

## End Week 12 (March 25<sup>th</sup> 2012) – Status of Accelerators

### TI (Peter Sollander)

<http://wikis/display/TIOP/2012/03/19/TI+summary+week+12,+2012>

day	events
Monday, March 19	<ul style="list-style-type: none"><li>• 22:34 -- 18kV cable fault on the SPS stable loop. 7 minutes downtime of the machine. EL in Tuesday to start fault diagnostics.</li></ul>
Thursday, March 22	<ul style="list-style-type: none"><li>• 17:30 -- Switch on of 18kV loop again after repairs</li><li>• 17:39 -- New cable failure on same part of the loop, between BA5 and BA6, now on different phase. Fault first thought to be in the same area, but tests showed that it will be necessary to dig elsewhere. Planned for Monday 26.</li></ul>
Saturday, March 24	<ul style="list-style-type: none"><li>• 06:17 -- LHC stopped because patrol lost on door between UJ83 and LHCb (door YCMM/YCMM01=RB84). Access piquet called in. Intervention necessary, finished by 12:05. Beam back around 16:30. Access team did NOT understand what might have happened.</li></ul>

### LINAC 2 (Giulia Bellodi)

On Monday morning 19/03, in the shadow of the SPS stop, an RF intervention took place to replace the Frank James amplifier tube in Tank1, given a history of instability and faults over the previous week. At the same time some inspections were carried out on the Linac pumping group (in view of a future installation of a new vacuum

gauge) and on the SEM grids in the LTE/LTL lines. The source HV column was cleaned and the H2 bottle level checked. The max voltage of the modulator amplifier in the LI.CBU01 buncher cavity was reduced after increased sparking was observed last week.

Another Frank James fault occurred on Tank1 on Thursday morning.

Profiting from a beam stop on Friday afternoon the HV filter of the tube was changed. Close monitoring will continue.

On Friday night/morning two RFQ trips occurred (at midnight and 6am), in both cases within 1.5hrs after an increase in the average beam intensity delivered (but not peak). As a precautionary measure the RFQ amplitude was slightly reduced to 3700mV over the weekend, to achieve better stability in view also of the combined Linac2/PSB MD that will take place tomorrow morning.

## Booster (Jocelyn Tan)

A busy week. Ongoing issues during the week :

### 1/Oscillations during the last turn in the PSB for TOF:

\*observed on OASIS, the horizontal signal of the ring BPM located in PSB section 1 : Oscillation noise superposed to the normal signal during the last turn .

\*observed on OASIS, the transv FB BPM located in PSB section 4L5 : no noise observed during the last turn, neither H nor V plane.

Kicker effect ?? The KFA14L1 specialist was asked to check the stability of the kicker pulse. He claims signals are as the specialists' references.

Observation with the half turn PU did not help as the high intensity beam was saturating the Sum signal.

**2/Automatic gain setting for ejection trajectories** : the sum signal was saturated for some PUs in BTP line. It was not a hardware issue. On Thursday, the FESA experts had a look into the code. They think the issue is solved but ask to check the trajectories. They'll come in the CCC next time it happens again.

**3/Longitudinal instabilities for CNGS and TOF beam** : they required a daily fine tuning for a good capture in the PS.

Other issues during the week:

### Tuesday

In the afternoon, there was an intervention for POPS. As the beam was not sent for physics, we decided to cut the beam in the PSB to grant access into the PS ring. Down time ~50mn.

INCA issue: non refreshed WorkingSet & Knobs : ("Waiting for PSB cycle ...").

The cause of the problem was related to FGC devices renaming done on Friday 9 March.

INCA team was in the CCC: They say that they are renaming parameters, it's introduce this bug.

### Wednesday

Afternoon: beam cut, Isolde DSO tests went well.

INCA issue: In the afternoon, while mapping LHCINDIV 4CNGS, the C02 GFA was that of a typical high intensity beam (step like), instead of the one allowing longitudinal shaving. The problem was due to a bug on the monitoring of Virtual properties. This is being followed-up by the INCA team.

During the night, the BI.KSW went on standby, and restarted right after a reset.

The PIPO was called for BT.BHZ10, which had tripped but could not restart remotely. The down time was 50mn.

### Thursday

INCA issue: The BLM knobs have NON-PPM values, although it's indicated as PPM (blue color title). OP proposed to set all BLM thresholds as PPM.

The sequence manager was displaying a status "reserved" by a workstation on a boot menu. An OP issue was sent.

It seems the GFA editor is not killed after "clear context" action. An OP issue was sent.

