

# Draft Budget for CMS Maintenance & Operations in the Year 2007

## INTRODUCTION

This document summarizes the funding requirements for the payments that the CMS Collaboration plans to make in the year 2007 in order to maintain and operate the already constructed detectors and Collaboration-wide facilities (M&O Cat. A).

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

Both M&O Cat. A and Cat. B costs have been scrutinized by the RRB Scrutiny Group for M&O. The Annexes presented here are based on the scrutinized costs unless otherwise stated.

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 2007" in the Summary Table (**Annex 2**) have been reviewed by the RRB Scrutiny Group and are based on the updated PhD 2006 count.

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

## M&O CATEGORY A

With respect to the Preliminary Draft Budget for the year 2007 presented at the previous RRB meeting (cf. CERN-RRB-2006-035), the present budget request has been lowered from 10'902 kCHF to 9'698 kCHF.

The present budget request has changed in a few areas:

- A.3.02, Collaborative tools and facilities maintenance and operations have been introduced.
- A.4, On-line computing, has been updated to reflect the most update purchase schedule of farm PCs and therefore of their replacements. A new algorithm for the scheduling of replacements has been discussed and agreed with the Scrutiny

Group. Manpower hiring has been delayed to closely follow the hardware purchase and installation. This profile contains the purchase of 2 staged DAQ slices, as already stated in the CMS Financial Plan to the April 2005 RRB and the CMS Status Reports to the April 2006 RRB (cf. respectively CERN-RRB-2005-015 and CERN-RRB-2006-031).

- A.9, Core Computing, has been reprofiled to reflect the updated CMS software plan and the experience gained in this first year of Core Computing operations.

The estimated manpower cost for A.9, Core Computing, in the year 2007 totals some 980 kCHF. For this particular category and as for the current year, the CMS Collaboration strongly prefers to receive contributions directly from the Institutes/Funding Agencies rather than hiring personnel through CERN.

Annex I.A gives the projected costs for M&O-A until 2010. The integrated amount for the period 2007-2010 has decreased by some 3.3 MCHF from the estimate presented at the April 2006 RRB (cf. CERN-RRB-2006-035).

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

## **M&O CATEGORY B**

With respect to the forecast for the year 2007 given in the M&O Preliminary Draft Budget presented at the April 2006 RRB (cf. CERN-RRB-2006-035), the present budget request has decreased from 7'312 kCHF to 6'262 kCHF.

The Tracker decrease in 2007 is due to the reprofiling in the ramp-up of the expenditures.

ECAL has fully reviewed the costs resulting in an annual decrease of around 10% of the total.

HCAL has reviewed the yearly profile with an overall stable budget for the period 2006-2010.

The Muon detectors have reviewed the 2007 as well as some other expenditures in the future, resulting in an annual decrease during the period 2006-2010.

It should be noted that the forecast expenditure for 2008 and beyond (cf. Annex I.B) is likely to change with the experience gained during the first run in 2007.

## **M&O CATEGORY B SHARING**

### ***Material Resources***

The CMS Collaboration will continue to share its M&O Cat. B costs for the year 2007 by responsibility for all subsystems.

### ***Technical manpower***

The technical manpower required at CERN from the Institutes (item B.2.01 in Annex B.1) will be shared by responsibility for all subsystems.

## **STATUS OF 2006 CORE COMPUTING M&O**

The Core Computing area was introduced in M&O in 2006. The current status after some 9 months of operations is detailed below.

### **M&O-A**

The RRB approved in October 2005 a Core Computing budget, Category A, for the year 2006 totaling 1'417 kCHF. Of these, 1'317 kCHF were for manpower, equivalent to 15 FTE.

The amount actually invoiced was lowered by one third, to 878 kCHF, equivalent to 10 FTE, to take into account the time needed to ramp up the effort.

Out of the budgeted 10 FTE, 9.7 have been secured, providing the common effort for Core Computing.

The CMS Collaboration has found a satisfactory solution for other 5 FTE, which have been contributed on a voluntary basis by Germany, Italy, US-DoE and US-NSF.

### **M&O-B**

The Core Computing activities falling under the Category B were estimated to 70 FTE to be contributed voluntarily by the Institutes of the Collaboration.

The work planned has been carried out satisfactorily and the necessary human resources provided as expected.

