Accelerator Complex Status

End week 31 (Monday 6 August 2018)

TI (Ronan Ledru)

A reasonable week with nevertheless a more serious issue on the SPS North area water cooling circuit during the first half of the week; A primary water leak in the gallery GT807 had to be repaired following the burst of a corroded piece of pipe. Since the system does not contain enough isolating valves in the return path it took a long time before the repair could be made.
Details: https://wikis.cern.ch/display/TIOP/2018/08/31/TI+Summary%2C+Week+35

LINAC2 (Francesco Di Lorenzo):

Linac2 is running very well, we got 40 flashovers during the week .

LINAC3 (Francesco Di Lorenzo):

Linac3 is running very well. On Thursday Detlef has refilled the oven1 with new lead (Pb) . Sebastian and the people of the Vacuum group have changed the strip foil on the (quatrième bras) . The beam intensity was about 30 uA thanks to Detlef's frequent re-tuning.

LINAC4 (Bettina Mikulec):

The HW commissioning is finished; for the RF the commissioning up to 3 MeV. The beam commissioning to the 3 MeV chopper dump started Thursday late afternoon and LEBT optimisation and RF commissioning up to 160 MeV ongoing.

LEIR ():

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PSB (Bettina Mikulec):

- Very good week with 97.9% availability
- Wednesday 18:00 the machine could be restarted within 10 minutes after an electrical glitch
- Wednesday after midnight the Ring 1 C02 cavity tripped and couldn't be reset; M. Haase had to come in and replace the screen control unit (1 h stop)
- Thursday night the Ring 3 C16 cavity tripped and wouldn't restart; the operator used transverse shaving instead to produce the LHCPROBE beam for the LHC filling. In the morning an access was required, and M. Haase replaced a broken driver board in the machine as well as a filter for the current measurement on surface (1.5 h stop).
- Thursday afternoon shortly after 3pm, none of the machines could be controlled anymore. A. Bland and his CO colleagues had to restart a database frontend
- Since Friday we cannot use the MD2 timing user anymore, as one of the timings (BX.SCY-BGEN) related to the B-train generation is not sent; this will be followed up with the CO timing specialist today
- Friday night problems with the Ring 3 C16 cavity re-appeared. The RF piquet

diagnosed that the cavity couldn't hold amplitudes above 1.8 kV anymore. We decided to continue running with reduced amplitude until today, but most probably another access and maybe a tube exchange will be required.

ISOLDE (Miguel Lozano):

It has been a good week at ISOLDE.
We delivered 11Be at 7.5 MeV/u to XT03 from GPS . No major faults to report. Only some issues with RILIS (laser ionization) but apart from that the accelerator was very stable and performed very well.

We have already installed a new target on HRS and the separator setup is done in preparation for the next run .

PS (Matthew Fraser):

It was a good week for the PS with close to 95% availability, however, frequent trips of F16.QDE217's power converter have been a recurrent issue throughout the week and caused difficulty providing ion beam to the SPS. TE-EPC are aware and investigating. The very low intensity version of SFTPRO was set-up at short notice and sent to the SPS on Tuesday morning so that MD's could be carried out to take advantage of the downtime of the North Area. On Tuesday evening, it was decided to stop operation for an access when both vertical wire-scanners found themselves in undefined states causing 1h 30 mins of downtime; 64V could be used again immediately and 85V put back in operation on Friday. On Thursday, KFA21 went down requiring a piquet intervention and causing over an hour of downtime for SFTPRO. Operation was perturbed over the weekend by problems with the 10 MHz RF system. On Friday night, the gap relay on C76 broke and the spare C11 was put into operation, which caused reduced intensity for AD until an access was made to fix the relay on Saturday at afternoon. The access caused 1h 15 mins downtime. Problems were experienced with C11 last week; however, those had been assumed as repaired on Monday by the RF specialist. The AWAKE bunch was produced over the weekend with satellites being reported by the SPS that will need following-up.

AD ():

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ELENA (Christian Carli):

During last week, AD antiproton shifts were scheduled for ELENA and/or GBAR everyday from Monday to Friday. Most of the time we split the 8 hours shifts into a few hours "operation" for GBAR and a few hours for ELENA commissioning and setting-up.

