March 06, 2006

LHC EXPERIMENT-ACCELERATOR DATA EXCHANGE WORKING GROUP (LEADE)

Minutes of the 29th Meeting held on March 06, 2006

Present: A. Ball, Ph. Farthouat, A. Gorisek, R. Hall-Wilton, Ch. Ilgner, R. Jacobsson, R. Jones, J. Lewis, D. Macina, H. Niewiadomski, Th. Pauly, A.-L. Perrot, B. Puccio, R. Schmidt, J. Serrano, A. Smith, W. Snoeys, D. Swoboda, J. Troska, E.Tsesmelis

1. MATTERS ARISING

Approval of the Minutes

The minutes of the 28th LEADE meeting were approved with one modification concerning the coordination of the data exchange between the machine and the experiments by Detlef Swoboda.

2. GENERATION AND TRANSMISSION OF SAFE BEAM PARAMETERS (B. PUCCIO)

Bruno Puccio started his presentation with a reminder on the data format and the rate at which the safe-beam parameters are transmitted. He then explained the way these parameters are transmitted over the timing network and received by the users via the standard timing VME board. In case of missing information after a defined time-out, the system will be brought into a safe failure state.

A general remark is not to wait with cabling activities concerning controls.

3. GENERAL MACHINE TIMING AND SAFE BEAM PARAMETERS (J. LEWIS)

In his presentation, Julian Lewis discussed the logical structure of the Central Beam and Cycle Manager, including the source of the timing (clocks and UTC). The Controls Timing Receiver is completely hardware based, there is no CPU running software, but nevertheless it has up to 8 fully configurable counters (50 MHz) that can operate in different modes. The system sends information out in the form of a telegram.

The BST Master has a multi-tasking CPU (FPGA) and it keeps the turn number and UTC time. It distributes the BST message once per turn, which is 64 bytes long.

Specifications on the General Machine Timing are in preparation. Among other information, LHC timing distributes:

- Beam Energy.

- Beam Intensity R1 & R2.
- Target Bunch and Ring for next injection.
- Machine mode, coast, ramp etc.
- Particle type P+ Ions etc.
- Safe beam flags.
- Time stamps.
- Controls information & CTR Triggers as needs become apparent, it is flexible, things can be added on the fly.
- User information as requested.

4. DATA EXCHANGE FROM LHC-BI TO EXPERIMENTS – PB-PB RUNNING (R. JONES)

Rhodri Jones updated the list of data available from AB-BDI, completing the information for the TOTEM and ATLAS Roman-Pot BPMs.

The measurement of the total longitudinal distribution has been removed from the LHC baseline, so this signal will not be available in LHC phase I ("ghost-bunch measurement", see also the comments on the engineering check in 5). Some objections were expressed against this decision by CMS.

The data for ion running is expected to be the same as for protons, but no total longitudinal distribution will be available, even if it becomes available for protons due to the fact that the synchrotron light spectrum is too far in the IR region for a detection which is sensitive enough. This also means that no abort gap monitor will be available for ion running. A shorter-period undulator would be required to replace the current SC undulator to shift the SR from IR to visible wavelengths. Rüdiger Schmidt mentioned that the TCTQ collimators are installed already for proton running. Abort-gap monitoring is important as a monitoring tool, not as a protection tool.

A list of all parameters provided is available from AB-BDI.

5. FUNCTIONAL SPECIFICATION – DATA EXCHANGE BETWEEN EXPERIMENTS AND ACCELERATOR (E. TSESMELIS)

An engineering check has been launched to the functional specifications on data exchange between the experiments and the accelerator. Emmanuel Tsesmelis reported on comments he has received:

- Software-based Experiment-Beam Interlocks are also able to beam dump.
- The Position of Collimators (particularly TCTs) needs to be communicated to experiments.
- The Development of BSRL monitors to measure total longitudinal distribution has been stopped. This information will therefore not be available in Phase I (see also 4).
- Requirements from experiments on General Machine Timing and Safe LHC Parameters are needed.

- The TTC system will provide a 40.08 MHz timing signal for the period from injection to colliding mode.

- The two ATLAS and eight TOTEM Roman Pot BPMs will transmit the horizontal and vertical beam positions every second.

Provisional dates for the remaining meetings in 2006 (16:00 hrs, 40 R-A10):

May 15,
June 26,
July 24,
September 4,
October 16,
November 27.

Ch. Ilgner