## **SUMMARY**

The numbers given in this document are summarized in **Annex 2**. It should be noted that funds paid in 2007, which will not have been committed during 2007, will be reported to the April 2008 RRB and will be carried forward.

## **ANNEXES**

### **Budget Requirements for M&O in 2007**

**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 2007

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

**Annex B.1 :** M&O Cat. B Budget Request 2007

**Annex B.2 :** M&O Cat. B Budget Sharing 2007 by Funding Agency and Subsystem

**Annex B.3 :** M&O Cat. B Estimated Costs Incurred in 2007 by Funding Agency and Subsystem

**Annex I.A :** Foreseen Cat. A Costs 2006-2010

**Annex I.B :** Foreseen Cat. B Costs 2006-2010

# 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://cmsdoc.cern.ch/docofficial.shtml>  
(Count closed on October 4, 2006)

Institute FA	Data	
	PhD #	PhD %
Austria	11	0.9%
Belgium	27	2.3%
Brazil	9	0.8%
Bulgaria	5	0.4%
CERN	72	6.2%
China	13	1.1%
Croatia	7	0.6%
Cyprus	3	0.3%
Estonia	2	0.2%
Finland	12	1.0%
France-CEA	14	1.2%
France-IN2P3	38	3.3%
Germany	46	3.9%
Greece	17	1.5%
Hungary	6	0.5%
India	26	2.2%
Iran	3	0.3%
Ireland	1	0.1%
Italy	181	15.5%
Korea	12	1.0%
Mexico	5	0.4%
New Zealand	3	0.3%
Pakistan	3	0.3%
Poland	12	1.0%
Portugal	5	0.4%
RDMS-DMS	24	2.1%
RDMS-Russia	48	4.1%
Serbia	3	0.3%
Spain	34	2.9%
Switzerland-ETHZ	14	1.2%
Switzerland-PSI	11	0.9%
Switzerland-UNIV	5	0.4%
Taipei	11	0.9%
Turkey	18	1.5%
United Kingdom	49	4.2%
USA-DOE	330	28.3%
USA-NSF	88	7.5%
Grand Total	1,168	100.0%

# ANNEX 2

## M&O Cat. A and B Costs by Funding Agency Payments expected in the Year 2007 (kCHF)

Funding Agency	Category A	Category B	Total Category A+B	Total Invoiced
Austria	76.3	88.6	164.9	76.3
Belgium	187.2	227.0	414.2	187.2
Brazil	74.7		74.7	74.7
Bulgaria	34.7		34.7	34.7
CERN	499.2	500.9	1,000.1	499.2
China	107.9	15.8	123.8	107.9
Croatia	58.1	42.0	100.2	58.1
Cyprus	24.9	18.0	42.9	24.9
Estonia	16.6		16.6	16.6
Finland	83.2	100.9	184.1	83.2
France-CEA	97.1	90.1	187.2	97.1
France-IN2P3	263.5	302.5	566.0	263.5
Germany	318.9	378.9	697.8	318.9
Greece	117.9	74.8	192.7	117.9
Hungary	41.6		41.6	41.6
India	211.9	55.5	267.4	211.9
Iran	24.9		24.9	24.9
Ireland	8.3		8.3	8.3
Italy	1,254.9	1,174.9	2,429.8	1,254.9
Korea	99.6	39.5	139.1	99.6
Mexico	41.5		41.5	41.5
New Zealand	24.9		24.9	24.9
Pakistan	24.9	79.2	104.1	24.9
Poland	83.2	131.2	214.4	83.2
Portugal	34.7	40.9	75.6	34.7
RDMS-DMS	199.3		199.3	199.3
RDMS-Russia	355.7	87.0	442.7	355.7
Serbia	24.9	12.0	36.9	24.9
Spain	235.7	148.7	384.4	235.7
Switzerland-ETHZ	97.1	83.1	180.1	97.1
Switzerland-PSI	76.3	61.8	138.0	76.3
Switzerland-UNIV	34.7	31.3	65.9	34.7
Taipei	91.3	66.1	157.4	91.3
Turkey	149.5		149.5	149.5
United Kingdom	339.7	265.9	605.6	339.7
USA-DOE	2,710.1	1,610.1	4,320.2	2,710.1
USA-NSF	722.7	535.8	1,258.5	722.7
<b>Grand Total</b>	<b>8,847</b>	<b>6,262</b>	<b>15,110</b>	<b>8,847</b>

