

## Accelerator complex status

### End week 36 (Sunday 7<sup>th</sup> September 2014)

#### TI (Peter Sollander)

Quite a lot of action last week. TI summary in the usual place:

<https://wikis/display/TIOP/2014/09/08/TI+summary+week+36,+2014>

#### LEIR (Sergio Pasinelli)

Main task of the week: Beam to the PS and LEIR injection optimization

##### Tuesday:

Extraction kicker timing(EEX-SKFA-TIM) was fixed by the timing and kicker specialists.

Linac 3 Water leak detected on the pepper pot. No beam from Linac 3 until Wednesday morning

##### Wednesday:

Linac 3 water leak on water circuit FTEF215 during the night. Beam back Thursday morning.

##### Thursday:

The gateway of the central timing crash. Edge effects cannot change cycle & general timings on then LEIR

##### All the week:

Ripple still present on the main quads at the injection have effects on the stability.

#### ISOLDE (Miguel Luis Lozano Benito)

##### GPS

##### Tuesday

GLM and GHM collections and IDS beam tuning (50 kV) during the day .

##### Wednesday

Proton scan on converter(80Ga, 76Ga and 140Cs).Lasers setup for Ga and yield checks. During the target yields it was noticed that the target production was lower than expected. Users take beam and confirm the low production. Users called during the night to try to increase the target production by moving the proton beam and the operation was done with the engineer in charge on the phone. After this no production increase was noticed.

##### Thursday

The target team takes over to investigate the target yield. Proton scan on target.

Users called because the beam shape was very bad. It was notice that after setting the oven1 current to 25 A the amount of total beam coming out from the target had increased up to 3.5 microamps.

After some investigations it was clear that some of the heating power applied to the mass marker went into the Rb dispenser flooding the ion source with Rb. With that huge amount of beam coming out of the target it was impossible to keep the HT on with protons on target.

It was then decided to leave the target hot during the night to try to decrease the Rb.

### Friday

The day after the total amount of beam coming out from the target had decreased around 50% and the shape was still pretty bad but the machine was retuned and transmission to IDS checked.

HT was only holding at very low protons per pulse but beam was delivered again to IDS were the impossibility of carrying on with the experiment with this conditions was confirmed.

### Saturday

Some more machine and equipment tests.

### Sunday

On Sunday it was decided to replace the GPS target with an already used target that was performing well to try to save some beam time.

### HRS

No Physics scheduled for this week on HRS. Target change on Friday.

Some cycling magnets investigations when one of the separator magnets stopped working. The problem we were trying to reproduce showed up and now we can't fix it. Experts had a look during the week and the weekend and although they haven't found the way to solve the problems it seems they have found a temporally solution for it.

### Monday

#### GPS

Fast target change and stable beam setup. A reused target has been installed on GPS frontend (#509UC2-C).

Some control issues during the morning that disappeared after a while.

Some HT sparks that are ramping down and back up the target and line heating.

Proton scan and beam for users.

Some HT trips when proton beam is higher than 1.2 microA and some problems with the GPS deflector plates movement.

#### HRS

Stable beam setup through separator magnets and RFQ.

FC490 is giving wrong measurements .Expert contacted.

And that is the end of a complicated week..

## Booster (Bettina Mikulec)

As a welcome change, a rather quiet week.

- Throughout the week some problems with the transverse feedback on ring 4, later also with ring 3 (water flow issue); the RF specialist exchanged a sensor on Friday.
- The Q-strips were found off twice beginning of the week with some detrimental effect on the intensity on higher-intensity users. We informed our MD users how to use the ppm-on/off-control of the Q-strips...
- A. Findlay managed with very delicate adjustments to provide 400E10 also for ring 4 for the SFTPRO h2 beam. Why this ring needs such a special treatment for the h2 beam has yet to be understood.
- Also for h1 cycles the intensity limit on ring 4 is not yet solved. This affects ISOLDE beams, but we can in most cases compensate with the other rings.
- Wednesday before 10pm BR2.C04 and the Meyrin compensators tripped. The PSB MPS had to be switched off. The filters were back at 11:24pm, but then the TFB ring 4 had to be reset locally and the RF specialist solved the cavity problem (related to the 7V DC tuning power supply). Beam was back at 1am (3h downtime).
- Thursday 6:13am: LTB.BHZ40 was in error. As it couldn't be reset, the piquet PO was called, but his phone was not available (like for Monday 25/08 early morning and Thursday 28/08 evening). C. Mugnier could be reached at home, and he proposed that the piquet First Line should be contacted instead. First Line changed the 15 V regulation card and beam was back at 7:31. Is there a phone coverage issue with certain piquets due to their home location and can this be improved?
- On Friday there were serious timing problems that occurred after a reboot of cfv-361-ctinj before lunch-time. There seems to be a bug in FESA3 when a non-ppm device becomes ppm. I. Kozsar had to clean up the frontend and all machine settings had to be driven on all users (not possible to only drive front-end specific settings – to be followed up with CO). Related to this problem was – it seems – a pressure increase in LT and a radiation alarm at 12:45. Beam back at 13:15 and pressure going slowly back to normal.
- Improvements were done throughout the week to increase the injection efficiency and in general the intensity.
- Setting up of LHC50 has started, and a beam was coarsely adapted for the PS to set up the basic RF parameters for h9 LHC beams.

