

Accelerator Complex Status

End week 45 (Monday 13 November 2017)

TI (Jesper Nielsen)

Tuesday 07/11/17 12:51: SF8 cooling towers tripped due to a low level alarm in the basin. The filters were blocked by leafs. Piquet quickly cleaned and restarted the cooling towers. As a direct consequence, complete stop of all cryoplants running at point 8 (LHCA, LHCCA, LHCB and LHCCB), then loss of cryo conditions on both S78 and S81. Approximate duration of the stop: 30 min. The cryo recovery lasted until after mid-night.

Thursday 09/11/17 23:03: Fire alarms in Booster and problem with BT1 SMV10 power converter. The problem was on a power strip., 6 hours of access were needed to repair.

Sunday 12/11/17 17:21: Electrical perturbation, confirmed by RTE on a 225kV line between Cornier and Passy. The line will be re-powered only Monday, TI will be informed before. The same day, due to rain there were also a few inundation.

Details: <https://wikis.cern.ch/display/TIOP/2017/11/13/TI+Summary+Week+45>

LINAC2 (Jean-Baptiste Lallement):

Linac2 had an excellent week with 100% availability. The source HV column was cleaned during the PSB stop on Friday.

LINAC3 (Jean-Baptiste Lallement):

The Linac3 week was also pretty good with only two source RF generator trips (10 min downtime on Monday and Sunday) and a tank2 trip that was restarted by the RF team (20 min downtime on Wednesday).

LINAC4 (Greta Guiduboni):

This is a short report of the second week of Linac4 under BE-OP responsibility:

- Running fine with a few trips from RF and source.
- First ppm operation of Linac4 after the modification of some watchdog properties
- Source fully running non-ppm and successful cesiation process
- A few remaining beam instrumentation issues being followed up.
- MD for testing wire scanner electronics for ESS
- MD for stripping foil and BTV at the test-stand
- First test of the Laser Emittance Meter

LEIR (Maria-Elena Angoletta):

Not one of the best for LEIR operation.

The main topic of the week was the kickers operation. LEIR operated from Monday 6th November to Thursday 9th November with two kickers (ER.KFH31 and ER.KFH32) instead of the usual three because ER.KFH34 went into fault and a switch needed to be changed. The idea was to wait until a PS or SPS access of a couple of hours to change the switch. During this time ER.KFH31 tripped very often, (about 10 times per day) owing to the extra voltage required to compensate for the missing kicker. A short downtime (about 5 minutes)

happened every time it tripped. Finally on Thursday 9 afternoon ER.KFH31 tripped one time too many and it was decided to make the access so as to change the switch on ER.KFH34. This was successfully done with a 4 hours intervention; normal operation with 3 kickers was recovered. An intervention on LEIR SEMGRIDS could also be done in the shadow of this access.

On Tue 7 morning the beam was suddenly injected but immediately lost. That could be traced back (with some effort) to the electron current in the electron cooling system that was about ½ of what it was expected to be. The expert came to investigate and found a faulty power supply in the control unit, which was promptly changed. Beam was lost for a bit over 3 hours due to this problem. This underlined the need for a better diagnostic of the ecooler system, as this is an essential system for LEIR's operation. Steps are being taken to achieve this.

On Tue 7 morning EPC removed a crate in the spare cavity (CRF43) to modify it and hopefully solve the problem of the failed remote reset. For two days therefore LEIR remained without its spare cavity, but it was considered a risk worth taking.

On Wed (during the SPS MD) there was downtime due to a Linac3 fault as well as to the Btrain generation crate (dleibgen) going down repeatedly.

The power crate for the CRF43 was reinstalled in the late afternoon and initial tests showed that the problem might now be solved. As CRF43 was only the spare cavity, not (yet) used for operation, no down time was due to this.

On Friday the LLRF changed the pick-up used for the phase loop, to a pick-up not included in the orbit system. This will allow BI to carry out calibrations in parallel with operation (with radial loop disabled). The EARLY user was setup to operate with the new pickup..

