End Week 10 (March 15th 2010) – Status of Accelerators

Summary

LINAC 2	Good week without problems
PSB	Good week, LHC / MTE beams delivered, setting up of other beams in progress
PS	Good week, LHC beams available
SPS	Good week with LHCPROBE and LHCINDIV beams for LHC
AD	
TI	Smooth week except for emergency stop in RR73 in the night towards Monday
LHC	Machine in good shape for 450 GeV, up to 3E10. Good progress for 1.2TeV

Linacs (A. Lombardi)

Linac2:

Linac2 had a good week without problems.

PS Booster (K. Hanke)

Good week, some problems with the extraction kicker on Wednesday, otherwise LHC and MTE beams were delivered and setting up of all user beams in the PSB is progressing.

Wednesday 10 Mar

Extraction kicker BE.BSW15L4 tripped, not resettable; specialist called. After 1h:10 beam was back, but the kicker immediately tripped again. After several trips and resets, which did not hold, another specialist was called in and the problem was permanently solved after about 2h.

Friday 12 Mar

From 13:00 we did a dedicated MD for which we disabled Ring4 (after coordinating with all potential users). At 18:00 all beams except the ones for LHC were stopped for radiation cool-down in view of the technical stop Monday/Tuesday.

Weekend quiet, the LHC requested LHCPROBE and LHCINDIV with varying intensities.

Monday 15 Mar

05:00 all LHC beams stopped, RP requires 3h cool-down before we give access for technical stop as from 08:00.

PS (G. Metral)

Good week without major problems.

Analysis ongoing to understand dependency of injection trajectories in the PS on super-cycle composition. There are hints that for specific use of the figure of 8 loop the field on the injection plateau has an error of about 4 Gauss. The FMR measurement is being setup to measure this error.

Some problems with JAVA console manager (working sets not updated or displayed), solved by emptying JAVA cache.

Beam operation this week : PROBE, INDIV, LHC50, MD1et MD2 (MTE) and MD3.

SPS (D. Manglunki)

The SPS has been providing the probe (mostly) and indiv beams to the LHC all week, with a technical stop on Thursday 11/3.

On Wednesday 10/3, a 12 bunch beam with 50ns spacing has been set up on a long 26GeV/c flat bottom in order to restart setting up the transverse damper, which is needed prior to start taking the MTE beam from the PS. The 50ns spacing beam has also been given with 36 bunches during Wednesday afternoon for e-cloud studies.

There are still some problems with MKP (Generator 3, PFN5) for which the piquet was called over the week-end.

On Monday 15/3, beams will be stopped at 5:00 for PS cool-down before the technical stop.

TI (P. Sollander)

The main event last week was the emergency stop in LHC tunnel RR73 during the night towards Monday.

- Tuesday 9/3,
    - a BE/CO front-end used as WorldFIP gateway fails and stops cryogenics in sector 3-4.
    - a perturbation seen on the ME9 (Jura substation), no consequences on the accelerators though.

No other events to mention really. Things were smooth for the rest of the week.

LHC (M. Lamont)

Beam tests over the weekend.

- From Friday afternoon various measurements, apertures, orbit feedback, chromaticity, beta-beating, ramp to1.18 TeV.
- TOTEM interlock tests, positive results
- RF adjustments for higher intensities up to 5E10 single bunch (still compatible with 5E9)

- Injection studies with higher single bunch intensities up to 6E10. Clean up to ~2.5E10, strong increase of losses from 3E10, to be continued. Positive: all losses caught by collimators.
- 1.2 TeV studies (ramp & flat): orbit, tune feedback, chromaticity, beta-beating, separation bumps.
- Monday 15.3, 06:00 beams switched off for technical stop.

Summary status 450 GeV:

- Tunes & chromaticity adjusted and controlled to nominal values routinely (good tools)
- Optics verified and corrected to a maximum beta beat of 20-30%. Almost in specification.
- Dispersion measured and verified (in vertical plane: 3 cm rms).
- Closed orbit adjusted to an rms of ~0.45 mm (about +-2 mm peak to peak)
- Golden reference orbit defined for collimation and machine protection.
- Aperture looks good with bottlenecks as predicted.
- Spectrometer and compensators set up and corrected with beam.
- Nominal separation bumps set up and included into the corrected closed orbit.
- Beam feedback commissioning partially completed, still ongoing.
- Grazing events delivered to ATLAS and CMS. Many splash events to all experiments.
- Collimation system (all ring collimators) set up with ~0.2mm accuracy. Cleaning and protection hierarchy verified with beam (efficiency: > 99%, limited by BLM resolution with this intensity).
- Beam instrumentation working very well
- Injection, beam dumps, machine protection commissioning well advanced (but not finished)
- 1-2 shifts needed to establish collisions in stable beams mode
- Good for 2 to 3E10 at the moment
- Higher intensities definitely need more work

Summary status Ramp/1.2 TeV:

- Looks very good to 1.2 TeV (with safe beams)
- Tune feedback operational
- Orbit feedback to finish commissioning
- Would hope that the extrapolation to 3.5 TeV should be straightforward
- Beating comparable with 450 GeV – no correction yet
- Tune, orbit, chromaticity under control
- Separation bumps collapse, collision tuning tested