## PS (Gabriel Metral)

Pas de problème majeur sur la machine PS affectant la production des faisceaux.

Poursuite de la mise en place des faisceaux LHC25 et 50.

Par contre, un 2eme fil volant horizontal a été endommagé. Les fils 54 et 68 sont donc maintenant a remplacé. Cette intervention nécessitera 1 journée d'arrêt des protons.

On disposerait d'environ 3 semaines avant que le SPS prenne les ions, ce qui permettrait de récupérer un vide correct.

Les problèmes des kickers 13 et 21 et des fils volants pénalisent fortement le setting up du faisceau MTE.

### **SPS (Yannis Papaphilippou)**

The week was dedicated on solving several problems with the main power convertors (PC), including an electrical fault in one of the 18kV busbar connector and the implementation of the new MAM card for the power convertor output current acquisition. There was also a lot of issues solved with missing cables that had to be pulled (mainly BLMs, vacuum pumps in LSS1) and kicker conditioning.

More specifically:

- The over-temperature magnet trips that were observed last weekend were found to be due to a malfunctioning water valve that was not regulating correctly the temperature in BA3 (output temp. of 50deg. instead of around 40).

The valve was repaired on Monday, thus fully solving the problem.

- On Tuesday early morning and after a night of pulsing the power convertors, the mains tripped with several faults including a non-resettable busbar fault. After investigation of TE/EPC and EN/EL, the trip appeared to be due to an 18kV faulty connector. The investigation continued during all Tuesday in order to check the busbar connectors in all 18kV stations and repair the fault. At the same time, a faulty temperature sensor on one transformer of SMD10 was changed.

- On Wednesday the machine was accessed by several teams for solving mainly cable issues, including BLMs and vacuum valves in LSS1, which enabled the start of the MKP conditioning on Thursday morning. Some supplementary BLM issues have to be solved during next week.

- On Thursday afternoon, the FGC card for the power convertor current acquisitions was put in operation.

This enabled the calibration of the mains and quads and the start of the compensation of the current in the different cycles from Friday and during the weekend.

- During Friday night, there were trips of the mains and quads followed by faults on the mains application. After having called FIRSTLINE piquet and investigation of the specialist, it was found that the version of the process running on the crate was not the one compatible to the new MAM card. The specialist restarted the process manually recovering the current acquisition. It should be also noted that the application was showing false faults on several SMDs without tripping the power convertors. All these should be investigated on Monday to allow safe operation of the power convertors.

- On Saturday night and after several trips of the QD power convertor, piquet FIRSTLINE was called to investigate a fuse fault that ended up to be a burned power resistor, that has to be repaired next week. The pulsing continued using the spare power convertor, although it was difficult to change configuration due to the present interlock logic and the experts need still to investigate next week, if this is well adapted.

- On Sunday, the RF power piquet was called for faults on cavities 1-2-4. Cavities 2 and 4 remained on fault after local resets (PLC not responding) and the RF control specialist will have to work on the problem tomorrow.

## **AD (Tommy Eriksson)**

For last week:

- Lots of time spent/lost due to trying to establish good orbits at low energy using orbit data with corrupted pickup calibrations...this had been checked and set correctly not that long ago !
- Correct polarities for the e-cooling orbit correctors was then finally established using correct pickup calibration
- Some problems with programming of the CO2 RF causing frequent trips
- Good emittances at 100 MeV/c were seen for the first time Thursday evening
- Timing problems for extraction Friday but timing experts busy at PSB/PS
- Basic RF set-up & debugging for extraction done on Friday
- Large fluctuations in e-cooling performance seen on Friday. Possibly due to not ideal alignment of the electron beam.
- Weekend spent on further tuning for reduction of losses and improvement of emittances after re-adjusting the electron beam.
- Very good emittances at 100 MeV/c on Sunday
- Today we try to resolve timing issues and continue with extraction
- Disco tests seem to block our workstations....not much done this morning so far...