CERN-RRB-2006-056 25th April 2006

ATLAS Progress Report

- Collaboration and management
- Construction status of the detector systems
- (Common Projects and installation: see Marzio Nessi's presentation)
- Computing and physics preparation
- Milestones and schedule
- Brief account on other activities
- Operation Model
- Status of Completion Planning
- Conclusions

Collaboration composition

At the last RRB in October 2005 the Expressions of Interests to join the ATLAS Collaboration of six new groups were announced

Since then the discussions and negotiations for their contributions have been constructive, and the admission procedures have been concluded, they were approved all unanimously by the Collaboration Board on 24th February 2006 as new members

This means in particular that in each case necessary technical service tasks and in most cases hardware contributions have been identified, besides involvements in physics

Germany, BMBF

Institute of Nuclear and Particle Physics, Technical University Dresden
(LAr – HV and calibration, computing)

Institute of Physics II, Justus-Liebig-University, Giessen
(Forward and luminosity detectors – Roman Pots fibre tracking)

U.S.A., DOE

Physics Department, Oklahoma State University
(Pixels – Alignment, b-tagging, opto-links for upgrade)

Physics Department and Center for HEP, University of Oregon, Eugene
(TDAQ – HLT, level-2, commissioning)

Argentina, ANPCyT

The Agencia Nacional de Promocion Cientifica y Tecnologica (ANPCyT) is a new Funding Agency supporting the ATLAS Collaboration, and will join the ATLAS RRB

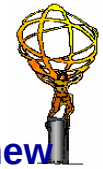
National University of La Plata

University of Buenos Aires

(Both: TDAQ – HLT, contributions to processor farm, controls and algorithms)

The RRB is kindly requested to endorse the admission of these six new Institutions in the ATLAS Collaboration

Formal Expression of Interest



Following detailed and fruitful discussions, the admission procedure has been initiated for four new groups from the following Institutions, which have submitted formal Expressions of Interest (EoI) letters to the CB of 24th February 2006

DESY (Hamburg and Zeuthen), Germany
(HLT, Grid computing, shower simulations)

Humboldt University Berlin, Institute of Physics, Berlin, Germany
(HLT, commissioning, computing, working very closely with DESY)

New York University, Department of Physics, New York, U.S.A.
(HLT algorithms for level-2 and EF, commissioning, power systems for upgrades)

SLAC, Stanford, U.S.A.
(Pixels – hard and software, HLT, simulations)

Contacts
Several contacts have not been encouraged at this stage to proceed to EoIs, these will need further consolidations and negotiations in order to assess the mutual benefits

