

## Accelerator Complex Status

### **End week 20 (Tuesday 22 May 2018)**

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#### **TI (Jesper Nielsen)**

Details: <https://wikis.cern.ch/display/TIOP/2018/05/22/TI+Summary+Week+20>

#### **LINAC2 (Giulia Bellodi):**

Linac2 had another excellent week, with 100% uptime.  
An intervention needs to be scheduled this week to replace a degrading RF amplifier tube on Tank1.

#### **LINAC3 (Giulia Bellodi):**

A lot of Tank1 breakdowns were observed at the start of the week. The RF team did an intervention on Wednesday PM to replace a power supply of the Tank1 amplifier measuring unit. In the wake of this, a fault occurred in the blue box measuring the filament current of the driver tube, delaying the restart.  
Breakdowns reappeared during the night and in the morning a second blue box measuring the reflected power of the cavity was found to be giving anomalous signals and was replaced. This finally fixed the problem.  
The source was quite unstable during the weekend with several HT breakdowns occurrences, requiring constant tuning.  
An oven refill is scheduled to take place on Thursday this week.

#### **PSB (Fanouria Antoniou):**

A very good week for the PSB with an availability of 98.1% corresponding to a total downtime of 3.2h. The main downtime came from a trip on BTM.QNO05 which requested the piquet intervention and lasted for 1h26min.

The phase noise reliability run started this week and applied to the LHC25, BCMS and MTE beams successfully. The application to the AD beam is also in progress. In preparation of the commissioning of an LIU Q-strip converter a successful test on the hierarchy of the qstrip was performed.

Several MD studies took place this week as well, focusing on: Phase noise studies, PSB transverse feedback commissioning, Finemet cavity setting up and setting up an alternative working point cycle for optics and space charge studies.

#### **PS (Frank Tecker):**

The PS had an excellent week of smooth running, with beam availability above 97%.

The main issues were BI.DVT30 in the PSB (1:18 downtime), an access in the PS to fix the C56 gap relay on Friday (1:10 downtime), a trip of the C66 cavity with C11 not

working (0:28 downtime), and a few shorter stops. The AD was further affected by magnet power converter DE1.BHZ10 (0:51 downtime) and opening an access door (0:27 downtime).

The intensity on SFTPRO was increased to 1600e10 protons. The Ion beam setup is ongoing. The EAST beams were optimized to stay below the alarm level on the radiation monitor PAXP502. Even though the beam and the settings are similar to last year, the radiation level has increased.

### **ISOLDE (Erwin Siesling):**

The week has been very smooth for ISOLDE with no specific issues.

GPS has been used for MD for the new fast tapestation by Tim Giles until Wednesday-morning.

At HRS the target was changed for a used, but well performing, UC target #618. It was outgassing quite a bit which made heating it up a slow process. With a small delay (which was not noticed by the users) the stable beam setting-up went very smooth including the ISCOOL (RFQ) in bunched mode. Proton-scan and quick yield check was done on Wednesday when the central beamline became available and stable beam tuning to the VITO experiment started right after.

The VITO users started taking radioactive Na beam as of Friday-afternoon once they had solved a vacuum problem in their setup. They have been running smoothly ever since.

On Wednesday the very first MEDICIS target has been put in place (#646 M). They will take in parallel the HRS proton beam with the HRS users. The target will be retracted once the number of protons sent to HRS reach the 5E18. Operations are handled by the MEDICIS operation team in cooperation with the ISOLDE users and supervisor.

At GPS the target was changed on Friday for a new #653 UC Ta target. The target has been heated and setting-up will start as of tomorrow (Tuesday).

### **AD & ELENA (Pierre Freyermuth):**

For this week AD did not encounter any major problem, and we could improve a little bit the total yield of the machine. Despite it requires continuous care to maintain the last percents.

Details:

- On Tuesday the 15th, few short stops due to PS and Booster issues (septum and kicker)
- We dedicated the complete morning ELENA time of Wednesday the 16th to let the target specialists investigate an increasing of water loss in the target cooling system. After inspection of the target itself, they concluded that there is not a increase of the few drops leak here. We restarted after their green light the normal operations.
- During the nighttime of Thursday the 17th PS team called first line to repair the AD injection septum.
- On Friday the 19th, we ask Heiko to fine tune the PS/AD synchro as the target P/Pbar yield is extremely sensitive to the beam structure. Heiko did a perfect job in a time record.

- So far over the 'long' weekend, PS team had to call First line once for a tripped power-supply.

### **SPS (Verena Kain)**

What a week! In the night from Monday to Tuesday ZS4 started sparking during LHC filling. Operation for fixed target had to be stopped and could not be resumed despite the expert working. On Tuesday the issue was diagnosed to be a broken HV feedthrough. An intervention was planned for Wednesday morning where ZS4 was to be disconnected and secondary vacuum established at the feedthrough location. The intervention was successful. Slow extraction could then be re-established in the early afternoon Wednesday without ZS4. The MST girder was aligned slightly further towards the circulating beam. The losses on TPST and MST1 are slightly higher than before the intervention, but acceptable. The LHC was reporting issues again with losses and steering in TI 2 and when finally also the indiv beam had very bad trajectories in both lines, TI 2 and TI 8, it became clear that the orbit in the SPS must have changed and be different for the BCMS LHC1 and INDIV cycle. It was finally traced back to the orbit correctors in BA2 having lost their settings and loaded some other settings. The BA2 FGCs were/are frequently re-booting due to the logging that was put in place for the extraction elements. The logging service does not have the correct RBAC rights for these FGCs. A fix will be put in place next Tuesday. Also, the problem with the FGCs rebooting and losing their settings has been repaired Thursday morning.

The MDs on Wednesday unfortunately were cancelled due to the ZS intervention in the morning and the LHC filling investigations in the afternoon.

Thursday evening a bad injection through TI 8 led to massive losses on the transfer line collimators and quenched Q7R8. Investigations afterwards revealed that the losses had been caused by a coupled bunch instability that had developed in the horizontal plane after the scraping and caused the last bunches of the second and third batch to oscillate wildly. The bunch-by-bunch trajectory recording in the LHC IQC showed this.

Other things:

HiRadMat ATLAS pixel was carried out and finished Tuesday night. The ion prep cycle was in the supercycle several times during the week for Thomas to set up . Measurements that are carried out once per shift indicate that the interturn short in MBB.30470 is slowly becoming worse. AWAKE took beam during week. They have identified their source of trajectory instabilities - a dipole magnet. One third of HiRadMat BTV was executed on Friday. The spark rate on ZS5 was high during the time with more than 144 bunches. ABT recommends to do HiRadMat with high intensity next time without slow extraction. A strategy with physics coordination will have to be defined.

### **LHC (Enrico Bravin & David Nisbet):**

A storm of 16L2 beam losses started in the night of Monday, with 3 subsequent ramps lost until the number of bunches was lowered to 900. Then slow ramp back to

2556 bunches on Thursday night. After just 3 fills at 2556b, another 16L2 storm started on Sunday. This time a single 900b fill of 3-4 hours was sufficient to calm down the situation before a succesfull 2556b fill made it again to stable beams. With the exception of the 16L2 storms, no major issues, bt of course lower luminosity production.

A BSRT calibration was performed Friday evening with 10 bunches of varying emittances.