Minutes of the 37th LHCb Resource Review Board Meeting
(CERN, Geneva, 26th October 2016)

Present

Y. Zhang, Cheng He (National Natural Science Foundation of China, China)
L. Sun (Wuhan University, China)
R. Le Gac (CPPM IN2P3/CNRS, France)
H. Prasse, M. Gast (BMBF, Germany)
H. Mahlke, W. Ehrenfeld (BMBF/DESY-PT, Germany)
U. Uwer (University of Heidelberg, Germany)
D. Nicmorus (Observer from FAIR, Darmstadt, Germany)
N. Pastrone (INFN, Italy)
A. Cardini (University of Cagliari, Italy)
S. Bentvelsen (NIKHEF, Netherlands)
D. Drewniak (Ministry of Science and Higher Education, Poland)
R. Savu, A. Fazacas (Institute of Atomic Physics, Romania)
V. Savrin (Institute of Nuclear Physics, Moscow State University, Russia)
V. Shevchenko (NRC Kurchatov Institute, Russia)
A. Vagner (Tomsk Polytechnic University, Russia)
M. Martinez Perez (Ministry of Economy and Competitiveness, Spain)
E. Grauges (Universitat de Barcelona, Spain)
O. Schneider (EPFL Lausanne, Switzerland)
A. Medland (STFC, United Kingdom)
M. Coles (National Science Foundation, United States of America)

LHCb
C. D'Ambrosio, T. Gershon, A. Golutvin, R. Lindner, M. Pepe-Altarelli, S. Roiser,
A. Schopper, V. Vagnoni, G. Wilkinson,

CERN
G. Cavallo, E. Elsen (Chairman), S. Foffano, F. Gianotti, F. Hemmer, M. Krammer,
E. van Herwijnen (Scientific Secretary), T. Wengler

Scrutiny Group
C. Touramanis, E. Iacopini

Excused: I. Bediaga (RENAFAE, Brazil), M. Steinacher (CERN), P. Verdier (CNRS/IN2P3,
France)

Documents can be found in the RRB Indico pages; accessible via the LHC-RRB home page http://cern.ch/committees/LHCRRB
E. Elsen welcomed the delegates to the LHCB LHC Resource Review Board.

2. **Approval of the minutes of the last meeting.** E. Elsen, Director for Research and Scientific Computing.
CERN-RRB-2016-067

The minutes of the last LHCb RRB meeting CERN-RRB-2016-067 were approved.

3. **Status of the experiment.** G. Wilkinson, spokesperson
CERN-RRB-2016-107, [slides](#)

4. **LHCb Upgrade Status.** G. Wilkinson, spokesperson
CERN-RRB-2016-111

Summary of 3 & 4:

The Run 2 operation has been very successful, with the detector working well. LHCb has responded rapidly to the (very welcome) challenge of the remarkable machine performance. LHCb continues to deliver important results in flavour physics, spectroscopy, and beyond. In certain areas we are reaching exceptional ($10^{-4}$) precision. Core flavour-physics analyses are now fully exploiting Run 2 data. The LS2 Upgrade will deliver huge increase in physics:

- Good progress on all subsystems; challenges inevitably emerge, but are being tackled appropriately;
- SciFi system now in production phase, other projects soon to follow;
- Progress being carefully monitored through milestones, with comprehensive internal review scheduled for January.

Discussions already underway about consolidation activities in LS3, and also about a possible 2nd, high-luminosity, Upgrade, on longer time-scale (LS4).

E. Elsen: What are your plans for the pA run and do you have teams ready to analyse the data?
G. Wilkinson: There are measurements that we are ideally qualified to do, for example charm meson production and photo production in pA collisions. We hope we will be given the integrated luminosity we have requested. The team is relatively small but recent additions to the collaboration have been in this area. We have identified a small number of core analyses that we want to execute in a timely fashion and we are well prepared.

