

CERN-RRB-2013-043

ATLAS Resources Review Board, April 16, 2013




For RRB approval (2012)
For RRB information (2013)

**ATLAS Full Design Luminosity Detector Activities
Closing Report 2012 and Status Report 2013**

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to approve the final payments for 2012 and to take note of the 2013 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 April 2012 RRB (CERN-RRB-2012-078).

FDL TDAQ BUDGET
REPORT ELEMENTS
 Initial TDAQ scope
 TDAQ 2012 contributions
 TDAQ 2013 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).

There were no payments or contributions related to TDAQ CORE activities in 2012 (**Table 1**).

Table 2 shows the status of the planned TDAQ budget for 2013, amounting to 0.1 MCHF. These contributions will cover the installation costs of auxiliaries related to additional HLT boxes. It will complete the initial TDAQ CORE investments referred to above.

OTHER FDL
ACTIVITIES
REPORT ELEMENTS

📁 Status of IBL

📁 Description of other FDL activities

📁 Next steps

2. Other FDL Detector activities

The status of other FDL-related activities was given to the RRB in October 2012 (CERN-RRB-2012-078). 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 IBL-MoU has been put in place (see CERN-RRB-2012-028-Appendix 1). Work is in good progress and the sensor production is nearing its completion and the assembly and integration work is in full swing, as planned.

Total payments in IBL amounted to 2.0 MCHF in 2012 for modules and stave construction, including new project money and related payments initially provisioned in M&O-B as part of the initial b-layer replacement scheme, as well as beam pipe and centralized tooling support included in M&O-A (1050 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 is advancing as planned. The activities were reported in the October 2012 RRB (CERN-RRB-2012-078). 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. This has permitted ATLAS to support the above urgent repair work of the SQP, with the active help of CERN.

During 2012, 1.2 MCHF was spent on production and tooling costs, as well as for related infrastructure services.

Table 1 summarizes the payments for IBL and Pixel SQP in 2012. For the IBL, the sharing of payments per Funding Agency includes here both pledged new project funds, as well as any commitments initially planned in M&O-B (Pixels).

Table 2 shows the status of FDL construction efforts in 2013. There is currently no work on the Forward Detectors. The IBL proceeds with the modules assembly and installation (1.3 MCHF) funded by project money. Related beam pipe and technical support (1.0 MCHF) is included in M&O-A. SQP replacement work proceeds with payments planned at 0.8 MCHF to complete the related testing and construction activities of the mechanical structures. It also includes the associated technical services and manpower costs for the planned long LHC shut-down starting 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 2012 RRB (CERN-RRB-2012-

078). The financial framework for Phase 1 amounting to 36 MCHF was endorsed in that same meeting. ATLAS will thus proceed by submitting sub-project specific Technical Design Reports (TDRs) followed by Construction MoU Addenda, as the technologies mature and the funding becomes available.

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). It is reminded 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. The Common Fund part will be covered by using deferral funds and help from CERN.

Concerning Phase 2, the Letter of Intent has been approved by the ATLAS Collaboration Board and submitted to the LHCC. As reported in the October 2012 RRB, the present cost estimate for Phase 2, using the construction CORE-costing, amounts up to 290 MCHF, depending on the final technology options chosen. The detailed costs will be known as each sub-project specific TDRs are submitted.

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				42			42
Chile							0
China NSFC+MSTC							0
Colombia							0
Czech Republic							0
Denmark							0
France IN2P3				140			140
France CEA							0
Georgia							0
Germany BMBF				450			450
Germany DESY							0
Germany MPI							0
Greece							0
Israel							0
Italy				350			350
Japan				66			66
Morocco							0
Netherlands				23			23
Norway				52			52
Poland							0
Portugal							0
Romania							0
Russia							0
JINR							0
Serbia							0
Slovak Republic							0
Slovenia				23			23
South Africa							0
Spain				74			74
Sweden							0
Switzerland				260			260
Taipei							0
Turkey							0
United Kingdom				93			93
US DOE+NSF				320			320
CERN				107	456		563
from deferrals					590		590
total sub-detector	0	0	0	2000	1046	0	3046
in addition in M&O-B					192		192
in addition in M&O-A				1050			1050

Notes:

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

FDL Contributions to ATLAS Detector during 2013 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				18			18
Chile							0
China NSFC+MSTC							0
Colombia							0
Czech Republic							0
Denmark							0
France IN2P3				80			80
France CEA							0
Georgia							0
Germany BMBF				308			308
Germany DESY				72			72
Germany MPI							0
Greece							0
Israel							0
Italy				187			187
Japan				26			26
Morocco							0
Netherlands				16			16
Norway				9			9
Poland							0
Portugal							0
Romania							0
Russia							0
JINR						100	100
Serbia							0
Slovak Republic							0
Slovenia							0
South Africa							0
Spain				58			58
Sweden							0
Switzerland				140			140
Taipei				41			41
Turkey							0
United Kingdom							0
US DOE+NSF				135			135
CERN				227			227
from deferrals					150		150
total sub-detector	0	0	0	1317	150	100	1567
in addition in M&O-B					230		230
in addition in M&O-A				995	432		1427

Notes:

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

Proposed Sharing of Phase 1 by Funding Agency (Payments, in MCHF)

28.03.13

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							0.1	0.2
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							3.6	
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	5.8
	9.3	8.0	0.4	3.6	12.0	2.7	36.0	

Notes:

1. All figures are target figures, while preparing sub-project specific TDRs and MoU Addenda
2. In some cases, they represent funding requests submitted, or being submitted
3. Sub-projects of expressed interest are highlighted in green
4. Column "technology options" indicate possibility of supplementary contributions, subject to technology choices