August 27, 2007

LHC EXPERIMENT-ACCELERATOR DATA EXCHANGE WORKING GROUP (LEADE)

Minutes of the 39th Meeting held on August 27, 2007

1. LHC GENERAL MACHINE TIMING (GMT) (J. LEWIS)

Julian Lewis presented an overview of the LHC General Machine Timing (GMT).

The GMT distributes both the LHC Telegram and the LHC Machine Events. LHC Telegrams are sent out each basic period of one UTC second and the 17 parameters distributed provide a snap-shot of the LHC machine state. LHC Machine Events are sent out when a change in the machine is observed that affects the machine state. The resolution of the UTC timing is 25 ns with a jitter of better than 10 ns peak-to-peak. Both the LHC Telegrams and Events contain a header identifying the parameter or event and a 16-bit payload providing the value of the parameter or information relevant to the Event. Examples of parameters include information on the injection parameters, the beam energy and intensity, the safe beam flags and the beam and machine modes. The updated complete list of parameters can be consulted at

http://ab-dep-co-ht.web.cern.ch/ab-dep-co-ht/timing/Seq/tgm.htm

and

http://ab-dep-co-ht.web.cern.ch/ab-dep-co-ht/timing/Seq/mtgConfig.htm

The transmission and reception of the GMT signals has been agreed and is being implemented. The distribution of the GMT is done via an RS-485 copper 500 Kbit cable giving 8 x 31 bit timing frames per millisecond and via optical fibres for long distance transmission.

The GMT system is capable of generating a Post-mortem Event (PM). There are two Beam Permit Flags, one per LHC ring, arriving at the LHC central timing inputs from the Safe Machine Parameter Verifier (SMPV) hardware modules, which are part of the Beam Interlock System (BIS). Moreover, there are two Beam Dump Events that may be sent from the LHC central timing to the LHC control system to dump the beam in one or the other ring. When both rings are dumped, the PM is sent twice within 1 ms.

Julian also presented the lay-out of the Safe Machine Parameter (SMP) distribution. The main SMP for the LHC includes the beam energy, Safe Beam Flags, the Moveable Device Allowed Flag and the Safe Injection Flags. One such distribution will be made to each LHC experiment. The requirements and specification regarding the distribution to the experiments should be communicated to J. Lewis by the contact-persons of the Collaborations.

2. DIP STATUS REPORT (K. KOSTRO)

Kris Kostro gave a report on the Data Interchange Protocol (DIP), pointing out that he is the co-ordinator for the publication of the data. As of October 2007, parts of the DIP data will be progressively published on the system, either from simulated or random-generated events. The experiments reiterated their requirement of having all the data available on the DIP by three months prior to LHC start-up.

The generation of data is under the responsibility of the individual equipment groups, covering areas such as the vacuum, collimators, beam loss monitors and beam position monitors as well as data provided by the experiments.

The status of the DIP may be consulted at:

https://twiki.cern.ch/twiki/bin/view/Leade/WebHome

The inclusion of information from the software injection inhibit interlock could also be included on the DIP. A status report on this interlock will be given at a future meeting of LEADE.

3. STATUS OF CABLING (D. SWOBODA)

On behalf of Detlef Swoboda, Emmanuel Tsesmelis presented the present status of the cable installations for the various machine-experiment interface systems – TTC, BST, GMT, BPTX, BRAN, BIS and MCS/MSS. Except for some re-cabling for ALICE (to a different counting hut), all cabling is completed now. Some cables still need to be terminated or equipped with connectors. This work is planned to be done in September. The experiments are invited to check the cabling in place and to report any non-conformities to Detlef, who is co-ordinating the link between the experiments and the technical cabling group.

4. JOINT LHC-EXPERIMENTS WORKSHOP ON OPERATIONAL PROCEDURES: CMS REQUESTS (A. MACPHERSON)

Alick Macpherson provided some feedback from CMS on issues discussed at the recent Joint Machine-Experiment Meeting on the Experiment Protection from Beam Failures. CMS requests that the following issues be discussed in length:

- Powering of the Beam Radiation Monitoring (BRM) system from the machine power.
- Actions to be taken following a beam abort.
- State and actions on BEAM_PERMIT following a post-mortem analysis.

These issues will be discussed in more detail at future meetings of LEADE.

Provisional dates for the remaining meetings in 2007 (16:00 hrs):

October 15, room: 40-R-A10,
November 26, room: 40-R-A10.

Ch. Ilgner