

M&O Main Cost Estimates in KCHF		M&O Category																M&O Main Cost Estimates in KCHF															
		O=Operations				C=Consumables												TOTAL		TOTAL		TOTAL		TOTAL									
		2002	2002	2002	2002	2003	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006	2007	2007	2007	2007	2002/2007		2002/2007		2002/2007		2002/2007	
		ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb
Detector related costs		5	219	199		150	452	617	5	340	597	874	165	624	2,142	1,564	691	1,650	4,298	2,949	1,044	1,803	4,298	2,994	1,044	Detector related costs		4,572	12,006	9,197	2,949		
Magnet	A M																																
Magnet	A O													40	80	12		40	100	20		40	100	20		Magnet				120	280	52	
	A C													50	20	10		50	25	15		50	25	15						150	70	40	
Magnet controls	A O													46	210			61	180			61	180			Magnet controls				169	570		
	A C													11	59			15	45			15	45							42	149		
Magnet power supply	A O		4				12				12			8	8	20	4	8	8	20	4	8	8	20	4	Magnet power supply				24	52	60	12
	A C		5				15				15			10	75		5	10	75	30	5	10	75	30	5					30	260	60	15
Gas systems	A O		50			30	50	30		45	50	40		60	50	90	120	180	50	160	120	180	50	160	120	Gas systems				495	300	480	360
	A C					10		30		20		40		30	50	40	20	50	100	50	20	50	100	50	20					160	250	210	60
Gas consumption	A O																									Gas consumption							
	A C		50	50			70	100		150	200	100		110	200	200	300	312	200	300	300	455	200	300	300					878	870	1,150	1,000
Cooling systems	A O		50			30	110	30		45	110	70		60	110	150	20	180	110	190	20	180	110	190	20	Cooling systems				495	600	630	60
	A C					10	5	20		20	10	30		30	15	30	10	50	15	40	10	50	15	30	10					160	60	150	30
Cooling fluids(above -50°C)	A O		5				5				5				5		5		5		5		5		5	Cooling fluids(above -50°C)				30	30	15	
	A C		5				5				15				20	15	10		20	10	10		20	10	10					85	55	30	
External cryogenics	A O			60				210				170			700	250			1,040	300			1,040	300		External cryogenics				2,780	1,290		
	A C														320	30			430	30			430	30						1,180	90		
Proximity cryogenics	A O																									Proximity cryogenics							
	A C																																
Cryogenic fluids (below -50°C)	A O																									Cryogenic fluids (below -50°C)							
	A C			24				42				24				24				24				24								162	
Moving/hydraulic systems	A O		50	50		40	100	50		40	100	50	5	40	100	50	5	80	50	50	5	80	50	50	5	Moving/hydraulic systems				280	450	300	15
	A C			15		10	30	20		10	30	50		10	30	25	10	10	30	25	10	10	30	30	10					50	150	165	30
Detector safety systems	A O							15		20		20		40		25	10	40		25	10	40		25	10	Detector safety systems				140		110	30
	A C									40				40		10		40	20	10		40	20	10						160	40	30	
Detector-specific radiation protection	A O																									Detector-specific radiation protection							
	A C									10				10	20			10	20			10	20							40	60		
Shutdown activities	A O																	160	500	530	150	160	500	470	150	Shutdown activities				320	1,000	1,000	300
	A C																	35		20		35		20						70		40	
Detector (re-)integration & survey	A O																									Detector (re-)integration & survey							
	A C																																
General Technical support	A O													180				120	300	350		120	300	350		General Technical support				240	600	880	
	A C													25				710	80			710	80							1,420	165		
UPS maintenance	A O		5			10		5		10	30	15		20	30	25		20	30	25		20	30	25		UPS maintenance				85		120	95
	A C						50			50				50	10			50	20			50	50							250	80		
Electronics pool rentals	A O																									Electronics pool rentals							
	A C					10		20		20	50	50		38	100	100		48	100	100		58	200	100						175		470	350
Beam pipe & vacuum	A O																	80	120	80		80	120	80		Beam pipe & vacuum				160	240	240	160
	A C																	80	120	80		80	120	80						160	240	240	160
Counting & control rooms	A O							50		60		100		60		100	10	60		100	30	60		100	30	Counting & control rooms				240		450	70
	A C									50				50	50	5		50	50	15		50	50	15						200		150	35
Secretariat		41	40	45	45	119	110	115	120	160	170	205	125	209	245	205	165	217	270	300	180	226	290	300	195	Secretariat				972	1,125	1,170	830
Secretarial assistance	A O					70	45	70	70	100	90	140	70	140	140	140	105	140	140	185	105	140	140	185	105	Secretarial assistance				590	555	720	455
	A C																																
