

## MEMORANDUM

Date: 27 March 2013

To: Members of the LHCb RRB  
From: C. D'Ambrosio  
Subject: Status of M&O Category A.

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**Budget Closing Report for 2012**

The closing result for 2012 is given in Table 1. 2012 is the third-time full data-taking year for LHCb. As already noted in CERN-RRB-2011-040, the 2010 exercise, which represented a first-time full data-taking year, had shown an under-spending in Detector Related and General Services. This trend was confirmed with the 2011 results (CERN-RRB-2012-056) and anticipated for the 2012 year, by decreasing both lines (see Table 3).

The main deviation is on detector related line. It shows an under-spending of 42 kCHF, again related to a smooth year of data-taking, resources optimization and consolidation work done. However, this under-spending is very much reduced and it was anticipated, as discussed with the Scrutiny Group. In fact, a few expenditures from year 2011 were charged in year 2012, due to the important shut-down activities that took place between December 2011 and March 2012. The largest over-spending (33 kCHF) is recorded in the "secretariat" line. This was also foreseen and the scrutiny group was informed.

Due to demanding conditions for the 2011 - 2013 activities, Core Computing shows an expected overspending and this line has already been adjusted from year 2013 onwards (see Table 3). Finally, the Communications line shows an under-spending, again due to EVO, which was budgeted at 100% on SG request (see CERN-RRB-2011-076).

Due to the LHC activity and the demanding LHCb running conditions for 2011-13, we anticipated the completion of the Farm for 2010. However, more consolidation had been deemed necessary for the general network infrastructure and the farm itself, which was achieved thanks to two extra-contributions (see CERN-RRB-2011-040). Both belonged to DAQ-NONCORE contributions and were of the order of 300 kCHF each. For year 2012, we planned to further consolidate by adding a ~10% more CPU power, through again a CERN contribution (50%, ~100 kCHF) and part of the foreseen CPU replacement policy for 2012 (50%, ~100 kCHF). This acquisitions have allowed LHCb to run at the highest possible luminosity, L0 trigger and disk writing rates.

As agreed at the latest RRBs (CERN-RRB-2011-090, CERN-RRB-2012-056 and CERN-RRB-2012-108), we have transferred on the "Online Account" a total of 400 kCHF + 300 kCHF + 300 kCHF, after consultation with the SG. These transfers constitute the base of our "CPU replacement strategy", consisting in annual equivalent transfers of 300 kCHF in order to satisfy the Farm needs until year 2018 (see also Table 2 and CERN-RRB-2011-076).

The overall surplus on the 2012 year budget is 13.9 kCHF. Owing to the principle of keeping our budget as constant as possible over the years, this surplus together with those from previous years should serve in covering the 2013 - 2014 long shutdown years, when important

consolidation, replacement of ageing components and maintenance on the detector general infrastructure will be taking place, whilst keeping the related lines essentially constant (see also CERN-RRB-2011-076, CERN-RRB-2011-088 and CERN-RRB-2011-90).

2012	Budget	Used	Difference
detector related	880	837.7	42.3
secretariat	185	218.1	-33.1
communication	50	16.2	33.8
core comp	150	180.7	-30.7
on line (see text)	900	931.7 (631.7 + <b>300</b> )	-31.7
test beams	30	20.0	10.0
laboratory	50	35.8	14.2
general services	330	320.9	9.1
Totals	2575	2561.1	13.9
Online account		<b>300</b>	

Table 1: M&O Cat.A in kCHF at book closing for 2012. To be noted, the 300 kCHF moved in the online account. Together with the previous funds, this line is at a total of 1000 kCHF.

In Table 2, details on the 2012 main expenditure lines are given. We propose that the overall under spending of 13.9 kCHF is kept as buffer in the M&O Cat.A budget. We will report back to RRB in October.

Detector related costs	Magnet	65
	Gas	307
	Cooling	60
	Safety	35
	Tech. support	163
	Beam pipe	53
Secretariat	Secretarial aid	212
Communication	EVO	15
On-line computing	System Manag.	354
	Hardware	277
Test beams, calibration	Operation	20
Laboratory operations	Operation	36
General services	Cool., vent. etc	126
	Transport and cranes	121
	Survey	14

Table 2: Partial list of the main items paid from 2012 M&O Category A

### Current status of the 2013 M&O Category A budget

In October 2012 the RRB approved the M&O Category A budget for 2013 for a total of 2,820 kCHF, including a power cost of 970 kCHF and a VELO Spare contribution of 100 kCHF. As already pointed out in CERN-RRB-2012-108, the LS1 activities have already started with a non-negligible increase in expenditures on the M&O Category A budget by the end of March. However, we are confident that the expenditure will follow closely the budget forecast (CERN-RRB-2012-108 and CERN-RRB-2012-114).

