LHC-Beam Commissioning Working Group

Notes from the meeting held on
2 February 2010

Present: Maria Alabau, Reyes Alemany, Gianluigi Arduini, Ralph Assmann, Tobias Bär, Wolfgang Bartmann, Chiara Bracco, Oliver Brüning, Rama Calaga, Lene Drosdal, Stephane Fartoukh, Kajetan Fuchsberger, Rossano Giachino, Massimo Giovannozzi, Brennan Goddard, Per Hagen, Eva Barbara Holzer, Lars Jensen, John Jowett, Mike Lamont (chair), Alick Macpherson, Malika Meddahi, Gabriel Mueller, Gulia Papotti, Mario Pereira, Laurette Ponce, Bruno Puccio, Stefano Redaelli, Frank Schmidt, Marek Strzelczyk, Ralph Steinhagen, Stefan Roesler, Ezio Todesco, Rogelio Tomas, Jan Uythoven, Jörg Wenninger, Simon White, Uli Wienands.

Excused: Verena Kain, Walter Venturini Delsolaro.

1. Comments from previous minutes

None.

2. LHC schedule – Mike Lamont

Decision taken at Chamonix –see presentation of Steve Myers:
In 2010 and 2011, LHC will operate at 3.5 TeV. There will be a short shutdown in 2010-2011 and a long shutdown in 2012 to prepare the LHC for 7 TeV operation.

3. Planning for the LHC re-start

Mike Lamont listed the different phases of the LHC re-commissioning phases, together with the timeline. See details in Mike Lamont's presentation.
To note:

- As much time as needed will be given in order to perform all the necessary checks.
- It was clarified that the beam commissioning tests (understanding issues of 2009) will first start with all experiments off -magnets+solenoids- to disentangle possible sources of problems.
- Collimator setting up will be a lengthy procedure and enough time must be given to perform this work -will be more beneficial in the long term. Extensive cleaning efficiency studies will have to be done.
- Orbits, tunes must be well into controls before ramping the collimators and making their final setting-up.
- Chromaticity measurements: will be mandatory to build some confidence in the measurements.
- Optics checks and machine protection checks will be done before moving from one commissioning step to the next one.
- Injection matching, including emittance measurements, must be done at an early stage and given the appropriate time.
- 450 GeV collisions have been requested for a couple shifts, together with splashes (to be clarified).
- 50 ns bunch spacing: how the filling scheme will look like? Being defined. Brennan Goddard raised the point that in terms of transverse energy density, some failure scenarios will already be at ½ nominal thresholds. BI testing will have to be done as well for this bunch spacing.

- Preparing for high intensity should be addressed as soon as possible, after 2-3 weeks of commissioning. It will request extensive checks, such as BI, injection, dump, cleaning efficiency …

Daily shift by shift LHC re-start planning will be done. **Follow-up: Mike Lamont**

Timeline shows the first 450 GeV collisions after 2 weeks of commissioning. It was stressed that adequate time will be given to commission the LHC as needed.

4- LHC Beam Commissioning workshop at Evian: follow-up

A summary of the Evian LHC Beam commissioning workshop was presented by Mike Lamont at the Chamonix LHC Performance workshop: slides

Follow-up on power convertor investigation -Massimo Giovannozzi: It was checked whether some power converters could explain the observation made (hump, or source of beta-beating). For the time being the answer seems to be negative, but some investigations are still on-going and more will continue with beams. See details in email1 – email2
Concerning the power converters in IR3 and 7, checks of the MQWBs will be done as well. Ezio Todesco added that source error from the MQWA seems indeed highly unlikely, their model being pretty solid, a 3% uncertainty should be considered highly improbable.
Ezio Todesco asked if an error on the MQWB could explain the measured beta beat? Rogelio Tomas said that a trim on the MQWB cannot correct for the beta beat.
Gianluigi Arduini added that the beta beat measurements confirmed that a polarity error is excluded as at 1.2 TeV, the situation improves.
Ezio Todesco added that MQTL pre-cycling must be done and will be an important addition to analyse and understood the situation.
Proposal: Carry on with the power supply checks. Will need a systematic investigation with beams.

List of follow-up actions available here.

5. A.O.B

Daily 8:30 HWC meeting in the CCC conference room.

Daily 17:00 machine check-out meeting, starting as of tomorrow, 3 February, CCC glass box.

Gianluigi Arduini on HWC: 4 sectors are in phase 2 and the plan is to have 1 or 2 additional sectors late on 2 February. There is an issue with sector 12 preventing to ramp with the nQPS connected to the interlock which is not understood and was not detected by the previous steps of the commissioning
Mike Lamont asked whether the deadline for the injection test on 15/2 can be met. Gianluigi Arduini replied that it could still be possible but it will depend on the results of the investigations for Sector 12.

Plans: closing the LHC for the 15 February and going to machine check out and injection tests.

Added after the meeting: Tentative date of the LHC sector tests: Wednesday 17 February –pending LHC HWC progress.

To note: HWC work and machine check-out tests need overlapping coordination, in order to meet the deadlines. Alick Macpherson: In particular, the issue of who is addressing the scheduling/planning of the machine checkout in the period prior to the sectors being handed over to OP, and the issue of hampered software development and application checkout due to the unavailability/instability of the software environment that is made available to OP (ie VMware problems)

Next meeting: **9 February 2010,** 15:30, 874-1-01. Agenda will be sent in due time.

Malika Meddahi.