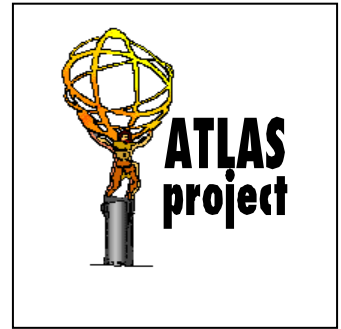


CERN-RRB-2009-024

ATLAS Resources Review Board, April 28, 2009



2008 and 2010 ATLAS M&O Budgets



CERN-RRB-2009-024

ATLAS Resources Review Board, April 28, 2009

For RRB approval




Part 1

Closing Report for 2008 ATLAS M&O Budgets

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to approve the final M&O payments for 2008.

The RRB approved the year 2008 Maintenance and Operation (M&O) budget in October 2007 (CERN-RRB-2007-073) for 14 109 kCHF (Category-A), including cost of energy of 2 200 kCHF, and 6 866 kCHF (Category-B), respectively.

M & O B U D G E T
REPORT ELEMENTS
 Payment Summary
 Activity Description
 Table References

1. M&O Budgets for 2008

The final M&O payments in 2008 amounted to 12 826 kCHF in Category-A (including energy) and 6 821 kCHF in Category-B. The remaining open commitments amounted to 1 715 kCHF in total (A+B). The total payments were 153 kCHF above the budgeted income (i.e. invoices sent out) due to the longer shut-down period and extended use of available technical services.

In 2008, the Category-A costs covered various technical services invoiced by CERN such as access and cranes operation, site management, providing gases and coolants, running the cooling and ventilation plants (5.2 MCHF) as well as operating the cryogenic plants at Point 1 (3.0 MCHF) and operating the TDAQ system (2.1 MCHF). Core computing infrastructure services were also provided for and this amounted to 1.8 MCHF.

The CERN member state share of the energy cost for 2008 was paid by CERN in full and partially for those non-member states contributing to the machine construction outside the M&O budget. The cost of energy consumption for 2008 amounted to 0.7 MCHF (non-member state part).

In Category B, the main costs were related to operation of the electronics systems as well as carrying out repairs in-situ in the ATLAS cavern. The above activities included related mechanics (0.3 MCHF), electronics replacements and pool rentals (2.0 MCHF) and area operation and purchasing of store items (0.2 MCHF). Sub-detector spares were purchased worth 2.5 MCHF. The hired technical manpower supported all these activities (1.9 MCHF).

The value of in-kind contributions in Category-A amounted to 1.2 MCHF and to 0.1 MCHF in Category-B.

As a consequence of the 2008 payments and amortization of the remaining open commitments from the past, the cumulative budget balance (i.e. the approved budgets less executed payments and remaining open commitments) amounts to + 65 kCHF in Category-A and + 14 kCHF for Category-B. Due contributions in 2008 amounted to 1.2 MCHF in Category-A and 0.4 MCHF in Category-B.

For Category-A, the status of contributions (sent invoices less received contributions) are shown in the document "Financial Report" (CERN-RRB-2009-027).

Table 1 summarizes the 2008 M&O payments per system. The participating institutes provided, as part of their deliverable obligations, 41 man-years for detector-related activities and 87 man-years in core computing tasks.

Table 2 shows the 2008 M&O contributions made for 2008 by the Funding Agencies for each system.

It should be noted that in order for ATLAS to pay for the 2008 expenses as well as for the past open commitments, permission was given by the CERN Management at the very end of the year to exceptionally overdraft on the M&O-A accounts while waiting for due contributions.