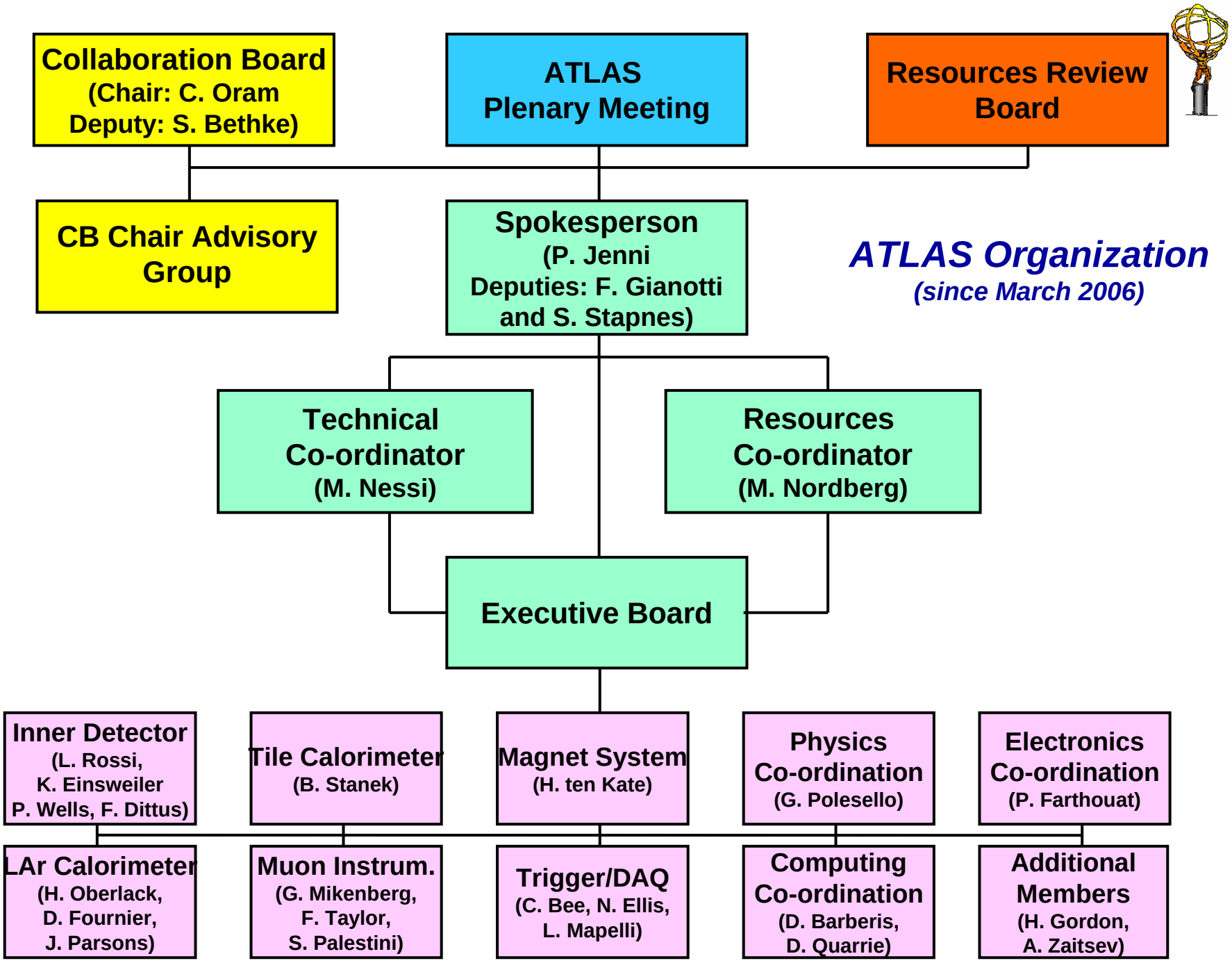
No action is requested at this stage from the RRB concerning these EoIs and contacts

ATLAS Collaboration

(Status April 2006, 158 Institutions, 35 Countries)

