Draft Budget for CMS Maintenance & Operations in the Year 2012

INTRODUCTION

This document summarizes the funding requirements for the payments that the CMS Collaboration plans to make in the year 2012 in order to maintain and operate the already constructed detectors and Collaboration-wide facilities (M&O Cat. A).

In addition we present estimates for the subdetectors maintenance and operations expenses (M&O Cat. B).

Both M&O Cat. A and Cat. B costs have been last scrutinized by the RRB Scrutiny Group for M&O before the October 2011 RRB. The Annexes presented here are based on the latest available figures.

The Cat. A costs are invoiced by CERN on behalf of the CMS Collaboration.

The Cat. B costs will be invoiced only upon request of each Sub-detector and only for a small fraction of the total presented here.

The figures shown as "Payments expected in the year 2012" in the Summary Table (**Annex 2**) have been reviewed by the RRB Scrutiny Group and are based on the updated PhD count.

Timely and early payments for this budget are necessary due to the operational nature of the costs presented here.

M&O CATEGORY A

The total estimated cost for M&O-A in 2012 is 15'035 kCHF (13'235 kCHF excluding power costs). For comparison, the total M&O-A 2011 Budget was 14'353 kCHF (12'553 kCHF excluding power costs).

This request represents a decrease of 1'698 kCHF as compared to the 2012 Preliminary Draft Budget request presented at the April 2011 RRB where the proposed total amount was 16'733 kCHF.

This reduction was achieved mainly as a result of reviewing expenditures related to DAQ hardware replacement (A.4. On-line computing). The overall reduction of the allocation for On-line hardware equipment in the years 2012-2015 resulting from this review is

some 1'400 kCHF as compared to the budgetary projection presented to the April RRB. In agreement with the RRB Scrutiny Group it is proposed that the allocation specifically for On-line computing would be retained in a special account, which would allow carry-over from one year to another. The objective of this approach is to allow the Collaboration to make expenditures at the most appropriate time without being dependent on eventual modifications to the LHC schedule and restrictions of the budgetary year.

An increase of some 150 kCHF is requested in the category of Detector Related Costs related to an increase requested in the allocation for A.1.18 Safety and to moving the costs of the CAEN & Wiener power supply maintenance contract from M&O-B to M&O-A (A.1.15).

In the category of Communications an allocation of 250 kCHF is requested for Collaborative Tools due to the continuous reliance on the EVO videoconferencing system.

As compared to the M&O-A budget presented to the April RRB, modifications have also been made in the projection for the years 2013 – 2015 due to the foreseen implications of the Long Shutdown planned for 2013 and part of 2014. This concerns the categories of Detector-related costs (budget lines A.1.05, A.1.06, A.1.07, A.1.09, A.1.10, A.1.12, A.1.13), Test Beam Facilities (budget line A.6.02) and General Services (budget lines A.7.04, A.7.05, A.7.06, A.7.11).

Annex I.A gives the projected costs for M&O-A until 2015.

This updated budget request has been discussed with the RRB Scrutiny Group.

M&O CATEGORY B

With respect to the forecast for the year 2012 in the Preliminary Draft Budget for M&O-B presented at the April 2011 RRB (cf. CERN-RRB-2011-113), the present budget request has changed in the ECAL, HCAL, Muon and Trigger areas.

Most of the changes are very limited at a level of a few percent of the Subsystem's budget except for the Trigger, which has made a reduction of 235 kCHF of which 190 kCHF on the allocation for electronics equipment and 60 kCHF on Hired Manpower (and an increase of 15 kCHF on Communications).

The total M&O-B draft budget has decreased from 6'791 kCHF to 6'639 kCHF as compared to the figures presented to the April RRB.

The CMS Collaboration will continue to share its M&O Cat. B costs for the year 2012 by responsibility for all Sub-systems.

Annex I.B gives the projected costs for M&O-B until 2015.

The updated budget request has been presented to the RRB Scrutiny Group.

M&O CATEGORY B SCRUTINY

As agreed at the October 2010 RRB, a scrutiny process was put in place for CMS (and other LHC experiments).

The RRB Scrutiny Group has carried out an in-depth scrutiny of the finances of all the CMS Sub-systems. This process was carried out in two stages. First, an internal scrutiny was carried out by Internal Scrutiny Groups (ISG) established for each Subsystem, which reported to the CMS Resources Manager. Subsequently reports of the ISGs were presented to the RRB SG, which then had dedicated meetings and presentations from all the CMS Subsystems. Full documentation was provided as requested by the RRB SG.