Economat	A O																									Economat							
	A C	15	10	15	15	20	15	15	15	25	15	15	20	30	15	15	20	35	20	15	20	40	20	15	20					165	95	90	110
Fax, photocopiers, printers	A O																									Fax, photocopiers, printers							
	A C																																
Printing and publication	A O																									Printing and publication							
	A C	26	30	30	20	29	50	30	25	35	65	50	25	39	90	50	25	42	110	100	35	46	130	100	50					217	475	360	180

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		O-Operations					C-Consumables					O-Operations					C-Consumables							TOTAL	TOTAL	TOTAL	TOTAL									
		2002	ALICE	ATLAS	CMS	LHCb	2003	ALICE	ATLAS	CMS	LHCb	2004	ALICE	ATLAS	CMS	LHCb	2005	ALICE	ATLAS	CMS	LHCb	2006	ALICE	ATLAS	CMS	LHCb	2007	ALICE	ATLAS	CMS	LHCb	2002/2007	2002/2007	2002/2007	2002/2007	
Communications		15	100	14			15	115	17			15	150	20			15	220	21			40	270	22			40	270	22					140	1,125	116
GSM phones	A O		5					5					10					20					20					20							80	
GSM phones	A C	10					10					10					10					10					10							60		
GSM phones	B O		80	12				80	15				90	18				100	18				5	100	18			5	100	18				10	550	99
GSM phones	B C																						20					20		40						
Automatic call-back	A O																	50					100					100		250						
Automatic call-back	A C	5					5					5					5					5					5			30						
Automatic call-back	B O		15	2				30	2				50	2				50	3				50	4				50	4	245	17					
Automatic call-back	B C																																			
On-line computing (no rec. media)		340	80				10	345	260			20	820	1,150	150		238	1,715	1,560	570		471	2,935	1,990	740		1,167	3,955	7,640	770		1,906	10,110	12,680	2,230	
System management	A O	240					10	240	70			20	360	180	110		180	480	660	400		320	600	870	400		450	600	1,100	400		980	2,520	2,880	1,310	
System management	A C																																			
Data storage, (temporary on disk)	A O																																			
Data storage, (temporary on disk)	A C											10						50	10				100	40			23	500	40							
Data recording media (permanent on tapes/cassettes)	X X																																			
Data recording media (permanent on tapes/cassettes)	X X																																			
removed from Cat A totals	X X																																			
Detector controls	A O							40					90					150					511	3,325	1,209	200	1,516	6,150	1,503	580						
Detector controls	A C																																			
Computers/processors/LANs	A O	20					20	50				25	30	40	50		50	30	60	190		102	30	80	190		177	150	280	430						
Computers/processors/LANs	A C																																			
Software licenses	A O	10						15					320	720				1,025	560	50			10	2,050	680	50	443	3,070	5,650	50						
Software licenses	A C																																			
Common desktop infrastructure	A O	40	80				40	100				90	110	30			33	150	100	30		91	225	130	30		149	225	160	30						
Common desktop infrastructure	A C																																			
Common desktop infrastructure	A C	30					30					30					30					30					30			60						
Test beams, calibration facilities		305	645	390	220		227	655	490	250		177	605	410	270		177	165	410	230		177	120	260	160		177	120	200	140		1,241	2,310	2,160	1,270	
General operation	A O		60					60					60					60					40					20								
General operation	A C	30					30					30					30					30					30									
Common electronics	A O																																			
Common electronics	A C	46	70	20	25		70	20	25			70	40	25			70	40	15			70	10	15			70	10	15							
Electronics and DAQ	B O		40					40					40					40					20					20								
Electronics and DAQ	B C		20					20					20					20					10					10								
Counting & control rooms	A O		5					5					5					5					5					5								
Counting & control rooms	A C		5					5					5					5					5					5								
Gas systems	A O	40					45	40				45	40				45	40				25	40				25	40								
Gas systems	A C	7					7					10	5				7					10	5				7									
Gas consumption	A O	20					20					20					20					20					20									
Gas consumption	A C		10	20				10	30				10	30				10	20				10	10				10	10							
Gas systems	B O																																			
Gas systems	B C		20					20					20					20					10					10								
Gas consumption	B O																																			
Gas consumption	B C		20					20					20					20					10					10								
External cryogenics	A O	260					260					340																								