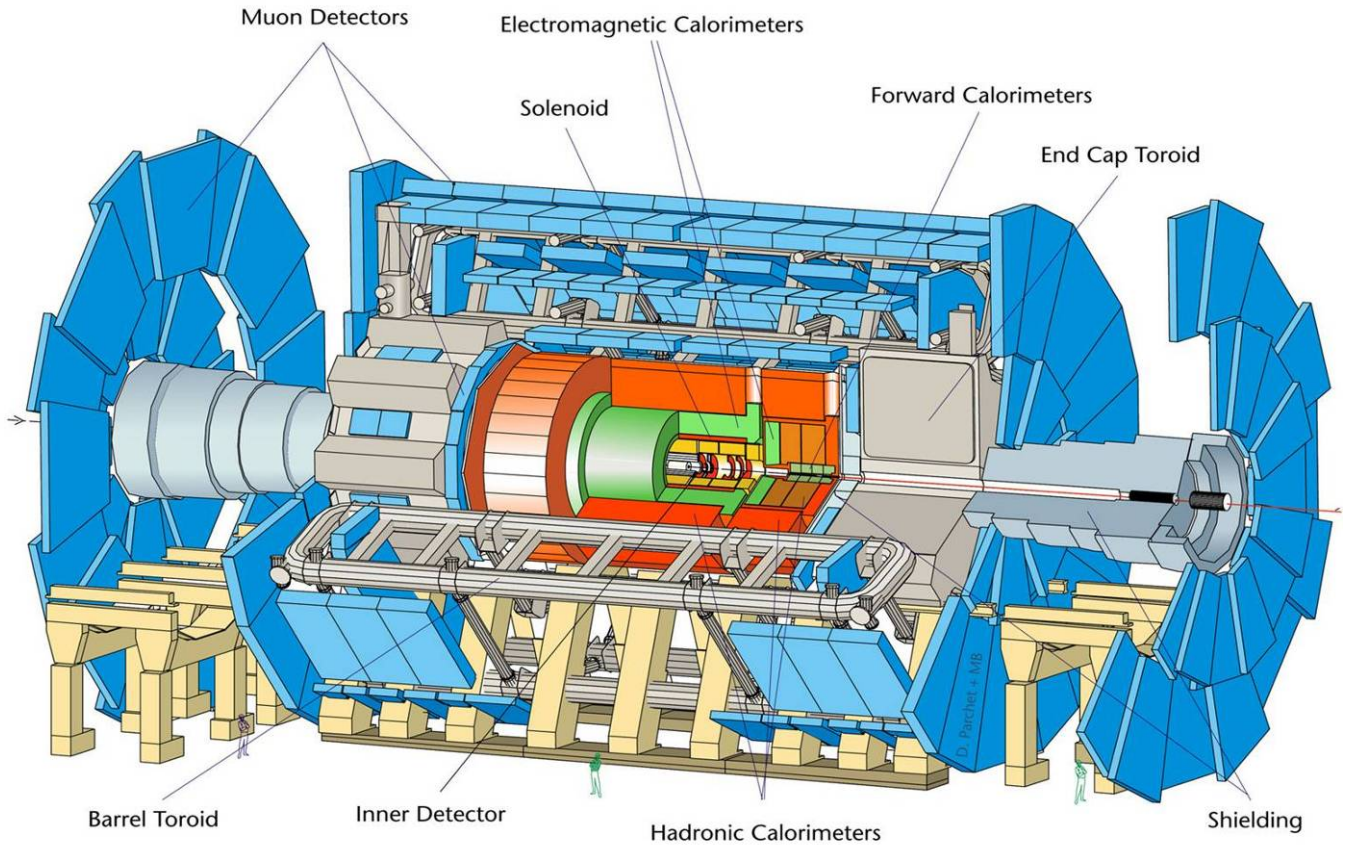
Albany, Alberta, NIKHEF Amsterdam, Ankara, LAPP Annecy, Argonne NL, Arizona, UT Arlington, Athens, NTU Athens, Baku, IFAE Barcelona, Belgrade, Bergen, Berkeley LBL and UC, Bern, Birmingham, Bologna, Bonn, Boston, Brandeis, Bratislava/SAS Kosice, Brookhaven NL, Buenos Aires, Bucharest, Cambridge, Carleton, Casablanca/Rabat, CERN, Chinese Cluster, Chicago, Clermont-Ferrand, Columbia, NBI Copenhagen, Cosenza, INP Cracow, FPNT Cracow, Dortmund, TU Dresden, JINR Dubna, Duke, Frascati, Freiburg, Geneva, Genoa, Giessen, Glasgow, LPSC Grenoble, Technion Haifa, Hampton, Harvard, Heidelberg, Hiroshima, Hiroshima IT, Indiana, Innsbruck, Iowa SU, Irvine UC, Istanbul Bogazici, KEK, Kobe, Kyoto, Kyoto UE, Lancaster, UN La Plata, Lecce, Lisbon LIP, Liverpool, Ljubljana, QMW London, RHBNC London, UC London, Lund, UA Madrid, Mainz, Manchester, Mannheim, CPPM Marseille, Massachusetts, MIT, Melbourne, Michigan, Michigan SU, Milano, Minsk NAS, Minsk NCPHEP, Montreal, McGill Montreal, FIAN Moscow, ITEP Moscow, MEPhI Moscow, MSU Moscow, Munich LMU, MPI Munich, Nagasaki IAS, Naples, Naruto UE, New Mexico, Nijmegen, BINP Novosibirsk, Ohio SU, Okayama, Oklahoma, Oklahoma SU, Oregon, LAL Orsay, Osaka, Oslo, Oxford, Paris VI and VII, Pavia, Pennsylvania, Pisa, Pittsburgh, CAS Prague, CU Prague, TU Prague, IHEP Protvino, Ritsumeikan, UFRJ Rio de Janeiro, Rochester, Rome I, Rome II, Rome III, Rutherford Appleton Laboratory, DAPNIA Saclay, Santa Cruz UC, Sheffield, Shinshu, Siegen, Simon Fraser Burnaby, SM Dallas, NPI Petersburg, Stockholm, KTH Stockholm, Stony Brook, Sydney, AS Taipei, Tbilisi, Tel Aviv, Thessaloniki, Tokyo ICEPP, Tokyo MU, Toronto, TRIUMF, Tsukuba, Tufts, Udine, Uppsala, Urbana UI, Valencia, UBC Vancouver, Victoria, Washington, Weizmann Rehovot, Wisconsin, Wuppertal, Yale, Yerevan

