

## End Week 37 (September 19<sup>th</sup> 2011) – Status of Accelerators

### Linacs (M. O'Neil)

#### Linac 2:

Quiet week. Nothing to report.

#### Linac 3:

Difficult week. Switched to oven 2 on Monday as oven 1 exhausted. Stability and intensity very poor at start of week. Stability improved during the week but intensity remained low. An oven refill is taking place Monday, 19<sup>th</sup> Sept.

### PS Booster (B. Mikulec)

The week has been very good with only minor machine stops.

The main problem that affected practically all machines occurred on Thursday early morning at ~1:20am when the machine could not be controlled anymore (working sets and knobs couldn't be opened). This was due to a faulty network switch for the IP57 service that feeds various important servers). In principle this problem was solved around 9:30am, but then there was still an issue with an INCA server that had to be rebooted. The PSB operator had again control over the machine around 11:30am. Nevertheless beams that were already programmed in the supercycle at 1:20 in the morning continued to be produced and extracted during this period.

A lot of time was dedicated to transverse emittance measurements (LHC request to measure the transverse emittance as a function of LHC bunch intensity for the 50ns DB beam) and for the preparation of a very demanding MD beam in the framework of LIU (special type of LHC beam proposed by E. Metral with very short bunch length; A. Findlay).

### ISOLDE (M. Lozano Benito)

#### GPS:

No problems from the operation side. C yields checks (IS445) from Wednesday until Friday morning.

#### HRS:

7Li set up from Tuesday until Friday night.

Difficult set-up as expected for the 7Li. The element is very light and we could not take it after the EBIS. We decided then to go for Na that was the second option.

On Saturday afternoon (13.30 h) users called me because there was a problem with the RFQ (Linac) RF amplifier.

The amplifier tube was giving an error because it was too hot. We decided then to lower the frequency from 50 Hz to 20 Hz and it could work during the weekend. I helped them to tune the beam into their experiment with stable beam and to go for radioactive beam.

## **PS (A. Grudiev)**

In general, smooth running providing beams for all users. LHC\_50ns double bunch 36 and 12 bunches, AD, EASTA EASTB, EASTC, TOF, SFTPRO and CNGS operation continued at nominal intensities.

Some issues:

On Tuesday 15:30 fault of ZT8.QDE01. No beam to DIRAC for about 40 minutes.

During Monday, Tuesday and especially Wednesday MPS tripped many times (10 times in total) always with the same fault "FGC interlock". Specialists could not identify any problem. MPS is stable now.

During the whole week, many resettable faults of the 10 MHz cavities: C51, C56, C86, C96. The situation became worse on Sunday. Morning at 5:00 specialist had to come in and fixed C51 and C81 which after many resets during previous night could not be reset any more. No beams for 1 hour. Specialist had to come in again at noon to fix again C51. In addition, C96 could not be reset due to the same fault "feedback gain" for some time during the morning. Piquet LLRF had to come in and fix the problem with feedback gain of C96. There were again several resettable faults of C51 during Sunday evening. In general the situation with 10 MHz cavities is worrying and perturbs operation.

Also on Sunday afternoon first line had to come in at 13:40 to repair F61.QDE04. No beam for EAST zone for ~2.5 hours.

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

Quiet week for the AD with the following exceptions:

-Night from Thursday to Friday. Problems with a DSC that controls a certain number of power converters. The Piquet CO worked for a few hours to repair. Night from Sunday to Monday: problems with a converter for the stochastic cooling (DR.SCV1DCPOWPRE) that does not switch on and two trim converters, DR.DVT1608 & DR.QSK1404. First line is still intervening....

## **LEIR (D. Manglunki)**

A quiet week for LEIR

The machine was restarted during the morning of Monday 12/9, after the power cut which had occurred on Sunday.

Since Tuesday, the Early beam has been programmed with a double injection to compensate for the low intensity from Linac3.

On Tuesday afternoon after the InCA release, archive tests have restarted to take place; there are still some remaining issues.

During the whole week and until Sunday evening, LEIR provided the Early beam for SPS setting up and nominal/intermediate beam 24/7.

The machine will be stopped on Monday during the refill of the Pb ovens in the Linac3 source.

Many thanks to the Linac3 team for their efforts in keeping the source up during the whole week.

