LHC-Beam Commissioning Working Group

Notes from the meeting held on
22 September 2009

Present: Maria Carmen Alabau, Gianluigi Arduini, Ralph Assmann, Roger Bailey, Tobias Bär, Oliver Brüning, Helmut Burkhardt, Octavio Dominguez, Kajetan Fuchsberger, Rossano Giachino, Brennan Goddard, Eugenia Hatziangeli, Hitomi Ikeda, Delphine Jacquet, Lars Jensen, Verena Kain, Mike Lamont (chair), Malika Meddahi, Gabriel Mueller, Mario Pereira, Laurette Ponce, Bruno Puccio, Stefan Roesler, Jan Uythoven, Walter Venturini Delsolaro, Jorg Wenninger, Simon White, Frank Zimmermann.

Excused: Reyes Alemany, Massimiliano Ferro-Luzzi.

1. Comments and actions from the last minutes

None.

2. News from LMC – Mike Lamont (slides)

Summary notes from previous LMC meetings, written by Brennan Goddard or Frank Zimmermann, are available here.
Few points from the last meeting (16 September): (Mike Lamont's slides)
- Cryogenics very stable, good progress in readiness for beam start-up.
- Powering tests on going, good progress.
- DSO tests scheduled for beginning of week 43, right before the first LHC injection tests planned for 24 / 25 October.
- To note from Massimilio Ferro-Luzzi presentation (slides): requests of injector MDs in the SPS for testing new bunch spacing (> 100ns) -ALICE- and for shifting PS to SPS train transfers for LHC filling - for experiments luminosity trade-off. Implications of these modes of running to be evaluated. General feeling: let's keep it simple at the beginning of the commissioning!
- To note from Werner Herr presentation (slides):
  - β^*= 2 m with crossing angle off;
  - β^*= 3 m with crossing angle on;
  - Alice and LHCb spectrometers will be at full field at 3.5 TeV;
  - With crossing angle: only one polarity of LHCb spectrometer possible (for any β^*).

From a suggestion of Oliver Brüning it was agreed to start with β^*= 3 m optics - avoiding to switch back and forth from 2 m to 3 m.
Werner Herr suggestion: crossing angle should be tried at an earlier stage, even for small number of bunches.
Mike Lamont: squeeze will be done one IP at a time.

3. Dry Run news – Verena Kain (slides)

Abort gap: results from week 37-38:
Transverse damper, first version of the abort gap cleaner and abort gap monitoring:
Good progress. Missing:
- Timing events to start and stop damping, abort gap cleaning;
- Sequencing for damper (also a couple of standard sequence tasks for power...);
- Tune step cleaning mode for abort gap cleaner;

- Proper handling of coupled critical settings in application;
- Logging and alarms for abort gap monitor still to come;
- XPOC analysis for abort gap still missing.

More details:
https://espace.cern.ch/mddb/Activity%20Tracking%20Tool/Activity%20Tracking%20Welcome.aspx?View={593B6E53-F6F9-4485-8646-E7E683D0F681}&SelectedID=48

Week 38:

LHC RF for ions:

Beam process "RAMP_3.5TeV-ions_V1" prepared. Functions generated for Momentum, RF and Transverse Damper. Cycle made resident with success.

BTV video switching, device BVideoMux, now working from EquipState in RBAC "strict" mode, "lhcop" rights, for devices in injection regions, LSS2 and LSS8. LSS6 dump line device not yet available for testing.

Test of the operational mode:

1. Prepared a sequence which was changing the Accelerator Mode every 3mins (different modes, operational and non-operational)
2. Each update of the Accelerator Mode was visible in the LSA db and the timing telegram (handled by the LSA server)
3. Each update of the Accelerator Mode which also changes the Operational Mode was received by the cmw-configuration-server as a notification from the db-publish-service
4. On each update of the Operational Mode, the cmw-configuration-server was pushing new mode value to the predefined set of cmw servers in LHC (for test purpose only LHC BLMs were used)
5. Using the cmw-admin tool, could verify that the Operational Mode was successfully updated in the cmw servers

Page 1 updates have also been checked: working well.

Test will have to be repeated to test other accelerator systems.

IQC: pending: BLM data not handled correctly yet.

BI XPOC Analysis:

- BLMs get all signals and processed properly. BLM readings were logged at the moment of dump.

Logging of XPOC results for BLMS needs reconfiguration, not tested.

- BCT: get signals from transfer line BCTs. BCT ring gives some data, but occasional problems. BCT dump did not give any data. Check on names of FESA fields for the different BCTs, needs to be fixed. Being followed up.
- In the XPOC System: the BCT module only needs to read from the BCTFD. The BCTFR and TI2/TI8.BCTFI are read in the module which generates the dump context.
- Fixed display BCTFD.62 not displayed or just wrong label.
- Vacuum: list of devices needs to be updated. For the devices read, the results seem to be ok. No vacuum logging tested. Problem in CMW to read signal for vac.VGPB.623253.R, does read in PVSS.

More details at
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Default RBAC mode is set in strict. Issues are being worked on progressively. Verena Kain will organise another RBAC strict mode dry run in order to check all the remaining applications which are not yet under “rbac strict mode”.

In the next 3 weeks: Feedback systems, LSA clean-up, coherent set of knobs (naming convention?). 15-16 October: handshake dry run with experiments.

4. Update on the reworked LHC beam commissioning plan – Malika Meddahi for the LHC Beam Commissioning Planning team (slides)

Over the past years, the detailed stages and associated steps of the LHC beam commissioning have been very precisely defined and fully recorded. A detailed commissioning schedule is now being extracted from this complete documentation, keeping the relevant steps needed in order to safely achieve beam collisions with moderate intensity at 3.5 TeV. The schedule proposes to present on a shift basis the deliverables to be met, together with their target values. Time duration, people involved, beam types and pre-requisites will be as well listed. The work is on progress, examples have been shown and a first draft is expected for the end of September, to be discussed at the LHC beam commissioning meeting on 6 October.

Oliver Brüning commented that aperture would also be important to be checked early to allow safe operation, and agreed that work like aperture scans would be ideal for working at night.

Brennan Goddard asked Ralph Assmann to comment of 2e10p+ at 3.5 TeV for TCT safety. This intensity should be O.K. Numbers to be checked at injection. Should anyway start the whole commissioning exercise with pilot intensity.

Oliver Brüning added that the collimator settings will be needed for 450 GeV collisions, together with the optics. He added that all tools needed for bringing beams into collisions, and monitoring the beam parameters will have to be listed and prepared.

5. Latest news on the Transfer Line Beam tests –Rossano Giachino - Malika Meddahi

Dates: from Friday 25 September, 18:00 or earlier, to Tuesday 29 September, 07:00.

Particles: Protons (budget of 1e14 per line) and ions Pb^{82+} (budget of 1e11 per line).

Transfer line beam test programme: link

J. Wenninger: Ions usefully extracted to TT60 on 21 September, nominal emittance, but not yet synchronized.

Rossano Giachino: All equipments tested and ready. Patrol on Friday 25 September. Beam will be available as scheduled or even earlier.

Next meeting

Tuesday 29th September 2009, 15:30, 874-1-011. Agenda will be sent in due time.

Malika Meddahi.