Total Scientific Authors	**1650**
Scientific Authors holding a PhD or equivalent	**1320**


Collaboration Board
(Chair: C. Oram
Deputy: S. Bethke)
ATLAS
Plenary Meeting
Resources Review
Board
CB Chair Advisory
Group
Spokesperson
(P. Jenni
Deputies: F. Gianotti
and S. Stapnes)
ATLAS Organization
(since March 2006)
Technical
Co-ordinator
(M. Nessi)
Resources
Co-ordinator
(M. Nordberg)
Executive Board
Inner Detector
(L. Rossi,
K. Einsweiler
P. Wells, F. Dittus)
Tile Calorimeter
(B. Stanek)
Magnet System
(H. ten Kate)
Physics
Co-ordination
(G. Polesello)
Electronics
Co-ordination
(P. Farthouat)
LAr Calorimeter
(H. Oberlack,
D. Fournier,
J. Parsons)
Muon Instrum.
(G. Mikenberg,
F. Taylor,
S. Palestini)
Trigger/DAQ
(C. Bee, N. Ellis,
L. Mapelli)
Computing
Co-ordination
(D. Barberis,
D. Quarrie)
Additional
Members
(H. Gordon,
A. Zaitsev)

Construction progress of the detector systems

(The Common Projects and installation will be covered by M Nessi)



ATLAS superimposed to
the 5 floors of building 40

Diameter	***25 m***
Barrel toroid length	***26 m***
End-cap end-wall chamber span	***46 m***
Overall weight	***7000 Tons***

Inner Detector (ID)

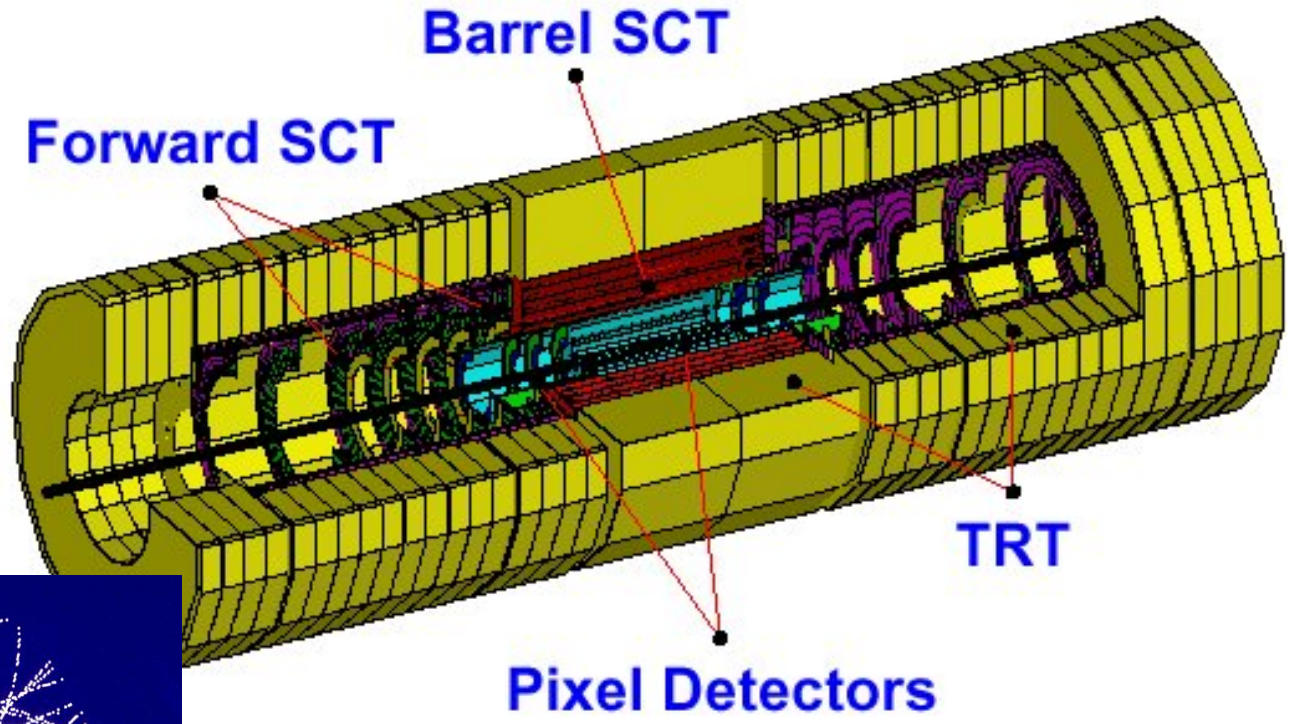
The Inner Detector (ID) is organized into four sub-systems:

