

CERN-RRB-2012-028

ATLAS Resources Review Board, April 24, 2012

For RRB approval (2011) For RRB information (2012)

ATLAS Full Design Luminosity Detector Activities Closing Report 2011 and Status Report 2012

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to <u>approve</u> the final payments for 2011 and to <u>take note</u> of the 2012 status report for the Full Design Luminosity activities.

The initial ATLAS construction period finished by the end of 2008. The initial detector configuration was determined in 2002, following an updated financial plan endorsed by the RRB at that time. As described in the Cost to Completion (CtC) plan (CERN-RRB-2002-114 rev.), original CORE items worth some 30 MCHF were staged to liberate financing to bridge the gap between cost to completion (CtC) and available firm financial pledges. It was understood that once the CtC budget of 72.6 MCHF was fully pledged, the deferred funds would be returned to complete the Full Design Luminosity (FDL) detector, as defined in the Technical Proposal (CERN/LHCC/94-43). While waiting for remaining pledges and the deferred funds to become available, related planning started in 2009. Latest progress was reported in the October 2011 RRB (CERN-RRB-2011-067;068).

FDL TDAQ BUDGET							
REPORT ELEMENTS							
Diritial TDAQ scope							
DAQ 2011 contributions							
DAQ 2012 status							

1. Completion of the TDAQ System

Following the closing of the ATLAS detector for the start-up of LHC in September 2008, some 2.5 MCHF worth of TDAQ equipment remained to be installed at ATLAS, before the liberation of deferred funds to be used to complete the TDAQ system (see CERN-RRB-2009-066).

Table 1 provides the final TDAQ CORE contributions made in 2011, as part of the remaining TDAQ CORE funds. The total planned expenditure amounts to 0.9 MCHF, corresponding to purchasing some 300 High Level Trigger (HLT) boxes and related equipment.

Table 2 shows the planned TDAQ budget for 2012, amounting to 0.1 MCHF. These payments cover the installation of additional HLT boxes and related auxiliaries and will complete the initial TDAQ CORE investments referred to above.

OTHER FDL					
ΑСΤΙVΙΤΙΕ S					
REPORT ELEMENTS					
🗁 Status of IBL					
Description of other FDL					
activities					
D Next steps					

2. Other FDL Detector activities

The status of other FDL-related activities was given to the RRB in October 2011 (CERN-RRB-2011-068). Following the submission of the Technical Design Report of the Insertable b-layer project (IBL) to the LHCC (CERN-LHCC-2010-013) and its endorsement, the Interim-IBL-MoU has been replaced by the definite version (see Appendix 1). Work is in good progress and the sensor production is gearing up as planned.

Total payments in IBL amounted to 2.4 MCHF in 2011 for modules and stave construction, including new project money and related payments made from M&O-B as part of the initial b-layer replacement scheme (139 kCHF), as well as beam pipe and centralized tooling support included in M&O-A (940 kCHF).

There was no scheduled work on Forward Detectors (CERN/LHCC/2004-010) or the Zero Degree Calorimeter (CERN/LHCC/2007-001).

The urgent Inner Detector Pixel Service Quarter Panels (SQP) repair work was reported in the April 2011 RRB (CERN-RRB-2011-025). As endorsed by the Collaboration Board, 3.2 MCHF of project funding have been provisioned for the repair work extending up to 2013, shared between ATLAS (deferral funds of 1.9 MCHF) and CERN (1.2 MCHF). In addition, 1.1 MCHF of related support is included in the M&O (A, B) budgets.

Concerning the use of deferrals funds above, it is reminded that deferring some parts of the Pixel detector and TDAQ in 2002, as part of the planning for the Cost to Completion (CtC) financing, has liberated cash for FDL activities and has permitted ATLAS to support the above urgent repair work of the SQP, with the active help of CERN.

During 2011, 2.0 MCHF was spent on production and tooling costs.

Table 1 summarizes the payments for IBL and Pixel SQP in 2011. For the IBL, the sharing of payments per Funding Agency includes here both pledged new project funds, as well as related transfers done from M&O-Pixels (CERN-RRB-2012-026, Table 1).

Table 2 shows the status of FDL construction efforts in 2012. The work on the Forward Detectors is finished for the time being. The IBL proceeds with the modules production (2.3 MCHF) funded by project money. Related beam pipe and technical support (1.1 MCHF) is included in M&O-A. SQP replacement work proceeds with payments planned at 1.8 MCHF to cover related testing and construction of the mechanical structures as well as the associated manpower in order to match the planned LHC shut-down in 2013.

An update of ATLAS upgrade plans for Phase 1 (for long shutdown 2018) and Phase 2 (for long shutdown 2022) was provided in the October 2011 RRB (CERN-RRB-2011-110). ATLAS proceeds by submitting for each Phase a Letter of Intent (LoI), followed by sub-project specific Technical Design Reports (TDRs) and Construction MoU Addenda, when the technologies and funding become available.

Concerning Phase 1, the LoI (CERN-LHCC-2011-012) was submitted to the LHCC end of 2011 which encourages ATLAS to proceed with the related TDRs and MoU Addenda. The present cost estimate for Phase 1, using the construction CORE-costing, amounts to about 36 MCHF, depending on the final technology options chosen. The detailed costs will be known as each sub-project specific TDRs are submitted.

