

CERN-RRB-2011-069

ATLAS Resources Review Board, October 17, 2011




For RRB to approve

Request for 2012 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 2012.

The M&O budget request for the ATLAS detector in 2011 amounts to 23.0 MCHF in payments. The ATLAS detector will be running a full long year in 2012 at Point 1 in data-taking mode before entering a long shut-down in 2013 and part of 2014, in accordance with the machine schedule. Its performance is being closely monitored and its functionalities constantly checked and maintained. The supporting technical infrastructure remains fully operational (e.g. cryogenics, gases, coolants, access operations, cooling and ventilation plant). The present budget follows from an internal update of the 2011-2012 work program planning and from interactions with the RRB Scrutiny Group (CERN-RRB-2011-076).

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. M&O Budget Request for 2012

The 2012 ATLAS M&O request for Category-A items is 17.9 MCHF (including energy) and 5.1 MCHF for Category-B items. The request is 12% lower than the preliminary estimates presented in April, 2011 (CERN-RRB-2011-028).

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 11.2 MCHF). Another cost driver is the operation of the LAr and magnet systems at an annual level of 2.3 MCHF, including repairs on turbines. The general support for running the TDAQ system is 2.2 MCHF. Core computing (infrastructure) services are planned at 2.1 MCHF.

In Category-B, the maintenance activities continue at a nominal level, as the detector systems have now reached full operation status.

The main Category-B cost driver is related to running the detector modules and related electronics and controls (2.3 MCHF), including payment advancements for spares that are arranged internally within ATLAS. Scheduled maintenance work of detector structures and mechanics, including the use of store items, amounts to 0.4 MCHF. The cost of hired technical manpower to run the facilities is estimated at 2.0

MCHF. The Category-B budget for 2012 includes now also the Forward Detectors (FD), as a community has been formed around them. The FD was previously included in M&O-A.

The manpower required from institutes for operation expert tasks (OTP), excluding shifts, amounts to 312 man-years. In addition, 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 138 man-years is planned to be provided in full as in-kind contributions.

Figure 1 provides a summary of actual payments up to end of 2010 and a forward look to M&O budget estimates up to 2018. Following the wishes expressed in the April 2011 RRB, the 2012 M&O Category-A budget and future estimates have been smoothed using averaging up to 2018, in order not to exceed the current budget levels and to facilitate more accurate budget planning for the Funding Agencies. No cost-variation index is applied. It should be noted that this was possible only by manually modulating the budget line for TDAQ replacements. As a consequence, the smoothing is made up to 2018 by which time the nominal luminosity is achieved. However, this implies a cumulative deficit of 3.7 MCHF up to end of 2015 which is amortized by 2018, if the current replacement model of four full years is applied. Discussions with the Scrutiny Group and the CERN Management continue as to how best adapt the replacement model for the future.

The breakdown between Categories A and B in 2012 is provided in **Table 1** and M&O budget forecasts for both categories up to 2018 inclusive, in **Table 3**.

Table 2 shows the expected contributions for 2012 for each Funding Agency and system (Categories A and B). The Category-A contributions are based on authors holding a PhD or equivalent 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 2018 (MCHF)