The Scrutiny Group concluded that the budgetary process in each of the CMS Sub-systems is carried out in a thorough and satisfactory manner and that there are no issues that would give rise to concern.

SUMMARY

The numbers given in this document are summarized in **Annex 2**. It should be noted that funds paid in 2012, which will not have been committed during 2012, will be reported to the April 2013 RRB and will be carried forward.

ANNEXES

Budget Requirements for M&O in 2012

Annex 1 : PhD Scientists per Funding Agency

Annex 2 : M&O Cat. A and B Costs by Funding Agency

Annex A.1 : M&O Cat. A Budget Request 2012

Annex A.2 : M&O Cat. A by Funding Agency

Annex B.1 : M&O Cat. B Budget Request 2012

Annex B.2 : M&O Cat. B Budget Sharing 2012 by Funding Agency and Subsystem

Annex B.3 : M&O Cat. B Estimated Costs Incurred in 2012 by Funding Agency and Subsystem

Annex I.A : Foreseen Cat. A Costs 2012-2015

Annex I.B : Foreseen Cat. B Costs 2012-2015

ANNEX 1

PhD Scientists per Funding Agency Based on the Annually Revised Annex 13 of the M&O MoU

The List of Names is Available at http://cms.cern.ch/iCMS/jsp/page.jsp?mode=cms&action=url&urlkey=CMS_DOCOFF (Count closed on October 3, 2011)

	Data	
Institute FA	PhD #	PhD %
Austria	19	1.4%
Belgium-FNRS	18	1.3%
Belgium-FWO	19	1.4%
Brazil	17	1.2%
Bulgaria	9	0.7%
CERN	78	5.7%
China	13	1.0%
Colombia	3	0.2%
Croatia	6	0.4%
Cyprus	5	0.4%
Egypt	3	0.2%
Estonia	3	0.2%
Finland	15	1.1%
France-CEA	16	1.2%
France-IN2P3	51	3.7%
Germany-BMBF	61	4.5%
Germany-DESY	45	3.3%
Greece	16	1.2%
Hungary	10	0.7%
India	29	2.1%
Iran	6	0.4%
Italy	160	11.7%
Korea	22	1.6%
Lithuania	1	0.1%
Mexico	11	0.8%
New Zealand	2	0.1%
Pakistan	2	0.1%
Poland	15	1.1%
Portugal	9	0.7%
RDMS-DMS	22	1.6%
RDMS-Russia	61	4.5%
Serbia	3	0.2%
Spain	49	3.6%
Switzerland-ETHZ	20	1.5%
Switzerland-PSI	8	0.6%
Switzerland-UNIV	5	0.4%
Taipei	17	1.2%
Turkey	25	1.8%
United Kingdom	53	3.9%
USA-DOE	318	23.2%
USA-DOE-NP	23	1.7%
USA-NSF	88	6.4%
USA-NSF-NP	12	0.9%
Grand Total	1,368	100.0%

ANNEX 2

M&O Cat. A and B Costs by Funding Agency

Payments expected in the Year 2012 (kCHF)

Funding Agency	Category A	Category B	Total Category A+B	Total Invoiced
Austria	183.8	97.7	281.5	183.8
Belgium-FNRS	174.1	80.4	254.6	174.1
Belgium-FWO	183.8	85.2	269.0	183.8
Brazil	186.8	230.0	416.9	186.8
Bulgaria	87.1	39.3	126.4	87.1
CERN	754.6	549.8	1,304.4	754.6
China	142.9	6.5	149.4	142.9
Colombia	33.0	6.5	39.5	33.0
Croatia	65.9	22.2	88.1	65.9
Cyprus	55.0	25.3	80.2	55.0
Egypt	33.0	9.8	42.8	33.0
Estonia	33.0	10.0	43.0	33.0
Finland	145.1	48.3	193.5	145.1
France-CEA	154.8	88.7	243.5	154.8
France-IN2P3	493.4	191.3	684.7	493.4
Germany-BMBF	590.1	257.5	847.7	590.1
Germany-DESY	435.3	151.1	586.5	435.3
Greece	154.8	51.1	205.9	154.8
Hungary	96.7	7.9	104.7	96.7
India	314.5	193.9	508.3	314.5
Iran	65.9	9.3	75.3	65.9
Italy	1,547.9	868.0	2,415.9	1,547.9
Korea	241.8	39.3	281.1	241.8
Lithuania	11.0		11.0	11.0
Mexico	120.9		120.9	120.9
New Zealand	22.0		22.0	22.0
Pakistan	22.0	19.6	41.6	22.0
Poland	145.1	130.3	275.4	145.1
Portugal	87.1	23.3	110.3	87.1
RDMS-DMS	241.8	20.1	261.9	241.8
RDMS-Russia	618.0	245.4	863.4	618.0
Serbia	33.0	16.6	49.6	33.0
Spain	474.0	109.4	583.5	474.0
Switzerland-ETHZ	193.5	84.7	278.2	193.5
Switzerland-PSI	77.4	54.1	131.5	77.4
Switzerland-UNIV	48.4	37.2	85.6	48.4
Taipei	186.8	65.8	252.6	186.8
Turkey	274.8		274.8	274.8
United Kingdom	512.7	212.8	725.5	512.7
USA-DOE	3,467.2	1,777.4	5,244.5	3,467.2
USA-DOE-NP	250.8	15.4	266.2	250.8
USA-NSF	959.5	757.3	1,716.7	959.5
USA-NSF-NP	130.8		130.8	130.8
Grand Total	**14,050**	**6,639**	**20,689**	**14,050**

