

# Accelerator Complex Status

## End week 31 (Monday 8 August 2016)

### TI O

#### LINAC2 (Mike O'Neil):

Leak detection and RGA of the source did not reveal any leaks meanwhile the source performance has improved 2-3% over the week. RF amplifier of tank 3 shows signs of an aging tube which will require a 2-3 hour intervention this week to replace it.

#### LINAC3 (Mike O'Neil):

Good performance of around 30uA. Some recurrent problems with second ITL bending magnet power supply BHZ02 which was replaced but still trips occasionally. One hour stop due to LEIR water station intervention. Oven refill is planned for Tuesday along with removal of pepperpot from the beamline.

#### LEIR (Steen Jensen):

Tuesday, August 2nd 2016

- Issues
  - 18h16, 5m: RF cavity fault => Reset => OK
- Activities
  - Tune shift measurements

Wednesday

- Issues
  - 17h42, 18h: All water cooled elements off in preparation of EN-CV intervention Thursday morning
- Activities
  - LN3 MD, tune shift measurements, instability studies, studies on cooling as function of closed orbit, test of cycle with new optics

Thursday

- Issues
  - 08h30, 30m: Change of switch allowing fast turn-off of e-cooler electron beam
  - 08h45, 20m: Change of cooling water pump
  - 10h49, 10m: ER.SMH40 unable to restart => A. Prost did local reset => OK
  - 11h14, 10m: Transverse damper vertical amplifier in water flow fault => L. Arnaudon did reset/on => OK
  - 13h53: Septum ER.SMH11 in un-resettable fault
  - 18h49, 30m: LN3 down (power glitch ?)
  - 19h23, 5m: CRF41 down => restart => ok
- Activities
  - Study on capture stability when using frequency modulated capture, tune shift measurements, 100ms injection tests, studies

on blow-up@capture, 100ms injection tests, studies on cooling as function of closed orbit

Friday

- Issues
  - Nothing to report
- Activities
  - Tune shift measurements, test of cycle with new optics, instability studies

Saturday

- Issues
  - Nothing to report
- Activities
  - Nothing to report

Sunday

- Issues
  - 00h55, 10m: ITL.BHZ02 (LN3) tripped => reset => OK
- Activities
  - Nothing to report

### **PSB (Klaus Hanke):**

All in all quiet week.

On Tuesday there was a problem with a protection of a transformer, and TI asked us to power down the PSB until the problem was fixed. Down time about 2h.

Wednesday morning a stop for access in the switchyard (for the PS dedicated MD) but ISOLDE was not requesting beam anyway.

On Thursday there was a planned stop for the Linac source intervention. The linac intervention revealed no leaks.

In the evening there were two glitches due to storms, but everything could be reset within a few minutes.

On Sunday low transmission through the LT was observed. After some investigations by the PSB operator it was concluded that the problem was related to the Linac RF. First the Linac supervisor was called, then the RF expert. The problem is related to the RF of tank 3, change of an amplifier is planned for next week. The RF expert did some tuning on tank 3, the situation became stable and it is hoped that this will hold until a permanent fix is in place. Under observation.

### **ISOLDE (Emanuele Matli & Erwin Siesling):**

Very good and calm week from operations point of view:

GPS:

In standby this week. Target change foreseen this afternoon (or tomorrow-morning if not ready).

HRS:

Running a UC target (#579) for an Aluminium run for the COLLAPS experiment. The target was clamped onto the front-end on Tuesday. Stable Aluminium beam ionized by the RILIS lasers was taken through the ISCOOL (RFQ) both in continuous and bunched mode on Wednesday after which the beam was taken to the COLLAPS experiment over night and tests carried out on a fast switching beamgate, especially installed for this run.

Proton-scan and yield tests were done on Thursday-morning according to plan and the radioactive run started.

Smooth running, also over the weekend.

Issues:

Short stop of the protons due to the LINAC2 intervention on Thursday-morning as well as a short stop this morning.

The HRS separator magnets stopped cycling twice within an hour on Thursday but no further problems during the rest of the run.

Minor issue with the beam instrumentation application that stopped working: A reboot of the front-end computer did the job.

The semgrid (both hor and vert) in the BTY line does not trigger at the correct moment from time to time (we will discuss this problem with the semgrid application specialist J.F. Comblin).