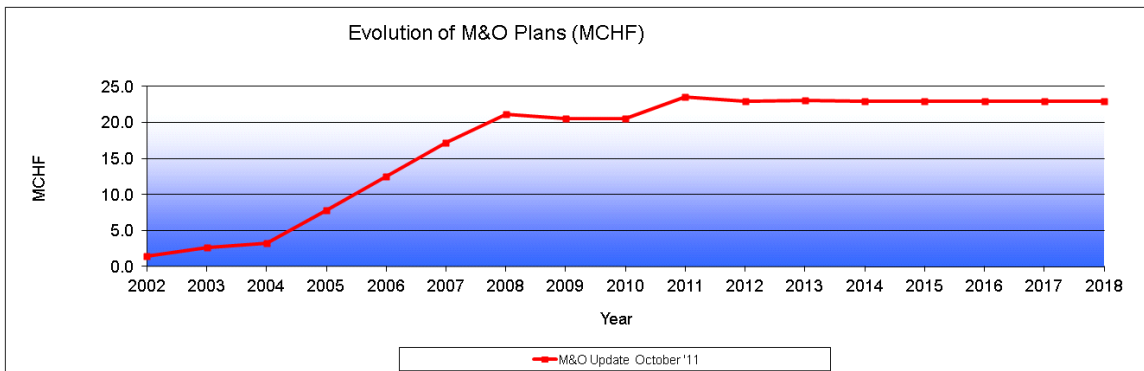


Table 3. Evolution of M&O Budget up to 2018 (MCHF)

M&O BUDGET EVOLUTION (Categories A and B), in MCHF																		
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Category A	1.0	1.6	2.6	5.6	9.0	10.5	14.3	14.4	14.8	18.4	17.9	17.8	17.7	18.4	18.2	18.2	18.1	218.5
Category B	0.4	1.1	0.7	2.2	3.5	6.7	6.8	6.2	5.7	5.2	5.1	5.2	5.3	4.6	4.8	4.8	4.9	73.2
Total (A+B)	1.4	2.7	3.3	7.8	12.5	17.2	21.1	20.6	20.5	23.6	23.0	23.1	23.0	23.0	23.0	23.0	23.0	291.7

M & O I N - K I N D
P R O P O S A L
E L E M E N T S
Introduction
Proposal for in-kind

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; 1090 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 (0.3 FTE), IN2P3 (1.1 FTE), BMBF (1.5 FTE), DESY (0.2 FTE), Israel (0.2 FTE), Italy (1.6 FTE), Poland (0.2 FTE), Russia (0.6 FTE), Spain (0.4 FTE), UK (1.9 FTE), US (4.0 FTE). The average cost is 91 kCHF/FTE. The invoices sent to the above Funding Agencies 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 the above in-kind contributions for 2012, they will be reported for the April 2012 RRB.

ATLAS M+O (A) and (B) Payments in 2012 (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	FD	Comp.	M&O		
Detector related costs Cryogenics operations Detector operations	6,493			60		26	14	55	10			165	Mechanics & Cooling & Cryogenics
Secretariat 2 FTE charged to ATLAS Publications, consumables	305	165	285	260	45	715	345	210	102			2,127	Standard electronics Crates, electronics pool rentals
Collaborative tools GSM phones Computer network connections Videoconferencing, archiving	410	10	20	10	5	40	5	100	10			200	Detector controls
Core computing (infrastr. & services) Software process service Central production & operation	2,128												
On-line computing Detector controls Software licences	1,897	90	20	30	120	10	20		18			308	Areas SRI-operations (ID), system tests, lab oper.
Test beams, facilities Testing equipment (DCS) Consolidation	2,435	1	5		8	5	5	5	3			32	Communications
Laboratory operations Assembly areas, workshops TDAQ laboratory equipment	105	24	30	30	80	10	10		17			201	Store items
General services Heavy handling Technical support, storage Survey Outreach Energy	4,093						30		33			63	Sub-detector spares
TOTAL	17,866	290	360	390	258	806	429	370	193	0	3,096	(Excluding hired manpower for Category B)	
Hired manpower at CERN (in kCHF)	incl. above	250	275	295	317	389	191	270	67			2,054	
Institute manpower (in FTE), excl. shifts	0	21	24	27	30	67	28	90	28	138		453	Class 3 expert tasks (OTP)
TOTAL M&O FOR A	17,866	540	635	685	575	1,195	620	640	260	0	5,150	TOTAL M&O FOR B	

Notes:

