Accelerator Complex Status

End week 42 (Monday 22 October 2018)

TI (Ronan Ledru)

Details: https://wikis.cern.ch/display/TIOP/2018/10/22/TI+Summary%2C+Week+42

LINAC2 (J-B. Lallement):

The Linac2 RF tripped due to an intrusion Friday night (see Linac3 report) and had to be restarted 3h later.

LINAC3 (J-B. Lallement):

Loss of Switchyard patrol at 00:30am in the night from Friday to Saturday because a door was forced at the end of Linac3 by 5 persons – to be followed up (3h beam stop for the whole complex). Otherwise change of stripping foil on Friday upon request from LEIR.

LINAC4 (B. Mikulec):

Low-energy beam stoppers grounded to remove latency of beam return after beam stopper removal. Investigations continued on the non-working bunch shape measurement and on other BI instruments. Investigations on source RF instabilities as a function of the requested RF power. TE-EPC reconfigured the Linac4 FGC3 modules used for the FGC62 power converters, which were all found non-functional last week. Source caesiation on Friday with parallel machine access and an intervention on the RFQ to change the adaptation of the modulator to increase the voltage of the klystron for more power margin; still over the weekend many RFQ trips were observed. There is a doubt on the RF phasing – to be followed up.

LEIR (R. Alemany Fernandez):

High beam availability.
The NOMINAL cycle was upgraded to 8 injections (usually 7) and fast acceleration, which resulted in an increase in extracted intensity from LEIR of 10.51 e10.
Good LEIR performance until Wednesday, after which the intensity degraded from LINAC3, preventing to reach LIU values. LINAC3 tried to change the stripper foil, but this did not help much, also the source performance was not as good as at the beginning of the week.
Many MDs in parallel.

PSB (B. Mikulec):

Another excellent week with 98.6% availability. Apart from the 3h downtime due to the lost Switchyard patrol only 3 minor faults. Main focus of the week was the continuation of the beam preparation of the upcoming LHC MDs and of pre-LS2 reference measurements plus a wide range of machine development studies.

ISOLDE (M. Lozano Benito):

It has been a quite busy and productive week at ISOLDE without major issues.
GPS: the machine was set up for negative ions and delivered 211At to GLM (IS615) where the users managed to measure the electron affinity of astatine.
HRS was set up for delivering beam to VITO and IDS.

PS (H. Damerau):

An average week for the PS with beam availability of about 93% for most user beams with the exception of the T11 beam line of EAST North where no beam could be sent during the night from Wednesday to Thursday for almost 10 hours due to a problem with the access system, which has only been solved on Thursday morning.
During the night from Friday to Saturday the access door YEPZ02.SWY=351 between Linac3 and Switchyard was forced. A surveillance camera registered five people leaving Linac3 on Saturday at 0h30. A patrol of the sector was required to resume beam operation. The event stopped the PS for in total 3h10.
On Sunday morning the power converter of the extraction bumper PE.BSW14 tripped. The trouble-shooting turned out to be difficult and caused 5 hours downtime for all fast extracted beams including the fixed target beam.
Several trips of the pole face windings due to their regulation were again observed. POPS also required a couple of resets, in some cases when a cycle was played which was not yet correctly mapped to an LSA user.
For the upcoming MDs in LHC and SPS various beams have been prepared and checked: a high-intensity 8b4e beam with 48 bunch batches at PS extraction, 12 bunches spaced by 25 ns with a very high intensity of up to 2.5E12 p/b, as well as a variant of the BCMS with 24 bunches for an MD in the SPS.

AD (P. Freyermuth):

Good week for AD.
Very few issues after the restart of the electron cooler. The efficiency of the machine is comparable to the one at the beginning of the run.
Fine-tuning in the PS allowed to increase the proton intensity up to 1450E10 on the target. The AD extracted intensity decreased a bit during the weekend, reminding that the AD needs constant care to keep the performance up.

ELENA (C. Carli):

ELENA commissioning has resumed last week with antiprotons available again from the AD. During morning shifts from Monday to Friday, the antiprotons from the AD were injected into ELENA either for operation for the GBAR experiment or for further setting up.
ELENA commissioning concentrated on electron cooling studies. According to the scraper, small transverse emittances close to nominal values have been observed after cooling at the intermediate 35 MeV/c plateau. Nevertheless, this has been achieved without particular action to optimise cooling (effect of attempt to optimise cooling just before AD cooler vacuum problem?). Small transverse emittances at 100 keV measured with the scraper as well after cooling at 100 keV with some optimisations.

Issues are still the loss along the second ramp down to 100 keV (after many efforts to understand) and very limited observations made with the profile monitors of the lines. The H-/proton source was again not available despite all efforts by several groups to finally have working isolation transformer (failure on Friday of the week before of a 400 Hz generator connected to the primary windings of this isolation transformer). Further investigations took place (HV tests with the primary grounded, preparation of another 400 Hz generator and electronics to protect to protect this device against damage due to discharges) in view of making the source operational.

SPS (H. Bartosik)

It was a busy week for the SPS. On Monday AWAKE started the final run with proton beam of this year. On Tuesday the setting up of the long LHC ion filling cycle resumed and big progress was made. Up to 12 injections of 4 bunch batches from PS were successfully acceleration to flat top. Mostly the setting up of extraction and fine optimization of the RF settings remains to be done. The dedicated MD on Wednesday was devoted to the last session with crab cavities this year. Among other results, the transparency of two crab cavities with equal voltage but opposite phase could be demonstrated. On Thursday a cycle for the 8b4e beam as requested for next week's LHC MDs was prepared. For about 5 hours the North Area beam had been stopped for setting the ZS to minimum voltage and thus avoid sparking, as agreed with the physics coordinator. This allowed reaching 1.6e11 p/b in 2x48 bunches of the 8b4e beam. Friday morning the machine was given to EPC to perform the repair of the fire detection cable on the SMD9 power converter for the main dipoles, and to perform a preparatory test with new electronics on the QS power converter.
The beam availability was about 90%. Large part of the downtime is attributed to injector faults, which occurred especially in the weekend. On the SPS side, a problem with the North Area access system on Tuesday stopped the North Area beam for about an hour. About 1.5 hours downtime were accumulated due to a fault on the TX5 of cavity 3 on Sunday evening.
Some issues with LHC filling were encountered, especially over the weekend. Losses at SPS injection and intermittent beam quality affected the LHC fillings of Saturday night and Sunday evening. The BQM triggered on many shots. Furthermore, losses in the transfer to the LHC were observed. The reason for this is not yet understood, but investigations are ongoing. In addition, the LHC filling on Sunday evening was affected also by the fault of TX5, which tripped just before the LHC filling could be completed. Unfortunately, the LHC had to dump and refill afterwards.

LHC (E. Bravin):

Good week with 82.2% availability and 62.1% stable beams. CMS is now above 65 fb-1.
The week started with a cryo stop in point 8 (filter de-clogging) that eventually lasted for 24 hours. The 600b ramp-up fill was made on Tuesday morning. On Friday a dump occurred due to gas injection in Pt. 4 and related vacuum degradation (misunderstanding between the BI and vacuum team). Some yet unexplained strong blow-up was observed on Sunday afternoon on B1V.