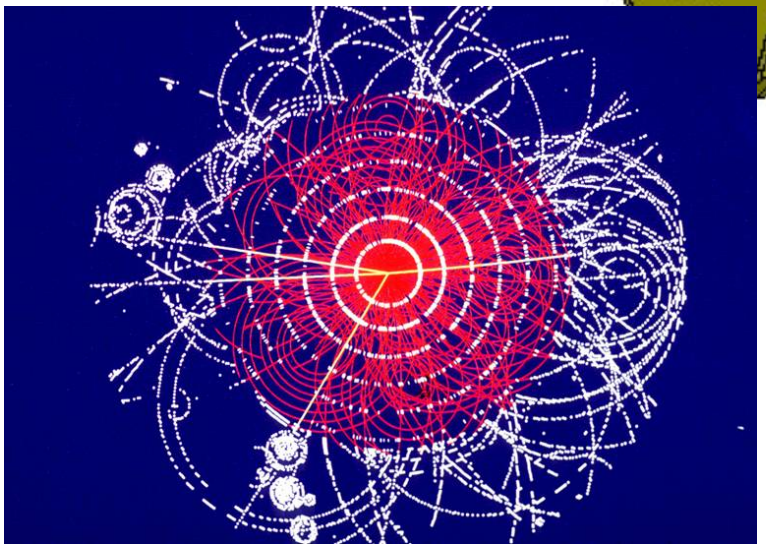
Pixels (0.8 10^8 channels)

Silicon Tracker (SCT)
(6 10^6 channels)

Transition Radiation Tracker (TRT)
(4 10^5 channels)

