March 29, 2004

LHC EXPERIMENT-ACCELERATOR DATA EXCHANGE WORKING GROUP (LEADE)

Minutes of the 16th Meeting held on March 29, 2004

Present: R. Assmann, S. Baron, G. Beetham, M. Clayton, M. Deile, N. Ellis, P. Grafström, Ch. Ilgner, R. Jacobsson, R. Jones, J. Lewis, T. Rohlev, R. Schmidt, J. Serrano, E. Tsesmelis, J. Varela

1. MATTERS ARISING

Approval of the Minutes

The minutes of the 15th LEADE meeting were approved without modification.

TTC Coordination Issues (E. Tsesmelis)

Sophie Baron has kindly accepted to become contactperson from PH Department for matters concerning TTC coordination with the LHC machine. As a first task, she shall collect all pertinent information on the TTC system and present a summary to an upcoming meeting of LEADE. She will also be contacting the representatives from each experiment to discuss further details. A first meeting between Sophie Baron and the representatives from the experiments will be held in the near future to kick-off the discussions.

The representatives from the experiments are:

ALICE:	D. Evans
ATLAS:	P. Farthouat
CMS:	T. Rohlev, J. Troska
LHCb:	R. Jacobsson

LHC Machine Slow Signal Reception in SR Buildings (G. Beetham)

Gary Beetham reported on the status of the cabling for the slow machine GMT timing signals. The multi-mode fibres connecting the PCR to the SR surface buildings have been ordered, while it has been decided that the connection from the SR buildings to the underground service areas (US caverns) and from there to the experiment areas (UX caverns) will be in copper.

BPTX Cabling (Ch. Ilgner)

Christoph Ilgner presented a compilation of the data required for the BPTX cabling campaign which will be launched by the end of April 2004. The information

required includes the rack number in the respective counting rooms in the underground areas. The information will be transferred to TS/EL on April 21, 2004.

Action: The technical coordinators of ALICE, ATLAS, CMS and LHCb are asked to approve the start and end points (incl. rack number) of the signal cables from the BPTX devices to the counting rooms by April 21.

2. REQUIREMENTS OF EXPERIMENTS ON THE BEAM SYNCHRONOUS TIMING (R. JACOBBSON, J. VARELA)

Richard Jacobsson reported on the Beam Synchronous Timing (BST) for LHCb, stating that the data are sent to the network, in a format similar to the other front end data. A short discussion arose on the inclusion of the bunch crossing (BX) type in the message. Channel A is used as a revolution counter.

Joao Varela presented the CMS requirements coming from the Trigger Fast Control and the Detector Control System on the BST. The requirements are:

- Distribution of BST messages to the experiment.
- Final specification of BST message content and format.
- Specification of BST/TTC message protocol and timing.
- Update of GPS time once per 10 orbits (or better).
- CMS specific BST items should be located in racks LHC, BPTX or BPM (S1 E 8-10).

Nick Ellis stated that the scheme for ATLAS will be similar, including a time stamp at the 25ns level.

3. THE FUNCTIONALITY OF THE NEW CTX MACHINE TIMING CARD (J. LEWIS)

The central beam and cycle manager (CTX) stands in the context of several time distribution networks being in use at CERN (LEIR, PSB, CPS, AD, SPS (2 systems), BST). The physical source of all clocks, including UTC, is the SmartClock (a commercial system by HP). The time information provided by the SmartClock comes from the GPS network, with an atomic clock as a backup system. It is transferred to the CTSYNC as a 1Hz signal and a 10MHz phase-locked loop, from which the CTSYNC generates the 40MHz clock.

Its basic periods are 1200, 900 and 600 ms, from which the 1Hz pulse (advanced by 100 μs with respect to UTC) is generated.

The event logic and the trigger logic exchanging telegrams (rather messages than event-type datasets) on the machine status.

The controls timing receiver (CTR) card comes in 4 formats: PMC, PCI, VME and G64. Three systems are envisaged, one system for each LHC ring and one system for the experiments.

Further information can be found under
http://ab-div-co-ht.web.cern.ch/ab-div-co-ht/ .

4. BEAM SYNCHRONOUS TIMING VIA THE TTC SYSTEM (R. JONES)

Rhodri Jones gave a report on the TTC system, stating that there is no coupling between the experiment TTC (UTC based) and the timing system of the machine group (CTR, based on the real beam timing, i.e. arrival times of the bunches).

5. LHC INITIAL OPERATION AT LOWER ENERGY (R. SCHMIDT)

In view of a proposal discussed at the 2003 Chamonix meeting, Rüdiger Schmidt presented the idea to run the LHC in its first year of operation at lower energy.

The probability of transient beam losses occurring is influenced by the beam energy. Here the beam loss fluctuation observed at the HERA ring provides some input. Magnet quenches induced by beam losses cannot be avoided. As an example, quadrupoles are operated at 1.9K and a safety margin of 1.6K, which means that the magnet can withstand 3.5K for a short time without quenching.

In his conclusion Rüdiger promoted the idea to wait for the magnet tests (every magnet will undergo at least 3 tests) before the LHC start-up energy is decided.

Ch. Ilgner

Provisional Dates for 2004 meetings:
17 May
14 June
19 July
6 September
18 October
13 December