At the beginning of the week, we worked mainly on steering in the AD to ELENA transfer line, which is tricky due to the missing profile monitors. The aim was to improve steering in general to make sure that we do not lose beam touching apertures and to be able to do again quadrupole scans to characterise the beam injected into ELENA (some indications for significant mismatch - a first quadrupole

scan done about two months ago allowed to improve, but since the steering must have degraded).

Later this week, work concentrated on testing bunched beam cooling, necessary to generate bunches with sufficiently small lengths and energy spread, and to improve conditions for GBAR. It was surprisingly easy to improve the situation (but still a bit less than a factor two has to be gained in bunch length and energy spread by empirically optimizing trajectories in the cooler and other settings). We have now slightly more than the intensity of one nominal bunch regularly extracted towards GBAR.

The cabling of the electron cooler is finally completed and the compensation settings (to make sure that the field lines in the region, where beams interact, are as straight as possible) have been programmed. I hope that we will as well gat an explication how these compensation setting finally have been derived. One of the very next steps (beside still working on the loss along the second ramp and efficiency in general) is to optimise electron cooling on both plateaus.

The profile monitors are still a issue with very limited progress again during the last weeks. This Tuesday, when the expert working on these monitors (external contribution) will finally be at CERN, yet another meeting organized by Rhodri (thanks again to BE/BI for getting involved more and more) will take place.

SPS (Francesco Velotti)

The SPS week 35 was characterised by a large, to use an euphemism, water leak in the NA, leading to about 80% availability. This was caused by a rusty valve that broke off and caused 23 hours of no beam for the NA. During this issue, we tried to profit to perform, or at least start, a slow extraction MD. This wasn't easy as foreseen as the TAX cooling is part of chain 9 (needed to send beam also to the TT20 TED). In the end, this worked out and we could profit of about 3h of dedicated SE MD.
Still on Monday, it was scheduled the DSO test for a new zone in the NA. This failed due to a problem in the access matrix. The DSO test was then tried again Tuesday morning and, this time, succeeded.
On Tuesday and Friday, we had ion setting up, but this was, unfortunately, perturbed significantly by very frequent trips of a quadrupole in TT2 (used only for ions). The PS crew is following this up.
In these first days of the week, we recorded multiple events of H damper trips on SFTPRO cycle, luckily always before reaching FT.
On Wednesday, the MD was dedicated to the crab cavity. The MD was carried out in COAST, and the studies were regarding the estimation of the emittance growth with crabs on. On Thursday, the HI MD for LIU beams took place. Four batches of 12 bunches at 2e11 ppb were accelerated at FT.
On Friday we observed something peculiar. The MKQH was set to kick on MD2, but, instead, a few times in a hour, it was fired on SFTPRO beam, luckily during the ramp. The H damper was tripping as consequence of the too large oscillations to correct for. ABT experts have been alerted and they are investigating. It might be related to a timing problem.

Also, in preparation for the AWAKE run #3, which started Sunday morning, the MKE4 delay was increased in order to try to get rid of “satellites” forming before the actual bunch and perturbing the experiments (maybe still some optimisation is possible but to be followed up with kicker experts). During the weekend, AWAKE started smoothly and no particular problems were observed.
The only issue for the NA during the weekend was due to the access system in PPE 184.

LHC (Jorg Wenninger and Monday morning meeting):

Presently we are at 10 days before the next MDs and TS block with ~ 47.9 fb-1 integrated.
During the week the RF voltage was further reduced from 4.5 MV to 4 MV which is the target setting. In addition over the weekend the Octopoles could be further reduced without any negative effects on the beam.
The weekend was a bit rocky with issues on Saturday on orbit corrector power converters and access system issues that required a repair and a patrol of Point 3. The remainder of the weekend was completed with short fills interrupted mainly by QPS issues. The very good injector availability and the short injection times helped saving time, allowing for a reasonable accumulation of luminosity over the weekend.
The peak luminosity went up by about 10% throughout the week, but nothing was changed to the beam conditions, hinting either a change on the experiment side with the publication of the luminosity or an improvement on the beam brightness before going into collision.
The LHC is well on track for the 50 fb^{-1} before the council week and has passed the 140 fb^{-1} mark for the entire run 2.