

## End Week 24 (June 21<sup>st</sup> 2011) – Status of Accelerators

### Linacs (D. Kuchler)

**Linac 2:** Linac2 had a relatively good week.

Tuesday a RF tube (Frank James of Tank3) had to be changed, because it reached the end of its lifetime. Since Wednesday we had again some intensity dips as we had the whole last year. But they disappeared without intervention over the weekend. Thursday a quadrupole and the watchdog had to be reset (LA1.QDN19S).

**Linac 3:** started last week for commissioning of the source.

### PS Booster (K. Hanke)

All in all a good week.

Throughout the week (and the previous weeks) resettable faults of the C16 cavities and some steerers and quads with cooling water problems. This will be checked during the upcoming technical stop.

Measurements continued on the wire scanners (reported at last Friday's MSWG).

Thursday reset done on BI4.DISP; Thursday afternoon Linac tail clipper cut the beam for an unknown reason, eventually rebooting the dsc DCPSBLM cured the problem.

Sunday morning the only stop worth mentioning, trip of BE1.KFA14L1 required local intervention of the operator, then the specialist was called who could fix the problem; after 30 min we could extract 3 rings, the problem was fully solved for all rings after 1h30min.

Throughout the week maintenance of our LHC beams, preparation and documentation of the 100 ns beam and setting up of STAGISO for the coming week.

### ISOLDE (M. Lozano Benito)

Busy week with many problems at Isolde.

#### - GPS

-During a target change on Tuesday there were some mechanical problems with the robot that made impossible to install the target planned.

There are some mechanical problems in the robot system and spare parts have already been ordered but it will take around six weeks to get them here.

On Friday a new target was installed by hand on GPS (by Thierry).

#### - HRS

The sparking problem in RFQ has been solved on Friday after many hours of investigation (since Tuesday). Now it is working fine.

There was no beam planned for HRS this week so after the problem with GPS we decided to install GPS's target onto HRS front end, but unfortunately that target worked for 4 hours and then it broke.

On Friday morning we installed a spare target in HRS and we gave stable beam to users.

Proton scan and yield measurements on Saturday morning. Radioactive beam to users during all the weekend without any major problem.

### **PS (S. Gilardoni)**

The PS week was pretty good. All the beams, either for the normal operation or for the MDs, were regularly delivered, with only minor problems.

On Monday - Tuesday, the magnetic septum 57 for the slow extraction was tripping pretty often. It was finally found that the Irms limit was reached in these cases. This could be corrected by shortening by 20 ms the function of the septum current on the DIRAC user without affecting the spill.

Concerning the LHC-type beams, more investigations were done to understand the source of the small ghosts bunches after the batch, in particular of the LHC50 12 bunches. This is usually not a problem for the beam quality delivered to the LHC, since they are not extracted thanks to the reduction of the duration of the extraction kicker. Still, we are trying to understand better the source of them to reduce at minimum the losses at extraction.

Concerning the beam instrumentation, the wire scanner measurement campaign continued. Thanks to the common effort between BI, OP and ABP, the emittance measurements between the machines are much more coherent.

Concerning the orbit system, four pickups have problems: for three of them more investigations will be done during the technical stop, since an access in the tunnel is required. The fourth, the one near the injection kicker, is not working correctly at the first turn with low intensity beams for which a high gain is required. In this case, the signal is perturbed by the pulsing of the kicker. The BI experts are progressing on the investigations about the issue on the synchronisation of the acquisitions.

Concerning MTE, the measurements to investigate the capture and trajectory oscillations continued. Tests with a different orbit gate width and gain were done. This is to exclude that eventual oscillations observed would be due to the gate chosen, or to the gain. The data analysis is progressing.

The BI experts intervened to trim the settings of the measurement on this particular user, all my gratitude to them.

A 2 GeV flat cycle was prepared to test the capture/trajectory fluctuation at a different energy. Currently, we just developed the non-linear model of the machine at this energy and now we are computing via the madx model the currents of the non-linear elements to produce the fix points/islands.

More observations were done concerning the B-field fluctuations at injection. Last friday, new set of magnetic and orbit data were taken together with the colleagues from MSC, the analysis is ongoing. On the operational beams, in particular on TOF, a difference on the MRP of 1-2 mm is observed at injection depending on the TOF cycle position in the supercycle; for the CNGS, the operators

regularly avoid to program a TOF before the CNGS to reduce at minimum the losses on the CNGS cycle. On top of this, the second CNGS show an MRP slightly different from the first.

### **AD (C. Oliveira)**

Very quiet week without any operation problems, apart from a minor with an injection power converter on Sunday morning.

### **SPS (K. Cornelis)**

Another not so good week for fixed target physics. The problems with the north area access system continued: intrusions (or intrusion like events), blocked doors, unclear state of doors and interlocked elements.... But the main perturbation for the north area came from a vacuum leak in TT20, more precisely in the sector between the two splitters. The leak was clearly due to corrosion with acids, produced by the radioactivity, dripping on the bellows, after having burned a hole in the protection shield. The vacuum leak occurred on Wednesday evening and the repair, including pumping, was finished on Friday around noon. The duration of the intervention was dominated by the high radioactivity in the intervention zone.

For the other users (LHC and CNGS) we had two stops on Thursday, one hour each, for the intervention on the 18kV cable to BA5. Since Wednesday evening we have SMD13 back into operation, giving us a spare main power supply station.

Since Friday we observed a slightly higher horizontal emittance on the 50 nsec beam on some cycles. Measurements indicated that the beam was already bigger in TT2. This problem is still under investigation.

### **LHC (B. Holzer)**

Quite difficult week for LHC with several problems.

Main issues were:

- The Cryo problem in point 8 on Saturday, where the recovery is still ongoing.
- Instability on injection oscillations causing losses and difficult conditions to fill the machine.

More details under:

<http://lhc-commissioning.web.cern.ch/lhc-commissioning/>

### **TI (P. Sollander)**

- Tuesday, June 14

- 22:37 -- Electrical trip in RR13. 400V feeder EBD140/15 (US15) trips and cuts power to RR13 equipment current lead heaters, demi water and ventilation. EN-EL sent in to switch feeder back on. No fault found. Unclear why the trip occurred for the time being.

Wednesday, June 15

- 02:50 -- Beam Imminent Warning fault in point 5. Cannot restart after electrical trip. Piquet called in. Changed relay on evacuation system. BIW OK again.
- EN-EL starts digging up the 18kV cable outside the CCC.
- 11:02 – EBD1/13 trips again. Same problem as Tuesday night. Electricians sent in to find problem. It turns out that there is an earth current greater than 10A tripping a protection. QPS team on site with EN/EL to try to measure earth currents. No problems found. Machine closed and started again later in the evening.
- 18:55 – After the EL switch on, closing the machine again. Beam Imminent Warning in P5 not working AGAIN. Like last night. Piquet called in, but could not find a problem with the installation. To allow LHC to start, piquet triggered the sirens manually. An intervention during day time by expert is needed and will be scheduled for Friday. Until then, if evacuation signals needed after access, piquet must be called in to trigger manually.

Thursday, June 16

- Preparations for BA5 18kV cable repairs. EL will need to have the SPS stopped two times for the intervention, once to prepare and once to verify for faults. Each stop for about one hour. To be co-ordinated with the LHC to avoid unnecessary down time.
- GS-ASE specialist intervention to fix the problem with the Beam Imminent Warning in P5.