

## **RRB Apr. 25<sup>th</sup> 2012**

- Situation of Common Funds
- Situation of Core Funds
  
- Projected M&O Cat. A budgets for the coming years
- Total M&O Cat. A budget and detailed expenditure in 2011
- Approved budget for 2012 and projected for 2013
- Conclusions

## Common Funds situation at February 2012

COMMON FUNDS expenditure situation at February 2012				
All in kCHF				
Detector	Outflow	Inflow	Committed	Totals
OTR	3.5	0	0	3.5
CALO	0	0	0	0
DAQ	0.6	0	0	0.6
INFRASTRUCTURE	94.7	0	0	94.7
MUON	0	0	0	0
RICH	0	0	0	0
TOTAL	98.8	0	0	98.8
RICH HPDs	73.1	0	0	73.1
VELO NON CORE	84.8	-87.4	0	-2.6
	256.7	-87.4	0	169.3

A 301 kCHF is still uncommitted at present (February 2012).

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 have asked (see CERN-RRB-2010-040 and -115) for an extension of the Common Funds lifetime to year 2013.

## Core

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

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

## M&O A forecast (without VELO and Power) in kCHF:

	Year						
	2009	2010	2011	2012	2013	2014	2015
Detector related costs	914	920	920	880	920	920	880
Secretariat	192	192	185	185	185	185	185
Communications	12	50	30	50	50	50	50
Core Computing	100	150	150	150	150	150	150
Online Computing	850	750	810	900	900	900	900
Test beams, calibration facilities	20	30	30	30	40	40	30
Laboratory operations	60	60	60	50	50	50	50
General services	360	360	360	330	330	330	330
	<b>2508</b>	<b>2512</b>	<b>2545</b>	<b>2575</b>	<b>2625</b>	<b>2625</b>	<b>2575</b>

Budget is kept constant and has been slightly redesigned, to take in account “collisions” and “shutdown” years (CERN-RRB-2011-90). Online Computing line reaches its “steady-state” in 2012. In our constant budget and replacement models, we expect this amount to be enough to cover needs until 2018.

Communication, takes in account EVO/VIDYO. We shall follow the DR and SG directions as to how/if to budget it for the coming years.

## Budget 2011 main lines (without VELO and Power)

2011	Budget	Used	Difference
detector related	920	752	168
secretariat	185	172	13
communication	30	36	-6
core comp	150	151	-1
on line (see text)	810	825 (525+300)	-15
test beams	30	9	21
laboratory	60	21	39
general services	360	283	77
Totals	2545	2249	296
Online Account		400	

As expected, another full year of operations did not change much our expenditure. To be noted, the 300 kCHF reserved for the special online account, and the 400 kCHF already moved in there in 2011. This is in line with our “buffering programme” (CERN-RRB-2011-088). The other lines show a relatively well balanced budget.

## Budget 2011 main lines (without VELO and Power)

### ONLINE replacements

- Most of our carry-over funds come from our online replacements policy (replace only when needed in a constant budget). In order to buffer these funds for future FARM needs, we have set-up a special account. The expenditures on this account need to be cross-signed by the Director of Research. Following our replacement model, we “park”:

400 kCHF initial buffer (done) and 300 kCHF (proposal to RRB for 2011).

- The experience from last year and the set  $4 \times 10^{32} \text{ cm}^{-2}\text{s}^{-1}$  luminosity for 2012 again ask for a small farm consolidation, which has now been finalized:  $\sim 200$  kCHF, shared equally between M&O Cat.A and an extra CERN contribution. The M&O cat.A amount engaged is well in line with our replacement model.

## Budget 2011 main lines (without VELO and Power)

### Long Shutdown 1 (LS1)

- We estimate a ~5% cost increase in M&O cat.A, from a shutdown year with respect to a collision year. However, for LS1 we are assessing in detail the expected M&O expenditures inside a coherent framework:

For the overall system (M&O cat. A)

For each sub-detector (M&O cat. B)

