

LHC Beam Operation Committee

Notes from the meeting held on 23rd August 2011

List of Participants

1. Activities during Technical Stop #4 (Julie Coupard)

Julie Coupard summarized the planned interventions concerning the technical infrastructure, the machine equipment and the powering tests during the upcoming technical stop (TS) (29.08.2011 – 02.09.2011).

Technical Infrastructure: There will be interventions on the lift in PM25 on Wednesday (31.08.) and Thursday (01.09.) which will prevent access to Pt.2 during these days.

A main intervention is the **repair of optical fibers** which will start on Monday 29.08. 18:00. This will affect the beam interlock system (BIS) and the LHC Access Safety System (LASS). **Thus, no other access to the tunnel is possible during this intervention.** The LASS validation will be done directly after the intervention; the Departmental Safety Officer (DSO) test is planned for Friday 02.09. 19:00 - 20:00 (only one door on one point).

Due to interventions on the cryogenics, **cryo start and cryo maintain will not be kept for sectors 12, 78 and 81.**

Machine equipment: Interventions are planned for 11 beam instrumentation systems, the kicker magnets in Pt. 2, 4, 6 and 8, the machine protection system and the vacuum system.

Powering tests: Mainly on Wednesday and Thursday, including a quench propagation test.

Julie Coupard also points out that there are new safety rules for radio-protection.

Discussion:

Laurette Ponce and Jorg Wenninger believe that the planned 1 hour for the DSO test is very optimistic.

Laurette Ponce points out that powering tests require that parts of the machine are patrolled, but the DSO test is not done before Friday evening.

Simon Baird replies that the DSO test is needed for beam related protection only. The access system will be fully functional directly after the LASS validation.

Pierre Charrue adds that **several interventions from IT-CS and BE-CO are planned which will affect multiple systems ([see here](#)).**

2. Alternative filling schemes with 1380 bunches (Massimiliano Ferro-Luzzi)

Massimiliano Ferro-Luzzi explained the present filling scheme for 1380 bunches with 50ns bunch spacing: There are 12 bunches which are shifted by 25ns in order to collide in ALICE instead of LHCb. This results in an increased long range beam-beam effect in LHCb on these bunches, but the experience with this filling scheme showed that it is a feasible operational solution.

Massimiliano Ferro-Luzzi presented an **alternative filling scheme**, where the shift of the 12 bunches is removed in order to increase the luminosities in ATLAS, CMS and LHCb. The alternative filling scheme also implicates that there are only collisions of main bunches with satellite bunches in ALICE. This alternative approach has been tested for four different filling schemes during the intensity ramp-up after the last technical stop. Since the achieved luminosities in ALICE did not reach ALICE's requirements, it was reverted to the filling scheme with main-main collisions in ALICE. A precise analysis of the alternative filling scheme is difficult because the longitudinal density monitor (LDM) was not configured to measure the bunch intensity of satellites during the tests and also no AFS summary files are available from ALICE so far.

With an assumed 0.1% satellite population, the expected luminosities ratios (ATLAS/ALICE) were between 45% and 190% of the observed luminosities ratios. Massimiliano Ferro-Luzzi stressed that ALICE also increased their luminosity expectations over the advertized luminosities.

Massimiliano Ferro-Luzzi mentioned that Steve Hancock has developed a scheme with which **the 25ns satellite population is potentially controllable in the PS**. The method has still to be tested all the way to the LHC.

Massimiliano Ferro-Luzzi points out that a luminosity leveling could compensate for uncertainties in the satellite population and stressed that **the approach should be tested before the winter stop to be able to make an educated decision for the operational scenario for 2012**.

Discussion:

Jorg Wenninger states that large satellites (intensities above a few percent of the main bunches) could be measured by the SPS beam quality monitor (BQM).

Jorg Wenninger and Massimiliano Ferro-Luzzi underline that the satellite and abort gap population is much lower than expected.

3. Upcoming meeting:

Tuesday, 30th August: **next LBOC meeting (15:30 in 874-1-011)**.