

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

Minutes of the 26th Meeting held on November 07, 2005

Present: S. Baron, N. Ellis, D. Evans, Ch. Fabjan, Ch. Ilgner, R. Jacobsson, R. Jones, D. Macina, A. Morsch, Th. Nagel, Rüdiger Schmidt, J. Serrano, W. Smith, D. Swoboda, J. Troska, J. Wenninger, E. Tsesmelis

1. MATTERS ARISING

Approval of the Minutes

The minutes of the 25th LEADE meeting were approved without modification.

2. PROPOSED UPGRADE TO TTC SYSTEM (S. BARON)

Sophie Baron presented the upgrade she proposes to the TTC system, starting with a summary of the current TTC status.

Outdated transmission equipment, available only in limited quantity without spares, has to cope with an increasing number of signals to be transmitted. The design of this equipment is not well documented, and online monitoring is not possible. Outside the guaranteed periods, no stable clock can be provided.

Apart from Sophie herself, there is no on-call support team for the system during the running of the LHC, which would be available to fix the transmission, if needed.

The new proposal comprises a new RF-to-TTC interface; in general, the system is designed to be as similar to the AB-RF system as possible, i.e. it uses standard AB/RF transmitter and receiver modules. Operation, maintenance and on-call support of the backbone will be ensured by the AB-RF operation and piquet teams up to the reception level at the experiments' side.

An agreement between AB-RF, AB-CO, AB-BDI, TS-EL, PH-ESS on the one side and ALICE, ATLAS, CMS and LHCb on the other is currently in the approval phase. Open points of the discussion are the standardization of the crate controllers, the access for the AB-RF piquet to their modules and the RF-to-TTC module specifications.

At the end of Sophie's presentation, the participants appreciated both the speed and quality of her work. In a short discussion, it was stated that timing cabling needs to be approved by the experiments.

3. SUMMARY OF DATA EXCHANGE BETWEEN EXPERIMENTS AND ACCELERATOR (E. TSESMELIS)

Emmanuel Tsesmelis reported on recent results of LDIWG, which has defined a single-data exchange mechanism between all systems involved in LHC data operations. It requires a DIP databus, supporting publish/subscribe data exchange, 250 kBytes/s and 100 messages/s, which will be dominated by LHC cryo; the latency will be about 1 s. DIP is a simple and robust publish/subscribe system, which supports an on-change data exchange, with API provided for C++/Java and Windows/Linux, its format includes a timestamp and quality flag.

For evaluation, two DIP products (DIM and SonicMQ) were selected for evaluation, with both having passed all test cases. DIM was selected due to lower cost and simpler maintenance philosophy. A demonstration is planned for the December 2005 meeting of LEADE.

Moreover, data of the LHC controls system can be logged and retrieved by the TIMBER facility, which is an input/output interface (web-deployed GUI), offering both graphical visualisation and file output.

Finally, Emmanuel gave a list of equipment producing data to be sent from the experiments to the machine, representing a minimum set of information to be transmitted, and also the parameters to be transmitted from the machine to the experiments.

4. STATUS OF FUNCTIONAL SPECIFICATIONS ON LHC EXPERIMENT BEAM INTERLOCK (J. WENNINGER)

Jörg Wenninger gave an update on the approval process of the functional specifications on LHC-Experiment Beam Interlock, communicating the following:

The experiment interlock signals will not be maskable, but each experiment must ensure, that its interlock signals do not disturb the machine commissioning. They need to be operational during the machine check-out period before the injection of the first beams.

Hardware interlock inputs to the LHC BIC system will be provided for all LHC magnets (spectrometers and solenoids), also in view of the relatively fast beam movement after a power failure of the ALICE and LHCb spectrometer magnets (about $1\sigma/700$ ms). For the solenoids, the effect on the beam is expected to be smaller, and the time constants are longer. Input connectors to the BIC system will be prepared for all magnets, in any case, the connection will be established for the spectrometer magnets. For the solenoid magnets, the connection will be made based on beam tests during commissioning.

There are also some proposals to change signal names for both practical and LEP-consistency reasons.

The possibility to influence the beam injection without dumping the beam (“injection inhibit”) can be requested by all experiments and the LHC beam dumping system (IR6). Hardware implementation, responsibilities and also financial issues still need to be defined and solved. Possible implementations are an injection-permit loop and point-to-point connections of each client to IR2 and IR8.

5. A. O. B.

Some issues were briefly discussed. The fact, that the ALICE and LHCb spectrometer magnets are controlled by the machine, not by the experiments themselves, was mentioned by Detlef Swoboda.

Wesley Smith expressed concern about the lack of monitoring of the satellite bunches, which could spoil the luminosity measurement.

Ch. Ilgner

Provisional date and room for the remaining meeting in 2005 (16:00 hrs):

December 5, room 4-S-013