CERN-RRB-2006-072

ATLAS Resources Review Board, October 23, 2006

For RRB to approve

Request for 2007 ATLAS M&O Budget

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to approve the M&O budget for 2007 as well as proposed new in-kind contributions in Category-A.

The ATLAS M&O (A and B) budget request for 2007 amounts to 18.7 MCHF in payments. Preliminary M&O budget estimates for 2007 were presented to the RRB in April 2006 (CERN-RRB-2006-029), amounting to 19.1 MCHF at the time. The present budget follows from an internal update of 2006-2007 work program planning and from interactions with the RRB Scrutiny Group (CERN-RRB-2006-104).

Point 1 with its underground caverns and surface halls and buildings is the centre stage of related ATLAS M&O activities in 2007. The cryogenics and supporting technical infrastructure are in place and are running in operation mode. The detectors are being commissioned in Point 1 for the planned low-energy run at the end of the year and their functionalities will be constantly checked and monitored.

M&O BUDGET REPORT ELEMENTS

- Budget summary
- Activity Description
- Table References

1. M&O Budget Request for 2007

The 2007 M&O payments for Category-A items are planned at 11.7 MCHF (including power) and 7.0 MCHF for Category-B items. The Category-A activities continue increasing in 2007 as planned. The main reasons for the increasing payments in Category-A w.r.t. the 2006 budget are as follows:

- Sustained operation of the cryogenics plant at Point 1 for the magnet and LAr systems requires larger operation teams and more technical support, as well as urgent repairs for the He-transfer line insulation and refrigerator turbines;
- Technical crews managed by the Technical Coordination are needed to operate the site (detector access, cranes, heavy handling etc.);
- System administration of the TDAQ processor farms being installed and operated ;

- Request for collaborative tools (videoconferencing, archiving);
- Increased power consumption.

In Category-B, a large fraction of the systems are being installed and operated. The dominant cost drivers are replacement of electronics modules, amortization of spares as well as the operation of the specially equipped SR1-building for the Inner Detector.

Table 1 gives the breakdown of the M&O (Categories A and B) budget for 2007. The dominant part of the cost in category-A is associated with the cost of operating the overall cryogenics plants, detector access and gas systems (5.2 MCHF) as well as providing general technical services (3.0 MCHF, including electricity). In Category-B the cost drivers are technical services (1.8 MCHF), replacement of electronics (1.5 MCHF), gases (1.3 MCHF) and area operation activities (1.1 MCHF).

Table 2 shows the expected contributions for 2007 for each Funding Agency and system (Categories A and B). The Category-A contributions 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 provides a summary of actual payments up to 2005 and a forward look to M&O budget estimates up to 2010. It should be noted that, in parity with CMS, the Category-B projections also include the replacement of the Pixel b-layer by 2012 (2.5 MCHF), starting with payments from 2008 onwards.

Figure 1. Evolution of M&O Budget up to 2010 (MCHF)