External cryogenics	A C	25					55					50																								
Proximity cryogenics	A O																																			
Proximity cryogenics	A C																																			
Safety & radioprotection	A O																																			
Safety & radioprotection	A C	10					10					10					10					10					10									
Irradiations	B O																																			
Irradiations	B C		50	20	10			50	20	10			35	20	10			25	20	10			5	20	10			5	20	10						
Modifications	A O		10					60					10					10					10					10								
Modifications	A C	82					50					10																								
Modifications	B O																																			
Modifications	B C																																			
Electronics pool rentals	A O																																			
Electronics pool rentals	A C	70	30	30			70	30	30			70	30	30			70		30			70		20			70		20							
Electronics pool rentals	B O																																			
Electronics pool rentals	B C		210	120	100			190	120	120			80	120	140			70	120	120			45	80	80			45	40	60						

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M&O Category
O=Operations
C=Consumables

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		2002	2002	2002	2002	2003	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006	2007	2007	2007	2007	TOTAL	ALICE	ATLAS	CMS	LHCb	
		ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	ALICE	ATLAS	CMS	LHCb	2002/2007	ALICE	ATLAS	CMS	LHCb	
Laboratory operations		160	20	65	280	180	20	55	280	180	20	45	280	210	220	45	280	910	270	35	280	875	270	25	Laboratory operations	1,400	2,515	820	270		
Assembly areas, clean rooms, active storage areas	A O				60				60				60				60				60				Assembly areas, clean rooms, active storage areas	300					
Assembly areas, clean rooms, active storage areas	A C	50		50		50		40		50		30		50	20	30		50	20	20		50	20	10	Assembly areas, clean rooms, active storage areas		300	60	180		
Workshops	B O														20			320	20			320	20		Workshops		640	60			
Workshops	B C																								Workshops	600	180	550	30		
Laboratory instruments	A O				50				50				50				50				50				Laboratory instruments	250					
Laboratory instruments	A C	20			20				20				55				55				55				Laboratory instruments		225				
Electronics pool rentals	B O																	145				125			Electronics pool rentals						
Electronics pool rentals	B C																								Electronics pool rentals	250					
General services		792	1,339	766	791	859	1,913	1,047	997	1,289	2,922	1,418	1,208	1,483	4,016	2,284	2,274	3,284	5,290	3,970	2,895	3,916	6,120	3,995	2,890	General services	11,623	21,600	13,480	11,055	
Cooling & ventilation	A O	36	52	48	28	72	104	96	56	108	156	144	84	144	208	192	112	180	280	240	140	180	280	240	140	Cooling & ventilation	720	1,080	960	560	
Power	A O	50	330	95	50	50	540	280	150	383	1,050	350	100	485	2,070	1,000	1,000	1,644	3,270	2,000	1,600	2,226	4,070	2,000	1,600	Power	4,838	11,330	5,725	4,500	
Power distribution system	A O	15			15					20				20				30				30				Power distribution system		130			
Heavy transport	A C	5	10		5	10				5	20			5	30			160	5	30		160	5	30	Heavy transport	320	30	130			
Cranes	A O	100			300				400				400			100	120	200	250	20	120	200	250	20	Cranes	240	1,600	500	140		
Cars	A C	50			90				140		190		140		190		160	90		160	160	90		160	Cars		50	140			
Safety & radioprotection	A O	40			90				140		190		140		190		160	90		160	160	90		160	Safety & radioprotection	320	590	700			
INB compliance	A C	5	30		10	30			20	50		20	50		20	50		20	70		20	70		20	INB compliance		95	300			
Radioactive waste disposal	A O	10	5		15	5			20	5			20	5			20	5		20	5		20	5	Radioactive waste disposal	105	30				
Access system	A C	25	30	15	25	30	15		25	40	30		25	40	30		25	30	30		25	30	30		Access system		150	200	150		
Elevators	B O																								Elevators	150					
Gerant de site	B C																								Gerant de site						
Flood control	C O	15			15				15				15				15				15				Flood control	130		270	150		
Insurance (CERN standard)	C C	10	5		15	10	20		20	30	20	20	20	20	30	20	20	20	140	20	20	20	140	20	20	Insurance (CERN standard)	80	365	95	100	
Cleaning	C O	160	160	160	160	160	160	160	160	160	160	160	120	120	120	120	80	80	80	80	80	80	80	80	80	Cleaning	760	760	160	760	
Survey	C C	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Survey	60	60	20	60	
