LHCb

CERN-RRB-2005-047
10th June 2005

Minutes of the 14th Resources Review Board Meeting

Held at CERN on 20th April 2005

Present:

Europe
F. Le Diberder (IN2P3, Paris, France), B. Jean-Marie
J. Richter (BMBF, Bonn, Germany), K. Ehret (BMBF/DESY)
U. Dosselli (INFN, Rome, Italy), F. Ferroni, G. Martelotti
F. Linde (NIKHEF, Amsterdam, Netherlands), A. van Rijn
J. Królikowski (University of Warsaw, Warsaw, Poland), G. Polok
V. Zamfir (National Institute for Physics and Nuclear Engineering, Bucuresti, Romania), Livia Puscaragiu (Geneva Mission, Delegate), S. Stoica
V. Savrin (Ministry of Science and Technology, Moscow, Russia)
B. Adeva (Unversity of Barcelona, Barcelona, Spain)
G. Parisod (EPFL, Lausanne, Switzerland), A. Bay
R. Wade (PPARC, Swindon, United Kingdom), V. Gibson

Asia
W. Shen (NSFC, Beijing, China PR), Y. Zhang, P. Ji

CERN
J. Engelen (chairman), P. Geeraert, E. van Hove, D. Jacobs, C. Jones (secretary), C. Saitta, D. Schlatter, E. Tsesmelis

LHCb
T. Nakada; E. Aslanides, R. Forty, A. Smith, W. Witzeling

Apologies
M. Schmelling (MPI Munich)

14th Meeting of the LHCb Resources Review Board RRB, 20th April 2005

Documents can be found at the URL http://committees.web.cern.ch/Committees/LHCRRB/ and are also listed in Appendix 1 of these minutes

1. Introduction J. Engelen, Chief Scientific Officer

J. Engelen welcomed RRB delegates to this 14th session. He introduced Chris Jones as the new scientific secretary of the RRB.

2. Approval of the Minutes of the 13th Meeting (CERN-RRB-2004-108)

The minutes of the 13th meeting were **approved** subject to the correction that J. Richter was not present. The minutes of the plenary session were also approved without comment. J. Engelen thanked D. Jacobs for having exceptionally taken both these minutes. There were no matters arising.

3. Status of the Experiment T. Nakada, Spokesperson

Paper CERN-RRB-2005-034 Presentation CERN-RRB-2005-056

T. Nakada presented a status report on the LHCb experiment. He began by describing the overall configuration and components of the detector, and its location in pit 8 which included an electronics area, behind a shielding wall, which would be accessible even during collisions.

3.1 Construction Status

T. Nakada noted first the interference between the installation of the LHCb detector and the special configuration of the QRL cryogenic line which connects the LHC magnets and the cryoplant installed next to the LHCb detector. The scaffolding needed for this installation in the region of the muon detector hinders any work in its vicinity. Clearly any delay in the installation of the QRL would cause serious problems for the installation of the LHCb detector.

Fabrication of the beam pipe was progressing well. The magnet had been assembled, positioned, aligned with respect to the beam and switched on. The first field map measurements, including peripheral areas where detectors needed to be protected, corresponded well with simulations. A further field map would be measured once the RICH1 shielding boxes were in place.

The mechanics of the VErtex LOcator, VELO, had made good progress. For the detector modules the Beetle chips had been completed in a production run and Hybrids were in production phase. Production of the modules themselves would start in May 2005 and remained on a somewhat tight schedule.

For RICH1 the production was in progress but its schedule was also very tight. For RICH2 the mechanical structures were now complete and the mirrors were being aligned prior to transport to the experimental area in July 2005. They had now received HPD tubes with which they were satisfied, and series production of the 480 tubes was starting. Test facilities were also being set-up. Overall there was no margin in the schedule for these tubes which should all arrive by November 2006.

The Outer Tracker had been late but, at the 50% milestone, it had recuperated its delay thanks to a special effort by the institutes and people involved. A full scale prototype of the frame for the outer tracker and electronics had been fully loaded.

The Silicon Tracker consisted of two parts. The trigger tracker used exactly the same sensors as the CMS OB-2 sensors from Hamamatsu. CMS had made a temporary loan of 100 sensors to LHCb which still awaited 1000 of these sensors. The CMS production schedule was delaying the

LHCb deliveries but it was hoped to borrow more sensors from CMS to allow things to progress in the meantime. For the inner tracker they had received 49 pre-series sensors but 531 were required. Prototype module production had started.