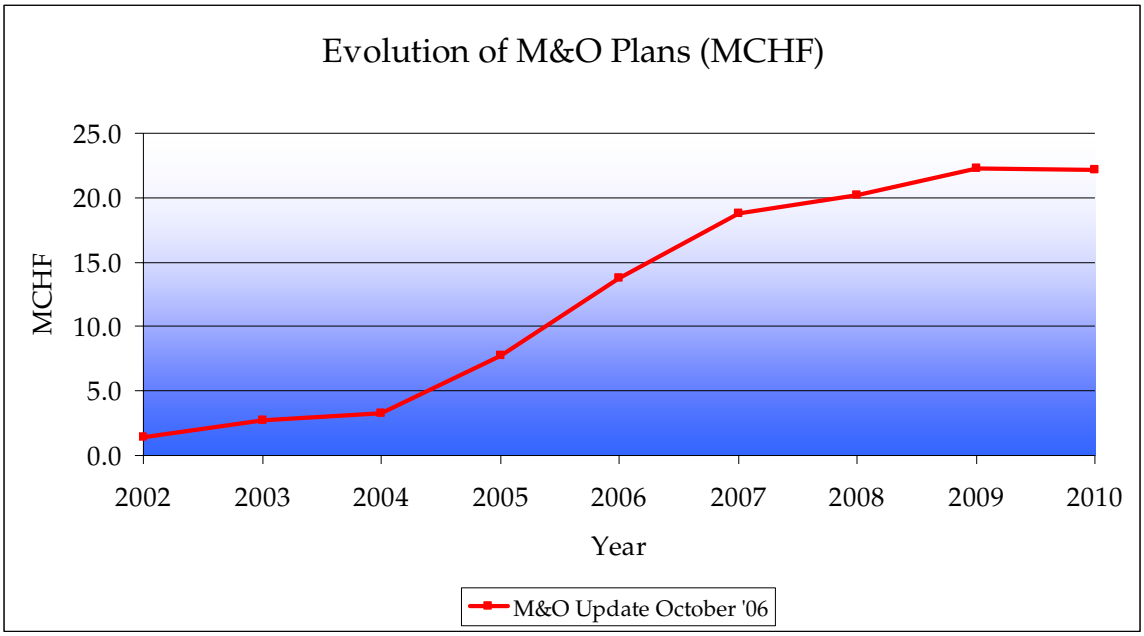

Figure 2. Evolution of the M&O budget up to 2010 (MCHF)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Category A	1.0	1.6	2.6	5.6	9.4	11.7	13.1	14.1	14.1	**73.2**
Category B	0.4	1.1	0.7	2.2	4.4	7.0	7.1	8.2	8.1	**39.2**
Total (A+B)	**1.4**	**2.7**	**3.3**	**7.8**	**13.8**	**18.7**	**20.2**	**22.3**	**22.2**	**112.4**

Table 3 shows the status of the M&O MoU signatures on September 20, 2006. The Funding Agencies who have not yet signed the Agreement are: Brazil and Switzerland.

2. New In-Kind Contributions (Category –A)

According to paragraph 9.3 in the ATLAS M&O MoU (CERN-RRB-2002-035), the RRB needs to agree to possible in-kind contributions made to Category-A (Annex 9).

1. Offers being finalized (Action: RRB to approve)

1.1 Core computing tasks (infrastructure and services; 870 kCHF, from multiple Funding Agencies)

The addendum for core computing Category-A M&O-A (CERN-RRB-2005-008) describes the computing tasks related to infrastructure and services. The following Funding Agencies offer in-kind contributions for these tasks: Czech Republic (0.40 FTE), IN2P3 (1.0 FTE), BMBF (0.9 FTE), MPI (0.3 FTE), Israel (0.2 FTE), Italy (1.8 FTE), Poland (0.1 FTE), Russia (0.3 FTE), JINR (0.4 FTE), Taipei (0.1 FTE), UK (1.5 FTE), US (3.0 FTE). The average cost is 88 kCHF/FTE. The sent invoices will be reduced accordingly; however, the final financial values for each task will be settled once the achieved work packages have been completed and verified. In case any corrections need to be made for in-kind contributions for 2007, they will be reported for the April 2007 RRB.

1.2 Surveyors (160 kCHF, JINR)

The RRB approved an in-kind contribution of 480 kCHF from JINR in October 2003 for surveying tasks in the ATLAS cavern. The present agreement is coming to an end in 2006 and needs to be extended to 2008. The extension is necessary to ensure the proper alignment of the detectors as well as to monitor the movement of the cavern floor to ensure required accuracies for the physics run in 2008.

Planned ATLAS M+O (A) and (B) Payments in 2007 (kCHF)

Item & Cost Driver (by RRB SG Headings)	Cat. A M&O	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Comp.	Cat. B M&O	Item & Cost Driver (by RRB SG Headings)
Detector related costs Cryogenics operations Detector operations	5,183		10	305	285	65	65	530		1,260	Mechanics & Gas & Cooling & Cryogenics Gases (ID, Tiles, Muons)
Secretariat 1.5 FTE charged to ATLAS Publications, consumables	245	315	165	180	45	360	220	310		1,595	Standard electronics Crates, electronics pool rentals
Communications GSM phones Computer network connections Collaborative tools	120	10	20	10	5	30	75			150	Detector controls
Core computing (infrastr. & services) Software process service Central production & operation	1,475										
On-line computing Detector controls Software licences	1,405	30	245	50	643	30	110			1,108	Areas SR1-operations (ID), system tests, lab oper.
Test beams, facilities Magnet Cryo Op. in B180 On-line computing support TDAQ common electronics	180				5	5	5	5		20	Communications
Laboratory operations Assembly areas, workshops TDAQ laboratory equipment	75	40	40	30	50	50	55			265	Store items
General services Heavy handling Technical support, storage Survey Outreach Energy	3,039	100	137	270		245	25			777	Sub-detector spares (incl. b-layer replacement)
TOTAL	11,722	495	617	845	1,033	785	555	845	0	5,175	(Excluding hired manpower for Category B)
Hired manpower at CERN (in kCHF)	incl. above	100	108	80	657	280	250	330		1,805	
Institute manpower (in FTE)	0					2	6	10	86	104	
TOTAL M&O FOR A	11,722	595	725	925	1,690	1,065	805	1,175	0	6,980	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.