Over the weekend there was a short downtime due to a trip of the CRF41 cavity, that was solved with a remote reset. The NOMINAL user was setup to work with the new phase PU, in view of the SPS MD on Wed 15Th November.

On the MD side, it is worth mentioning the first tests of the LEIR LLRF with the new Btrain system. On Wed 8 November the communication was successfully validated and data from the new Btrain system could be successfully acquired and displayed in Oasis. The new Btrain was not yet calibrated hence it was not possible to use it on the beam. This will be hopefully achieved in a new MD this coming week.

PSB (Simon Albright):

Mostly a good week for the PSB, one major fault in Ring 1, minor faults otherwise. Special beams for the LHC were delivered within specification along with the usual operational beams.

Prior to Fridays intervention there was an ongoing problem with BT1.SMV10. An ongoing drift in the acquired current required monitoring and correcting by operators. There has also been a small drift seen in BT4.SMV10 and intermittent fluctuations in the acquired current of BT2.BVT20. The fluctuations in BT2.BVT20 are less than 1% but appear to coincide with vertical trajectory fluctuations in the transfer line from ring 1 and ring 2.

Small interventions in the BT1.SMV10 power supply temporarily returned the performance, requiring stops of ring 1. However, the problem was not resolved. Thursday night shift saw a complete failure of BT1.SMV10 followed by a fire alarm and access by the fire brigade. EPC piquet was unable to restart the

septum. As the operational beams could be supplied either in degraded mode or as normal it was decided to organise the intervention on Friday morning. On Friday morning ring 2 cavities stopped pulsing for about 2 hours requiring piquet and expert intervention. The decision was taken to start the BT1.SMV10 intervention as soon as possible, beam was stopped at 0826 and returned at 1501. The expert found that a stripline had failed, this was replaced and appears to have solved the drift in the acquired current. A full MD schedule as usual saw successful demonstration of the white rabbit B-Train, along with the usual diverse studies.

ISOLDE (Miguel Lozano Benito):

It has been a very good at ISOLDE.

We have been delivering 56Cu to XT03 at different energies from Wednesday night.

Only some time down (around 6 h) due to some problems at the BOOSTER and minor interruptions due to some electrostatics elements trips at GPS separator and CA0.

In parallel GLM has been taking some samples of 64Cu and 61Cu .

PS (Klaus Hanke):

A very good week for the PS with only a few problems on the PS side.

Most of the down time was caused by trips of the POPS which occurred regularly throughout the week. The down time related to these trips is always about 10 min, but there was quite a number of them. There was also a broken PLC which caused some radiation monitors to trip. Otherwise only a few resets here and there.

On Tuesday A. Beaumont deployed the new B-train measurement and White Rabbit distribution on all users. So far there are no issues with the new system.

In the second half of the week (Thursday/Friday) there were PSB problems with the vertical septum (see PSB report), which caused quite some down time for the proton operation in the PS but we could continue with ions and make good progress. During an MD on Wednesday Xe beam could be sent to the East Area dump.

On Friday evening a number of radiation monitors tripped and we had to stop operation. The RP piquet had to disconnect several monitors, and to compensate for this he decreased the threshold on some of the others. This allowed us to resume operation. Then the problem could be traced down to a faulty PLC which was changed, and we went back to the original thresholds.