The E-Cal and H-cal detectors were being assembled in point 8 and progressing to schedule. For the Muon system the chamber production had been late across the six production sites. Production was now catching up and nominal production yields were now being achieved at all sites. Manpower was critical in order to maintain these rates. Installation and commissioning would continue into the first quarter of 2007.

For the trigger and online the level 0 trigger planning was progressing to schedule. They had made the decision to make the level 1 and high level trigger to be executed in the same CPU farm and a real-time system challenge would take place in summer 2005 to test this concept.

For the computing there were three areas: Software Framework and Distributed Computing, Computing Resources, Physics Application Software. There was major ongoing work to adapt the software framework to the online environment and to adapt the distributed computing to the LCG services. LHCb had now completed their computing model which would result in a computing TDR to be submitted in June 2005. For each sub-system the software for the geometry, simulation, decoding, alignment and calibration was the responsibility of the sub-system in question. Some projects had manpower problems in this area.

For Phase II of the Data Challenge there had been problems between the LCG software (Storage Resource Manager) and the Tier 1 centres concerned which had prevented them to use LCG software but this was now considered solved.

3.2 Current Organisation

LHCb had recently elected a new Collaboration Board chair and renewed for three years the appointments of the Spokesman and Technical Coordinator. They had enlarged the management by appointing a Deputy Spokesman for three years as was appropriate as first day physics approached. They had created a Physics Planning Group, chaired by the Physics Coordinator. They had simplified the Trigger and Computing organisation. The names of the people concerned could be found in the paper and presentation.

3.3 Cost and Funding

T. Nakada reminded the RRB that the construction MoU foresaw the total cost of the experiment at 75.05 MCHF and a requested funding of 73.30 MCHF, thus leaving some parts of the detector under funded. The signed MoU contributions came to less than requested amount leaving a total under-funding of 4.79 MCHF.

In April 2005 this situation was completely reviewed, including a re-optimisation of the detector, with the result was that some costs went down and some went up. In this plan the under-funding was now at 4.255 MCHF, and hence it was unavoidable to ask for funding beyond the current funding commitments.

It was therefore important to ask whether everything had been foreseen in this number. After consideration they had concluded that the Calorimeter, Magnet, Infrastructure, L0, VELO, ST, and Online showed no indication of a cost increase being necessary. However, for the OT there was a probable under estimate in the infrastructure and services of the order of 700 KCHF. Therefore the final overall missing funds would probably be around 5 MCHF.

T. Nakada then proposed a number of detailed measures with the aim of dealing with this shortfall, many of which were under discussion with the finding agencies concerned. (See his presentation for details for this proposal.) The proposal consisted overall of two parts, one in which approved

money was moved internally within the collaboration to cover different parts of the detector, and a second part for which new funding was needed at the level of 5 MCHF.

3.4 Conclusions

In conclusion, T. Nakada summarized as follows:
1) Production, installation and commissioning of many subsystems was progressing well: beam pipe, magnet, VELO mechanics, RICH2 and Calorimeter
2) Delay in the OT module production had been fully recovered
3) Delivery schedule for TT sensors was not optimal
4) There was a tight schedule for VELO sensors, RICH1 mechanics and HPD's
5) Muon chamber production was almost at the nominal rate, but the end of production would slip to early 2007
6) A funding short fall (~5 MCHF) to be solved
7) LHCb was fully committed to be ready for the collisions in 2007 and see no technical problem, but manpower was critical everywhere
8) Help by RRB for 6) and 7) would be highly appreciated

Discussion

J. Engelen thanked T. Nakada for his presentation and suggested that the discussion should be taken in two parts. Firstly the construction progress, including the deliberations of the LHCC that had been provided by E. Tsesmelis, and then the financial part.

U. Dosselli congratulated LHCb on their progress and asked how CMS had enough silicon to lend sensors to LHCb. W. Witzeling replied that at any one time LHCb was asking to borrow about 2% of the number of sensors that CMS had in stock. J. Engelen added that the quality of the sensors was so good that some of the control measures could be eased and that had helped to increase the production rate.

J. Engelen then turned to the financial part of the presentation. He was not intending to ask at this meeting for the RRB to agree to an increase of 5 MCHF. He proposed rather to deal with those issues that could be considered as LHCb "internal solutions" and which did not require new funds, but which in detail required a re-organisation of the spending of existing money. Finally he proposed a short discussion on how to deal with raising the additional funds required.

After some discussion it became clear that the details of the proposed financial plan were both somewhat complex and insufficiently discussed with the Funding Agencies at this stage for agreement to be reached.