### Forecast for the 2014 M&O Category A budget

The estimated budget for 2014 will be examined with the Scrutiny Group in the coming months and presented for ratification to the RRB in fall 2013. There are no changes from 2013 to 2014, which reflect the discussions from last year, agreed upon with the SG, and which are described in CERN-RRB-2012-108 and CERN-RRB-2012-109, mainly due to the present long shutdown. In line with the principle of keeping the budget as constant as possible over the years and owing to the previous surpluses to be kept as buffer for the LS1 years, any revisions are unlikely to make significant changes to the overall budget. The total budget currently stands at 2,667 kCHF including the power cost at 600 kCHF. The VELO Spare programme finishing in 2013, no funds are levied for this anymore (see Tables 3 and 4). Table 3 also shows past and future proposed budgets.

The sharing between the different Funding Authorities is based on the number of PhD equivalent members at each institute. This number is normally agreed for the next year in September of the previous year. As usual, the power is shared by all Funding Authorities, but only charged to Non Member States. Provisionally, with the same numbers of PhD equivalents as for 2013, the sharing is given in Table 4.

Item List	2011	2012	2013	2014	2015	2016
Detector related cost	920	880	920	920	880	880
Secretariat	185	185	185	185	185	185
Communications	30	50	10	10	10	10
Core computing	150	150	170	170	170	170
Online computing	810	900	890	890	890	890
Test Beam and calib. facilities	30	30	35	35	25	25
Laboratory operation	60	50	50	50	50	50
General services	360	330	320	320	320	320
Power	970	970	970	600	300	970
VELO Spare	100	100	100	0	0	0

Table 3: Running and proposed M&O Cat.A budgets for 2013 and 2014 respectively and their evolution for 2014 - 2016 in kCHF. The VELO spare funding profile started in 2009 and ends in 2013. Note also the fact that we charge the power on the subsequent operation year.

2014	PhD eq. total/ funding auth.		M&O A	VELO	Power	
			kCHF	kCHF	kCHF	
			2,580	0	600	Total
		%	CHF	CHF	CHF	CHF
BRAZIL	18	4.6	117,868		27,411	145,279
FRANCE	42	10.7	275,025		0	275,025
BMBF GERMANY	13	3.3	85,127		0	85,127
MPI, MPG, GERMANY	5	1.3	32,741		0	32,741
IRELAND	2	0.5	13,096		3,046	16,142
INFN ITALY	58	14.7	379,797		0	379,797
NETHERLANDS	17	4.3	111,320		0	111,320
P. R. CHINA	6	1.5	39,289		9,137	48,426
POLAND	8	2.0	52,386		0	52,386
HHNIPNE ROMANIA	7	1.8	45,838		0	45,838
RUSSIA	30	7.6	196,447		19,357	215,804
SPAIN	16	4.1	104,772		0	104,772
SWITZERLAND	25	6.3	163,706		0	163,706
UKRAINE	3	0.8	19,645		4,569	24,213
UK	73	18.5	478,020		0	478,020
USA	16	4.1	104,772		23,074	127,846
CERN	55	14.0	360,152		0	360,152
<b>TOTAL</b>	394	100.0	2,580,000		86,593	2,666,593

Table 4: Sharing of the estimated 2014 budget in CHF for M&O Category A. The VELO spare programme has come to an end. The power line is only an estimation due to the partial shutdown in 2013.

### M&O Category B

There are no major changes since the October 2012 RRB (see CERN-RRB-2012-108).

## Report on Common Fund and CORE expenses

### Situation at 28 February 2013

#### Common Fund

Spending from Common Funds further slowed down as foreseen (see CERN-RRB-2011-038). In order to preserve liquidity, a loan of 150 kCHF was established from Common Funds to “VELO NON CORE” (see also CERN-RRB-2010-115). The inflow seen in the line correspond to the 2012 year contribution for VELO spare and it is not exactly 100 kCHF, due to missing 2012 contributions. The VELO spare programme ends in 2013.

Considering all the lines shown in Table 1, 388 kCHF is still uncommitted at present (February 2013). We do not expect any cash flow problem.

In view of the long shutdown in 2013–14 and of the foreseeable important interventions on sub-detectors and on general safety and infrastructure, we asked and obtained to maintain the Common Fund account active until the end of year 2013, see CERN-RRB-2010-040 and CERN-RRB-2010-115.

COMMON FUNDS closure, year 2012				
All in kCHF				
Detector	Outflow	Inflow	Committed	Totals
OTR	0	0	0	0
CALO	0	0	0	0
DAQ	0.1	0	0	0.1
INFRASTRUCTURE	2.4	0	0	2.4
MUON	0	0	0	0
RICH	0	0	0	0
TOTAL	2.5	0	0	2.5
RICH HPDs	0	0	0	0
VELO NON CORE	7.4	-99.2	0	-91.8
	9.9	-99.2	0	89.3

**Table 1: Status of Common Fund as at end of year 2012 in kCHF**

#### Core

Most of the Core spending came to an end in 2006. Purchasing for DAQ and data storage has continued throughout 2010 with the 3<sup>rd</sup> “tranche” of the FARM, which has been achieved in December 2010 and which has been funded by Core and non-Core resources.

No institute has indicated that it has additional requests for funds to be presented to the RRB.