**Proposed Sharing of M+O Contributions
for ATLAS in 2012 by Funding Agency (kCHF)**

10/6/2011

Funding Agency	Category-A items		Category-B items budgeted								Budget Total	Comp. B (FTE)	Authors M&O-A			
	Invoiced*	Budgeted	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	FD				Total		
Argentina	40	40	0	0	0	0	0	0	2	0	2	42	0	4		
Armenia	10	10	0	0	0	0	1	0	0	0	1	11	0	1		
Australia	119	119	0	27	0	14	0	0	0	0	40	159	1	12		
Austria	17	20	0	2	2	0	2	0	1	0	7	27	0	2		
Azerbaijan	20	20	0	0	0	0	1	0	0	0	1	21	0	2		
Belarus	49	49	0	0	0	0	0	0	3	0	3	52	0	5		
Brazil	99	99	0	0	0	0	0	5	0	0	5	104	1	10		
Canada	589	603	0	0	0	0	204	0	0	0	204	808	5	61		
Chile	40	40	0	0	0	0	0	0	2	0	2	42	0	4		
China NSFC+MSTC	129	129	0	0	0	0	3	0	3	0	6	135	1	13		
Colombia	49	49	0	0	0	0	0	0	3	0	3	52	0	5		
Czech Republic	275	326	2	1	0	1	0	6	0	6	16	343	3	33		
Denmark	92	109	0	0	31	5	0	0	0	0	37	146	1	11		
France IN2P3	883	1048	58	0	0	12	212	61	0	13	355	1403	8	106		
France CEA	225	267	0	0	0	0	66	0	24	0	90	357	2	27		
Georgia	49	49	0	0	0	0	1	0	1	0	2	51	0	5		
Germany BMBF	1316	1562	210	57	0	72	82	0	51	57	529	2092	12	158		
Germany DESY	242	287	0	0	0	0	32	0	32	33	97	384	2	29		
Germany MPI	250	297	0	32	0	16	36	0	17	0	101	397	2	30		
Greece	142	168	0	0	0	0	0	0	8	0	8	176	1	17		
Israel	193	198	0	0	0	0	0	0	10	0	10	208	2	20		
Italy	1324	1572	184	0	0	29	61	53	169	36	532	2104	12	159		
Japan	678	692	0	72	0	47	0	20	96	0	235	927	5	70		
Morocco	89	89	0	0	0	0	4	0	0	0	4	93	1	9		
Netherlands	233	277	0	23	0	14	0	0	57	0	94	371	2	28		
Norway	133	158	0	34	0	20	0	0	0	0	54	212	1	16		
Poland	192	227	0	2	5	2	0	0	0	2	11	239	2	23		
Portugal	108	129	0	0	0	0	0	5	0	1	6	135	1	13		
Romania	119	119	0	0	0	0	0	6	0	0	6	125	1	12		
Russia	548	662	0	0	14	3	7	5	5	0	33	696	5	67		
JINR	257	257	0	0	2	1	3	4	4	0	13	270	2	26		
Serbia	59	59	0	0	0	0	3	0	0	0	3	62	0	6		
Slovak Republic	75	89	0	0	0	0	4	0	0	0	4	93	1	9		
Slovenia	69	69	0	2	0	1	0	0	0	0	3	73	1	7		
South Africa	49	49	0	2	0	0	0	0	0	0	2	51	0	5		
Spain	358	425	0	18	0	9	38	79	0	0	144	569	3	43		
Sweden	258	307	0	13	40	13	14	20	0	5	104	410	2	31		
Switzerland	192	227	0	44	0	23	10	0	0	0	77	304	2	23		
Taipei	89	89	2	1	0	1	1	0	0	0	4	93	1	9		
Turkey	119	119	0	0	6	0	0	0	0	0	6	125	1	12		
United Kingdom	1482	1760	0	304	0	292	0	0	0	0	597	2356	14	178		
US DOE + NSF	3655	3718	84	0	334	0	316	316	135	76	1260	4978	29	376		
CERN	1082	1285	1	2	251	0	92	40	17	32	435	1720	10	130		
total	15,995	17,866	540	635	685	575	1195	620	640	260	5,150	23,016	138	1,807		
			System-specific items													

Notes:

*Invoiced to FAs; includes energy cost adjustments

List of qualified authors with PhD or equivalent (September 30, 2011) used for Category-A

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

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