J. Engelen proposed that the members of the LHCb collaboration begin an interaction with their own funding agency delegates, such that LHCb could present a prepared overall financial plan to a future RRB. On the other hand, in the light of the very good progress reported, and that the 5 MCHF was a relatively small part of the overall budget, he would like to see that this RRB make overall positive and encouraging remarks to the collaboration.

F. Linde agreed that it was important to complete this detector. He also expressed clearly that he would like to see just one bill, not a succession of bills. He felt that the logic of the above proposed solution was hard to follow given, for example, that it moved money from the OT detector which was already short of money. He wanted an overall bill prepared before the next discussion.

K. Ehret asked the status of the Brazilian contribution. T. Nakada felt that the proposed core contribution of 1.6 MCHF was not very realistic, and that in the end Brazil was in a position only to contribute processing power, but they were already contributing to the M&O. U. Dosselli asked in this case whether they were a member of LHCb to which the answer was that they had not

signed the MoU. J. Engelen noted that it was not constructive to discuss this further in the absence of a Brazilian representative.

U. Dosselli noted that the competitor experiment had been cancelled and asked whether there was an opportunity to enlarge the collaboration as a result. T. Nakada replied that there were talks with some Italian groups, but that as far as Americans were concerned, he had the impression that the physicists close to Fermilab, including the Italian groups associated closely with them, would rather join the CMS experiment. There was a possibility that Syracuse might join LHCb but there were strong constraints on the money that this might bring, and in which form. They might, for example, contribute in manpower, in M&O and possibly in spares. U. Dosselli felt strongly that the RRB should not accept "free lunches". Those that wished to collaborate had to make an appropriate contribution.

U. Dosselli wished to make a comment on behalf of INFN. The funding proposal of LHCb was not new to INFN and there was a will to help. However funds were very hard to find at the present time and they were struggling to find them so as not to delay the construction of the experiment. He agreed completely with the proposal of the Chairman that the RRB should be given a complete picture on which to base their decision. He was concerned whether the style of the proposed solution was such that it was already impossible to achieve. J. Engelen replied that, if the latter were true, than one would have to ask LHCb to stage the experiment, and that was certainly not something one wished to do unless really necessary.

R. Wade asked whether the statements made by the Director General at the ATLAS and CMS RRBs, that CERN was prepared to help with the cash flow, were valid for LHCb as well, and J. Engelen replied indeed that this was so.

The Chairman thanked T. Nakada for his detailed presentation.

4. LHCC Deliberations (paper only) — E. Tsesmelis, LHCC Scientific Secretary

Paper CERN-RRB-2005-023

Delegates had no further comments to make and the RRB **took note** of the report of E. Tsemelis.

5. Financial matters — P. Geeraert, Head, CERN Finance Dept.

Paper CERN-RRB-2005-014 Presentation CERN-RRB-2005-057

5.1 Status of Common Fund accounts

P, Geeraert presented an update to his financial paper. The common fund currently had a positive balance of 4.848 kCHF. There were many outstanding contributions to the common fund, with just under 5 MCHF due from Member States and about 0.5 MCHF from Non-Member States (see table 1.2 of the paper for the breakdown by Funding Agency). In total these outstanding contributions amounted to 5.3 MCHF.

5.2 Status of M&O accounts

For the M&O A account, after receiving new contributions from Germany and the Netherlands, the current balance was about 300 kCHF. However the list of outstanding payments was long, with many funding agencies having payments outstanding for more than one year.

For 2002-2003 there were some 95 KCHF outstanding in total from China, Poland, Romania, Russia, and Ukraine. For 2004 there were 53 kCHF in total outstanding from the same funding agencies. For 2005 there were still some 792 kCHF to be received. Finance Division would be sending reminders for the outstanding payments.

There being no comments on these numbers, the RRB **took note** of this financial report.

6. Construction Budgets — A. Smith, Resources Manager

Paper CERN-RRB-2005-035 Presentation CERN-RRB-2005-058

6.1 Common Fund

A. Smith reported that the spending from the common fund last year had been about 1 MCHF less than foreseen, largely because they had not spent as much on data acquisition and infrastructure as had been expected. However the planned spending for 2005 was around 5.3 MCHF and the spending for 2006 was close to 4 MCHF. It was clear that the outstanding contributions were absolutely essential and needed to arrive within the next 12 to 18 months if LHCb was not to enter into the red.

