

CERN-RRB-2012-080

ATLAS Resources Review Board, October 29, 2012




For RRB to approve

Request for 2013 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 2013.

The M&O budget request for the ATLAS detector in 2013 amounts to 22.0 MCHF in payments. The ATLAS detector will be entering a long shut-down in early 2013 until mid-2014, in accordance with the machine schedule. Despite the shut-down, the supporting basic 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 2012-2013 work program planning and from interactions with the RRB Scrutiny Group (CERN-RRB-2012-114).

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1. M&O Budget Request for 2013

The 2013 ATLAS M&O request for Category-A items is 16.8 MCHF (including energy) and 5.1 MCHF for Category-B items. The request is 4% lower than the preliminary estimates presented in April, 2012 (CERN-RRB-2012-026).

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 9.9 MCHF). Another cost driver is the operation of the LAr and magnet systems at an annual level of 1.1 MCHF, including repairs on turbines. The general support for running the TDAQ system is 3.6 MCHF, implementing the commonly agreed new TDAQ HLT replacement scenario (CERN-RRB-2012-118) and replacing the read-out boards. Core computing (infrastructure) services are planned at 2.1 MCHF.

In Category-B, the maintenance activities can be covered at a nominal level, despite extensive repair and replacement work planned for the shut-down period.

The main Category-B cost driver is related to servicing 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 0.7

MCHF. The cost of hired technical manpower to run the facilities is estimated at 2.1 MCHF.

The manpower required from institutes for operation expert tasks (OTP), excluding shifts, amounts to 294 person-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 person-years is planned to be provided in full as in-kind contributions.

Figure 1 provides a summary of actual payments up to end of 2012 and a forward look to M&O budget estimates up to 2018, including the cost of energy and defined parts of the IBL (CERN-RRB-2011-028 Annex 1).

Following the wishes expressed in the April 2011 RRB, the 2013 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. This implies a cumulative deficit of 1.3 MCHF up to end of 2015 which is amortized by 2018, when the new TDAQ replacement model of five full years is applied. The annual modulations are managed within the framework agreed with the RRB (CERN-RRB-2012-118).

The breakdown between Categories A and B in 2013 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 2013 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)

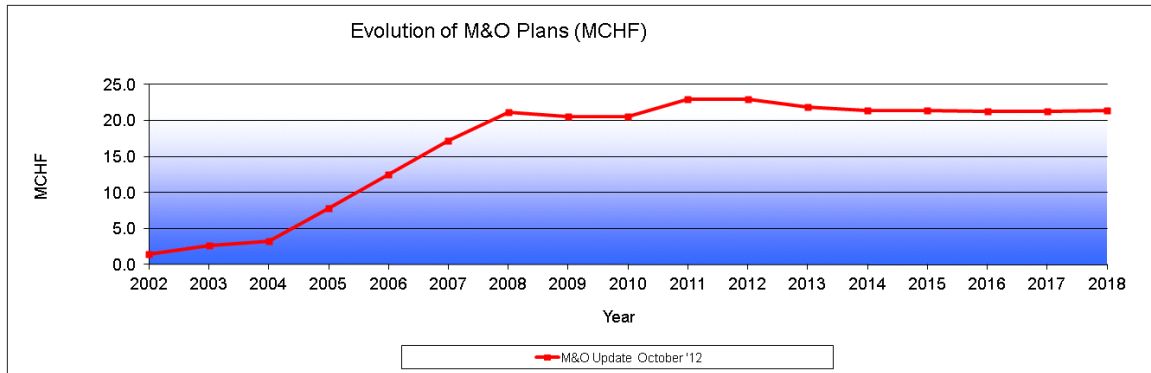


Table 3. Evolution of M&O Budget up to 2018 (MCHF)

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	16.6	17.9	16.8	16.5	16.8	16.5	16.5	16.4	207.8
Category B	0.4	1.1	0.7	2.2	3.5	6.7	6.8	6.2	5.7	6.4	5.1	5.1	4.9	4.6	4.8	4.8	5.0	74.0
Total (A+B)	1.4	2.7	3.3	7.8	12.5	17.2	21.1	20.6	20.5	23.0	23.0	21.9	21.4	21.4	21.3	21.3	21.4	281.8

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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 2013, they will be reported for the April 2013 RRB.

1.2 HV/LV cables, DAQ equipment (detector related support; 354 kCHF, INFN)

The IBL MoU, endorsed by the RRB in April 2012 (CERN-RRB-2012-028-Appendix 1), includes general work packages accounted for in M&O-A, worth 4.1 MCHF. This work packages include, among others, High-Voltage/Low-Voltage supplies and related DAQ equipment at a CORE value of 354 kCHF. These items are included as part of M&O-A budget, included in the 10.1 MCHF total budget of the IBL. INFN has the required knowledge, infrastructure and competence in providing the above equipment as an in-kind contribution by 2014, the annual deliveries and recognition to be agreed with the IBL Project Management.