Common ID items





Pixels

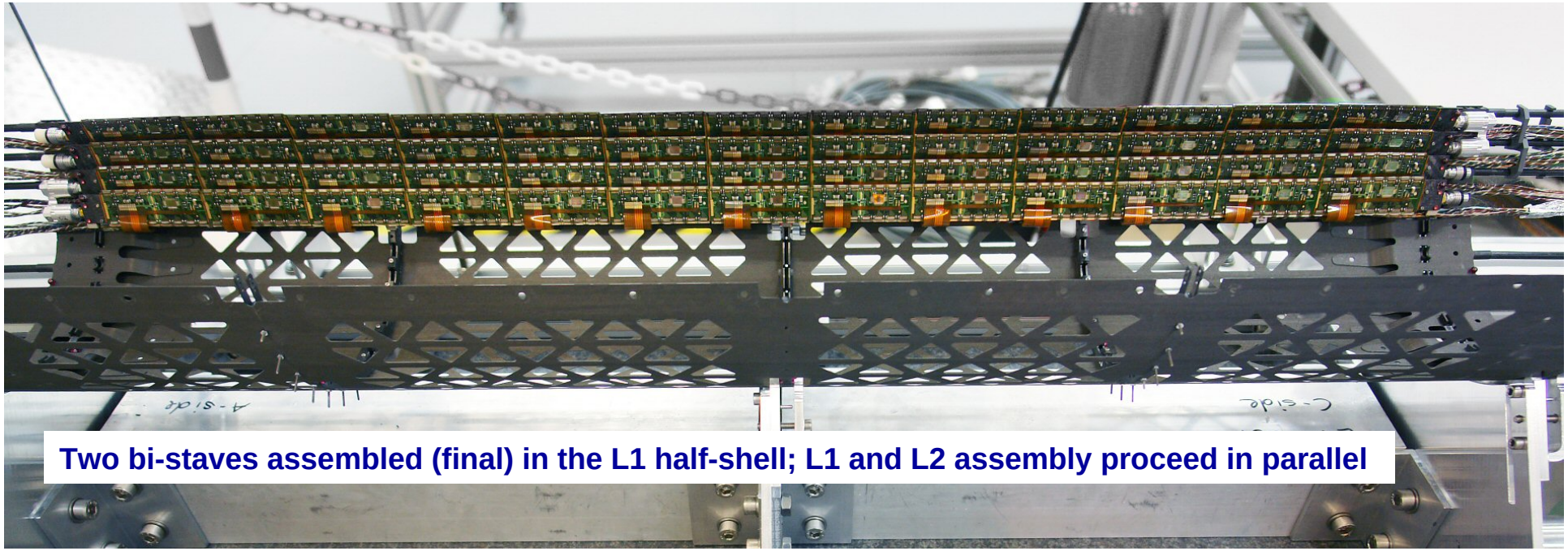
As reported in detail at the last RRB, the Pixel project was affected by a technical problem that required highest priority recovery action:

Corrosion leaks in the barrel cooling tubes

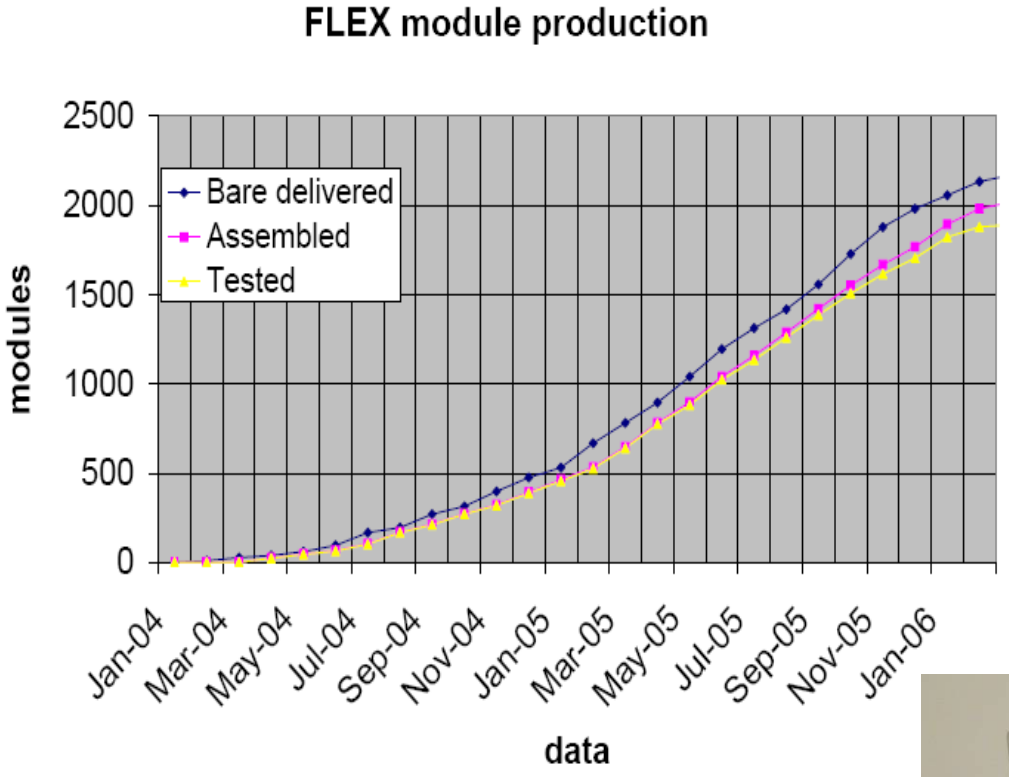
A repair and replacement strategy was developed which includes production of new staves for the B-layer, repair of bare staves with new cooling lines, and insertion of new cooling tubes in staves already equipped with glued modules

