

## **Updated M&O Budget estimates for ATLAS 2002**

Based on the draft budget estimates presented to the RRB in October 2001 (see ATLAS RRB-D 2001-124), the ATLAS Management, supported by the ATLAS Executive and Collaboration Boards, invites RRB to approve the following updated allocations for Maintenance and Operation (M&O) activities for ATLAS in 2002, charged to the Collaboration (excluding category C):

### M&O (Commitments 3.6 MCHF, payments 2.3 MCHF)

The M&O (A) activities in year 2002 are dominated by the operation of the toroid magnet facility in building 180 and general services needed for operating the infrastructure. It also includes a carry-over of the cost of the cryogenics operations for the magnet facility in 2001. TDAQ support is being provided to the system beam tests in terms of on-line computing management and common electronics equipment and related software.

The M&O (B) activities in 2002 comprise system test beam operations in the North Area and East Hall for calibrating detector modules performance in beams. The cost drivers are electronics pool rentals as well as testing and qualification of delivered components and produced modules. These costs are well understood as they are similar to recorded expenses in 2001. More details for both M&O (A) and (B) payments in 2002 are provided in Table 1.

The M&O (A) planned payments for 2002 are some 750 kCHF lower than what was planned for in ATLAS RRB-D 2001-124. Following the second round of cost scrutiny and re-organization of work, the electricity payment profile has been adjusted (- 250 kCHF) and shifts in payments in hydraulic systems (- 200 kCHF), laboratory operations, consultancy & heavy transport (- 300 kCHF). A large share of the shifts are expected to result in net savings.

The revised M&O budget for 2002 represents the minimum to carry out the necessary technical tasks without seriously slowing down the Project. The 2002 budget request will not be affected by foreseen changes in the machine completion dates. The installation of the detectors can start only after the

magnets are in place; the testing of the first BT coils must be completed in full before the magnet installation work can start at the end of 2003.

A provision for future commitments up to 7.5 MCHF was proposed in ATLAS RRB-D 2001-124 for certain critical spares and infrastructure items due to availability and affordable cost (in Category B). It was explained that in case these options were executed before 2005, they would appear as payments only after 2005 unless instructed otherwise by the Funding Agencies. In its meeting on October 22, 2001, the RRB authorized the RRB Chair to negotiate needed payment advancements for LAr spares and certain infrastructure items, against firm pledges from institutes represented by those responsible for their funding. A first such arrangement was reached for the LAr FEB spares in December, 2001 (up to 1.4 MCHF). The next planned arrangement is for the SCT DMILL chips (up to 1.1 MCHF). If taken up, it is planned to be put in place in late 2002 and is thus included in the planned commitments for 2002.

The proposed sharing per Funding Agency, not including rebates, is provided in Tables 2 and 3. The sharing of M&O Category A items is based on the number of qualified authors (PhD physicists and engineers with equivalent degree as stipulated in the draft M&O MoU). The sharing for Category B is all based on CORE contributions in the systems concerned.

It should be noted that the present planning assumes that the initial detector is ready for low luminosity physics in 2006. An expected delay in the machine construction schedule will not affect the present cost estimates for 2002 as the detector construction and testing activity is not being delayed.

**ATLAS M&O (A) and (B) Budget Estimates for 2002 (kCHF)**

Item & Cost Driver	Category A	Category B	Item & Cost Driver
	M&O	M&O	
Detector related costs Cooling systems, power supplies	20	75	Mechanics & Gas & Cooling & Cryogenics Gases (ID, Tiles, Muons)
Secretariat Office consumables, prints	40	490	Standard electronics Electronics pool rentals for test-beams
Communications GSM phones Computer network connections	0	25	Detector controls DCS replacements for ID for test beams
On-line computing TDAQ system management Software licences	75	230	Areas Test-beam activities (ID)
Test beams Magnet Cryo Op. in B180 Carry-over from 2001 TDAQ electronics	720 250	0	Communications
Laboratory operations Assembly areas, workshops TDAQ electronics	20	10	Store items
General services Electricity Cooling & ventilation Heavy transport, crane operations Survey Outreach	290	0	Sub-detector spares (Critical spares dealt with separately)
<b>TOTAL</b>	<b>1,415</b>	<b>830</b>	<b>(Excluding hired manpower for Category B)</b>
Hired manpower at CERN (in kCHF)	incl. above	85	
Institute manpower (in FTE)	0	4	
<b>TOTAL M&amp;O FOR A</b>	<b>1,415</b>	<b>915</b>	<b>TOTAL M&amp;O FOR B</b>

