LHCb Technical Board 25 November 2002

Agenda

1. **Approval of last TB summary**
2. **The LHCb-Light set-up and M1** **T.Nakada/G.Carboni**
   (transparencies)
3. **Plans for the Trigger TDR** **H.Dijkstra**
   (document transparencies)
4. **RRB outcome and budget matters** **A.Smith**
5. **Proposal for a common L1 FE module** **J.Christiansen**
   (transparencies)
6. **Preparing for the Comprehensive Review** **T.Nakada**
7. **Milestones and Schedules** **All**
   (transparencies more information)
8. **AOB**
   - **Installation review**
   - **TB calendar**

Participants: G. Carboni, J. Christiansen, H. Dijkstra, R. Forty, J. Harvey, J. Lefrançois, R. Lindner, C. Matteuzzi, T. Nakada, A. Pellegrino (telephone), T. Ruf, B. Schmidt, O. Schneider, A. Schopper, A. Smith, O. Steinkamp, O. Ullaland, W. Witzeling

Excused: D. Lacarrere, D. Websdale

1. **Approval of last TB summary:** The Summary of the TB on 11th October 2002 was approved.

2. **The LHCb-Light set-up and M1:** G. Carboni gave a summary report on the decision of the muon group to keep the first Muon Station M1. The Muon System as described in the TDR, is based on five stations, it appears robust, well designed and optimized. Suppressing the first station would deteriorate the momentum resolution by 50 % and result in a 20-30% loss in the trigger performance at 100 kHz. As there is no room for recovering the loss, i.e. by a higher granularity in M4-M5, which would not help at the trigger level and would mean a cost increase by 400kCHF, the Muon Group concluded that M1 is really necessary and should be built. However, in case of missing resources, an appropriate solution, i.e. staging of one station or part of it, has to be considered.

3. **Plans for the Trigger TDR:** After describing briefly the planned content of the Trigger TDR, H. Dijkstra discussed the present status of the Trigger and the schedule for 'pre-TDR' decisions. The L0 electronics was reviewed and the bandwidths division is underway. LHCb-light and passed experience lead to new

requirements for the Level 1 trigger such as increased number of CPUs, access to all relevant data and ability to distribute the CPU power over L1 and the High Level Trigger.
First indications of the latest L1 analysis show that the magnetic field in the upstream region was stronger in the last but one simulation and therefore gave better results. The nature of the modification of the RICH1 magnetic shielding that led to this reduction of magnetic field has to be clarified.
The Technical Board agreed to adopt a maximal L1 output rate of 40 kHz, the depth of the L1 buffer has still to be settled.
Two solutions for the implementation of L1 are under study, the path towards a decision was outlined and a conclusion should be reached in March 2003 with the help of a review panel.

4. **RRB outcome and budget matters:** A. Smith reported that R. Cashmore requested to stay with the original LHCb Cat A budget even though we were led to believe that the cost for cooling and ventilation to be charged by the CV group would be less. The sharing among institutes remains as presented in Cambridge. Although we have expressed the wish that the invoices for 2003 M&O should only be sent out in 2003, we have been asked to provide the figures and addresses because some of the funding agencies of ATLAS and CMS have requested to be billed this year. However, we will attempt to delay our billing.
   Since the RRB, Alasdair has started to gather information on both the expected income profile and the spending profile for the Common Fund. With the preliminary information available it seems that most of the CF spending on Data Handling will have to occur late (2006/7).
   We have been requested to produce much more detailed CORE commitment estimates. The RRB wants to see the commitment/spending for the current as well as estimates for the following year for the sub-detectors detailed by funding agency. LHCb objected to this because of the risk of figures being presented to the RRB that are different from those presented by the national representatives to their funding agencies, but we were over-ruled. This will require close coordination for establishing these tables and each institute or country will need to nominate one contact person who can ensure consistency of the figures.

5. **Proposal for a common L1 FE module:** As detector groups advance in their implementation of the final front-end electronics, the proposal of a common L1 front-end module has to be considered now. Jorgen Christiansen presented the advantages as well as the disadvantages of a common L1 Front-End together with an estimate of numbers of modules for each individual system.
   Before a prototype can be expected (June 2003 seemed to be optimistic), a well-defined specification has to be written.

6. **Preparing for the Comprehensive Review:** LHCb will have its first LHCC Comprehensive Review on 27th and 28th January. The full complement of LHCC referees will look at LHCb in plenary and parallel sessions. Visits to the LHCb

assembly areas (building 156 and 20) will take place and for these some posters should be prepared. A detailed agenda will be agreed upon with the LHCC referees in the forthcoming meeting.

7. **Milestones and Schedules:** W. Witzeling presented the LHCb Schedule and Milestones draft document. This document will be filed in EDMS. The project leaders/coordinators were asked to provide a system schedule during the LHCb week in December. From the system schedules the master schedule will be produced, which is requested by the LHCC referees for the Comprehensive Review in January.
   Werner showed a first milestone preview table (see annex) and asked for feedback on the forthcoming milestones. He also informed the Technical Board that such a preview of the LHCb milestones (6 months in advance) would now be done quarterly, such that delays and problems can be noticed well in advance.

8. **AOB**
   - **Installation review:** There will be a one-day LHCb installation review (by a panel that includes directors, division leaders, LHCC referees and other experts) in the first week of March (4/5/6-03, not yet decided, which day).
   - **TB calendar:** Technical Boards will be held once per month. During LHCb weeks the TB meeting are currently proposed for Wednesday afternoon.

Annex

Milestone – Preview

System	Subsystem	Milestone	Planned Date	Achieved Date
CALO	ECAL Mech	Start of serial production	January-02	January-02
RICH	R2mechopt	Engineering Design Review	March-02	March-02
CALO	SPD/PS Mech	end of optimization of engineering design (EDR)	March-02	March-02
CALO	ECAL Mech	10% of stack assembly	March-02	March-02
VELO	Electronics	Beetle 1.2 MWP run	April-02	April-02
CALO	HCAL Mech	Start serial production	May-02	May-02
RICH	Photondet	Working 40MHz pixel readout chip	June-02	June-02
DAQ	ECS	ECS software framework first release	June-02	June-02
VELO	Electronics	Test of hybrids (Beetle1.1+SCTA_VELO)	October-02	*achieved*
RICH	Photondet	Working HPD with 10Mhz readout	December-02	*?!?!?*
VELO	Mech/Vac	Engineering Design Review with LHC group	January-03	*December '02*
VELO	Silicon	Design review	February-03	*January '03*
CALO	HCAL Mech	10% of mechanics assembly	February-03	*achieved*
VELO	Electronics	FE chip review and decision	March-03	*January '03*
MAGNET	Magnet	Reception of coils and yoke	March-03	*expected okay*
DAQ	ECS	ECS electronics interfaces prototypes ready	March-03	*expected okay*
VELO	Electronics	Final prototype of digitizer board	May-03	*expected okay*
Outer Tracker	Module	Engineering design completed (EDR)	May-03	*expected okay*
RICH	R2mechopt	Production drawings completed	May-03	*expected okay*
VELO	Silicon	Production Readiness Review	June-03	*expected okay*
CALO	SPD/PS Mech	start of serial production	June-03	*expected okay*
MUON	Electronics	Full chain electronics test completed	June-03	*expected okay*
DAQ	TFC	TFC prototypes ready	June-03	*expected okay*