Proposed Sharing of M+O Contributions for ATLAS in 2007 by Funding Agency (kCHF)

10/6/2006

Funding Agency	Category-A items		Category-B items budgeted							Budget	Core comp.
	Invoiced*	Budgeted	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Total	Categ.B (FTE)
Argentina	8	8	0	0	0	0	0	0	0	**8**	
Armenia	8	8	0	0	0	0	0	5	0	**12**	
Australia	79	79	0	22	0	30	0	0	0	**131**	0
Austria	48	55	0	0	0	0	0	0	0	**55**	
Azerbaijan	8	8	0	0	0	0	0	0	0	**8**	
Belarus	47	47	0	0	0	0	0	0	0	**47**	
Brazil	47	47	0	0	0	0	0	4	0	**51**	0
Canada	333	339	0	0	0	0	128	0	0	**467**	3
China NSFC+MSTC	110	110	0	0	0	0	3	0	8	**122**	0
Czech Republic	242	276	8	5	0	11	0	24	0	**323**	0
Denmark	69	79	0	0	54	19	0	0	0	**151**	
France IN2P3	545	623	82	0	0	45	191	102	0	**1043**	7
France CEA	166	189	0	0	0	0	87	0	59	**335**	1
Georgia	39	39	0	0	0	0	0	0	0	**39**	
Germany BMBF	669	765	172	54	0	167	42	0	70	**1271**	2
Germany DESY	55	63	0	0	0	0	0	0	0	**63**	0
Germany MPI	172	197	0	27	0	36	18	0	23	**301**	0
Greece	283	323	0	0	0	0	0	0	27	**350**	
Israel	124	126	0	0	0	0	0	0	69	**196**	0
Italy	1069	1223	189	0	0	107	57	63	252	**1891**	6
Japan	427	434	0	109	0	145	0	0	185	**873**	0
Morocco	63	63	0	0	0	0	2	0	0	**65**	
Netherlands	145	166	0	21	0	32	0	0	82	**301**	2
Norway	69	79	0	33	0	49	0	0	0	**161**	2
Poland	117	134	0	3	12	9	0	0	0	**158**	0
Portugal	103	118	0	0	0	0	0	48	0	**166**	
Romania	95	95	0	0	0	0	0	14	0	**109**	
Russia	438	497	0	3	124	71	63	53	74	**886**	0
JINR	237	237	0	0	16	11	20	38	48	**370**	0
Serbia	32	32	0	0	0	0	0	0	0	**32**	
Slovak Republic	69	79	0	0	0	0	3	0	0	**82**	
Slovenia	47	47	0	13	0	18	0	0	0	**79**	
Spain	269	308	0	19	0	26	25	95	0	**472**	2
Sweden	152	174	0	24	94	65	16	43	0	**417**	
Switzerland	152	174	0	79	0	105	11	0	0	**369**	
Taipei	63	63	19	8	0	21	8	0	0	**119**	3
Turkey	71	71	0	0	0	0	0	0	0	**71**	
United Kingdom	925	1057	0	199	0	279	0	0	0	**1534**	10
US DOE + NSF	2228	2256	125	81	223	255	257	173	238	**3608**	33
CERN	904	1033	0	25	402	191	131	143	41	**1966**	15
total	10,727	11,722	595	725	925	1690	1065	805	1175	**18,702**	**86**
			System-specific items						**6,980**		

Notes:

*Invoiced to FAs; includes energy cost adjustments

Updated list of qualified authors with PhD or equivalent (September 30, 2006) used for Category-A

Category-B is based on CORE contributions

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

ATLAS M+O MoU Signatures

(Status September 20, 2006)

Funding Agency	Signed Date	Signed by
Argentina		
Armenia	02.09.2002	H. Asatryan
Australia	17.10.2003	A. Williams
Austria	02.10.2002	R. Kneucker
Azerbaijan	20.03.2003	N.A.K. Guliyev
Belarus	25.03.2005	Y. Pleskachevsky
Brazil		
Canada	09.09.2002	I. Blain
China NSFC+MSTC	02.08.2002	Wang Naiyan
Czech Republic	20.01.2003	J. Niederle
Denmark	18.08.2004	J.R. Hansen
France CEA	04.09.2002	F. Gounand
France IN2P3	25.09.2002	J.J. Aubert
Georgia	22.08.2002	A.N. Tavkhelidze
Germany BMBF	12.09.2002	R. Koepke
Germany DESY		
Germany MPI	28.06.2002	S. Bethke
Greece	20.09.2005	I.Tsoukalas
Israel	23.08.2002	D. Horn
Italy	25.11.2002	E. Iarocci
Japan	31.03.2003	H. Sugawara
Morocco	04.02.2004	S. Belcadi
Netherlands	14.11.2002	J. Engelen
Norway	04.09.2002	O.H. Ellestad
Poland	18.10.2004	J.K Frackowiak
Portugal	26.06.2002	A. Trigo de Abreu
Romania	21.04.2004	G. Popa
Russia	26.03.2006	A. Fursenko
JINR	07.08.2002	A.N. Sissakian
Serbia	12.08.2005	A. Popovic
Slovak Republic	26.11.2002	M. Fronc
Slovenia	22.04.2003	Z. Stančič
Spain	19.02.2003	P. Morenés
Sweden	25.11.2002	K. Bremer
Switzerland		
Taipei	12.07.2002	C.J. Chen
Turkey	12.03.2003	N.K. Pak
United Kingdom	24.09.2002	J.F. Down
US DOE + NSF	18.10.2002	T.B.W. Kirk
CERN	04.12.2002	D. Schlatter

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