

CERN-RRB-2009-066

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ATLAS Resources Review Board, April 28, 2009

For RRB information




**Towards ATLAS Full Design Luminosity Detector  
and Beyond**

**Status Report 2009**

# Introduction

*The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to take note of the status report for the 2009 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).




<hr/> <i>FDL TDAQ BUDGET</i>	<b>1. Completion of the TDAQ System</b>
<hr/> <i>REPORT ELEMENTS</i>	As part of the CtC plan in 2002, as well as due to changes in the institute participation, the scope of the initial TDAQ system was reduced from 42.8 MCHF to 30.4 MCHF. By the end of 2008, 27.9 MCHF worth of original CORE value had been delivered to ATLAS, thus leaving some 2.5 MCHF
<hr/>  Initial TDAQ scope	worth of equipment to be installed at ATLAS before installing the currently staged parts.
<hr/>  TDAQ 2009 status	
<hr/>  References	

**Table 1** shows the status of remaining TDAQ CORE contributions for 2009, amounting to 2.1 MCHF. Following the agreement with CERN management to close the initial construction accounts in 2008, a set of new accounts have been created for the TDAQ system. As from April 2009 onwards, these will be reported as part of FDL detector completion efforts. The corresponding commitments have been reported earlier (see Table 2 in CERN-RRB-2009-023). Table 1 is an update of Table 9 in document (CERN-RRB-2008-120).

Once the deferred funding (see Table 8 in CERN-RRB-2009-023) of 9.1 MCHF becomes available, all or part of it will be used to reach the required TDAQ performance for the physics analysis. It should be noted, however, that ATLAS will

need to recognize CERN 1.9 MCHF for the additional manpower effort due to the delay in the start-up in 2008 (see CERN-RRB-2008-120, part 2).

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<i>OTHER FDL</i>
<i>ACTIVITIES</i>
<i>REPORT ELEMENTS</i>
 Staged CORE items
 Description of present FDL activities
 Next steps

## 2. Other FDL Detector activities

The scope of the FDL ATLAS detector was reduced, as a temporary measure, in 2002 as part of the CtC financial plan (CERN-RRB-2002-114 rev.). The total CORE value of the deferred items amounted to ca. 30 MCHF at the time.

The staged items in 2002 included common items such as shielding, processors as well as components from the Inner detector (3<sup>rd</sup> pixel layer, TRT C wheels, electronic & cables), Tile Calorimeter (gap scintillators), LAr Calorimeter (RODs) and the Muon system (EES/EEL chambers, CSC layers). Some of the above items have meanwhile been restored. Once staged, the original Funding Agency responsibilities ceased and they were taken over centrally by ATLAS.

The present value of the remaining staged items is estimated at 20 MCHF and their fate much depends on the measured performance of the ATLAS detector. This has been reported to the RRB (see e.g. CERN-RRB-2008-083). The detailed plan, the timing and cost sharing remains to be discussed with Funding Agencies.

It is clear, however, that the common infrastructure will require improvements, e.g. the shielding as well as environmental monitoring, configuration control, access improvement and cooling/gas/cryo-systems. These improvements are also necessary to move beyond the FDL configuration and towards the Super-LHC.

Since 2002, ATLAS has submitted Letters of Intent for Forward Detectors (CERN/LHCC/2004-010) and for the Zero Degree Calorimeter (CERN/LHCC/2007-001). The Forward Detectors Technical Design Report (CERN/LHCC/2008-004) was approved in 2008. These activities are not included in the present financial plans (initial construction, M&O) and have been, so far, supported by Funding Agencies on a voluntary and supplementary basis. The estimated additional cost of the forward detectors is 1.5 MCHF (see e.g. CERN-RRB-2008-083). These efforts require also centralized technical support from ATLAS and these efforts are not yet included any financial plan. They are currently being evaluated.

As part of the FDL detector configuration (CERN/LHCC/94-43), a replacement of the Inner Detector (Pixel) b-layer was envisaged. The active detector part of this replacement effort was included in 2002 in the Pixel M&O (Category-B) budget, currently as of 2009 onwards. Some level of effort (for the corresponding beam pipe

improvement) is included also in M&O Category-A budget. A dedicated project leader has been nominated to coordinate the b-layer replacement (Insertable B-layer, or IBL project). Discussions are on-going as to the scope, institute participation and sharing of funding between M&O, FDL and upgrade activities.

ATLAS management continues its informal discussions with the Funding Agencies concerning how best to move forward. It will return in the October RRB with a proposal. Meanwhile, in consultation with the CERN management, a set of new accounts have been created for the related FDL activities to control and monitor the voluntary contributions made by Funding Agencies.

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*S U P E R - L H C*

*R E P O R T E L E M E N T S*

 CERN plans

 ATLAS preparations

 Next steps

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### 3. Towards the Super-LHC

At present, the Super-LHC is planned to become operational by 2018 (so-called Phase 2). The CERN Scientific Policy Committee has encouraged CERN to pursue its plans. (CERN-SPC/919).

In accordance with the CERN plans, ATLAS has started to prepare the way towards a high luminosity upgrade detector. For this purpose, a centralized Project Office has been set up as well as appropriate structures to review and endorse upgrade R&D proposals. More details on current R&D activities, funded by Funding Agencies on a voluntary and individual basis, can be found on the ATLAS web pages (<http://atlas.web.cern.ch/Atlas/GROUPS/UPGRADES/>). At present, 16 such proposals have been endorsed by the ATLAS Executive Board.

ATLAS plans to proceed by drafting a Letter of Intent, possibly for 2010, followed by Technical Proposal(s), creating a Memorandum of Understanding (MoU) or several specific MoUs for implementing these upgrade programs.

ATLAS management continues its informal discussions with the Funding Agencies concerning how best to move forward. It will return in the October RRB with a proposal. Meanwhile, the book keeping for the voluntary contributions made by Funding Agencies will be managed, for technical reasons, within the FDL detector activities.

**Planned FDL Contributions to ATLAS Detector during 2009**  
**by Funding Agency**  
(Payments, in kCHF)

Funding Agency	Inner Det.	LAr Cal.	Tile Cal.	Muon cham.	Trigger /DAQ	Common Items	total
Argentina						0	0
Armenia						0	0
Australia						0	0
Austria						0	0
Azerbaijan						0	0
Belarus						0	0
Brazil						0	0
Canada						0	0
Chile						0	0
China NSFC+MSTC						0	0
Colombia						0	0
Czech Republic					20	0	20
Denmark						0	0
Finland						0	0
France IN2P3						0	0
France CEA						0	0
Georgia						0	0
Germany BMBF						0	0
Germany DESY						0	0
Germany MPI						0	0
Greece						0	0
Israel						0	0
Italy						0	0
Japan						0	0
Morocco						0	0
Netherlands						0	0
Norway						0	0
Poland						0	0
Portugal					150	0	150
Romania						0	0
Russia						0	0
JINR					100	0	100
Serbia						0	0
Slovak Republic						0	0
Slovenia						0	0
Spain						0	0
Sweden						0	0
Switzerland					830	0	830
Taipei						0	0
Turkey						0	0
United Kingdom						0	0
US DOE+NSF						0	0
CERN					1045	0	1045
from deferrals							
total sub-detector	-	-	-	-	2,145	-	2,145