Blinking working sets of EJ-Corr-Ring1-2 were reported on Tuesday : this CO issue solved by the kicker specialist in his SKSU GM class. As it needed areboot of the DSC's to take it in account, Herve did the reboot Thursday night in the shadow of a POPS trip . He did a Reload of DCPSBDISP, DCPSBKSU1 & DCPSBKSU2.

### Friday

At 2:40PM, in the shadow of a POPS intervention + a change of SPS HV cables, we decided to cut the beam and inform equipment specialists on the call list. No intervention in the PSB ring was required : inspection on tank1 Franck James tube, and swap of the BT.BHZ10 from the spare power supply to the normal one. Down time 1h. Smooth restart of the PSB.

The Linac supervisor has decreased the RFQ amplitude from 3750 to 3700mV. It seemed transparent for the injection trajectories.

The power supplies of the BTY line have been checked. The beam should be sent towards HRS on Monday morning.

### Saturday

5mn before the morning shift, the C16 went off for an air flow fault. Ok after a reset. Down time 6mn.

In the afternoon, the BT.KFA20 went off and restarted right after a reset.

### Sunday

The TOF is still changing, and the operators try to optimize it continuously. Meanwhile, they have set the BTP quadrupoles as the beam documentation (it was a little bit different). The changes have been validated by the PS.

#### BEAMS:

On Tuesday, the LHC25 high intensity for scrubbing run has been checked: 200E10ppb,  $E^*(1\text{sig})_{x/y} = 3.8/3.2$ ,  $EI=1.26\text{eVs}$

On Sunday, the LHC25NomMD has been checked (MD3 user).

ISOLDE has been checked. HRS should get the beam first. The beam permit has been signed.

### PS (Ana Guerrero Ollacarizqueta)

Beam stopped ~8h due to POPS failures and DSO tests. POPS was switched back to normal mode but the problem of the IGBTs is still under investigation. DSO tests were done on Monday for AD, and Tuesday for TOF.

CNGS beam was optimized for injection to SPS then sent to SPS on Wednesday evening.

Beam for physics was already sent to TOF on Thursday afternoon once radiation measurements for intensity calibration on the target were finished.

Beam LHC25 scrubbing was set-up.

From Thursday an increasing number of shots have been lost at injection for high intensity beams, CNGS, TOF and LHC25. It was then decided to run with reduced intensity as for Friday afternoon

while the problem was not solved or losses reduced. One of the sources of the losses might have been the failure of multipole power converters and their controls. Up to now results are not concluding but at least intensities could be increased on Sunday.

## SPS (Yannis Papaphilippou)

The week was devoted to the final setting up and delivery of the CNGS beam and in parallel providing probe and indiv beams for the LHC. The main issues were electrical faults associated to the 18kV cables and RF transmitter trips. More specifically:

On Monday morning, the SPS was stopped for around 5 hours for investigating a fault on the 18kV cable between BA1-BA2. Interventions were carried out in parallel for replacing the burned power supply of RF transmitter 4 (TRX4), and on the calibration of the last three TT41 pickups (just before the CNGS target). The CNGS beam line steering and target table alignment with respect to the horn took place during the afternoon with low intensity beam.

During Monday night, TI warned us that there is another 18kV cable fault between BA5 and BA6, on the stable cable loop. We had to stop the SPS again for EDF experts' investigation for around 3 hours on Tuesday at midday.

The RF power experts kept the TRX4 on surveillance until Tuesday evening for understanding the power supply fault, so no high-intensity beam was possible until that point. On Tuesday evening and during the night, LHC25ns beam with three batches was used for scrubbing. On Wednesday morning, the new optics of the TT41 line for CNGS was tested and implemented successfully. At midday, the tube of TRX1 was replaced due to frequent trips in the shadow of an intervention for the PS POPS. During the afternoon, TRX1 tripped again stopping the beams for 1.5h during RF experts' investigation. The problem was finally fixed on Friday morning.

On Wednesday evening, CNGS physics production started, with 3.5-3.6e13p on target per cycle. On Thursday, a large variation of the horizontal centroid position of CNGS beam in the muon monitor was associated to the MKE4 kicker when pulsing after an LHC cycle. In the afternoon, the reconnection of the 18kV cable between BA5 and BA6 revealed that there was an additional problem in that area and EDF came back for investigations on Friday afternoon, stopping the beams for 1.5h. After this intervention, the PS started having problems with all high intensity beams and the CNGS had to be delivered with low intensity until the problems were fixed on Sunday morning.

An additional problem with RF transmitters on Friday evening (TRX6 and 8) required the intervention of the RF power piquet and expert (4h down time). Finally, on Sunday afternoon the MSE4 septum tripped with an internal fault, and the piquet PO had to increase the AC current detection threshold (~2h down time). The investigation will continue on Monday.

## LHC

Commissioning is progressing well. Full details:

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