Passive storage space	C O	30	10	30	30	10	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	Passive storage space	45	90	90	45	
Access system	C C	30	20	10	30	30	20	10	30	30	60	30	30	30	60	30	30	30	60	30	30	30	60	30	30	Access system	180	280	140	180	
Elevators	C O	20	15	20	20	15	20	20	20	30	20	20	20	20	30	20	20	20	30	20	20	20	30	20	20	Elevators	120	150	120	120	
Gerant de site	C C	15			15				30				30				30				30				Gerant de site		150				
Flood control	C O	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	Flood control	1,500	1,500	1,500	1,500	
Insurance (CERN standard)	C C	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Insurance (CERN standard)	60	60	60	60	
Cleaning	C C	20	30	20	30	10	20	10	10	10	20	10	10	10	20	10	10	10	20	10	10	10	20	10	10	Cleaning	70	130	70	80	
Survey	C O	100	50	50	100	100	50	50	100	100	100	100	150	100	150	150	200	200	200	200	200	200	200	200	200	Survey	850	700	750	850	
Passive storage space	A O																								Passive storage space						
Passive storage space	A C																								Passive storage space						
Passive storage space	B O																								Passive storage space						

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		2002	2002	2002	2002	2003	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006							2007	2007	2007	2007		
Common desktop infrastructure	A O		20	20				20	25			20	35			30	50				30	50			30	50	Common desktop infrastructure			150	230		
Office space	A C			10				10				10				10					50			10			Office space		75		60		
Consultancy	C C	10	15	15	10	10	15	15	10	10	20	20	10	10	20	20	10	10	20	20	10	20	20	10	20	20	Consultancy	60	110	110	60		
			90	130	20		90	130	40		90	130	20		200	90	480	200		200	80	480	200		200	80	480	200		600	520	1,830	680
Reviewing	A O			20				20				20				20					20			20			Reviewing				120		
Engineering	A O		20				20				20				10						10			10			Engineering		600	300	1,650	680	
Training	A O			10				10				10				10					10			10			Training				60		
Outreach	A C		20				20				20				20						20			20			Outreach		120	600	360	90	
Outreach	A O													50							100			50			Outreach			200			
	A C		20	50	60	10	20	50	60	10	20	50	60	10	20	75	60	20	20	100	60	20	20	75	60	20		120	400	360	90		
GRAND TOTALS A_i + B_i + C_i		1,163	2,898	1,790	1,165	1,665	3,810	2,854	1,494	2,286	5,449	4,417	2,013	3,232	8,723	7,003	4,216	6,299	14,143	10,549	5,296	7,789	15,903	16,209	5,306	GRAND TOTALS A_i + B_i + C_i	22,434	50,926	42,822	19,490			
no data recording media																											no data recording media						
A TOTAL (no data rec. media)	A _i	503	2,058	1,030	371	1,015	2,995	2,084	667	1,616	4,629	3,487	1,163	2,542	7,963	5,993	3,375	5,534	12,473	9,349	4,419	7,009	14,238	15,019	4,434	A TOTAL (no data rec. media)	18,219	44,356	36,962	14,429			
B TOTAL under above headings	B _i		260	350	124		240	365	147		115	395	170		95	425	151		805	335	112		770	295	92	B TOTAL under above headings		2,285	2,165	796			
C TOTAL	C _i	660	580	410	670	650	575	405	680	670	705	535	680	690	665	585	690	765	865	865	765	780	895	895	780	C TOTAL	4,215	4,285	3,695	4,265			
Additional subsystem B costs (not included under above headings)	B _s		465				600			130	370			767	2,612			1,064	7,215	8,345	1,900	1,165	8,800	8,345	2,200	Additional subsystem B costs (not included under above headings)	3,125	20,062	16,690	4,100			
B _i + B _s			725	350	124		840	365	147	130	485	395	170	767	2,707	425	151	1,064	8,020	8,680	2,012	1,165	9,570	8,640	2,292	B _i + B _s	3,125	22,347	18,855	4,896			
A _i + B _i + B _s		503	2,783	1,380	495	1,015	3,835	2,449	814	1,746	5,114	3,882	1,333	3,309	10,670	6,418	3,526	6,598	20,493	18,029	6,431	8,173	23,808	23,659	6,726	A _i + B _i + B _s	21,345	66,703	55,817	19,325			
A _i + B _i + B _s + C _i		1,163	3,363	1,790	1,165	1,665	4,410	2,854	1,494	2,416	5,819	4,417	2,013	3,999	11,335	7,003	4,216	7,363	21,358	18,894	7,196	8,953	24,703	24,554	7,506	A _i + B _i + B _s + C _i	25,560	70,988	59,512	23,590			
Operation sub-items		571	1,441	818	597	1,027	1,966	1,391	773	1,218	2,523	1,804	1,094	1,738	3,361	3,472	1,884	2,889	4,488	5,325	2,051	3,029	4,438	5,475	2,031	Operation sub-items	10,473	18,217	18,285	8,430			
Consumables sub-items		592	1,457	972	568	638	1,844	1,463	721	1,068	2,926	2,613	919	1,494	5,362	3,531	2,332	3,410	9,655	5,224	3,245	4,759	11,465	10,734	3,275	Consumables sub-items	11,962	32,709	24,537	11,060			