### **PS (Rende Steerenberg):**

With an average beam availability of 93% the PS had a good week for beam delivery to the different physics user. The down time was dominated by trips of some power converters and POPS. The latter are closely followed. Also the repair of a differential current measurement on the high voltage transformer supplying part of the LINAC, PSB and the PS caused some downtime.

Wednesday morning the MTE beam was used during a dedicated MD to produce a high flux MTE beam with and without shadowing at the extraction region of SMH16 where the shielding was increased during LS1. The RP group then made dose rate measurement to establish an is-dose map that they will compare to the simulation made. The MD went smoothly and the results will be presented in at the IEFC in the near future.

The SPS took the ions on Thursday. The delivery is sometimes hampered by a problem on the power converter of a quadrupole in the TT2 line (F16.QDE217) that trips regularly and which is being worked on by the specialists of the TE-EPC group.

### **AD (Bertrand Lefort):**

Few problems this week but also some global improvements !

#### **— Wednesday**

Extraction kicker intervention to solve the jitter kick issue by A. Antoine: Two TPA board were changed for a new updated version. Now, we expect to have a jitter < 10 us.

#### **— Thursday**

C02 Cavity unresponsive : Since the beginning of the year the cavity was failing erratically. The diagnosis was difficult and inconclusive. "By chance" it

completely broke down on Thursday thanks to that, the failing parts (filament power supply) have been replaced and it now works like a charm ! Thanks a lot to Carlo Rossi for that ! Unfortunately, we have lost more than 7 hours.

#### — **This WE**

Some communication issues on the M1553 field bus that interconnect the DE0 power supplies making them uncontrollable. We haven't lost any beam time thanks to the fast & effective TE-EPC-CO piquet intervention !

#### **SPS (Django Manglunki):**

An average week for the SPS, with 86% beam availability. This was also the first week of the ion beam commissioning. Since the LHC has problems with its injection kicker heating, the batch spacing has now been increased again, this time to 300ns. Bunch intensity is adjusted by the PSB and fine-tuned to  $1.1 \times 10^{11}$  in the SPS by scraping.

On Wednesday 3/8 morning as the PS was in dedicated MD, the RF power team took the opportunity to work on TRX6 which was tripping several times during the previous night. Wednesday 3/8 afternoon the SPS was in MD too (Active Halo Control with tune modulation). MD finished at 17:30 and fixed target physics resumed at 18:00 as planned.

The ion beam started to be taken on Thursday 4/8 in TT10 but was only injected the next day, after it was found the generation of the current of the MSI had not been generated properly on the new cycle. The OP team kept optimizing the ion beam over the week-end.

On Friday 5/8 in the evening it was found that a feature of the demagnetizing cycling on the correctors can give problems on the following cycle in case the polarity is different. To be followed up. On Friday night started a series of problems on MKD. The ABT standby had to be called in and spend a great deal of his week-end on site, changing several thermostats, cutting cables, removing spark gaps. In total 7 hours of beam down time was due to MKD over the week-end.

Saturday 6/8 night the ion cycle was removed as it seemed to also start causing problems on MKD, with a missing distribution of the revolution frequency. To be followed up as it was fine before the week-end.

On Sunday 7/8 at 20:30 the mains tripped and the EPC standby had to call a specialist to help modifying the configuration, causing 2 hours beam down time.

#### **LHC (From the 8:30 meeting):**

Last week was dominated by the problem of the MKI-D beam 1 that sparked. Conditioning was done and the operational pulse length was reduced. This created a workable situation, but the kicker will need to be replaced in the longer term if it holds. It was also decided to remain with the 300 microseconds batch spacing and to reduce slightly the intensity per bunch to  $1.1 \times 10^{11}$  ppb.

The controlled bunch lengthening was also operationally used to increase the bunch length to 1.1 or even 1.2 ns.

The weekend saw mainly some shorter fills that were dumped by UFO, BLM communication issues in point 7 requiring access and a technical issue with the access system in point 8 that caused the loss of the patrol. Only one long fill was dumped on OP request.

The number of vacuum spikes in the MKI-D beam 1 has reduced drastically since the conditioning, the good working of the soft start and the reduction of the kick pulse length.

Just below  $2 \text{ fb}^{-1}$  could be accumulated since last Monday. LHC-b also passed fthe  $1 \text{ fb}^{-1}$  accumulated luminosity.

Topics for this week:

- Improve injection cleaning to allow for some more bunches to be injected.
- Test luminosity levelling for Point 1 and 5.
- Slowly restore the intensity
- Reduce the injection gap
- Install filter on the BLM electronic around the TDI.