These actions progress encouragingly well along a tight schedule for installation readiness Feb 2007

The installation schedule has been adapted as to accommodate the late availability
(Note that the Pixel sub-system can be installed independently from the rest of the Inner Detector)



Two bi-staves assembled (final) in the L1 half-shell; L1 and L2 assembly proceed in parallel



The rate for assembled and fully qualified modules meets the needs for a 3-hit system in time (1744 modules needed)

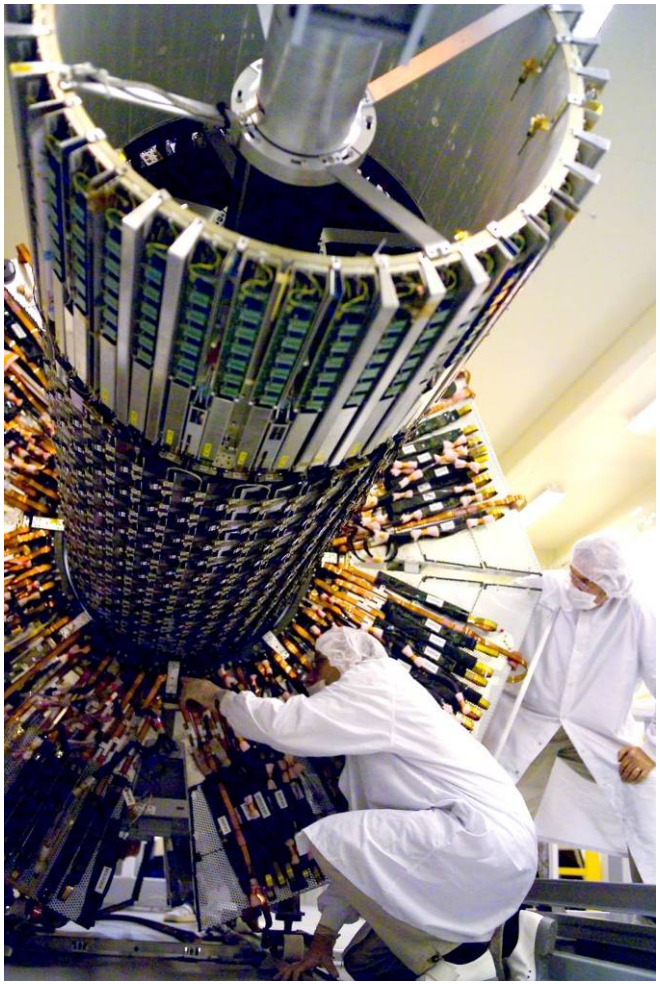
Assembly and integration, as well as preparation of the installation tools, proceed according to schedule