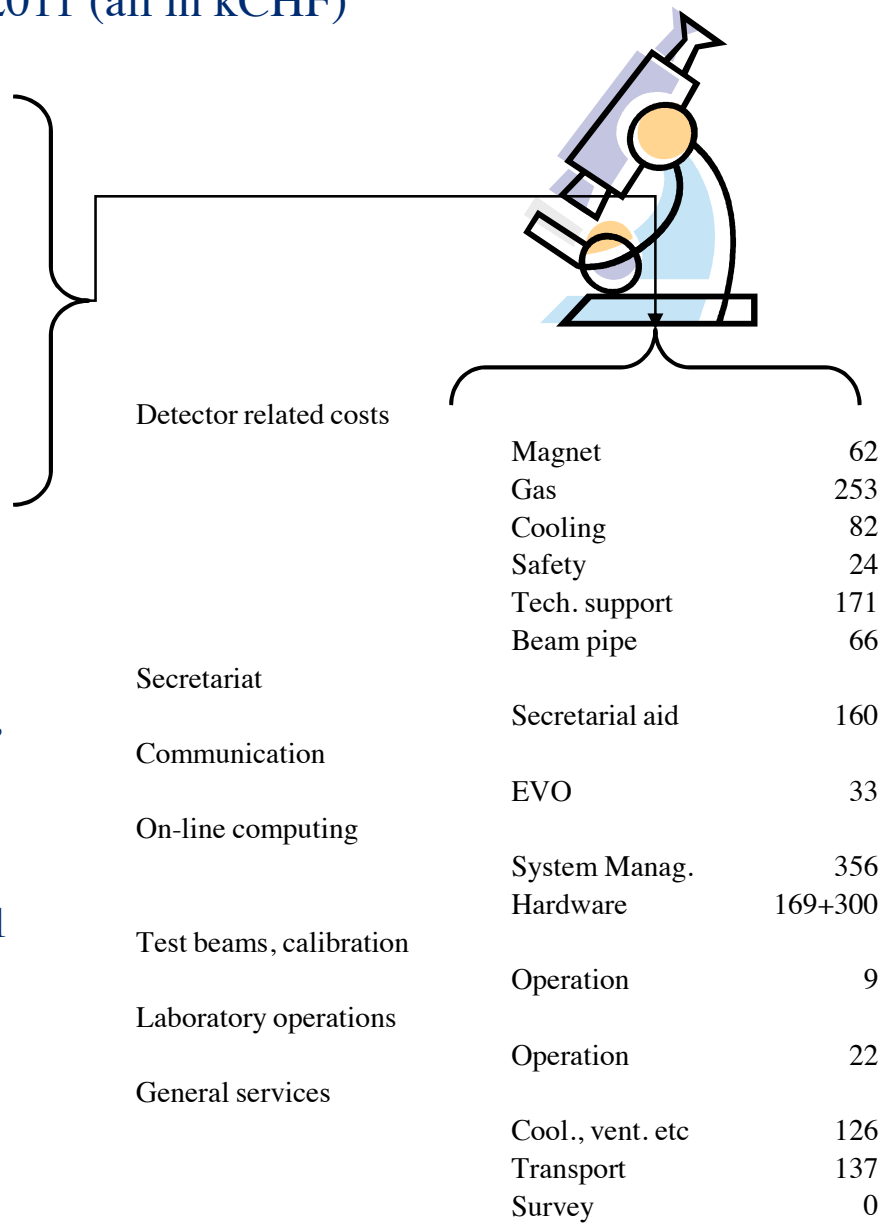
- We expect important maintenance and consolidation interventions for the general infrastructure, beam pipe, cooling, etc. However, due to the demanding running conditions for LHCb (optimization of physics throughput), we also expect effects on hardware and resources in general, including our sub-detector systems.: ageing, spares, possible breakdowns,etc.

Therefore, we propose to keep the surplus from 2011 as buffer for future LS1 activities.

We will report back to RRB in October.

# LHCb M&O Category A at Book Closing end 2011 (all in kCHF)

2011	Budget	Used	Difference
detector related	920	752	168
secretariat	185	172	13
communication	30	36	-6
core comp	150	151	-1
on line (see text)	810	825 (525+300)	-15
test beams	30	9	21
laboratory	60	21	39
general services	360	283	77
Totals	2545	2249	296
Online Account		400	



Rather well balanced budget. Due to the winter stop, a few orders hit towards the end of the year and are being charged to year 2012.

Therefore, we propose to keep the surplus from 2011 as buffer for future LS1 activities.

We will report back to RRB in October.



## Approved 2012 M&O Category A Budget :

2012	PhD eq. total/ funding auth.		M&O A	VELO	Power	
			kCHF	kCHF	kCHF	
			2575	100	970	Total
	%	CHF	CHF	CHF	CHF	
BRAZIL	18	4.9	126,294	4,905	47,575	178,774
FRANCE	43	11.7	301,703	11,717	0	313,420
BMBF GERMANY	14	3.8	98,229	3,815	0	102,044
MPI, MPG, GERMANY	7	1.9	49,114	1,907	0	51,022
IRELAND	2	0.5	14,033	545	5,286	19,864
INFN ITALY	55	15.0	385,899	14,986	0	400,886
NETHERLANDS	13	3.5	91,213	3,542	0	94,755
P. R. CHINA	3	0.8	21,049	817	7,929	29,796
POLAND	8	2.2	56,131	2,180	0	58,311
HHNIPNE ROMANIA	4	1.1	28,065	1,090	0	29,155
RUSSIA	31	8.4	217,507	8,447	34,716	260,669
SPAIN	17	4.6	119,278	4,632	0	123,910
SWITZERLAND	24	6.5	168,392	6,540	0	174,932
UKRAINE	3	0.8	21,049	817	7,929	29,796
UK	66	18.0	463,079	17,984	0	481,063
USA	9	2.5	63,147	2,452	22,527	88,126
CERN	50	13.6	350,817	13,624	0	364,441
TOTAL	367	100.0	2,575,000	100,000	125,962	2,800,962

