

## End Week 30 (July 31st 2011) – Status of Accelerators

### TI (Peter Sollander)

<http://wikis/display/TIOP/2011/07/28/TI+summary+week+30%2C+2011>

Events of the week: several electrical perturbations in the early hours of the morning. The events were unrelated and took place on different power lines in the area.

### ISOLDE (Didier Voulot)

It has been a quiet week at ISOLDE with no major problems.

Last week was devoted to HRS/REX set-up for a laser-ionised  $^{128}\text{Cd}$  run to Miniball. The run started on Friday afternoon with very good yields. In parallel GPS took TI beams during the night (until Thursday night) for an experiment on LA1 beamline and RILIS beam development.

### Booster (Alan Findlay)

This week has mainly been dominated by InCA issues, as we try to get the control system back into a usable state. We had a number of problems, many of which were discovered during our first task of the week, trying to set up the ion measurement cycle for our L3 colleagues.

We have to set up a cycle in the PSB where the L3 chaps and chapesses can safely take the ion beam from L3 and pass it down the LTB line to the measurement lines, while making a "hole" in the L2 proton beam. This has often caused a few problems to set up from what I can understand, and we had decided to add to our problems by removing their dedicated cycle and InCA-fing the machines since the last time it was done. To cut a long story short, this took us well over 24 hours before we had a "fix" in place and were able to let them test their beam.

In the process we were stymied by a number of things, which I'll try to give you a brief summary of. We'd normally load an archive & change the particle type for this cycle, but both these processes did not work due to controls issues. The particle type change could not be done due to the ions having been removed from the timing system during a clean-up and the timing expert being on holidays for 5 weeks. An attempt to load the archive was made, but it failed. The InCA support were quickly called in to help.

The particle type problem in the timing will probably not be solved before the expert returns, but the following day, Jean Francois made a quick and dirty fix so as to be able to get the particle type "PB53" loaded.

The Archives crashed due to all GFA functions having been corrupted for all archives imported during the InCA-fication of the PSB. This would be fixed and tested with a number of modifications by the end of the week. As luck would have it for the operation in question, we could get away without the GFA functions, so the InCA support "just" loaded the archive data in "expert" mode (not using the standard tools given to us mere mortals).

The archives were tested once again on Thursday afternoon, and I pronounced them "operational" after limited testing.

The archiving was not yet out of the limelight though, as the poor people operating the machine (get your hankies ready) were struggling to make sense of the naming that had been imposed for the imported archives. Herve rose to the challenge and took the issue to the InCA meeting for us, and by Friday evening had persuaded them to give us the information we needed to identify the stored archives.

We also did lots of normal operations and had the usual list of problems and fixes, but we handled these with our usual flair.

In summary, we had a slow week trying to get the controls to do what we want them to do, but by the end of the week we had resolved some major bugs, identified some others, but kept our beloved machine up and running. There is a long way to go in our training into the mad world that is InCA before we'll have our confidence back, and I note that a number of our operators have not been working on the machine while the support is available. The tunnel remains very dark....

## PS (Simone Gilardoni)

The PS week was pretty good, with only minor problems.

We regularly provided the operational beams whenever requested.

On Wednesday we lost as the rest of the complex about 40 minutes due to the network problems.

On Thursday, for not understood reason, the BTP trajectories needed to be re-steered from almost all the beam, after large losses were observed at the PS injection.

Investigations on the SMH57 (magnetic slow-extraction septum) continued in collaboration with ABT. The magnet was seldom tripping.

A contribution of the high temperature causing a part of the trips might come also from the losses of the CT extracted beams, since the septum introduces an aperture restriction during the CT extraction. A correlation between the supercycle composition and the temperature of the septum will be studied during the week.

A fraction of the losses causing high level of radiation at the route Goward could be cured by adjusting the BE.SMH15L1 at the PSB, found to have a difference between AQN and CCV of 20 A.

On top of this, the OP crews managed to optimise the injection of the CNGS and SFTPRO, bringing back the radiation level of the route Goward to low levels.

Still, higher than usual B-field fluctuations were observed at injection. The two consecutive CNGS or SFTPRO beams are clearly different at injection, making the beam steering more difficult. The MSC colleagues were contacted and they are putting in place a new acquisition system.

A similar problem was observed during the MTE measurements. The islands position was found clearly different depending on the cycle preceding the MTE one, as if there was a some hysteresis on the previous cycle remaining up to 14 GeV/c. Also for this the MSC colleagues were informed and they are trying to understand the effect.

On Sunday late afternoon, the injection of the CT-extracted beams suffered from a bad pulsing of the fast kickers in TT2 (DFAs, the 254 in particular). Unfortunately none of the experts was reachable by phone, so finally V. Mertens was contacted. A colleague from the ABT group intervened even if not expert of the system. Unfortunately, he did not manage to solve the problem.

The experts will be recontacted on Monday morning. The SPS considered the situation acceptable to continue the production of the CNGS/SFTPRO beams with larger losses at injection.

Concerning MTE, the measurement of the islands stability continued, after that BI managed to recover last Friday the settings lost for the MTE user. As mentioned, it was found that the off-momentum optics as the islands position were found depending on the preceding user in the supercycle. The tests on the hybrid-MTE (with CT elements) were resumed, since now the trajectory measurement is considered again operational, at least at 14 GeV/c.

## AD (Joao Carlos Oliveira)

### Tuesday

-We recover from vacuum leak and could give beam to users for the first time Tuesday at 19h00.

After fixing the feed-through in the ion pump near septum Monday 18th, the vacuum level was not recovering fast enough, that's why vacuum people decided to do an "étuvage"

With this vacuum issue, we lost 11.5 days of beam.

### Wednesday

- We had access twice the AD to install a vacuum pump on the cooling circuit of the extraction septum (SMI5306). The septum has an old vacuum leak which worsened after the "étuvage".

After installation of the pump we quickly reached  $1E-9$  on VGP5603. We were at  $1E-8$  beginning of the day.

We also recover 90% of the efficiency before extraction.

We lost 1h30 beam time with this intervention.

### Thursday @ 6h00

-No injected beam because of a power supply of the injection line.

Problem solved by first line.

No beam during 2h.

## SPS (Karel Cornelis)

No big problems during the past week in the SPS.

The floating MD on Wednesday with coasting beams was rather successful, in spite the fact that half of the time was lost for LHC filling. CNGS took advantage of the MD to take access. Therefore the CNGS beam was stopped on Tuesday night in order to cool down. The problem with the current in the horn, which was slightly lower during the second extraction, could be solved (in the end it turned out to be a timing problem). On Friday morning CNGS lost some time due to a controls problem with MKE4.

The availability for fixed target physics was 94% during the last week. The only problems were the traditional failures with NA access system (chain 11) where the piquet had to be called in to reset the system and a problem with TRX8 (stopping all beams) on Sunday evening.

During the week we gradually reduced the transverse blow up on the LHC beam to have it completely switched off since Thursday. The LHC seems to be very happy with these small emittances (1.5 to 1.7 micrometer). There was a spurious problem with the MKP on Wednesday morning which was excessively out gassing with the LHC beam. After some conditioning with one, two and three batches the problem disappeared.

## LHC

1380 bunches per beam, minimum emittances from SPS, peak luminosity up to  $2 \times 10^{33}$  cm<sup>-2</sup>s<sup>-1</sup>. Availability not so good – variety of issues including: SEUs, injection kicker erratics and a cryogenic PLC problem which has caused a major stop Sun – Monday.

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