# ANNEX A.1

## M & O Cat. A

### Budget Request for the Year 2007 (kCHF)

Maintenance & Operations (kCHF)				Year
Group	Description	Ref.	Details	2007
Maintenance & Operations	Detector related costs	A.1.01	Magnet	40
		A.1.02	Magnet controls	142
		A.1.03	Magnet power supply	60
		A.1.04	Gas systems	210
		A.1.05	Gas consumption	200
		A.1.06	Cooling systems	180
		A.1.07	Cooling fluids(above -50°C)	200
		A.1.08	External cryogenics	465
		A.1.09	Cryogenic fluids (below -50°C)	40
		A.1.10	Moving/hydraulic systems	100
		A.1.11	Detector safety systems	65
		A.1.12	Shutdown activities	410
		A.1.13	General Technical support	610
		A.1.14	UPS maintenance	80
		A.1.16	Beam pipe & vacuum	240
		A.1.17	Counting & control rooms	200
		Detector related costs Total		
	Secretariat	A.2.01	Secretarial assistance	180
		A.2.02	Economat	15
		A.2.04	Printing and publication	50
	Secretariat Total			245
	Communications	A.3.01	GSM phones; on-call service	20
		A.3.02	Automatic call-back	50
	Communications Total			70
	On-line computing	A.4.01	System management	395
		A.4.02	Data storage, (temporary on disk)	16
		A.4.03	Detector controls	95
		A.4.04	Computers/processors/LANs	690
		A.4.05	Software licenses	60
	On-line computing Total			1,256
	Test beams, calibration facilities	A.5.01	General operation	80
		A.5.02	Common electronics	45
		A.5.03	Electronics pool rentals	20
		A.5.04	Gas systems	10
		A.5.05	Gas consumption	10
	Test beams, calibration facilities Total			165
	Laboratory operations	A.6.01	Assembly areas, clean rooms	30
		A.6.02	Workshops	250
	Laboratory operations Total			280
	General services	A.7.01	Cooling & ventilation	470
		A.7.03	Power distribution system	60
		A.7.04	Heavy transport	610
		A.7.05	Cranes	70
		A.7.06	Cars	40
		A.7.08	Survey	130
		A.7.09	Storage space	70
A.7.10		Common desktop infrastructure	60	
A.7.11		Academic Subsistence	130	
A.7.12		Outreach	220	
General services Total			1,860	
Core Computing Infrastructure & Services	A.9.01	Central computing environment	141	
	A.9.02	Software process service	141	
	A.9.03	User support	141	
	A.9.04	Central production operations	458	
	A.9.05	Hardware	100	
Core Computing Infrastructure & Services Total			980	
Maintenance & Operations Total				8,098
Power	Electricity	A.8.01	Power Consumption	1,600
	Electricity Total			1,600
Power Total				1,600
Grand Total				9,698

# 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	76.3		76.3
Belgium	187.2		187.2
Brazil	62.4	12.3	74.7
Bulgaria	34.7		34.7
CERN	499.2		499.2
China	90.1	17.8	107.9
Croatia	48.5	9.6	58.1
Cyprus	20.8	4.1	24.9
Estonia	13.9	2.7	16.6
Finland	83.2		83.2
France-CEA	97.1		97.1
France-IN2P3	263.5		263.5
Germany	318.9		318.9
Greece	117.9		117.9
Hungary	41.6		41.6
India	180.3	31.7	211.9
Iran	20.8	4.1	24.9
Ireland	6.9	1.4	8.3
Italy	1254.9		1254.9
Korea	83.2	16.4	99.6
Mexico	34.7	6.8	41.5
New Zealand	20.8	4.1	24.9
Pakistan	20.8	4.1	24.9
Poland	83.2		83.2
Portugal	34.7		34.7
RDMS-DMS	166.4	32.9	199.3
RDMS-Russia	332.8	22.9	355.7
Serbia	20.8	4.1	24.9
Spain	235.7		235.7
Switzerland-ETHZ	97.1		97.1
Switzerland-PSI	76.3		76.3
Switzerland-UNIV	34.7		34.7
Taipei	76.3	15.1	91.3
Turkey	124.8	24.7	149.5
United Kingdom	339.7		339.7
USA-DOE	2288.0	422.1	2710.1
USA-NSF	610.1	112.6	722.7
<b>Grand Total</b>	<b>8,098</b>	<b>749</b>	<b>8,847</b>