ANNEX A.1

M & O Cat. A

Budget Request for the Year 2012 (kCHF)

Maintenance & Operations (kCHF)				Year
Group	Description	Ref.	Details	2012
Maintenance & Operations	Detector related costs	A.1.01	Magnet	30
		A.1.02	Magnet controls	142
		A.1.03	Magnet power supply	41
		A.1.04	Gas systems	260
		A.1.05	Gas consumption	600
		A.1.06	Cooling systems	226
		A.1.07	Cooling fluids(above –50°C)	220
		A.1.08	External cryogenics	375
		A.1.09	Cryogenic fluids (below –50°C)	40
		A.1.10	Moving/hydraulic systems	175
		A.1.11	Detector safety systems, BCM/BRM	200
		A.1.12	Shutdown activities	278
		A.1.13	General Technical support	544
		A.1.14	UPS maintenance	80
		A.1.15	Power supply maintenanace	85
		A.1.16	Beam pipe & vacuum	150
		A.1.17	Counting & control rooms	152
		A.1.18	Safety	360
	Detector related costs Total			3,956
	Secretariat	A.2.01	Secretarial assistance	232
		A.2.02	Economat	15
		A.2.04	Printing and publication	50
	Secretariat Total			297
	Communications	A.3.01	GSM phones; on-call service	20
		A.3.02	Collaborative tools	350
	Communications Total			370
	On-line computing	A.4.01	System management	980
		A.4.02	Data storage, (temporary on disk)	0
		A.4.03	Detector controls	0
		A.4.04	Computers/processors/LANs	2,818
		A.4.05	Software licenses	0
	On-line computing Total			3,798
	Test beams, calibration facilities	A.5.01	General operation	41
		A.5.02	Common electronics	15
		A.5.03	Electronics pool rentals	20
		A.5.04	Gas systems	10
		A.5.05	Gas consumption	10
	Test beams, calibration facilities Total			96
	Laboratory operations	A.6.01	Assembly areas, clean rooms	600
		A.6.02	Workshops	319
	Laboratory operations Total			919
	General services	A.7.01	Cooling & ventilation	595
		A.7.03	Power distribution system	60
		A.7.04	Heavy transport	297
		A.7.05	Cranes	35
		A.7.06	Cars	30
		A.7.08	Survey	157
		A.7.09	Storage space	50
		A.7.10	Common desktop infrastructure	40
		A.7.11	Reviewing & engineering	350
		A.7.12	Outreach	222
	General services Total			1,835
	Core Computing Infrastructure & Services	A.9.01	Central computing environment	562
		A.9.02	Software process service	317
		A.9.03	User support	208
		A.9.04	Central production operations	806
		A.9.05	Hardware	70
	Core Computing Infrastructure & Services Total			1,964
Maintenance & Operations Total				13,235
Power	Electricity	A.8.01	Power Consumption	1,800
	Electricity Total			1,800
Power Total				1,800
Grand Total				15,035

