

## Accelerator complex status

### End week 50 (Sunday 15<sup>th</sup> December 2014)

#### TI (Jesper Nielsen)

A rather busy week in TI.

<https://wikis/display/TIOP/2014/12/15/TI+summary+week+50%2C+2014>

#### Linacs (Rolf Wegner)

Linac2 was running well last week, a few resets of a few components were needed. We are shutting down the machine now.

Linac3 was running quite well. It was difficult to get a stable, high intensity beam. In the end, stability was preferred over intensity. We are shutting down the machine now.

#### LEIR (Django Manglunki)

At the beginning of the week, Michael performed many MDs (flat cycle, linear model), Sergio tested several remaining issues with TE/EPC, and Jerome implemented a new application programme to display the logging.

The beam was taken by the PS from Thursday evening to Saturday morning to take references in view of the coming Ar run. The SPS took the beam all of Friday, and accelerated it on three different cycles to prepare 3 of the requested momenta (150, 13 & 19AGeV/c).

On Saturday morning, for the last time we had a problem with the RF front-end (cfv-363-all1) where a reboot did not suffice; after rebooting it the SPS/LEIR OP team had to restart every task by hand.

The machine was turned off on Saturday afternoon.

#### ISOLDE (Miguel Lozano Benito)

It has been a good week at ISOLDE.

On GPS we had some beam time for the new beam line (VITO), some collections at GLM and some target yield measurements during the week. No big issues to report.

On HRS the restearing of the BTY line was done and after setting the machine up to deliver beam to COLLAPS they took beam during the week scanning different masses. Also TISD took some beam time.

On Friday morning some investigations about the target HT power supplies (HRS&GPS) took place.

On Sunday users called because they wanted an unplanned proton scan to move the proton beam from the target converter to the target itself.

Proton scan was done and users (COLLAPS) took beam until the morning when booster will stop for the winter.

## Booster (Bettina Mikulec)

Good last week!

The PSB was not showing any signs of fatigue after this challenging year (maybe contrary to its supervisors and operators...) running happily until the end.

Issues and comments for this week:

- Monday: The specialist managed to stabilise the 2 recombination septa BT1/4.SMV10 that exhibited a slow drift over time and perturbed the transfer trajectories.
- Tuesday: Final adjustments to optimise the 25ns BCMS beam for the SPS scrubbing run.
- Wednesday: Throughout the day issues with BT2.SMV20 that required piquet intervention (~1h40m downtime). There were also problems with the C16 cavity for ring2 that didn't pulse correctly; the specialists regulated the amplitude of the drive voltage.
  - Beam stop at 5pm to install an LHC-type BLM in section 4L1 of the PSB to study the hot spot there (unfortunately didn't bring any further information). A couple of parallel interventions took also place (in PSB and PS). Beam was back 2 hours later.
- Friday: At 3pm many magnets in BTY tripped with a bad external condition (cooling water problem). TI called the specialists who switched to another pump. Then BTY.QDE113 seemed to be in local; after First Line switched it again to remote, ISOLDE could continue taking beam (~1h downtime for them).
- Monday morning: All beams were stopped at 6am and the machine put securely to standby for its well-deserved X-mas rest.

## Finemet MDs:

Finemet tests throughout the week. The team managed to use the Finemet as C04 replacement, and with some C16 added they could accelerate 790E10 particles. On Friday the 7kV available from Finemet were distributed half for h1 and half for h2. Adding the missing 4.5 kV from C02 and C04 plus C16 blowup, 820E10 particles were accelerated. All planned tests could be finished for this year!

## PS (Guido Sterbini)

It was an intense week for the PS. The beams were shared between the experimental program, the SPS scrubbing run (first part of the week) and the MDs.