**Notes:**

1. Category A is charged to the entire Collaboration, B to the respective systems. Category C is charged to CERN as the Host Laboratory. Category C is not included in the figures above.

**Table 1**

**Proposed Sharing of M+O Commitments  
for ATLAS During 2002 by Funding Agency (kCHF)**

4/5/2002

Funding Agency	Category A*	Category B	TOTAL
	M&O	M&O	kCHF
Armenia	2	1	3
Australia	8	2	10
Austria	8	1	9
Azerbaijan	8	1	9
Belarus	9	1	10
Brazil	8	1	9
Canada	50	23	73
China NSFC+MSTC	16	2	18
Czech Republic	30	8	38
Denmark	8	5	13
Finland	0	0	0
France IN2P3	81	84	165
France CEA	24	24	48
Georgia	8	0	8
Germany BMBF	103	60	163
Germany MPI	27	17	43
Greece	27	4	31
Israel	20	11	30
Italy	162	107	269
Japan	64	38	102
Morocco	9	1	10
Netherlands	18	22	40
Norway	14	8	21
Poland	29	1	30
Portugal	10	11	21
Romania	12	3	15
Russia + JINR	120	79	199
Slovak Republic	8	1	9
Slovenia	7	1	8
Spain	34	29	62
Sweden	22	25	47
Switzerland	16	10	26
Taipei	9	3	12
Turkey	7	0	7
United Kingdom	160	31	190
US DOE + NSF	292	169	461
CERN	170	109	279
<b>total</b>	<b>1,600</b>	<b>915</b>	<b>2,515</b>
Provision for spares**		<b>1,100</b>	
<b>total</b>	<b>1,600</b>	<b>2,015</b>	<b>3,615</b>

**Notes:**

\* Rebates are not yet applied

\* Category 'C' costs are not included

\* Updated list of qualified authors (April 2, 2002)

\*\* 1.1 MCHF is for provision discussed on p. 2

M&O (A) is based on authors and M&O (B) on CORE

Table 2

**Proposed Sharing of M+O Payments  
for ATLAS During 2002 by Funding Agency (kCHF)**

4/4/2002

Funding Agency	Category A*	Category B	TOTAL kCHF
	M&O	M&O	
Armenia	2	1	3
Australia	7	3	10
Austria	7	0	7
Azerbaijan	7	0	7
Belarus	8	0	8
Brazil	7	1	8
Canada	44	15	59
China NSFC+MSTC	14	2	17
Czech Republic	27	6	32
Denmark	7	8	15
Finland	0	0	0
France IN2P3	72	66	138
France CEA	21	24	46
Georgia	7	0	7
Germany BMBF	91	67	158
Germany MPI	24	18	42
Greece	24	6	30
Israel	17	17	34
Italy	143	123	266
Japan	56	59	115
Morocco	8	0	9
Netherlands	16	25	42
Norway	12	4	17
Poland	26	2	28
Portugal	9	6	15
Romania	10	2	12
Russia + JINR	106	78	185
Slovak Republic	7	1	8
Slovenia	6	2	8
Spain	30	19	49
Sweden	19	25	45
Switzerland	14	13	27
Taipei	8	3	12
Turkey	6	0	6
United Kingdom	141	27	168
US DOE + NSF	259	185	443
CERN	150	105	255
<b>total</b>	<b>1,415</b>	<b>915</b>	<b>2,330</b>

**Notes:**

\* Rebates are not yet applied

\* Category 'C' costs are not included

\* Updated list of qualified authors (April 2, 2002)

M&O (A) is based on authors and M&O (B) on CORE

Table 3