ANNEX A.2

M & O Cat. A by Funding Agency

All Figures in kCHF

Funding Agency	Category A without Power Bill	Power Billed	Category A
Austria	183.8		183.8
Belgium-FNRS	174.1		174.1
Belgium-FWO	183.8		183.8
Brazil	164.5	22.4	186.8
Bulgaria	87.1		87.1
CERN	754.6		754.6
China	125.8	17.1	142.9
Colombia	29.0	3.9	33.0
Croatia	58.0	7.9	65.9
Cyprus	48.4	6.6	55.0
Egypt	29.0	3.9	33.0
Estonia	29.0	3.9	33.0
Finland	145.1		145.1
France-CEA	154.8		154.8
France-IN2P3	493.4		493.4
Germany-BMBF	590.1		590.1
Germany-DESY	435.3		435.3
Greece	154.8		154.8
Hungary	96.7		96.7
India	280.6	33.9	314.5
Iran	58.0	7.9	65.9
Italy	1547.9		1547.9
Korea	212.8	28.9	241.8
Lithuania	9.7	1.3	11.0
Mexico	106.4	14.5	120.9
New Zealand	19.3	2.6	22.0
Pakistan	19.3	2.6	22.0
Poland	145.1		145.1
Portugal	87.1		87.1
RDMS-DMS	212.8	28.9	241.8
RDMS-Russia	590.1	27.9	618.0
Serbia	29.0	3.9	33.0
Spain	474.0		474.0
Switzerland-ETHZ	193.5		193.5
Switzerland-PSI	77.4		77.4
Switzerland-UNIV	48.4		48.4
Taipei	164.5	22.4	186.8
Turkey	241.9	32.9	274.8
United Kingdom	512.7		512.7
USA-DOE	3076.5	390.7	3467.2
USA-DOE-NP	222.5	28.3	250.8
USA-NSF	851.3	108.1	959.5
USA-NSF-NP	116.1	14.7	130.8
Grand Total	**13,235**	**815**	**14,050**

ANNEX B.1

M & O Cat. B

Budget Request for the Year 2012 (kCHF or FTE)

Year	(All)

Amount (kCHF/FTE)			Detector						
Description	Ref.	Details	Tracker	ECAL	HCAL	Muon	Trigger	Core Computing	Grand Total
Material Resources (kCHF)	B.1.01	Mechanics	40	25	21	10			96
	B.1.02	Gas-system	60	15	0	20			95
	B.1.03	Cryo-system			0	0			0
	B.1.04	Cooling system	250	90	0	0			340
	B.1.05	FE electronics		0	638	55			693
	B.1.06	Standard electronics, PS (LV, HV)	110	83	32	115			340
	B.1.07	Standard electronics, Crates		20	61	70			151
	B.1.08	Standard electronics, RO Modules	100	115	25	92	300		632
	B.1.09	Controls, (DCS, DSS)	140	85	27	37			289
	B.1.10	Sub-Detector Spares	0	0	58	32			90
	B.1.11	Areas	90	80	7	89			266
	B.1.12	Communications	30	10	49	43	15		147
	B.1.13	Store Items	50	50	4	41			145
	B.1.14	Hired Manpower @CERN	720	550	608	1,291	185		3,354
Material Resources (kCHF) Total			1,590	1,123	1,531	1,895	500		6,639
Human Resources (FTE)	B.2.01	Technical Manpower @CERN	0	0	0	0	0		0
	B.2.02	Core Computing Manpower @CMS						8	8
Human Resources (FTE) Total			0	0	0	0	0	8	8

ANNEX B.2

M&O Cat. B Cost Sharing by Funding Agency and Subsystem

Funding Agency	Tracker	ECAL	HCAL	Muon	Trigger
Austria	2.9%				10.3%
Belgium-FNRS	5.1%				
Belgium-FWO	3.3%			1.7%	
Brazil			15.0%		
Bulgaria				2.1%	
CERN	12.7%	22.3%		3.5%	6.4%
China				0.3%	
Colombia				0.3%	
Croatia		2.0%			
Cyprus	0.2%	2.0%			
Egypt				0.5%	
Estonia				0.5%	
Finland	3.0%				
France-CEA		7.9%			
France-IN2P3	6.5%	7.9%			
Germany-BMBF	9.1%			5.9%	
Germany-DESY	0.9%		9.0%		
Greece		4.0%			1.4%
Hungary	0.2%			0.3%	
India		3.9%	9.0%	0.7%	
Iran	0.6%				
Italy	22.4%	12.0%		19.7%	0.8%
Korea				2.1%	
Lithuania					
Mexico					
New Zealand					
Pakistan				1.0%	
Poland					26.1%
Portugal		1.1%			2.2%
RDMS-DMS				1.1%	
RDMS-Russia		3.5%	0.4%	10.6%	
Serbia		1.5%			
Spain	0.4%			5.2%	0.8%
Switzerland-ETHZ	1.5%	5.4%			
Switzerland-PSI	3.4%				
Switzerland-UNIV	2.3%				
Taipei	0.2%	5.6%			
Turkey					
United Kingdom	5.6%	7.2%			8.5%
USA-DOE	13.3%	10.5%	48.7%	28.5%	32.3%
USA-DOE-NP	0.3%		0.7%		
USA-NSF	6.1%	3.3%	17.3%	15.9%	11.3%
USA-NSF-NP					
Grand Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

