

End Week 17 (May 2nd 2010) – Status of Accelerators

Booster (Klaus Hanke)

Reasonable week, we delivered beams for the SPS MD, MTE beams and as from Thursday LHCPROBE and INDIV for the LHC.

Tuesday 27/4 2.5h stop for an intervention on the cooling of the C02 cavities (LHC was off, and SPS was in access as well). In parallel an intervention on the Linac2 interlock chassis was done. Some tuning on the SFTPRO and CNGS MTE users. In the afternoon a short stop due a problem with the PS safety chain.

In the evening at 20:46 the linac RF went down and could not be reset. The Linac RF specialist was called and changed a HT ignitron, beams for the SPS MD were back 23:10.

Wednesday 28/4 morning (06:10) a power glitch brought the MPS, a number of other power supplies and the Linac RF down. The power glitch had taken out the water station, and once the water was back we switched back on our equipment; the EPC piquet had to intervene on two power supplies which did not want to come back on. All beams were back 11:13. Again the SPS MD suffered from the stop.

Thursday 29/4 the LHC started up with LHCPROBE. Since then they were taking PROBE and INDIV with varying intensities.

The rest of the week and the weekend smooth running.

PS (Yannis Papaphilippou)

Good week for the PS with minor faults, apart the general electrical network problem on Wednesday morning.

The PS recovered in around 3h and necessitated only an intervention for the BFAs and DFAs (oil circuit restarted and a thyatron changed).

The week started with the INCA MD during Monday and Tuesday. On Monday, the piquet power and specialist had a 2h-intervention for repairing the QKE power supply (PE.QKE16CT15), which presented a series of electronic faults.

On Wednesday morning, as the PSB was down after the electrical network glitch, an intervention took place for a repair in the EAST zone beam splitter (F61.SMH01) during which the magnets' emergency stop button was blocked.

For a final repair, an intervention is necessary in the next possibility for access.

The nominal LHC25 beam (4 batches) with remarkable stability and good beam characteristics was delivered to the SPS on Wednesday and Thursday for MD and scrubbing run.

During Saturday, and after a few HV interlocks, radiation alarms and resets, the specialist was called and intervened for repairing the KFA13 kicker (change of a charge control rack). At the same time, the piquet LLRF with the specialist was called due to bad pulses of cavity 91 (1-turn feedback switched-off).

SPS (Elias Metral)

The first Long Injector MD block of 72 h should have started on Monday 08:00, but due to the **vacuum leak observed on the dipole MBB.30090** the Friday before, the whole Monday was devoted to the magnet exchange. Due to a vacuum sector valve next to the magnet, which needed to be removed, the vacuum of the sectors 2+ and 3- had to be broken and it came back only at the end of the day. Furthermore, **due to an intervention in the TI12 and TI18 lines, which had to be finalized to protect the SPS in case of LHC helium leak**, the MD could not be started before Tuesday early afternoon. The good thing is that the necessary DSO tests for the NA could be performed in the shadow of these interventions.

Despite this catastrophic start, the nominal LHC beam was accelerated in the SPS up to top energy with only ~5% of losses on Wednesday evening, which is one of the best results obtained so far, and it was obtained already during the first MD of the year! The vertical emittance was as usual slightly above nominal (~ 3.6 micron), but ~ 3.5 micron were already measured in the PS just before extraction. This very good result could be achieved in particular due to the presence of the ZS experts (as the ZS out-gassing was the first limitation in the past few years to reach nominal intensity) and due to the fine adjustment of the longitudinal dampers. Concerning the ZS, the most effective settings seem to be: (1) ZS retracted (as usually done), HV ON to -7kV (usually we put 0kV), Ion traps ON -3kV/-6kV (as usual). All the results should be carefully analyzed, but it seems that we are now in good shape to study higher intensities than nominal in the SPS, which was never done in the past and which is planned for the next Long Injector MD of week 22.

The MD, which was planned to stop on Thursday 08:00, was extended in parallel to LHC operation until the end of Thursday afternoon (due to some delay with CNGS). Here again a very good result was obtained as we succeeded to inject Beam1 (and then Beam 2) in the LHC (from the LHCFast2 cycle) in the presence of nominal intensity in the SPS supercycle (on the LHC1 cycle). It was the first time such an operation took place in the SPS! It proved to be quite efficient and should be used during all the next Injector MD blocks (on Thursdays, as already planned on the Injector Accelerator Schedule).

Concerning physics, the first CNGS beam (with the new PS MTE, using the “low-intensity” version of ~ 1.6E13 p/p extracted from the PS) was seen on target on Thursday at the end of the afternoon.

On Friday, it was decided to move to the “high-intensity” version of ~ 2.2E13 p/p extracted from the PS. The initial transmission was ~ 80%. Since then, the OP team continuously increased it to reach ~94% (with ~ 3.7E13 p/p at 400 GeV/c in the SPS) on Sunday night (time of writing).

TI (Peter Sollander)

- Tuesday 27 afternoon, a technical problem on the gas detection system SGGAZ-00155 triggers the evacuation signal in sector 1-2. The problem is not yet fully understood. GS/ASE is investigating.
- Wednesday 28 morning, 400kV perturbation on EDF network stops the injectors. LHC cryogenics did not suffer. A transformer supplying ATLAS cryogenics tripped.
- Sunday 2 May, 400kV perturbation again, stops SPS and LHC, seen also by the LHC experiments Alice and LHCb. -- Still waiting for EL report for details.

LHC – full details under coordination at:

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

Technical stop Monday to Wednesday 26th – 28th April – long recovery, followed by a difficult Saturday. However, stable beams with 2 on 2 and around 1 e11 per bunch were successfully established at 450 GeV – another very useful milestone.