# ANNEX B.1

## M & O Cat. B

### Budget Request for the Year 2007 (kCHF or FTE)

Year	2007
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Amount (kCHF / FTE)			Detector					Core Computing	Grand Total
Description	Ref.	Details	Tracker	ECAL	HCAL	Muon	Trigger		
Material Resources (kCHF)	B.1.01	Mechanics	10	15		16			41
	B.1.02	Gas-system	0	5	1	13			19
	B.1.04	Cooling system	0	35	1	7			43
	B.1.05	FE electronics	0	0		170			170
	B.1.06	Standard electronics, PS (LV, HV)	548	164	10	304			1,026
	B.1.07	Standard electronics, Crates	0	30	10	47			87
	B.1.08	Standard electronics, RO Modules	748	143	10	324	490		1,715
	B.1.09	Controls, (DCS, DSS)	74	230		121			425
	B.1.10	Sub-Detector Spares	191	0	3	113			308
	B.1.11	Areas	100	180	22	178			480
	B.1.12	Communications	15	21	92	30			158
	B.1.13	Store Items	40	40	132	78			290
	B.1.14	Hired Manpower @CERN	400	535	330	235			1,500
	Material Resources (kCHF) Total		2,126	1,398	611	1,638	490		6,262
Human Resources (FTE)	B.2.01	Technical Manpower @CERN	6	10	9	17	8		50
	B.2.02	Core Computing Manpower @CMS						75	75
Human Resources (FTE) Total			6	10	9	17	8	75	126

# ANNEX B.2

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

Funding Agency	Tracker	ECAL	HCAL	Muon	Trigger
Austria	1.7%				10.6%
Belgium	10.7%				
Brazil					
Bulgaria					
CERN	13.5%	9.8%		4.2%	1.7%
China				1.0%	
Croatia		3.0%			
Cyprus		1.3%			
Estonia					
Finland	4.7%				
France-CEA		6.4%			
France-IN2P3	8.1%	9.3%			
Germany	11.6%			8.1%	
Greece		3.2%			6.1%
Hungary					
India		3.7%	0.6%		
Iran					
Ireland					
Italy	28.1%	14.8%		22.3%	0.9%
Korea				1.4%	3.5%
Mexico					
New Zealand					
Pakistan				4.8%	
Poland					26.8%
Portugal		2.1%			2.2%
RDMS-DMS					
RDMS-Russia		6.2%			
Serbia		0.9%			
Spain				9.1%	
Switzerland-ETHZ	0.8%	4.7%			
Switzerland-PSI	2.1%	1.3%			
Switzerland-UNIV	1.5%				
Taipei		4.7%			
Turkey					
United Kingdom	6.1%	8.5%			3.5%
USA-DOE	11.0%	14.4%	71.7%	35.3%	32.2%
USA-NSF		5.6%	27.8%	13.8%	12.6%
<b>Grand Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

All subsystems sharing by responsibility

# ANNEX B.3

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

Estimated Costs Incurred in 2007 (kCHF)

Funding Agency	Tracker	ECAL	HCAL	Muon	Trigger	Total
Austria	36.7				52.0	88.6
Belgium	227.0					227.0
Brazil						
Bulgaria						
CERN	286.6	137.2		68.6	8.5	500.9
China				15.8		15.8
Croatia		42.0				42.0
Cyprus		18.0				18.0
Estonia						
Finland	100.9					100.9
France-CEA		90.1				90.1
France-IN2P3	173.1	129.4				302.5
Germany	246.5			132.4		378.9
Greece		45.0			29.8	74.8
Hungary						
India		52.1	3.4			55.5
Iran						
Ireland						
Italy	598.4	206.3		366.0	4.3	1,174.9
Korea				22.4	17.0	39.5
Mexico						
New Zealand						
Pakistan				79.2		79.2
Poland					131.2	131.2
Portugal		30.0			10.9	40.9
RDMS-DMS						
RDMS-Russia		87.0				87.0
Serbia		12.0				12.0
Spain				148.7		148.7
Switzerland-ETHZ	17.0	66.1				83.1
Switzerland-PSI	43.8	18.0				61.8
Switzerland-UNIV	31.3					31.3
Taipei		66.1				66.1
Turkey						
United Kingdom	130.7	118.2			17.0	265.9
USA-DOE	234.3	201.4	437.6	579.0	157.8	1,610.1
USA-NSF		78.6	169.7	226.0	61.6	535.8
<b>Grand Total</b>	<b>2,126</b>	<b>1,398</b>	<b>611</b>	<b>1,638</b>	<b>490</b>	<b>6,262</b>