All subsystems sharing by responsibility

ANNEX B.3

M&O Cat. B Costs by Funding Agency and Subsystem

Estimated Costs Incurred in 2012 (kCHF)

Funding Agency	Tracker	ECAL	HCAL	Muon	Trigger	Total
Austria	46.1				51.6	97.7
Belgium-FNRS	80.4					80.4
Belgium-FWO	52.4			32.7		85.2
Brazil			230.0			230.0
Bulgaria				39.3		39.3
CERN	202.0	250.0		66.1	31.8	549.8
China				6.5		6.5
Colombia				6.5		6.5
Croatia		22.2				22.2
Cyprus	3.1	22.2				25.3
Egypt				9.8		9.8
Estonia				10.0		10.0
Finland	48.3					48.3
France-CEA		88.7				88.7
France-IN2P3	102.9	88.4				191.3
Germany-BMBF	145.4			112.1		257.5
Germany-DESY	13.7		137.4			151.1
Greece		44.4			6.8	51.1
Hungary	2.9			5.0		7.9
India		43.3	137.5	13.1		193.9
Iran	9.3					9.3
Italy	355.7	135.2		372.9	4.2	868.0
Korea				39.3		39.3
Lithuania						
Mexico						
New Zealand						
Pakistan				19.6		19.6
Poland					130.3	130.3
Portugal		12.5			10.8	23.3
RDMS-DMS				20.1		20.1
RDMS-Russia		39.3	6.0	200.1		245.4
Serbia		16.6				16.6
Spain	6.2			99.0	4.2	109.4
Switzerland-ETHZ	23.7	61.0				84.7
Switzerland-PSI	54.1					54.1
Switzerland-UNIV	37.2					37.2
Taipei	2.9	62.9				65.8
Turkey						
United Kingdom	89.1	81.3			42.3	212.8
USA-DOE	212.2	117.9	745.2	540.6	161.4	1,777.4
USA-DOE-NP	5.4		10.0			15.4
USA-NSF	96.7	37.2	264.6	302.2	56.5	757.3
USA-NSF-NP						
Grand Total	**1,590**	**1,123**	**1,531**	**1,895**	**500**	**6,639**

ANNEX I.A

M & O Cat. A Costs 2012-2015

(All Figures in kCHF)

All Amounts in kCHF					Year			
Group	Description	Ref.	Details	Type (1)	2012	2013	2014	2015
Maintenance & Operations	Detector related costs	A.1.01	Magnet	C	30	30	30	30
		A.1.02	Magnet controls	O	110	110	110	110
				C	32	32	32	32
		A.1.03	Magnet power supply	O	21	21	21	21
				C	20	20	20	20
		A.1.04	Gas systems	O	210	210	210	210
				C	50	50	50	50
		A.1.05	Gas consumption	C	600	300	500	600
		A.1.06	Cooling systems	O	196	331	280	196
				C	30	30	30	30
		A.1.07	Cooling fluids(above –50°C)	C	220	220	220	160
		A.1.08	External cryogenics	O	345	345	345	345
				C	30	30	30	30
		A.1.09	Cryogenic fluids (below –50°C)	C	40	10	60	40
		A.1.10	Moving/hydraulic systems	O	145	256	214	145
				C	30	30	30	30
		A.1.11	Detector safety systems, BCM/BRM	O	80	80	80	80
				C	120	120	120	120
		A.1.12	Shutdown activities	O	258	694	530	258
				C	20	20	20	20
		A.1.13	General Technical support	O	494	849	716	494
				C	50	50	50	50
		A.1.14	UPS maintenance	C	80	80	80	80
		A.1.15	Power supply maintenance	O	85	85	85	85
		A.1.16	Beam pipe & vacuum	O	30	75	58	30
				C	120	120	120	120
		A.1.17	Counting & control rooms	O	52	52	52	52
				C	100	100	100	100
		A.1.18	Safety	C	360	300	300	300
	Detector related costs Total				3,956	4,649	4,492	3,836
	Secretariat	A.2.01	Secretarial assistance	O	232	232	232	232
		A.2.02	Economat	C	15	15	15	15
		A.2.04	Printing and publication	C	50	50	50	50
	Secretariat Total				297	297	297	297
	Communications	A.3.01	GSM phones; on-call service	C	20	20	20	20
		A.3.02	Collaborative tools	O	250	250	250	250
				C	100	100	100	100
	Communications Total				370	370	370	370
	On-line computing	A.4.01	System management	O	980	980	980	980
		A.4.02	Data storage, (temporary on disk)	C	0	0	0	0
		A.4.03	Detector controls	C	0	0	0	0
		A.4.04	Computers/processors/LANs	C	2,818	2,318	2,918	3,218
		A.4.05	Software licenses	C	0	0	0	0
	On-line computing Total				3,798	3,298	3,898	4,198
	Test beams, calibration facilities	A.5.01	General operation	O	31	31	31	31
				C	10	10	10	10
		A.5.02	Common electronics	C	15	15	15	15
		A.5.03	Electronics pool rentals	C	20	20	20	20
		A.5.04	Gas systems	C	10	10	10	10
		A.5.05	Gas consumption	C	10	10	10	10
	Test beams, calibration facilities Total				96	96	96	96
	Laboratory operations	A.6.01	Assembly areas, clean rooms	O	500	500	145	145
				C	100	100	20	20
		A.6.02	Workshops	O	289	405	361	289
				C	30	30	30	30
	Laboratory operations Total				919	1,035	556	484