ATLAS M+O (A) and (B) Payments in 2008 (kCHF)

Item & Cost Driver (by RRB SG Headings)	Cat. A									Cat. B	Item & Cost Driver (by RRB SG Headings)
	M&O	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Comp.	M&O	
Detector related costs Cooling systems, power supplies Magnet Cryo Operations	6,435		5		83	1		178		267	Mechanical components, structures
Secretariat 2 FTE charged to ATLAS Publications, consumables	290	237	274	129	673	222	311	105		1,951	Standard electronics Crates, electronics pool rentals
Collaborative tools GSM phones Computer network connections	115							5		5	Detector controls
Core computing Services	1,825	1		3	17	18	4			43	Areas Test-beam activities, system tests (ID)
On-line computing Detector controls Software licences	1,960	1	6	1	16	7	7	6		44	Communications
Test beams On-line computing support TDAQ common electronics	90	5	5	12	83	8	24	42		179	Store items
Laboratory operations Assembly areas, workshops TDAQ laboratory equipment	75	142	581	600		1,134				2,457	Sub-detector spares
General services Heavy handling Technical support, storage Survey Outreach Energy	2,036										
TOTAL	12,826	386	871	745	872	1,390	346	336	0	4,946	(Excluding hired manpower for Category B)
Hired manpower at CERN (in kCHF)	incl. above	237	151	24	503	250	220	490		1,875	
Institute manpower (in FTE)	0	5	5	5	11	2	5	8	87	128	
TOTAL M&O FOR A	12,826	623	1,022	769	1,375	1,640	566	826	0	6,821	TOTAL M&O FOR B

Notes:

1. Category A are common items charged based on the number of authors holding a PhD or equivalent. Category B is system-specific and is based on CORE sharing.

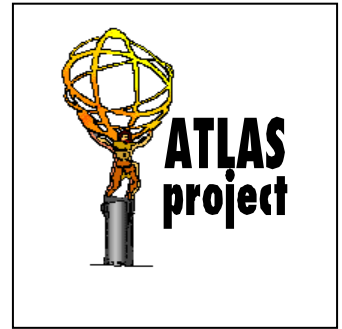
**M+O Contributions (cash and in-kind)
for ATLAS in 2008 by Funding Agency (kCHF)/rev**

4/22/2009

Funding Agency	Cat.A items*	Category-B item contributions						Total Cat. B	Total A + B	Core comp. Categ.B (FTE)	
		Pixel	SCT	TRT	IDGen	LAr	TileC				Muon
Argentina	17					1			1	18	
Armenia	9								0	9	
Australia	49		28		22				50	99	0
Austria	51			10		9	11		30	81	
Azerbaijan	9					1			1	10	
Belarus									0	0	
Brazil	47								0	47	
Canada	517					308			308	825	3
Chile	27							1	1	28	
China NSFC+MSTC						3		8	11	11	
Colombia	9							1	1	10	
Czech Republic	221	4	2		2			6	14	235	1
Denmark	73			40	11				51	124	
France IN2P3	675	115			29	241	80		465	1140	7
France CEA	183					91		35	126	309	1
Georgia	35					1		1	2	37	
Germany BMBF	617	249	60		111	53		47	520	1137	3
Germany DESY	154					50		56	106	260	1
Germany MPI	26		46		36	36		23	141	167	1
Greece	213							19	19	232	
Israel	161							8	8	169	0
Italy	1283	329			125	80	61	201	796	2079	6
Japan	527		112		88			113	313	840	0
Morocco	70					5			5	75	
Netherlands	154		25		23			59	107	261	2
Norway	88		42		38				80	168	2
Poland	110		1	3	2				6	116	1
Portugal							76		76	76	
Romania							14		14	14	
Russia	137		2	109	81	67	24	39	322	459	1
JINR									0	0	
Serbia	35					2			2	37	
Slovak Republic	26					4			4	30	
Slovenia	61		2		1				3	64	
Spain	352		35		28	53	126		242	594	2
Sweden	161		14	44	23	11	19		111	272	
Switzerland	161		57		45	9			111	272	
Taipei	70	2	1		1	1			5	75	2
Turkey	96					2		2	4	100	
United Kingdom	1151		380		413				793	1944	10
US DOE + NSF	2826	237	24	512	148	294	290	257	1762	4588	30
CERN	946		45	264	101	125	94	22	651	1597	15
total contributions	11,346	936	876	982	1,328	1,447	801	892	7,262	18,608	87
total payments	12,826	623	1022	769	1375	1640	566	826	6,821	19,647	