# ANNEX I.A

## M & O Cat. A Costs 2006-2010

(All Figures in kCHF)

All Amounts in kCHF					Year					Grand Total
Group	Description	Ref.	Details	Type (1)	2006	2007	2008	2009	2010	
Maintenance & Operations	Detector related costs	A.1.01	Magnet	C	50	40	40	30	30	190
		A.1.02	Magnet controls	C	70	110	110	110	110	510
				C	32	32	32	32	32	160
		A.1.03	Magnet power supply	O	10	30	30	20	20	110
				C	10	30	20	20	20	100
		A.1.04	Gas systems	O	80	160	160	160	160	720
				C	30	50	50	50	50	230
		A.1.05	Gas consumption	C	150	200	300	300	300	1,250
		A.1.06	Cooling systems	O	120	150	190	190	190	840
				C	50	30	30	30	30	170
		A.1.07	Cooling fluids(above -50°C)	C	15	200	200	200	145	760
		A.1.08	External cryogenics	O	180	345	345	345	345	1,560
				C	250	120	30	30	30	460
		A.1.09	Cryogenic fluids (below -50°C)	C	24	40	40	40	40	184
		A.1.10	Moving/hydraulic systems	O	50	50	50	50	50	250
				C	20	50	30	30	30	160
		A.1.11	Detector safety systems	O	25	25	25	25	25	125
				C	20	40	40	40	40	180
		A.1.12	Shutdown activities	O	110	390	390	390	390	1,670
				C	20	20	20	20	20	100
		A.1.13	General Technical support	O	550	550	550	550	550	2,750
				C	50	60	60	60	50	280
		A.1.14	UPS maintenance	C	50	80	80	80	80	370
		A.1.15	Electronics pool rentals	C						
		A.1.16	Beam pipe & vacuum	O	40	120	120	120	120	520
				C	40	120	120	120	120	520
		A.1.17	Counting & control rooms	O	120	120	120	120	120	600
				C	40	80	120	120	100	460
	Detector related costs Total				2,206	3,242	3,302	3,282	3,197	15,229
	Secretariat	A.2.01	Secretarial assistance	O	180	180	225	225	225	1,035
		A.2.02	Economat	C	15	15	15	15	15	75
		A.2.04	Printing and publication	C	50	50	100	100	100	400
	Secretariat Total				245	245	340	340	340	1,510
	Communications	A.3.01	GSM phones; on-call service	C	20	20	20	20	20	100
		A.3.02	Automatic call-back	C	0	50	100	100	100	350
	Communications Total				20	70	120	120	120	450
	On-line computing	A.4.01	System management	O	347	395	670	980	980	3,372
		A.4.02	Data storage, (temporary on disk)	C	25	16	27	47	186	301
		A.4.03	Detector controls	C	70	95	120	145	145	575
		A.4.04	Computers/processors/LANs	C	390	690	1,828	2,392	2,910	8,210
		A.4.05	Software licenses	C	60	60	90	120	150	480
	On-line computing Total				892	1,256	2,735	3,684	4,371	12,938
	Test beams, calibration facilities	A.5.01	General operation	O	80	60	40	40	30	250
				C	20	20	20	20	10	90
		A.5.02	Common electronics	C	45	45	15	15	15	135
		A.5.03	Electronics pool rentals	C	30	20	20	20	20	110
		A.5.04	Gas systems	C	10	10	10	10	10	50
		A.5.05	Gas consumption	C	10	10	10	10	10	50
		A.5.06	External cryogenics	C						
	Test beams, calibration facilities Total				195	165	115	115	95	685
	Laboratory operations	A.6.01	Assembly areas, clean rooms	C	40	30	20	20	20	130
		A.6.02	Workshops	O	220	220	220	220	220	1,100
		A.6.03	Laboratory instruments	C	30	30	30	30	30	150
	Laboratory operations Total				290	280	270	270	270	1,380