## SPS (Y. Papaphilippou)

It was a rocky week for the SPS, with a major fault in the CNGS horn and several smaller faults:

- On Monday morning, during an intervention in the access control system, security chain 11 tripped stopping CNGS and north area beams for 1.5 h. Next morning the north area beam was cut for around 2h for reclassifying the area behind an access door.
- On Tuesday afternoon, the PS MPS tripped and we decided to give access in the SPS machine for an RF and CV intervention which lasted 2.5hours.
- Tuesday evening, the CNGS horn tripped without possibility of reset. The piquet PO was called and during his investigation the power converter “exploded” (a big bang was heard from the device). Apparently a thyristor was broken and was replaced by a spare in the next days. As there were no more spares available (they will not be delivered until March), the CNGS team preferred to investigate any weakness in the circuit in order to be sure that this fault will not be repeated. During the intervention, some EM isolation weaknesses were found and fixed. The CNGS beam was back on Friday evening, after almost 3 days.
- On Wednesday morning one transmitter (TRX4) tripped and the piquet RF power was called. The problem was investigated and a quick fix was found during the afternoon after an intervention in the front end (2h without beam).
- On Wednesday afternoon, HiRadMat was commissioned for high intensity with 12 bunches. Due to several problems during the rest of the week, the multi-batch beam was left to be commissioned for next week.
- During Wednesday night, all machines faced a problem with the computer network. In the SPS, communication with a lot of equipment was lost and the beams were cut for around 2h for investigations by the piquet CO. The problem was solved in the morning when the network switch for the Service IP57 feeding various important servers such as CS-CCR-LSA1, CS-CCR-CMW1 and CS-CCR-JAS5 was reset. The reason of the problem is still under investigation.
- On early Saturday morning, the mains tripped due to an electrical network glitch. One of the RF transmitters (TRX7) could not be restarted and the piquet RF was called to put it back on (~1h without beam).
- On Saturday morning, there was a coil temperature fault on Quad34 of M2 line (COMPASS). The piquet was called and informed that the problem cannot be fixed during the week-end. It should be discussed on Monday morning of how to proceed.
- On Sunday afternoon two wobbling magnets (bend2 and bend3) close the T2 and T4 north area targets tripped with a water pressure fault. The former one was reset remotely but the latter fault persisted. The magnet piquet was contacted for investigation and RP piquet informed (in place for an LHC intervention). Apparently, there was no indication of water leak in the cooling system (BA80), but a little pressure spike was apparent when the magnet tripped. The piquet magnet short-circuited the fault, as the magnet is protected by water and coil temperature interlocks and the specialists will investigate further on Monday (3h without NA physics).
- Despite the difficulties of the week, progress was made in the LL RF setting up of the LHC ion beam.

## LHC (R. Assmann, G. Arduini)

Main issues:

- Beam conditions: inst. 1380 on 1380 bunches, peak bunch intensity  $1.39E11$ , 107 MJ stored energy per beam,  $\beta^* = 1$  m, inst. luminosity  $3.3 \times 10^{33}$
- Longest fill 16.5 h with int. luminosity of 117 pb-1
- 31% stable beams during week, total integrated luminosity during week 433 pb-1
- Total yearly integrated luminosity 3.2 fb-1

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

## TI (P. Sollander)

Tuesday, September 13:

- 09:07 -- LHC beam lost due to access doors in US45 opened by ventilation air flow (YCPS03=US450 and YCPS04=US450) intervention by Laurette and access piquet to find that the doors had not been properly closed. This is a known problem. GS-ASE will remove the door closers with the hope that people will close the doors better than the automatic door closers do.
- 14:30 The infamous MP7 cable had another problem. Cable squeezed during digging work. This time no trip, but the cable need to be repaired all the same. ATLAS stopped and network was reconfigured without major perturbation to operation. Cable repaired and put back in service on Thursday 15.

Thursday, September 15:

- 02:14: Massive communication problems in CCC. Almost all islands were touched to some extent. The problems were solved around 10 in the morning by rebooting the main switch of the IP56 network in the CCC.

Saturday, September 17:

- 07:02: CRYO stop of point 4 due to a communications problem with a PLC. LHC down for 26hrs. Again seems to be an SEU on a PLC (cfv-ux45-qui) See major event
- 12:59: Stop of the BA6 cooling circuits caused the SPS to stop. Initially the piquet was sent for a high level alarm in the reservoir, a leak alarm was accidentally made during draining of the reservoir.

Sunday, September 19

- 18:11: SPS north zone tripped due to a cooling problem in two magnets. Still down, awaiting intervention this morning.