Notes:

*Following invoices sent to Funding Agencies; including energy cost adjustments



CERN-RRB-2009-024

ATLAS Resources Review Board, April 28, 2009

For RRB to take note




Part 2

Preliminary 2010 ATLAS M&O Budget Estimates

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to take note of the preliminary M&O budget estimates for 2010.

The first M&O budget estimates for the ATLAS detector in 2010 amount to 22.7 MCHF in payments. In 2010, the ATLAS detector will be running in full operation mode at Point 1, its performance being closely monitored and its functionalities constantly checked and maintained. The supporting technical infrastructure will also be fully operational (e.g. cryogenics, gases, coolants, access operations, cooling and ventilation plant).

M & O B U D G E T
R E P O R T E L E M E N T S
 Budget summary
 Activity Description
 Table References

1. Preliminary M&O Budget Estimate for 2010

The preliminary 2010 M&O payments for Category-A items are 16.0 MCHF (including energy) and 6.7 MCHF for Category-B items. Both Category-A and B-activities stabilize and slightly decrease w.r.t 2009.

The dominant part of the cost in Category-A is providing the required technical services (e.g. detector access, gas systems, heavy handling, crane operations, cooling and ventilation maintenance services, electricity; amounting to 8.2 MCHF). Another cost driver is the operation of the LAr and magnet system at an annual level of 2.4 MCHF. The general support for running the TDAQ system and replacement of equipment is 3.4 MCHF. Core computing (infrastructure) services are planned at 1.9 MCHF. Work is in progress to verify the above cost estimates, taking into account updated schedule information. Only minor changes are nevertheless expected before submitting the final 2010 budget in October.

In Category-B, a slight decrease in maintenance activities is planned as the detector systems reach full operation status and becomes more stable.

The main Category-B cost driver is related to running the detector modules and related electronics (2.1 MCHF). Sub-detector spares amortization are planned at 2.0 MCHF, including payment advancements arranged internally within ATLAS. Scheduled maintenance work of detector structures and mechanics amounts to 0.5 MCHF. The cost of hired technical manpower to run the facilities is estimated at 1.6 MCHF.

Category-B also includes core computing tasks such as core computing management, software project management, data management and computer operations. An estimated manpower effort of 98 FTEs is planned to be provided in full as in-kind contributions, details yet to be confirmed.

Figure 1 provides a summary of actual payments up to end of 2008 and a forward look to M&O budget estimates up to 2012. The breakdown between Categories A and B is provided in **Table 3**. The Category-B costs include also the replacement of the Pixel b-layer, currently planned to be installed by 2013.

Table 4 gives the breakdown of the M&O (Categories A and B) budget estimates for 2010.

Table 5 shows the expected contributions for 2010 for each Funding Agency and system (Categories A and B). The Category-A contributions are based on authors and are split into two columns; the second column “budgeted” shows the cost sharing including electricity costs and the first column “invoiced” shows the amount to be invoiced to the Funding Agencies, taking into account the energy cost adjustments.

