

Accelerator Complex Status

End week 31 (Monday 7 August 2017)

TI (Jesper Nielsen)

Not too much for TI, though many interventions were carried out both by the operators and piquets for many smaller problems due to the high temperatures. Details: <https://wikis.cern.ch/display/TIOP/2017/08/05/TI+Summary+Week+31>

LINAC2 (Jean-Baptiste Lallement):

A very good week with only one non-blocking fault.

On Thursday afternoon, the intensity sent to ISOLDE was limited as long beam pulses entailed losses in the DTL with radiation level going above the first alarm level at the control room and at the PAD. It was caused by some of the tank1 quadrupoles field ramping down before the end of the pulse. The reason for this timing change is not clear yet (it could have been due to flat top length reduction induced by high temperature at the power converters).

LINAC3 (Jean-Baptiste Lallement):

A very good week with only 2 source resets.

LEIR (Sergio Pasinelli):

Main tasks of the week:

Optimization of the NOMINAL cycle (multiple injections)

EARLY beam sent to SPS for setting up

We have had some faults during the week:

- The rack which contains the DSC of the DFH bump was OFF. The specialist has been called and he found the "Disjonteurs" of the rack and of the start point OFF.
- Cavity CRF41 was OFF and cannot be reset remotely. The specialist has been called.
- The beam after a NOMINAL cycle was not injected. Found, the ejection value of the ETL.BHN10 on the NOMINAL, with the wrong polarity. 291 [A] instead of -291[A]

Nominal multiple injections studies:

- Orbit adjustments at the injection
- Optimization on the ECooler (current and orbit bump)
- Adjusted the capture of the beam.

Result => 7 injections and 6.5e10 charges.

EARLY beam was available Thursday and Friday for the SPS setting-up.

PSB (Bettina Mikulec):

Smooth week apart from a few resets and 2 short interventions of the piquet for the ring 1 extraction kicker.

An important ripple on the main power supply for the defocusing quadrupoles was observed, which seems to be due to a problem with the active filter of the spare QDE power supply, in operation since June. The specialists propose to switch back to the operational power supply this week, which will require a stop of ~1.5h, also because first the electromechanical switch that allows the configuration exchange, broken during a piquet intervention in July, has to be repaired.

A lot of activity on the MD front: h=2 cycle with h=1 synchronisation; longitudinal blowup using phase noise; bunch flattening through triple harmonic operation on ring 0 (Finemet); emittance measurements along the cycle taking into account scattering on the wire; dispersion measurements.

ISOLDE (Erwin Siesling):

HRS running with Ar beams for the VITO experiment this whole week. GPS preparations during the week for the upcoming Sm run (REX/HIE). RILIS laser tuning, proton scan and yield check as well as Sm injection into Trap/EBIS to define best charge state all done in preparation of the very dense schedule for the coming week.

Reasonably calm run except for a few issues this week:

- Tuesday-evening practically all vacuum sectors went down due to a short circuit created by one of the users. We recovered fast with help from Jose Ferreira Somoza and Abel Gutierrez (TE-VSC) and luckily the target vacuum sectors were not affected.
- Wednesday-evening the HT2 high voltage power-supply broke. We swapped for HT1 (since GPS was not taking beam) and survived. Thursday-afternoon HT2 was repaired by Jan Schipper and Thierry Gharsa (TE-ABT)
- Thursday-afternoon during the HT intervention we lost all power in the HT room bringing down the target heating of both HRS and GPS and causing the CPU card of the high voltage FEC to break. Many thanks to Benjamin Ninet (BE-CO) for helping out to replace the broken card. The power trip itself is not fully understood but suspected to be related to the repair on the HT2 (the circuit breaker seemed to have tripped when restarting after the repair).
- During the weekend a few times (3 times in 48 hours) some of the CAO sector elements went down. A reset put them back on. Does not seem to be a vacuum glitch or such. We will investigate further on Monday. It is hardly an issue for the experiment with so few trips.

VITO is very satisfied with the running of ISOLDE. They do have a few issues with their set-up, mainly polluted crystals.

PS (Ana Guerrero):

It has been a smooth week with 99% availability, the main fault being the power converter for PR.WFW which had to be exchanged by the spare on Sunday afternoon (1h15m beams down). Also during the weekend, the PIHLRF was called due to a C11 fault. The piquet concluded that there is probably a piece of

seal in the water cooling circuit and a 2h access is required, but the cavity it's back to work.

On the beams side, all operational beams have been delivered as requested. Since Friday a new version of the BCMS beam keeping a constant bucket almost up to the 2Gev flat-top and with 10% lower emittance (now 1.5um per plane for 640e10p) is sent to LHC.

One by one, operational beams are being prepared to use the new multi-harmonic source for test with SPS.

Also this week the new B-train was tested on the BCMS beam. Whereas all other operational beams have seen the change of trains transparently this beam will require further study, what corresponds to a drift of field of ~1gauss was observed on the flat bottom.

SPS (Hannes Bartosik):

The beginning of the week was rather smooth with only minor interruptions of machine operation. Significant downtime was however accumulated in the second half of the week: On Wednesday night the beam production had to be stopped due to spurious beam dumps. After about 5 hours without beam the problem could be solved by the kicker Piquet by exchanging a faulty MKD receiver card. On Friday an issue with the pulse forming network PFN6 of the MKP injection kickers was encountered. While first only a degradation of the kicker waveform was noticed on the fixed target beam, the PFN6 broke down completely during the LHC filling preparation at lunch time. Fortunately the LHC beam could be injected with a large horizontal closed orbit bump to compensate for the missing injection kicker strength and the LHC could be filled before launching an intervention. After inspection the ABT experts found a damaged brazing and a destroyed resistor. The repair works could be completed by the early evening. In parallel to this intervention the photomultiplier tubes of the wire scanners 416 and 519 were exchanged in order to improve the signal to noise ratio.

There were no major problems during the weekend.

Since Friday the BCMS beams are delivered to the LHC with about 10% smaller transverse emittances following optimisations on the PS side.

During the dedicated MD on Wednesday the Q22 optics was tested with 72 bunches accelerated to 450 GeV. At the same time optics studies were performed in TT20 in preparation for SHiP.

LHC (Markus Zerlauth and Stefano. Redaelli):

Following the recovery of the MD days and the VdM scans over the week started with production fills. Monday night the peak luminosity reached $1.624E34 \text{ cm}^{-2}\text{s}^{-1}$.

Throughout the week and also over the weekend some beam dumps were caused that possibly could have been induced by SEU.

The ATLAS Toroid tripped on Tuesday and the recovery was achieved by Thursday afternoon. In the shadow of this the BSRT calibration was performed and the SPS suffered from an injection kicker problem that required an intervention.

Also investigations for the 16L2 issue continued.

Over the weekend the machine ran well with long fills and 1.7 fb-1 accumulated. Some end of fill tests such as scraping, 16L2 losses and crossing angle test down to 90 micro meters were performed successfully.