

MPP meeting 11 dec November 2009

Agenda:

slightly modified wrt first announcement:

- Summary on the LBDS triggering issues (E. Carlier).
- Experience with LBDS XPOC (J. Uythoven)
- Analysis of D1 MPS tests with beam (R. Schmidt)
- AOB

Present:

Jan Uythoven, Daniella Macina, Siegfried Wenig (ATLAS), Alick Macpherson, Bruno Puccio, Markus Zerlauth, Barbara Holzer, Ruediger Schmidt, Annika Nordt, Mariusz Sapinski, Wolfgang Bartmann, Mario Deile, Robert Appleby, Tobias Baer, David Stickland, Bernd Dehning, Etienne Carlier, Jorg Wenninger, Mike Koratzinos

Minutes:

AOB:

There has been a request to have an information message sent to the distribution list when the minutes are out. We will try to do so.

LBDS triggering issues (Etienne):

Etienne summarized the triggering issues of the LHC beam dumping system (LBDS). He showed the conceptual diagram of the system. There are two trigger synchronization units (TSUs) for redundancy. There are two types of trigger: the synchronous beam dump trigger (SBDT) and the asynchronous beam dump trigger ABDT. Synchronization of trigger and beam at pt 6 in the TSU is within 10nsec. The synchronization has been tested and works fine. What gives problems is that the system is sensitive to revolution frequency (Frev) instabilities. Therefore the presence of and locking to the revolution frequency is now checked before starting the arm sequence.

The curiously named Asynchronous “synchronized” dump is when a dump request is received during the Frev pulse duration. For this case the original inhibition mechanism was not correct. It has been corrected now and the issue is now resolved.

For the future, two different VHDL codes with same functional requirements will be developed (redundant firmware). Test facility exists. Currently the TSU does not measure the Frev frequency, only the frequency difference with time. In the future also Frev will be measured. An external review of the system is being prepared – a French company has been identified. Ruediger encourages the team to talk to Ben to share experiences regarding external reviews.

There was some discussion (initiated by CMS) regarding the abort gap and how to ensure that no beam is present in the abort gap. There are currently no good diagnostics to know which bucket the beam is. A procedure should be defined but the experiments (including CMS) are safe if collimators are in their correct place.

Experience with XPOC (Jan)

Jan reported on the external post-operational checks (XPOC) of the LBDS system. XPOC has to guarantee the good status of the beam dumping system before each fill. The system checks that the last beam dump was executed correctly. If things appear not to be perfect, the machine should not be started before all anomalies are understood. The system can be reset only by an expert.

XPOC checks a number of systems: Kickers, vacuum (operational), BLMs (shortly), other beam instrumentation (under development), and abort gap monitor (in the future).

Currently the Sequencer checks a flag from XPOC, a step that can easily be bypassed by the operator. Also, a latched bit is set to FALSE in the SIS. This is still maskable, but at some point it will have to become unmaskable. There were some initial problems which caused XPOC tasks in the sequencer to fail, necessitating some adjustments. XPOC is logged.

Ruediger suggested having a special meeting on how to ensure that things are set up correctly and coherently when we start next year.

Experience with the PM system – analysis of a few dumps (Ruediger)

Ruediger first referred to the testing of the FMCMs (Fast Magnet Current Monitors). D1 was switched off with the FMCMs active and masked. In the first case the FMCMs detected the trip of the converter before any orbit change was detected. When FMCMs are masked, the BLMs dump the beam as expected.

While looking through the PM system, some BLMs apparently show high values. This is simply an artifact of the PM system and should be fixed. Rob's simulations of a D1 failure agree with what is observed.

Another event studied by Ruediger is the dump of B2 after a PIC trigger a minute after B1 was dumped by operation (5/12/09 19:30:26). There was an orbit movement in the vertical plane 4msec before the dump which is not understood. This was followed by an RB circuit trip. The sequence of events that led to this dump is not understood. We would like to understand all these events.

Last event shown by Ruediger is a trip in RQ in sector 12 (8/12/09 11:41:06.678). No beam losses around the ring, only in LSS6.

In conclusion Ruediger mentioned that the transient recording of the LHC, even at this early stage of the operation of the machine, is impressive.

One weakness of the current PM system was discussed: the timing of the QPS system is sometimes off making it difficult to correlate with other systems. Ruediger mentioned that the problem is understood but will take time to fix.

Atlas asked how to improve the information flow to the experiments regarding dumps. Markus said that in the future there will be a database with dedicated information, including a comment field as to the nature of the dump as analysed by the machine experts. Alick said he can put a Machine Protection fixed display in Vistars.

Information (various)

A small 2-day workshop will be organized by operations in January to digest the information we have gathered up to now.

The MPP minutes web site contains, apart from the presentations of this meeting, two LMC presentations, for information.

There was a discussion regarding the need of an analysis team. Bernd made the statement that we should document our analysis of various events so that we can refer to them in the future. Jorg added we should make sure we do not miss some important detail and Ruediger suggested a brainstorming session for the classification of events.

Jorg mentioned that next year beam tests will need to be re-done. Operations will develop and follow procedures like the HCC. For instance, steps would need to be signed off.