All Amounts in kCHF					Year			
	General services	A.7.01	Cooling & ventilation	O	326	326	326	326
				C	269	269	269	269
		A.7.03	Power distribution system	C	60	60	60	60
		A.7.04	Heavy transport	O	237	332	296	237
				C	60	60	60	60
		A.7.05	Cranes	C	35	287	193	35
		A.7.06	Cars	C	30	49	42	30
		A.7.08	Survey	O	152	152	152	152
				C	5	5	5	5
		A.7.09	Storage space	C	50	50	50	50
		A.7.10	Common desktop infrastructure	C	40	40	40	40
		A.7.11	Reviewing & engineering	O	350	396	379	350
		A.7.12	Outreach	O	52	52	52	52
				C	170	170	170	170
	General services Total				1,835	2,247	2,093	1,835
	Core Computing Infrastructure & Services	A.9.01	Central computing environment	O	562	562	562	562
		A.9.02	Software process service	O	317	317	317	317
		A.9.03	User support	O	208	208	208	208
		A.9.04	Central production operations	O	806	806	806	806
		A.9.05	Hardware	C	70	70	70	70
	Core Computing Infrastructure & Services Total				1,964	1,964	1,964	1,964
Maintenance & Operations Total					13,235	13,956	13,766	13,080
Power	Electricity				1,800	1,650	1,750	1,800
Power Total					1,800	1,650	1,750	1,800
Grand Total					15,035	15,606	15,516	14,880

(1) O=Operation, manpower intensive
C=Consumables

ANNEX I.B

M& O Cat. B Costs 2012-2015 for all CMS Subdetectors

(Material Resources in kCHF, Human Resources in FTE)

Amount (kCHF/FTE)			Year			
Description	Detector	Subsystem	2012	2013	2014	2015
Material Resources	Tracker	Pixel	285	285	280	265
		SST	1,305	1,305	1,290	1,235
	Tracker Total		1,590	1,590	1,570	1,500
	ECAL		1,123	1,273	1,123	1,123
	HCAL		1,531	919	919	919
	Muon	Barrel Alignment	53	53	53	53
		Drift Tubes	488	481	483	483
		EMU	1,063	1,063	1,063	1,063
		LinkAlignment	16	16	16	16
		RPC	275	363	363	254
	Muon Total		1,895	1,976	1,978	1,869
	Trigger		500	500	500	500
Material Resources Total			6,639	6,258	6,090	5,911
Human Resources	Tracker	Pixel	0	0	0	0
		SST	0	0	0	0
	Tracker Total		0	0	0	0
	ECAL		0	0		0
	HCAL		0	0	0	0
	Muon	Barrel Alignment	0	0	0	0
		Drift Tubes	0	0	0	0
		EMU	0	0	0	0
		LinkAlignment	0	0	0	0
		RPC	0	0	0	0
	Muon Total		0	0	0	0
	Trigger		0	0	0	0
	Core Computing		8	8	8	8
Human Resources Total			8	8	8	8