Figure 1. Evolution of M&O Budget up to 2012 (MCHF)

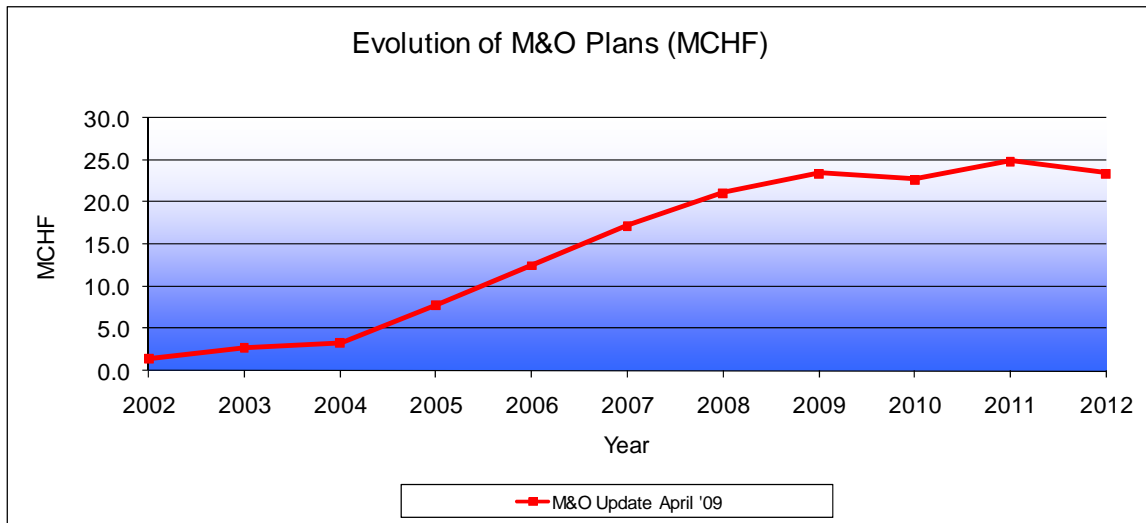


Table 3. Evolution of M&O Budget up to 2012 (MCHF)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Category A	1.0	1.6	2.6	5.6	9.0	10.5	14.3	16.4	16.0	18.6	17.2	112.8
Category B	0.4	1.1	0.7	2.2	3.5	6.7	6.8	7.0	6.7	6.3	6.2	47.6
Total (A+B)	1.4	2.7	3.3	7.8	12.5	17.2	21.1	23.4	22.7	24.9	23.4	160.4

The only remaining Funding Agency who has not yet signed the Agreement is Brazil (February 28, 2009).

Planned ATLAS M+O (A) and (B) Payments in 2010 (kCHF)

Item & Cost Driver (by RRB SG Headings)	Cat. A									Cat. B	Item & Cost Driver (by RRB SG Headings)	
	M&O	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Comp.	M&O		
Detector related costs Cryogenics operations Detector operations	5,843	279			100	20	20	125			544	Mechanics, structures, cooling
Secretariat 2 FTE charged to ATLAS Publications, consumables	305	250	280	359	600	295	140	210			2,134	Standard electronics Crates, electronics pool rentals
Collaborative tools GSM phones Computer network connections Videoconferencing, archiving	120					40	15	30			85	Detector controls
Core computing (infrastr. & services) Software process service Central production & operation	1,900											
On-line computing System administration HLT hardware repl., networking	3,210	5		5	20	10	65				105	Areas SR1-operations (ID), system tests, lab oper.
Test beams, facilities Magnet Cryo Operations On-line computing support TDAQ common electronics	465	1	6	1	10	5	7	5			35	Communications
Laboratory operations Assembly areas, workshops TDAQ laboratory equipment	105	5	5	10	80	10	25				135	Store items
General services Heavy handling Technical support, storage Survey Outreach Energy	4,067	1,000	296	300		350	50				1,996	Sub-detector spares (incl. b-layer replacement)
TOTAL	16,015	1,540	587	675	810	730	322	370	0	5,034	(Excluding hired manpower for Category B)	
Hired manpower at CERN (in kCHF)	incl. above	249	150	50	318	261	284	330			1,642	
Institute manpower (in FTE)	0	5	5	5	11	2	7	8	98		141	
TOTAL M&O FOR A	16,015	1,789	737	725	1,128	991	606	700	0	6,676	TOTAL M&O FOR B	