All Amounts in kCHF					Year						
Group	Description	Ref.	Details	Type (1)	2006	2007	2008	2009	2010	Grand Total	
	General services	A.7.01	Cooling & ventilation	O	120	175	195	235	235	960	
				C	120	295	315	355	355	1,440	
		A.7.03	Power distribution system	C	50	60	60	60	60	290	
		A.7.04	Heavy transport	O	490	550	400	280	280	2,000	
				C	60	60	60	60	60	300	
		A.7.05	Cranes	C	70	70	50	50	50	290	
		A.7.06	Cars	C	40	40	30	30	30	170	
		A.7.08	Survey	O	120	120	120	60	60	480	
				C	10	10	5	5	5	35	
		A.7.09	Storage space	C	100	70	50	50	50	320	
		A.7.10	Common desktop infrastructure	C	60	60	50	45	40	255	
		A.7.11	Academic Subsistence	O	130	130	60	50	40	410	
		A.7.12	Outreach	O							
				C		60	170	170	170	170	740
	General services Total				1,430	1,860	1,615	1,500	1,485	7,890	
	Core Computing Infrastructure & Services	A.9.01	Central computing environment	O	519	141	176	176	176	1,188	
		A.9.02	Software process service	O	217	141	176	176	176	886	
		A.9.03	User support	O	273	141	264	264	264	1,206	
		A.9.04	Central production operations	O	308	458	616	616	616	2,614	
		A.9.05	Hardware	C	100	100	100	100	100	500	
	Core Computing Infrastructure & Services Total				1,417	980	1,332	1,332	1,332	6,393	
Maintenance & Operations Total					6,695	8,098	9,829	10,643	11,210	46,475	
Power	Electricity				700	1,600	1,800	1,800	1,800	7,700	
Power Total					700	1,600	1,800	1,800	1,800	7,700	
Grand Total					7,395	9,698	11,629	12,443	13,010	54,175	

(1)

O=Operation, manpower intensive  
C=Consumables

# ANNEX I.B

## M& O Cat. B Costs 2006-2010 for all CMS Subdetectors

(Material Resources in kCHF, Human Resources in FTE)

Amount (kCHF/FTE)			Year						
Description	Detector	Subsystem	2006	2007	2008	2009	2010	Grand Total	
Material Resources	Tracker	Pixel	192	120	698	714	714	2,438	
		SST	1,085	2,006	1,455	1,455	1,455	7,456	
	Tracker Total		1,277	2,126	2,153	2,169	2,169	9,894	
	ECAL		1,390	1,398	1,324	1,324	1,324	6,759	
	HCAL		1,129	611	588	533	1,096	3,955	
	Muon	Barrel Alignment	35	29	24	24	24	136	
		Drift Tubes	604	373	607	607	607	2,798	
		EMU	908	805	574	576	576	3,439	
		Forward RPC	192	157	157	157	157	820	
		LinkAlignment	60	33	16	16	16	141	
		RPC Barrel	278	241	228	228	228	1,203	
	Muon Total		2,077	1,638	1,606	1,608	1,608	8,537	
	Trigger		490	490	490	490	490	2,450	
Material Resources Total			6,362	6,262	6,161	6,124	6,687	31,596	
Human Resources	Tracker	Pixel			2	2	2	6	
		SST	4	6	6	6	6	28	
	Tracker Total		4	6	8	8	8	34	
	ECAL		8	10	10	10	10	48	
	HCAL		11	9	9	9	9	48	
	Muon	Barrel Alignment	2	2	1	1	1	7	
		Drift Tubes	5	5	4	4	4	22	
		EMU	5	5	5	5	5	25	
		Forward RPC	2	2	2	2	2	10	
		LinkAlignment	1	1	1	1	1	5	
		RPC Barrel	2	2	2	2	2	10	
	Muon Total		17	17	15	15	15	79	
	Trigger		8	8	8	8	8	40	
Core Computing		70	75	81	81	81	388		
Human Resources Total			118	126	131	131	131	637	