ATLAS M+O (A) and (B) Payments in 2013 (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, gas system op., replacements Shutdown activities, support, safety	7,532					5	8	40	10			63	Mechanics
Secretariat 2 FTE charged to ATLAS Publications, consumables	305			20		1	8					29	Gas systems
Collaborative tools GSM phones Computer network connections Videoconferencing, archiving	250					5						5	Cryo-systems
Core computing (infrastr. & services) Software process service Central production & operation	2,128												
On-line computing System management Hardware replacements (HLT, networks)	2,300												
Test beams, facilities Testing equipment (DCS) Consolidation	360					420	30		54			504	Sub-detector spares
Laboratory operations Assembly areas, workshops TDAQ laboratory equipment	105	65	50	50	95	10	20		18			308	Areas SR1-operations (ID), system tests, lab. Operations
General services Heavy handling Technical support, storage Survey Outreach Energy	3,843	3	3	3	5	5	5	5	2			31	Communications
		28	30	72	34	10	23		18			215	Store items
TOTAL	16,823	316	343	305	344	791	397	300	189	0	2,985	(Excluding hired manpower, Category B)	
Hired manpower at CERN (in kCHF)	incl. above	294	294	240	329	290	250	349.5	95			2,142	
Institute manpower (in FTE), excl. shifts	0	31	22	25	23	35	32	100	26	138	432	Class 3 expert tasks (OTP)	
TOTAL M&O FOR A	16,823	610	637	545	673	1,081	647	650	284	0	5,127	TOTAL M&O FOR B	

Proposed Sharing of M+O Contributions for ATLAS in 2013 by Funding Agency (kCHF)

20/10/2012

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					
Argentina	56	56	0	0	0	0	0	0	3	0	59	0	6		
Armenia	9	9	0	0	0	0	1	0	0	0	11	0	1		
Australia	149	149	0	34	0	20	0	0	0	0	202	1	16		
Austria	16	19	0	2	2	0	2	0	2	0	27	0	2		
Azerbaijan	19	19	0	0	0	0	1	0	0	0	20	0	2		
Belarus	37	37	0	0	0	0	0	0	2	0	39	0	4		
Brazil	102	102	0	0	0	0	0	5	0	0	107	1	11		
Canada	601	613	0	0	0	0	222	0	0	0	835	5	66		
Chile	46	46	0	0	0	0	0	0	2	0	48	0	5		
China NSFC+M STC	158	158	0	0	0	0	4	0	4	0	166	1	17		
Colombia	37	37	0	0	0	0	0	0	3	0	40	0	4		
Czech Republic	315	362	3	1	0	1	0	6	0	6	380	3	39		
Denmark	89	102	0	0	30	7	0	0	0	0	139	1	11		
France IN2P3	912	1049	71	0	0	15	209	69	0	16	1429	9	113		
France CEA	242	279	0	0	0	0	71	0	30	0	380	2	30		
Georgia	37	37	0	0	0	0	1	0	1	0	39	0	4		
Germany BMBF	1194	1374	208	49	0	73	68	0	46	55	1872	11	148		
Germany DESY	234	269	0	0	0	0	37	0	37	24	367	2	29		
Germany MPI	242	279	0	32	0	19	32	0	17	0	380	2	30		
Greece	137	158	0	0	0	0	0	0	8	0	166	1	17		
Israel	178	204	0	0	0	0	0	0	10	0	214	2	22		
Italy	1275	1467	185	0	0	52	62	56	141	37	1999	12	158		
Japan	703	715	0	77	0	58	0	20	103	0	974	6	77		
Morocco	84	84	0	0	0	0	4	0	0	0	88	1	9		
Netherlands	242	279	0	24	0	17	0	0	60	0	380	2	30		
Norway	113	130	0	28	0	19	0	0	0	0	177	1	14		
Poland	194	223	0	2	4	2	0	0	0	3	234	2	24		
Portugal	105	121	0	0	0	0	0	5	0	1	127	1	13		
Romania	105	121	0	0	0	0	0	6	0	0	127	1	13		
Russia	577	603	0	0	11	3	6	5	5	0	634	5	65		
JINR	251	251	0	0	1	1	3	4	4	0	263	2	27		
Serbia	40	46	0	0	0	0	2	0	0	0	48	0	5		
Slovak Republic	81	93	0	0	0	0	5	0	0	0	97	1	10		
Slovenia	74	74	0	2	0	1	0	0	0	0	78	1	8		
South Africa	74	74	0	4	0	0	0	0	0	0	78	1	8		
Spain	379	436	0	20	0	12	37	89	0	0	595	4	47		
Sweden	250	288	0	13	34	17	13	22	0	5	392	2	31		
Switzerland	186	214	0	43	0	26	9	0	0	0	291	2	23		
Taipei	84	84	2	1	0	1	1	0	0	0	88	1	9		
Turkey	111	111	0	0	6	0	0	0	0	0	117	1	12		
United Kingdom	1501	1727	0	301	0	325	0	0	0	0	2353	14	186		
US DOE + NSF	3178	3222	17	0	334		268	294	173	76	4385	26	347		
CERN	960	1105	125	3	123	2	22	65		62	1506	9	119		
total	15,377	16,823	610	637	545	673	1081	647	650	284	21,950	138	1,812		
			System-specific items												

Notes:

* Invoiced to FAs; includes energy cost adjustments

List of qualified authors with PhD or equivalent (September 30, 2012) 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