Table 3 shows the status of the current discussions within ATLAS concerning the financial framework for Phase 1. It reflects the interest of the community to share the costs in a fair manner. The shaded areas indicate the tentative interest expressed by the ATLAS institutions in the sub-projects, which currently include: new Small Wheels (nSW), electronics for the Liquid Argon and Tile Calorimeters (LAr-E and TileC, correspondingly), Fast Tracker System (FTK), the Trigger-Data Acquisition System (TDAQ) and the Forward Physics System (AFP). An updated version will be submitted to the RRB for endorsement in October 2012. It should be emphasized that the indicated sharing of costs is tentative, subject to the choice of technologies and funding available. Formal commitments are expected to be made only at the stage of proceeding with sub-project specific MoU Addenda.

FDL Contributions to ATLAS Detector during 2011 by Funding Agency (Payments, in kCHF)

Funding Agency Forward Detectors ALFA IBL SCP Trigger /DAQ total Argentina Armenia Austria 0 0 Austria 0 0 Austria 0 0 Austria 0 0 Azerbaijan 0 0 Belarus 0 0 Brazil 0 0 Chian SSC+M STC 0 0 Combia 27 27 27 Demark 0 0 0 France IN23 156 156 156 France IN23 154 0 0 Ger many BM BF 154 0 0 Ger many BM BF 154 0 0 Ger many BM BF 11 0 0 Ger many BM BF 154 0 0 Ger many BM BF 0 0 0 Italy	Funding	Forw	vard Data	ctore	IBL	SQP	Trigger	total
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Notes:

Part of BMBF contribution (154 kCHF) was provisioned in the Pixel M&O in 2009-2010

FDL Contributions to ATLAS Detector during 2012 by Funding Agency (Payments, in kCHF)

Funding	Form	vord Doto	otoro	IDI	00D	Trigger	total
Funding		vard Dete		IBL	SQP	Trigger	total
Agency	ALFA	LUCID	ZDC			/DAQ	
	r	1	1			. n	
Argentina							0
Armenia							0
Australia							0
Austria							0
Azerbaijan							0
Belarus							0
Brazil							0
Canada				52			52
Chile							0
China NSFC+M STC							0
Colombia							0
Czech Republic							0
Denmark							0
Finland							0
France IN2P3		1	1	140			140
France CEA		 		140		╞──╢	0
						├───	0
Georgia				450		├───-	-
Germany BM BF	<u> </u>			450		├───┤	450
Germany DESY		+		50			50
Germany M PI							0
Greece					-		0
Israel							0
Italy				407			407
Japan				71			71
M or occo							0
Netherlands				23			23
Norway				57			57
Poland							0
Portugal							0
Romania							0
Russia							0
JINR						100	100
Serbia							0
Slovak Republic							0
Slovenia				30			30
South Africa		1					0
Spain		1	İ.	108			108
Sweden		1	İ.				0
Switzerland		1	1	260			260
Taipei	<u> </u>	1	1				0
Turkey		1	1				0
United Kingdom		1		93			93
US DOE+NSF		1	1	320			320
CERN			1	249	456		705
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from deferrals		1			740	1	740
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in addition in M & O-A			1	1050	524		1574

Notes:

BMBF contribution was provisioned in the Pixel M&O in 2009-2010

Proposed Sharing of Phase 1 by Funding Agency

(Payments, in MCHF) DRAFT

Funding	nSW	LAr-E	TileC	FTK	TDAQ	AFP	total	technology
Agency								options
							•	<u> </u>
Argentina							0.1	
Armenia							0.1	
Australia							0.1	
Austria							0.1	
Azerbaijan							0.1	
Belarus							0.1	
Brazil							0.1	
Canada							1.0	
Chile							0.1	
China NSFC+M STC							0.1	
Colombia							0.1	
Czech Republic							0.1	
Denmark							0.2	
France IN2P3							1.5	
France CEA							3.0	1.2
Georgia							0.1	
Germany BM BF							3.0	
Germany DESY							0.4	
Germany M PI							0.5	
Greece							0.3	0.7
Israel							1.7	
Italy							2.5	
Japan	<u> </u>						0.9	0.9
Morocco	<u> </u>						0.1	
Netherlands	_						0.7	
Norway							0.3	
Poland							0.0	
Portugal	<u> </u>						0.1	0.1
Romania	<u> </u>						0.1	
Russia	_						1.5	
JINR							0.4	
Serbia							0.1	
Slovak Republic							0.1	
Slovenia							0.1	
South Africa							0.1	
Spain							0.1	
Sweden	<u> </u>						0.6	
Switzerland	<u> </u>						1.1	0.4
Taipei	<u> </u>				L		0.1	
Turkey							0.1	
United Kingdom	<u> </u>						2.5	
US DOE+NSF							7.6	2.3
CERN							3.4	2.5
OLINI							3.4	
from deferrals							0.0	
	L							
from M & O (A+B)							0	0
total sub-detector	0.0	0.0	0.0	0.0	0.0	0.0	36.0	5.6
target (TDR)	9.3	8.0	0.0	3.6	12.0	2.7	36.0	0.0
	7.3	0.0	0.4	5.0	12.0	∠./	30.0	

Notes:

1. All figures are tentative and indicative, while waiting for further communication from the Funding Agencies

2. In some cases, they represent funding requests submitted, or being submitted

3. Sub-projects of tentative interest are highlighted in yellow, subject to technology choices

4. Column "technology options" indicate possibility of supplementary contributions, subject to technology choices