End Week 12 (March 29th 2010) – Status of Accelerators

Summary

LINAC 2	Fairly quiet week
PSB	Reasonable week with few minor problems, LHC / MTE beams delivered, setting up of other beams in progress
PS	Good week, LHC beams available, physics beam setting up in progress
SPS	Good week, apart from short-circuit problem in main dipole circuits. LHCPROBE and LHCINDIV beams for LHC, physics setting up in progress
AD	
TI	Smooth week except for Thursday when an Alice transformer failure tripped LHC ventilation and cryogenics.
LHC	Preparations for 3.5 TeV collisions, some worries about TI2 TED vacuum leak

Linacs (G. Bellodi)

Linac2:

Linac2 had a fairly quiet week.

The problem of the source intensity dips persists and keeps being monitored but no explanation has been found yet. The pattern is fairly regular (1-2 occurrences per hour over a couple of minutes), but sparse enough not to disrupt operations.

The only other major problem occurred on Friday night at 10pm, when beam losses appeared downstream of Linac2 in the transfer line to the PSB , triggering radiation alarms with intermittent behaviour. This was eventually linked to a faulty power supply of the LA2.QDN44 quadrupole, which had been replaced last week but badly installed, leading to a bad contact and oscillating current AQN values during the pulsing. Beam was unavailable for a couple of hours during the intervention.

PS Booster (K. Hanke)

Throughout the first part of the week smooth operation with our LHC beams and MTE beam for the PS, requiring regular adjustments. Setting up of other user beams (to be requested later, after Easter) progressing well.

Wednesday morning all beams went OFF with a strange timing problem, it took us a few minutes to investigate but resetting twice (!) dpsbksu2 made the extraction kickers come back on. Down time only a few minutes.

During the night from Friday to Saturday the trim power supply tripped, as already last week. EPC piquet and specialist intervened, it took in total 4h do bring the MPS back on, but this was to a large extent because the piquet was working on the SPS and came back to the Booster only once the SPS intervention was completed (which should not be the case according to GTPM). Some relay had burnt, according to the specialist nothing to worry about.

Friday around 22:00 all beams lost in the Linac2-PSB transfer line. Linac and Booster supervisors as well as the EPC piquet intervened, the problem was due to a quad in Linac tank 2 which had gone down with a faulty power supply and caused the beam to get lost far downstream the line. Once diagnosed the problem was fixed by the EPC piquet around 00:30.

PS (R. Steerenberg)

Last week was rather smooth running for the PS with very little down time. The LHCPROBE and LHCINDIV beam have been provided on a regular basis and every shift the extracted beam characteristics were measured and corrected when necessary. These beams are very stable and well within the specified values. On two occasions the transverse emittances were too big; once by a factor of 10 because the BBQ excitation remained active and the other time because the coherent oscillations at injection had changed.

Otherwise there were only minor technical problems that were quickly resolved. The ongoing problem with the GFAS, where the output function is corrupted or zero was further investigated and more diagnostics tools have been put in place by CO. However, for the moment there is not yet a conclusive solution, which we hope will be found before we will start the higher intensity beams.

During the week the AD beam setting up continued and the beam has now been adjusted transversely and longitudinally and it therefore almost ready for the AD.

Good progress was also made on the MTE side. The MD1 beam with 5E12 protons was extracted from the PS and injected and accelerated in the SPS for transverse damper adjustments since the middle of the week. A second MTE beam was setup on the user MD2 with the aim to prepare the beam with MTE extraction for the SPS fixed target physics beam production.

SPS (E. Metral)

The SPS has been providing the requested beams to the LHC throughout the whole week, except during two periods.

A first problem occurred on Monday afternoon with the main dipoles and led to a stop of few hours. After a trip due to an error in "delta I" (this measures the unbalance between the currents of the two circuits of the busbars of the main dipoles), a short-circuit between the two busbars was indentified between LSS3 and LSS4, more precisely between the dipoles MBB.40290 and MBB.40330. After having opened the hood of the busbars, a metallic rod (~ few mm width, ~ 10-15 cm long) sticked (and even partially welded) to the two busbars (below them) was found. The most sensible explanation is that this rod, which seems to be made of steel (and is therefore ferro-magnetic), was certainly there for some time and was raised by the magnetic field induced by the current in the busbars. Jeremie Bauche reminded us that without this "delta I" measurement installed by our previous colleagues in 1983, few meters of busbars could have been melt!

The second stop took place on Saturday and led to ~ 17 hours of downtime. A leak on the flexible bellows of the downstream TED.29132 of TI2 was detected. This leak was fixed with varnish. To avoid stressing, the TED has been be blocked out until a full repair is possible. Compensatory measures are required when giving access.

Finally, as from Wednesday the MD2 cycle was replaced by a CNGS2 cycle where the setting-up of the MTE beam (with ~ 5E12 p/p) has been taking place.

TI (P. Sollander)

The main event last week was the Alice transformer failure that tripped LHC ventilation and cryogenics.

- Monday 22
    - POPS emergency stop (already mentioned last week)
    - Short circuit in an electrical cupboard stops cooling in the North Zone for a couple of hours. No physics yet and no consequences.
- Thursday 25
    - Alice transformer failure trips 18kV breaker feeding ventilation units and cryogenics. Stops LHC for the day.

No other major problems last week.

LHC (O. Bruning)

Preparations for 3.5 TeV collisions ongoing.

Collimator set-up is finished, after some beam dumps provoked by adjustment of the ATLAS beam quality monitor.

Ramp to 3.5 TeV with non- colliding beam pattern

“End of fill” tests ongoing with debunched beam (RF off) to simulate asynchroneous beam dump.

A vacuum leak developed on Saturday on the moveable bellow of the TED downstream of TI2. The leak was fixed with varnish with the TED in the closed position which is considered more critical. Vacuum was stable when moving the TED out. The TED will be now fixed in open position to avoid any bellow movement. For LHC access temporary measures will be put in place based on the SPS extraction interlock system.

Several trips of the triplet RQX.R2, being followed up.