

CERN-RRB-2011-026

ATLAS Resources Review Board, April 12, 2011

For RRB approval (2010)
For RRB information (2011)

**ATLAS Full Design Luminosity Detector Activities
Closing Report 2010 and Status Report 2011**

Introduction

The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to approve the final payments for 2010 and to take note of the 2011 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. The progress was reported in the October 2010 RRB (CERN-RRB-2010-118).





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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 2009 status	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).
 De-staging	
 TDAQ 2010 budget	

Table 1 provides the final TDAQ CORE contributions made in 2010, 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.

It should be noted that Table 1 also includes de-staging of related TDAQ hardware by some 60 kCHF, funded by Chile. This is above the remaining TDAQ budget of 2.5 MCHF and is part of the planned efforts to enhance TDAQ performance beyond 2011.

Table 2 shows the planned TDAQ budget for 2011, amounting to 0.9 MCHF. These payments cover the installation of additional HLT boxes and related auxiliaries.

2. Other FDL Detector activities

The status of other FDL-related activities was given to the RRB in October 2010 (CERN-RRB-2010-118). The Interim-MoU for the Insertable b-layer project (IBL) has now been signed by most Funding Agencies and institutes involved. The IBL TDR was submitted to the LHCC in Autumn 2010 within the agreed financial framework of 9.7 MCHF. Work is in good progress towards selecting the sensor technology by the summer of 2011. Once the technology selection is made, the IBL MoU will become definite and the final round of signatures will be collected.

IBL-related expenditures started in 2010. Total payments in IBL amounted to 0.9 MCHF in 2010 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 (191 kCHF), as well as beam pipe and centralized tooling support included in M&O-A (180 kCHF). It should be noted that in 2009, some 0.8 MCHF was originally provisioned in the M&O-B budget for IBL. This is included in the expenditures planning for 2011.

The work on Forward Detectors (CERN/LHCC/2004-010) and the Zero Degree Calorimeter (CERN/LHCC/2007-001), having been supported by some Funding Agencies on a voluntary and supplementary basis, is nearing completion. The total additional cost of the forward detectors is 3.1 MCHF (see Table 1), including 1.1 MCHF of centralized technical support from ATLAS, financed through deferrals. The Forward Detector community is now organized and actively contributing within the governance structures of ATLAS.

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, would liberate cash for FDL activities as due CtC-contributions are received from some Funding Agencies (CERN-RRB-2009-023). At present, the collected cash has permitted ATLAS to support the completion of both Forward Detectors as well as funding the urgent repair work of the Inner Detector Pixel Service Quarter Panels (SQP), with the active help of CERN.

The needed SQP repair work was reported in the October 2010 RRB (CERN-RRB-2010-082). Subsequently, and 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). During 2010, 127 kCHF was spent on tooling, test equipment and on prototypes.

Table 1 summarizes the payments for IBL, Forward detectors and Pixel SQP in 2010. 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-2011-028, Table 1).

Table 2 shows the status of FDL construction efforts in 2011. The work on the Forward Detectors is finished for the time being. The IBL is proceed with the modules production (1.6 MCHF) funded by project money and the IBL part of M&O-B. Related beam pipe support (0.9 MCHF) is included in M&O-A. SQP replacement work proceeds with payments planned at 2.7 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.

FDL Contributions to ATLAS Detector during 2010 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							0
Chile						58	58
China NSFC+MSTC							0
Colombia							0
Czech Republic	138						138
Denmark							0
Finland							0
France IN2P3	128			160			288
France CEA							0
Georgia							0
Germany BMBF	324			174			498
Germany DESY	382						382
Germany MPI							0
Greece							0
Israel							0
Italy		292		221			513
Japan							0
Morocco							0
Netherlands				82			82
Norway							0
Poland	30						30
Portugal	50						50
Romania							0
Russia							0
JINR							0
Serbia							0
Slovak Republic							0
Slovenia							0
South Africa							0
Spain							0
Sweden	58						58
Switzerland				89		830	919
Taipei							0
Turkey							0
United Kingdom							0
US DOE+NSF			465	41			506
CERN	120						120
from deferrals	678	229	207		127		1241
total sub-detector	1,908	521	672	767	127	888	4,883
of which from M&O-B				191			191
in addition in M&O-A				180			180

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							0
Chile							0
China NSFC+MSTC							0
Colombia							0
Czech Republic				10			10
Denmark							0
Finland							0
France IN2P3				142			142
France CEA							0
Georgia							0
Germany BMBF				214			214
Germany DESY				72			72
Germany MPI							0
Greece							0
Israel							0
Italy				244			244
Japan				10			10
Morocco							0
Netherlands				40			40
Norway				23			23
Poland							0
Portugal							0
Romania							0
Russia							0
JINR						100	100
Serbia							0
Slovak Republic							0
Slovenia							0
South Africa							0
Spain				17			17
Sweden							0
Switzerland				291			291
Taipei				12			12
Turkey							0
United Kingdom				31			31
US DOE+NSF				293			293
CERN				154	1330	765	2249
from deferrals					1330		1330
total sub-detector	0	0	0	1553	2660	865	5078
of which from M&O-B				150			150
in addition in M&O-A				940			940