- During the whole week the dependence of the BTP trajectories on the SC composition perturbed the PS operation.
- On **Tuesday** morning the last horizontal wire scanner (68H) of the PS broke. Investigation are on-going.
- The cavity C40-78 had problems all along the week impacting on the length of the bunches delivered to the SPS.
- On **Wednesday** there was 1 h downtime of the East beams due a problem with the cooling water station. At 17h00 the beam were stopped for the scheduled PS and PSB interventions. The amplifier of the cavity 6 of the 200 MHz (C206) was repaired.
- On **Thursday** the C206 was retuned and is now available for operation. In the afternoon the Ar beam was injected to prepare for the ion MD in the SPS on Friday.

- EAST beams were stopped at midnight to allow access during the following day. The KFA4 started a long series of trips that continues until Saturday.
- On **Friday** the BSW14 had to be reset: this problem is recurrent and it is due to the high current value requested on TOF extraction.
- On **Saturday** the KFA4, after several resets and trips was switched off. The extraction of TOF was adjusted in degraded mode (without the KFA4). The other beams were not affected.
- On **Sunday**, during the late afternoon the PAXTOF04 triggered. The problem was due to F16.BHZ225S and BHZ167 power supplies. A workaround was found by reshuffling the TOF cycle in the SC.

## SPS (Benoit Salvant)

It was a bumpy week for the SPS with several technical issues that significantly brought down the beam availability to the North Area physics, and to a lesser extent to the second scrubbing run.

### Timeline

The week started with the second SPS scrubbing run with high intensity standard 25 ns with up to  $1.9 \times 10^{11}$  p/b, high intensity doublet with up to  $1.8 \times 10^{11}$  p/b, 8b+4e (first time injected in SPS) with up to  $2 \times 10^{11}$  p/b, and BMCS beam close to 2012 performance. These beam intensities were deemed very challenging and indeed significant losses were observed on flat bottom and along the ramp. More setting up and optimization time would be required in 2015. SPS scrubbers were very grateful for the excellent preparation of beams from injectors.

The last days of Fixed target proton physics for 2014 were strongly perturbed by the major faults described below until Saturday at 9:00 am, after which operation was finally back to stable production.

24 bunches were extracted to Hiradmat on Thursday evening.

The SFTION cycles for the 2015 Argon run were successfully accelerated up to flat top on Friday for 3 momenta (28.9, 42.2 and 333.3 ZGeV/c), and tests were performed to validate the new interlocks to prevent sending high intensity beam to the North Area during ion primary beam operation.

### Major faults

The major issues of the week were (chronologically):

- Magnet faults on a TT10 quadrupole (QID14) due to a failing cover switch (~4h downtime on Tuesday night and ~3h30 on Wednesday morning). TE/MS experts bypassed two magnet cover switches and will wait for the stop to repair them.
- A water cooling temperature fluctuation on the MST and MSE was interlocking the North Area extraction (~6h30 of very unstable conditions for the North area on Thursday morning). The problem was fixed by EN-CV experts.
- A recurring discrepancy between two signals of the mains current caused the BETS (Beam Energy Tracking System) to be in fault and prevent North Area extraction (for ~4h30 on Thursday afternoon, ~3h on Thursday evening, ~3h30 on Friday afternoon and ~2h on Saturday morning). This problem did not reappear after that but was not clearly understood by TE/EPC experts.

- The intensity on the North Area targets was not available and forced the OP team to stop the Fixed target beams for ~9h30 on Friday evening. In the absence of the BI expert, BE-CO and BE-BI colleagues came several times to replace and swap the acquisition cards of the SEMgrids. The temperature regulation of the room was not working properly and it is currently believed that it is the cause of the fault. After a final swap by the SPS OP team, the fault did not come back.

In addition to these major issues, there were also issues that caused less downtime (e.g. RF transmitter trips, North Area magnets in fault, trips of the mains, QF ripple during North Area extraction), and issues from the injectors.

It is also important to note that the new interlock to prevent too much intensity dumped on the TIDVG was triggered several times this week and indeed stopped the beams.

Big thanks to the piquets, best efforts and experts who helped us in coping with all these issues!