5. **LHCC Deliberations (paper only).** T. Wengler, LHCC Scientific Secretary
CERN-RRB-2016-112

Summary:

- The LHCC considers that LHCb has made excellent progress in all aspects of the experiment and the Committee congratulates the LHCb Collaboration on its achievements.
- 334 papers have been submitted to date.
- The detector has been operating well (average data taking efficiency 88%) during Run 2, recording 1.3 fb$^{-1}$. LHCb are ready for the Pb-p/p-Pb run which will provide a unique physics run for the experiment.
• Good progress reported on the LHCb Upgrades. The VeloPix and SALT128 chips have been received and work well.
• Some small delays have been accumulated and will be monitored by LHCb. A comprehensive review will take place early 2017.
• The microchannel cooling plates for the VELO are an area of concern. A fall back solution is being investigated; further delays to the schedule need to be closely monitored.

There were no questions arising from this presentation.

CERN-RRB-2016-109, CERN-RRB-2016-110 (slides)

103 kCHF was received since the cut-off date of 31 August. Outstanding 2016 contributions for M&O A for member states: 321 kCHF and for non-member states: 332 kCHF; together 653 kCHF, corresponding to 25.5% of the total.

M. Martinez: the contribution from Spain will come before the end of this year.

7. Budgets. C. D’Ambrosio, LHCb Resources Coordinator
CERN-RRB-2016-113 (slides), CERN-RRB-2016-114 (M&O and CORE Budgets), CERN-RRB-2016-115 (LHCb Upgrade Financial Status)

Summary:
On the first year of Run2, a small under spending appears in our budget lines, due to late bills and a delayed online position, as expected (CERN-RRB-2015-110 and CERN-RRB-2016-038). We kindly ask the RRB permission to keep the 2015 surplus. Year 2016 results at 31 August show a well balanced budget.

In 2017 a further increase in PhD equiv. is welcomed. It is fairly distributed between all our collaborating institutes and thus it does not affect much the single FA contributions, but further reduces the costs per PhD equiv. to ~5000 CHF per PhD equiv.

A new concept for the Online/Offline Operation is defining specific expenditures for the coming years. Due to the excellent LHC efficiency and luminosity delivery, the acquisition of 300 new nodes and 3.6 PB of disk storage has been advanced to 2016 with an investment of 0.95 MCHF. We expect a further ~0.3+0.3 MCHF to be spent in 2017 (see CERN-RRB-2015-110).

We plan to achieve this at a constant budget.

Cat.B funds and resources are healthy. As Cat.B funds are mostly managed by the specific projects, we take note of a decrease in their budgeted value as calculated in CHF.

Concerning the upgrade funding:

• ~85% of the LHCb Upgrade funds are committed;
• the Common Funds, addendum 1, scrutinized by SG and RRB, has been separated from the Sub-Detector Funds, addendum 2, scrutinized by LHCC;
• the RRB was asked to take note of the new time profile for Common Funds spending shown on slide 9.

LHCb thanks the RRB and the Scrutiny Group for their support and advice.

H. Prasse: How will you deal with the large cost of computing for the Upgrade?
E. Elsen: The reason for this large cost is that in the Upgrade, there is no longer a hardware trigger. Since this affects all subdetectors it has been attributed to the Common Fund. In the total cost of the 57 MCHF, there is a contribution of 16 MCHF which from the start was shared among all institutes.
C. Touramanis: LHCb are paying fully for their new online system as an Upgrade project, which simplifies tracking by the Scrutiny Group. Two of the other experiments are also installing new, larger online systems but will cover the cost partially from M&O A and partially from their upgrades. Thus the appearance of a relatively larger amount in the LHCb upgrade does not signify a substantial departure from the norm. There will be a common issue for all experiments when we discuss next year M&O levels in Run 3, when everybody will have to accumulate funds to replace those bigger farms in LS3.

7. 3 M&O Scrutiny Group Report. C. Touramanis, Chair, Scrutiny Group
CERN-RRB-2016-073

The RRB Scrutiny Group recommends the approval of the 2015 M&O closing report of LHCb.

The RRB Scrutiny Group recommends the approval of the 2017 M&O Draft Budget requests of LHCb.

LHCb have demonstrated a number of times that they are able to incorporate innovative computing solutions and new technologies. This allows LHCb to do more, more efficiently.

There were no questions from C. Touramanis’ presentation. The RRB approved the M&O A&B closing reports for 2015 and the budget requests for 2017.

There being no further business, E. Elsen thanked the delegates and closed the meeting. The proposed dates for the next RRB are 24-26 April 2017.