AD (Lars Joergensen):

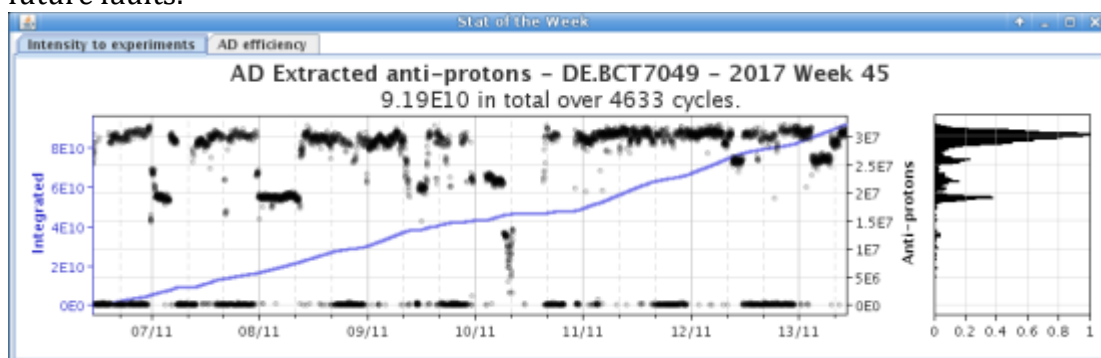
Only minor problems to report.

Monday we had AD MD with tests of the AD injection line for possible replacement in LS2 of quadrupole magnets with permanent magnets.

DI.DVT6067 trips often, but since it has a nominal current of only 1 A, it only reduces the intensity very slightly.

Tuesday morning there was a failure of the electron cooler. The water level in the collector cooling water tank was low. After an OP7 Excep, the water tank was refilled and the electron cooler was operational again. The electron cooler team request another OP7 Excep later in the week to ascertain the rate of water loss. Thursday morning, in the shadow of low beam intensity from the PS Booster, the access for the electron cooler is made. The BCCCA team also make an access to fine tune the cryogenic system of the apparatus.

Over the weekend there were several faults in one of the modules of the 10 MHz system, DR.AC10-26. A reset usually solved the problem, but A.Jibar has now installed a monitoring system and asks that we contact him directly in case of future faults.



SPS (Francesco Velotti):

Pretty good week for the SPS with about 90% availability for FT beam. The week started with the new cycle for FT ions physics - the new extraction energy was 179 ZGeV. NA experiments reported very good feedback for this week beam quality. The main down time was accumulated due to an extraction kicker problem in LEIR. After repeatedly tripping for the first part of the week, due to the need to use higher voltage on 2 kickers to compensate for the one missing, on Thursday the switch was replaced and operation restarted with no further problems.

During this week, LHC had special runs. This meant for the SPS to deliver mainly INDIVs for the high beta* run. Also, the special super cycle for VdM and BSRT calibration was prepared. This comprised nominal INDIV, VdM special INDIV and low emittance INDIV. Physics at 2.5 TeV was then started during the weekend. Friday ATLAS and CMS achieved (on average) 50 fb⁻¹.

The dedicated MD block was very dense - partially stripped Xe beam, dynamic bump for slow extraction (TED was cosigned and TT20 was switched to proton mode for the MD duration) and high intensity LHC beams (Q20 and Q22). On Thursday, the powering test of TT41 (AWAKE beamline) was successfully carried out. Also, the AWAKE beam was prepared to be used for Thursday evening for the BGI MD. As a side product, the AWAKE cycle is now ready.

LHC (Markus Zerlauth and Jorg Wenninger):

The first part of the week saw the final days of operation with 8b4e BCS at 6.5 [TeV](#). Wednesday was devoted to the setup for the high beta* run at 400 [GeV](#). Beam setup of the 2.51 [TeV](#) cycle with a fast ramp began Friday afternoon.

Major fault of the week: a cryo stop of 24 hours following a cooling water tower in point 8 Tuesday midday and a 6 hour stop due to the PSB extraction septum stripline on Friday.

Friday and Saturday was devoted to the setup and validation of the 2.51 [TeV](#) cycle and [VdM](#) scan which was completed by Sunday morning. Intensity ramp-up for the 2.51 [TeV](#) physics period on Sunday with a 524 and 1200b fills. Sunday evening was perturbed by a voltage drop on the EDF lines.

Plan: Operaiton at 2.51 TeV with long fills of around 24 hours.