## Projected 2013 M&O Category A Budget :

2013	PhD eq. total/ funding auth.		M&O A	VELO	Power	
			kCHF	kCHF	kCHF	
			2625	100	970	Total
	%	CHF	CHF	CHF	CHF	
BRAZIL	18	4.9	128,747	4,905	47,575	181,226
FRANCE	43	11.7	307,561	11,717	0	319,278
BMBF GERMANY	14	3.8	100,136	3,815	0	103,951
MPI, MPG, GERMANY	7	1.9	50,068	1,907	0	51,975
IRELAND	2	0.5	14,305	545	5,286	20,136
INFN ITALY	56	15.3	400,545	15,259	0	415,804
NETHERLANDS	13	3.5	92,984	3,542	0	96,526
P. R. CHINA	3	0.8	21,458	817	7,929	30,204
POLAND	8	2.2	57,221	2,180	0	59,401
HHNIPNE ROMANIA	3	0.8	21,458	817	0	22,275
RUSSIA	31	8.4	221,730	8,447	34,716	264,893
SPAIN	17	4.6	121,594	4,632	0	126,226
SWITZERLAND	24	6.5	171,662	6,540	0	178,202
UKRAINE	3	0.8	21,458	817	7,929	30,204
UK	66	18.0	472,071	17,984	0	490,054
USA	9	2.5	64,373	2,452	22,527	89,352
CERN	50	13.6	357,629	13,624	0	371,253
TOTAL	367	100.0	2,625,000	100,000	125,962	2,850,962

## Conclusions

The M&O Cat A budget has again shown to be well balanced over the recent years and after our second year of full operation.

For the near future, we do not expect large fluctuations of the main expenditure lines inside an essentially constant total budget. However, the stress of running at very challenging conditions is visible and is requiring extra attention.

During the course of the year a detailed technical and resources plan for the long shutdown of 2013 – 2014 will be finalized. We will come back to it at the Oct. RRB.

### Errata:

A typing error slipped in Table 4 on page 4 of CERN-RRB-2012-056: in the table, the year number on the left upper-side should read **2013** (and not 2012). Deep apologies.

## Category B M&O status

Cat. B M&O 2010 budget is given in the Table. The total is ~1100 kCHF, a bit less than half of the M&O Cat.A total. Category B M&O funds show to be constant over time inside ~10% . Preliminary investigation shows similar numbers for 2011.

CALO (CERN, ES, FR, RO, RU)	315
Level_0 (FR, IT)	60
Muons (CERN, IT, RU)	151
On Line (CERN)	80
Outer Tracker (GE, NL, PL, PRC)	120
RICH (CERN, IT, UK) (*includes contributions for the HPD-spare programme)	207*
Silicon Trackers (CH, ES, GE, UKR)	80
VELO (CERN, CH, EI, NL, RU, UK, USA)	135

CERN (CA, MU, ON, RI, VE)	230
CH (STs, VE)	81
ES (CA, STs)	35
FR (CA, L0)	140
GE (OT, STs)	93
IT (L0, MU, RI)	140
NL (OT, VE)	90
RU (CA, MU, VE)	115
UK (RI, VE)	195

Cat. B M&O budgets for 2010 in kCHF and per FA (>10 kCHF)

2010

TABLE 1 M&O

Cat. B

	Total for all SD
Mechanics	111
Gas-system	6
Cryo-system	0
Cooling system	15
FE electronics	128
Standard electronics, PS (LV, HV), Crates, RO Modules	230
Controls, (DCS, DSS)	70
Sub-Detector Spares	201
Maintenance of clean rooms, active and passive storage (including rentals), workshops	46
Communications (Piquet tools (ACB, GSM, etc...))	37
Store Items (Materials (screws, washers, tools, etc...))	26
Hired Manpower @ CERN (in CHF (Industrial Support))	0
Technical Manpower @CERN (in CHF (from Collaboration Institutes))	304
	0
	0
Total for 2010	1174
Total for 2010 as in CB and RRB	1148

Sums intended for 2010.

Most of the amounts are converted from euros to suisse francs and at different times (therefore they reflect reality with some uncertainty).

### Sub-line splitting for M&O Cat.B budgets for 2010 in kCHF