).

LINAC3 (Richard Scrivens):

The tank1 amplifier repair was finished on Monday evening, and the restart had the beam back to LEIR after lunch on Tuesday.
During the rest of the week there were a few trips of the source RF, and the RFQ.

LEIR (Steen Jensen):

Issues:

- Tuesday, September 12th2017
  - Beam back at 15h00
  - ER.XDN11 fault => PiPo => OK => ~30 minutes downtime
  - EI.QFN20 fault => PiPo => OK => ~25 minutes downtime
  - XenericSampler problem on ER.QFN1030, ER.QDN1030, …
- Wednesday
  - Error in LSA trim
  - XenericSampler timestamp issue => Rollback => OK
- Thursday
  - CGAFG and XenericSampler devices in FEC cfv-250-cpow red in DiaMon => reboot FEC => OK
- Friday
  - ER.QFN1030 down => Temperature related => Machine access (impact 100413) PiPo found unexplained external condition => reset external condition system => machine down with external fault => restart LEIR => 3h37 downtime
  - ER.SEH10 functioning, but with error in WorkingSet => related to InCA change making the device PPM-for-OP
- Saturday: Nothing to report
- Sunday: Nothing to report

Activities

- Machine developments

- EARLY: transfer line optics, setup for Xe39+
- NOMINAL: Space charge studies, cooler studies
- RF studies, BPM measurements, Cooler studies

PSB (Simon Albright):

Overall a good week for the PSB, with no major faults or downtime. From our standpoint the MDs for the LHC were very successful, all non-standard beams were produced on time and in spec.

On Tuesday BTY.QFO119 was down for ~1h15 minutes before being reset by the piquet. As ISOLDE was not taking beam there was no impact on operations.

The only long term fault was Wednesday from ~0600 until 1311. This was also non-blocking, but we struggled to provide sufficient intensity on the MTE beam. This was determined to be a solenoid in Linac2 providing insufficient current. The beam was stopped for ~5 minutes for the piquet to replace a module. Intensity was improved but we're still struggling to provide the intensity desired by the SPS. G. P. Di Giovanni is continuing to study the MTE beam to provide higher intensities within required emittances.

Apart from this there were a small number of brief power glitches and similar events. All were quickly resolved by the operators.

As usual there were MDs ongoing for most of the week.

ISOLDE (Alberto Rodriguez):

It has been a pretty good week from the operations point of view. The accelerators have been very stable and there has been barely no downtime due to problems with the equipment in the facility.

A low energy experiment that had started the week before finished on Tuesday morning. In parallel, we worked on the set-up for a new HIE-ISOLDE experiment (94Rb with an energy of 6.2 MeV/u from the GPS target to the Miniball experimental station). It was the first experiment that required using all 15 superconducting cavities. We started delivering radioactive beam on Wednesday evening (stable beam a day before). The target, separator and the linac have behaved very well. However, we have not been able to deliver the beam intensities originally planned due to the radiation level in a couple of hot spots in the hall. We have had to run at a reduced proton current during these days. The users have started seeing hints of new physics. But at this point, it is not clear if the results will be publishable.

PS (Klaus Hanke):

A very good first half of the week and a difficult second one for the PS. Main problems concerned the power converters and the wire scanners.

On Tuesday the RF piquet fixed the C51 which was not resettable. Also on Tuesday FWS 85V was blocked but could be unblocked remotely.

Wednesday FWS 65H was not in 'home' position, hardware re-initialised. Also trips of PR.WFNP, the piquet was called who then called the expert (A. Harle). They did a number of attempts but nothing could permanently fix the problem. More than 3 h stop for all beams, afterwards operation could resume except for LHCINDIV and SFTPRO. At 22:00 SFTPRO could resume operation but AD was still stopped (AD and PS SVs informed). An intervention was planned for Thursday around lunch time (in agreement with the LHC). That started 13:00 and required a stop of all beams. The problems were solved and operation of all beams resumed 15:49 (the main problem came from an incompatibility at the HW level between the normal PC and the Spare one. It is something that they will look on during the YETS). The LHLC MD was not affected by this.

On Friday morning PR.DHZ05-OC tripped, could first be reset but then stopped for good. The piquet was called and did a simple reset which did not work before. In the afternoon FWS 85V got stuck in an unknown position (not in the beam). An access was needed to de-block it. Total down time 53 min.
The 'consigne' is now not to use it any more until TS3.

During the weekend no major stops but repeated trips of the PFW power supplies.

On the positive side all beams requested by the LHC MD were delivered without problems.

AD (Lajos Bojtar):

Nearly perfect availability this week, only half an hour downtime due to a power supply. Nothing to mention.

SPS (Hannes Bartosik):

It was a relatively good week for the SPS with an overall beam availability of about 90% for the North Area experiments. Since Thursday the intensity on the Fixed Target cycle was further increased following the user requested sharing on the targets. Presently the beam intensity at flat top is about 3.5e13 p with an excellent transmission of about 95% in the SPS.
The major part of the downtime was caused by the injectors (about 12 hours). Apart from that, the beam had to be stopped for about an hour on Monday for an intervention on the 800 MHz RF. Furthermore it was realised that the active filter on the QD circuit was not working, which resulted in significant ripple at 600 Hz. This was fixed by an intervention on the PLCs controlling the active filters on Tuesday, which lasted also one hour. Since then the ripples at 600 Hz and at 70 Hz on the QD circuit are gone.

Besides the 8b4e beam presently used for LHC physics production, the SPS delivered a variety of different beams for the LHC MD block #3 which took place from Wednesday morning until the end of the week. This went rather smooth, the only exception being the high intensity 8b4e beam with 1.6e11 p/b as

requested for the high pile-up studies: The ZS voltage had to be reduced in order to avoid sparking in the extraction septa and consequently the North Area physics had to be paused both during the preparation of this beam on Tuesday and during the actual delivery to the LHC on Wednesday.

Worth mentioning is that the BCMS variant of the 8b4e beam was prepared for potential use in the LHC after the technical stop. The SPS measured transverse emittances of about 1.3 um for 2x32 bunches with 1.2e11 p/b at flat top.

Finally, first tests with partially stripped Xe (39+) took place on Thursday on Friday on a parallel MD cycle in preparation of detailed lifetime studies. So far it seems the lifetime due to stripping on the residual gas is on the order of 1 s.

LHC (Markus Zerlauth, Stefano Redaelli):

Smooth operation with 8b4e until Wednesday morning, only interrupted for a 30cm beta* setup fill with probes (coupling, optics, settings). MD3 started on Wednesday morning with a high pile up test. MD3 was quite efficient, only the Shottky MD and the long range beam-beam compensation wire were lost due to QPS issues on Saturday and Sunday.