

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 approve the final payments for 2011 and to take note 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).




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<i>R E P O R T E L E M E N T S</i>	
 Initial TDAQ scope	1. Completion of the TDAQ System
 TDAQ 2011 contributions	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).
 TDAQ 2012 status	

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.

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			IBL	SQP	Trigger /DAQ	total
	ALFA	LUCID	ZDC				
Argentina							0
Armenia							0
Australia							0
Austria							0
Azerbaijan							0
Belarus							0
Brazil							0
Canada				40		892	932
Chile							0
China NSFC+M STC							0
Colombia							0
Czech Republic				27			27
Denmark							0
Finland							0
France IN2P3				156			156
France CEA							0
Georgia							0
Germany BMBF				154			154
Germany DESY							0
Germany MPI				11			11
Greece							0
Israel							0
Italy				254			254
Japan							0
Morocco							0
Netherlands				90			90
Norway				12			12
Poland							0
Portugal							0
Romania							0
Russia							0
JINR							0
Serbia							0
Slovak Republic							0
Slovenia				65			65
South Africa							0
Spain							0
Sweden							0
Switzerland				121			121
Taipei							0
Turkey							0
United Kingdom				14			14
US DOE+NSF				262			262
CERN				112	884		996
from deferrals					883		883
total sub-detector	0	0	0	1318	1767	892	3977
in addition in M & O-B				139	216		355
in addition in M & O-A				940			940

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 Agency	Forward Detectors			IBL	SQP	Trigger /DAQ	total
	ALFA	LUCID	ZDC				
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				140			140
France CEA							0
Georgia							0
Germany BMBF				450			450
Germany DESY				50			50
Germany MPI							0
Greece							0
Israel							0
Italy				407			407
Japan				71			71
Morocco							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							0
Spain				108			108
Sweden							0
Switzerland				260			260
Taipei							0
Turkey							0
United Kingdom				93			93
US DOE+NSF				320			320
CERN				249	456		705
from deferrals					740		740
total sub-detector	0	0	0	2310	1196	100	3606
in addition in M & O-B					86		86
in addition in M & O-A				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

4/13/2012

Funding Agency	nSW	LAr-E	TileC	FTK	TDAQ	AFP	total	technology options
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+MSTC							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 BMBF							3.0	
Germany DESY							0.4	
Germany MPI							0.5	
Greece							0.3	0.7
Israel							1.7	
Italy							2.5	
Japan							0.9	0.9
Morocco							0.1	
Netherlands							0.7	
Norway							0.3	
Poland							0.1	
Portugal							0.1	0.1
Romania							0.1	
Russia							1.5	
JINR							0.4	
Serbia							0.1	
Slovak Republic							0.1	
Slovenia							0.1	
South Africa							0.1	
Spain							0.7	
Sweden							0.6	
Switzerland							1.1	0.4
Taipei							0.1	
Turkey							0.1	
United Kingdom							2.5	
US DOE+NSF							7.6	2.3
CERN							3.4	
from deferrals							0.0	
from M & O (A+B)							0	0
total sub-detector target (TDR)	0.0	0.0	0.0	0.0	0.0	0.0	36.0	5.6
	9.3	8.0	0.4	3.6	12.0	2.7	36.0	

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

Table 3 (Page 6)