

**LHC EXPERIMENT-ACCELERATOR DATA EXCHANGE WORKING GROUP  
(LEADE)**

**Minutes of the 25th Meeting held on September 05, 2005**

**1. MATTERS ARISING**

Approval of the Minutes

The minutes of the 24<sup>th</sup> LEADE meeting were approved without modification.

**2. RACKS FOR LHC TIMING UNITS (CH. ILGNER)**

Christoph Ilgner presented results of his inquiry on the rack layout for the LHC timing units, complemented by information on the TTC system provided by Sophie Baron.

The upgrade of the TTC system for 2007 will use the BST, which is not the case for the current system. The BST information is carried by an optical fibre, and is basically made of 64bit words encoded and broadcast using dedicated TTCex modules at the PCR, thus using the TTC encoding scheme. At the level of the experiments, the new TTC receiver will just receive this optical signal via an optical receiver and decode it using the TTCrx chip.

The 4 experiments will use this new TTC receiver board with the BST receiver mounted on it. This TTC receiver board will not be installed in the LHC rack, but on the 'timing' or 'trigger' racks.

Nevertheless, the BST can also be used by the experiments for other purposes, like UTC timing. In that case, an optical splitter may be needed, possibly to be included in the LHC rack.

The responsibility of the machine group ends at the output of the TTC transmitters.

**3. STATUS OF FUNCTIONAL SPECIFICATION ON LHC EXPERIMENT BEAM INTERLOCKS (J. WENNINGER)**

In his presentation, Jörg Wenninger presented failure scenarios and time constants, and how they reflect in the functional specification on LHC beam interlocks, focusing on 7 TeV operation. He discussed the main protection systems along with their capabilities and limits. Another important point was the impact of operation crews on machine protection.

With 11 GJ stored in the magnets and 0.36 GJ stored in each of the beams, the mandate of the machine protection system is to protect all LHC equipment against damage due to uncontrolled release of energy. This is done by means of active surveillance systems, passive protection devices and energy dumps, also to the benefit of the experiments.

There are several time constants for beam losses, ranging from more than 0.2 hours to single turn failures, which can be at injection, at extraction or with stored beams.

As an example, powering failures and the different systems involved in protection were discussed, as well as quench protection and the beam loss monitoring system (BLM) as the core beam monitoring system for protection.

Other possible failures are, among others, failures of the transverse feedback system, resulting in unstable beam, and failure of the RF system, with de-bunching beam and energy loss.

However, also during “stable beams”, continuous beam steering is necessary, which may invoke additional risks, as do movable devices (Roman Pots and VELO). Against dump sweep failures, for example due to kicker pre-firing, the TCDQ absorber downstream of the dump kickers will be positioned to protect machine elements and apertures from dump sweep.

As a summary, it was pointed out, that the machine protection system protects all LHC equipment, including the detectors.

#### **4. STATUS OF DATA INTERCHANGE PROTOCOL (DIP) (W. SALTER)**

On behalf of Wayne Salter, Emmanuel Tsesmelis gave a presentation on the status of the data interchange protocol, which is already available for C++/Java on Windows and Linux platforms, with a documentation provided through EDMS. IT/CO provides support, and interfaces for PVSS (experiments, cryogenics and vacuum), CMV (accelerators), technical services and PCVue (CSAM) exist.

The infrastructure is operational in Building 513, and selected accelerator data is already being posted and used by TCR. The experiments can use CSAM data, if needed, and tests with cryogenics data are ongoing.

The repository will be an Oracle database, which is currently being implemented, with a first version being deployed end of October.

#### **5. A. o. B.**

Some issues were briefly discussed, such as the eventual need for a GPS receiver per experiment for cosmic runs, when running together with other experiments, or the lack of a possibility to convert machine time into UTC.

Ch. Ilgner

Provisional dates and rooms for the meetings in 2005 (16:00 hrs):

November 07, room 4-S-013

December 05, room 4-S-013