6.2 Construction Budgets

The CORE spending for 2004 was slightly higher than the estimate, and for 2005 they planned to spend 22 MCHF. For 2006 the estimate was around 7 MCHF but he was convinced that this was a low figure.

The 2004 Construction Budget numbers were **agreed** by the RRB. There were no questions on the preliminary estimates for 2006.

7. M&O Budget — A. Smith

Paper CERN-RRB-2005-036 Presentation CERN-RRB-2005-058

7.1 Approval of Addendum 1 to the MoU for M&O of the LHCb Detector: Core Computing

Paper CERN-RRB-2005-010

J. Engelen introduced this point, explaining that the RRB was asked to approve in principle this addendum to the MoU in order to include core computing in the M&O budgets as has been originally foreseen in the MoU. The actual numbers giving the costs would be presented later in this meeting as preliminary estimates for 2006, and would be reviewed by the Scrutiny Group before being presented to the October 2005 RRB for approval. The RRB was asked first to agree to the principle of including core computing as defined in the addendum to the M&O budget.

K. Ehret questioned why there were no tasks in category A and everything was handled in category B. A. Smith replied that LHCb was hoping that all requirements could be handled as cat. B costs with institutes putting forward people to cover the work in a voluntary fashion. J. Engelen noted that indeed LHCb had a different model from the other three experiments.

There being no further questions or remarks, the addendum **was approved**.

7.2 Closing report for 2004, including Status of MoU Signatures

A. Smith presented the 2004 M&O category A report showing that they had overspent by 154 kCHF. This was mostly attributed to the advance purchase of gas for RICH1 to which the RRB had given permission a year ago. There was also a small overspend in general services, notably on management of on-line computing.

7.3 Preliminary estimates for 2006

The estimated M&O A costs for 2006 amounted to 1.455 MCHF. Detector related costs would increase because they would start to use gas in a substantial way. Secretariat costs would increase to meet the agreement that all experiments would supply two people in the secretariat. On-line computing would require a bigger installation than this year and general services would increase to cover handling and transport. This would all be reviewed by the Scrutiny Group.

The Power bill for 2006 had been estimated as 300 kCHF but it was now clear that this was a large over-estimate, largely because they no longer envisaged powering the magnet for long periods next year. Similarly they would not have such a large part of the on-line farm installed. The correct figure would be much nearer to 23-30 kCHF.

He showed the estimated budget sharing amongst Funding Agencies for 2006, and also the forecast M&O cat. A budgets for 2007 to 2009, with breakdown by detector components.

A. Smith showed the list of Funding Agencies which had signed the MoU for M&O. Since the last RRB both Poland and Romania had signed.

He showed the institutes that were contributing to Core Computing and the estimated contributions to the M&O category B in FTE's.

The being no questions and comments on the M&O Budgets, the RRB **took note** of the report.

8. Summary, Future Activities & A. O. B. J. Engelen

J. Engelen noted that LHCb had given the RRB a technical overview of the experiment which showed very positive progress, and a detailed picture of the financial situation that left the RRB with some concern. The internal movement of money within the experiment as proposed was agreed by the RRB. For the additional funding, which was not terribly large in the end, the RRB hoped not that they would not have to push LHCb into a regime of staging. They were therefore asked to make a detailed financial plan that would be the result of interactions between members of the collaboration and the Funding Agencies, and hence the members of this board, such that an informed discussion could be held at the next RRB in October 2005.

The next RRB meetings in 2005 will take place at CERN on
Monday 17th, Tuesday 18th and Wednesday 19th October 2005

There being no questions and no further business, the Chairman thanked the participants and closed the meeting.

Appendix 1

For this 14th Meeting the following papers are available at the Web Site:

http://committees.web.cern.ch/Committees/LHCRRB/LHCb/index.html

Papers:

Registration-14	Registration Form
CERN-RRB-2005-029	Agenda
CERN-RRB-2004-108	Minutes of the Previous Meeting
CERN-RRB-2005-047	Minutes of this meeting
CERN-RRB-2005-034	Status of the experiment
CERN-RRB-2005-023	LHCC Deliberations
CERN-RRB-2005-014	Financial Matters
CERN-RRB-2005-035	Construction Budgets
CERN-RRB-2005-036	M&O Budgets
CERN-RRB-2005-010	Add. 1 to MoU for M&O of LHCb Detector: Core Computing

Presentations:

CERN-RRB-2005-056	Status of the experiment
CERN-RRB-2005-057	Financial Matters
CERN-RRB-2005-058	Construction & M&O Budgets