End Week 12 (March 29th 2011) – Status of Accelerators

PS (Yannis Papaphilippou)

The main events of the PS during this week were the switching to the "good-old" MPS due to POPS failure and, the stop of TOF beam due to high activation in the nTOF target area. More specifically:

- Since the beginning of the week, it was observed that the injection field in all cycles was varying by about 1Gauss peak-to-peak, whereas it was optimized, at the beginning of the run, by the TE/EPC experts to be ~0.1Gauss. This was especially harmful for the LHC75 beam, where the synchronization between the PSB and PS revolution frequency was unstable, resulting in bunches injected, from time to time, in wrong buckets. It was thereby causing losses at ejection, due to the bad placing of the bunch-train with respect to the extraction kicker.

In agreement with the LHC, several small stops were scheduled during Monday and Tuesday morning, to allow tests and interventions of TE/ EPC colleagues. Finally, on Tuesday midday, burned capacitors in a POPS filter were discovered. It was then decided to switch to the motor-generator MPS, an intervention that took around 4h, and after some fine adjustment from the RF low-level team and the OP crew, the beams were back and remarkably stable. Apart from the fact that spare capacitors were not available, it is important for the TE/EPC team to fully understand why this failure occurred, before switching back to POPS. In this respect, the power experts decided to remain powered by the old MPS for the next couple of weeks and use also this time to fully assess the issue.

- Since Thursday morning and on request of NTOF and RP, the TOF beam was stopped, as important gas activation above the authorized limits was observed, coming from the cooling station of the target. The TOF beam was back for tests, during Saturday afternoon, on RP request.

Expecting further news tomorrow.

Some minor issues:

- A PS access was scheduled on Monday morning for repairing the 10MHz cavity C86. The expert suspected a gap relay but finally the problem was coming from a loose contact in a central building cable (~1h stop).

- Radiation alarms since the beginning of the week were caused by loss of CNGS beam at injection due to wrong pulses of the injection septum SMH42. Power and control piquets were contacted and the problem was suspected to be a power-supply timing card that was changed on Thursday evening, after a short intervention. The wrong septum pulses though re-appeared on Friday afternoon. PICO was contacted and tried to put some order in several timing cables during another short intervention. Since then, the septum pulses correctly.

Technical infrastructure (Peter Sollander)

Rather quiet week with only one major event report generated. A 45 minute stop of the CNGS:

Ventilation regulation problem stops CNGS physics for 45 minutes. Problem detected by TI. Very rapid intervention by CV and beams back at 20:30

SPS (Elias Metral)

On Monday afternoon, the CNGS production cycle (with ~ 4E13 p/p) was back to operation (reminder: the goal for 2011 is to send 4.7E19 pot; 4.03E19 pot were sent in 2010). Most of the week we run with 4 CNGS cycle + 1 LHCPROBE cycle for the cool-down. In fact, even with this configuration, we have to stop from time to time to keep the temperature below the interlock value set to 73 deg. Note that the target is well cooled to 24 deg: the problem is not the target temperature, but the temperature probe TT01 (ventilation temperature of the titanium window of the Helium tube just behind the target).

On Monday afternoon, we also investigated with the PS (Yannis) the reason of the smaller (by ~ 20%) 1st bunch of each batch of the 75 ns beam (on LHC3), as already observed sometimes last year. It seems that this is linked to some beam loading effects in the PS (followed up by Heiko): this effect was also observed in TT10 and in the PS before extraction. Note that sometimes the 1st bunch was observed to be more than a factor of two smaller than the others (with also the 2nd bunch affected), and in this cases it was due to the SPS injection kicker.

On Tuesday, the LHC restarted a couple of JMS-broker processes on cs-ccr-jas1, which seemed to block our CNGS muon profiles. Some checks were also done on the LHC3 cycle with the 75 ns beam to be sent to the LHC and the beam quality was again good. Finally, Daniel finished the SPS transverse damper set-up, verifying both the CNGS1 and LHC3 cycles (with 24 bunches).

The MSE4183 tripped several times at the beginning of the week and this was due to water problems (the chilled water circuit 414 was stopped).

On Wednesday, we had some discussions to verify the 50 ns and 25 ns beams in the SPS to be ready for the LHC scrubbing run. However, it was decided on Thursday not to do it before the technical stop. On Wednesday night, there were some trips with the MKP generator 3 (PFN6), which necessitated a tube change on Thursday morning.

On Friday, the LHC4 cycle was used to fill the LHC with bunches spaced by 525 ns.

On Saturday, the RBI81607 tripped each time the power supply tried to switch to LHC side: the drops to zero were not present on the CNGS cycle. It seems an incorrect function had been loaded which didn't include the drops to zero, which are necessary for the switching (it seems to be like this since the 18/03, which would explain why we had some problems recently).

Finally, all the SPS beams will be stopped tomorrow (Monday 28/03) at 08:00 for the technical stop. The idea is to start the access on Tuesday 29/03 (the interventions should be finished on Thursday 31/03 evening). This technical should be used to change some magnets, in particular the MSI, and to install two new scrapers in LSS1.

LHC

- Pushed to 200b at 3.5 TeV – record luminosity, 28 pb-1 delivered so far this year.
- 1.38 TeV run successfully completed

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