**Proposed Sharing of M+O Contributions
for ATLAS in 2010 by Funding Agency (kCHF)**

4/3/2009

Funding Agency	Category-A items		Category-B items budgeted							Budget Total	Core comp. Categ.B (FTE)	Authors M&O-A
	Invoiced*	Budgeted	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon			
Argentina	18	18	0	0	0	0	0	0	1	19	0	2
Armenia	18	18	0	0	0	0		1	0	19		2
Australia	71	71	0	19	0	16	0	0	0	105	1	8
Austria	51	62	0	0	10	0	9	10	1	92	1	7
Azerbaijan	26	26	0	0	0	0	1	0	0	27		3
Belarus	53	53	0	0	0	0	0	0	3	56		6
Brazil	62	62	0	0	0	0	0	3	0	65	0	7
Canada	506	520	0	0	0	0	256	0	0	777	3	59
Chile	26	26	0	0	0	0	0	0	2	28		3
China NSFC+MSTC	97	97	0	0	0	0	2	0	3	102	1	11
Colombia	9	9	0	0	0	0	0	0	1	10		1
Czech Republic	261	317	7	1	0	2	0	5	0	333	2	36
Denmark	73	88	0	0	33	10	0	0	0	132	1	10
France IN2P3	777	943	197	0	0	24	182	62	0	1408	6	107
France CEA	189	229	0	0	0	0	76	0	37	342	2	26
Georgia	44	44	0	0	0	0	1	0	1	46		5
Germany BMBF	1010	1225	407	43	0	88	34	0	33	1829	3	139
Germany DESY	218	264	0	0	0	0	65	0	65	394	1	30
Germany MPI	218	264	0	41	0	36	33	0	20	395	1	30
Greece	167	203	0	0	0	0	0	0	10	213	0	23
Israel	180	185	0	0	0	0	0	0	9	194	0	21
Italy	1278	1551	344	0	0	79	84	52	206	2316	8	176
Japan	628	643	0	111	0	96	0	0	110	961	3	73
Morocco	53	53	0	0	0	0	3	0	0	56		6
Netherlands	196	238	0	27	0	28	0	0	63	355	2	27
Norway	124	150	0	37	0	37	0	0	0	224	2	17
Poland	124	150	0	1	4	2	0	0	0	157	0	17
Portugal	124	150	0	0	0	0	0	7	0	157	0	17
Romania	106	106	0	0	0	0	0	5	0	111	0	12
Russia	435	555	0	0	9	5	5	4	4	583	2	63
JINR	300	300	0	0	2	1	3	4	4	315	0	34
Serbia	53	53	0	0	0	0	3	0	0	56		6
Slovak Republic	53	71	0	0	0	0	4	0	0	74		8
Slovenia	62	62	0	2	0	1	0	0	0	65	1	7
Spain	298	361	0	26	0	22	38	93	0	540	3	41
Sweden	174	212	0	13	40	23	10	17	0	316	0	24
Switzerland	153	185	0	45	0	39	7	0	0	276	0	21
Taipei	62	62	2	0	0	0	0	0	0	65	3	7
Turkey	141	141	0	0	0	0	4	0	3	148		16
United Kingdom	1351	1639	0	343	0	466	0	0	0	2448	10	186
US DOE + NSF	3414	3482	812	6	400	53	85	258	104	5199	30	395
CERN	930	1128	21	21	227	99	85	84	19	1685	15	128
total	14,131	16,015	1790	737	725	1128	991	606	700	22,691	98	1,817
			System-specific items						6,676			

Notes:

*Invoiced to FAs; includes energy cost adjustments

List of qualified authors with PhD or equivalent (September 30, 2008) used for Category-A. Chile and Colombia added in March 1, 2008

Category-B is based on authors, modulated by CORE contributions

Core computing in Category B expressed in Full-Time-Equivalents (FTE). Figure 0 refers to an effort smaller than 0.5 FTE