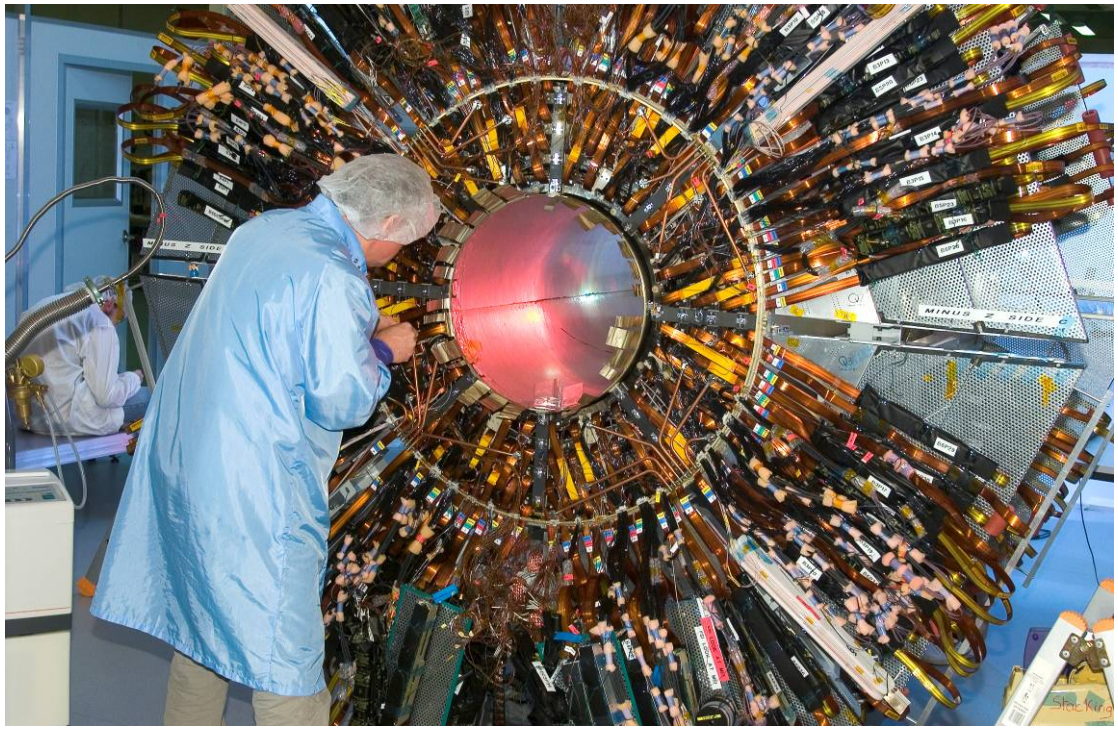
Shipment of the first complete end-cap is expected for mid-May, followed by cosmic ray tests in SR1

Three completed Pixel disks, each with 2.2 M channels

Silicon Tracker (SCT)

All four barrel cylinders are complete and at CERN





The pictures show different stages of the integration of the four barrel SCT cylinders

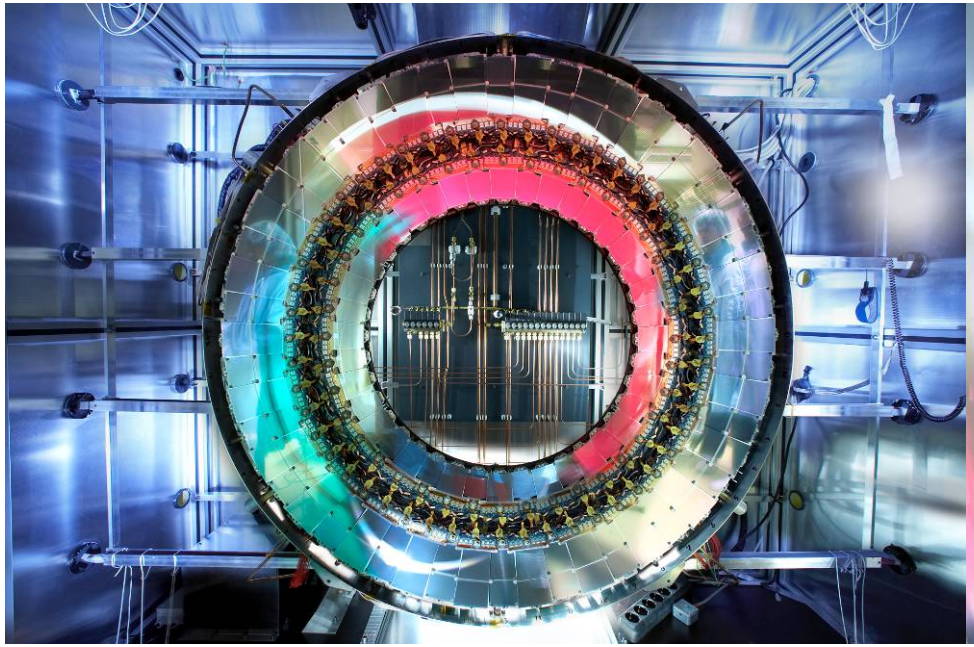
The cylinders have been tested before: 99.7% of all channels fully functional

End-cap SCT

All disks for the end-caps are finished as well

The first end-cap arrived end of February 2006 at CERN, the second one just last week

A completed end-cap SCT disk



Support cylinder to receive SCT end-cap disks

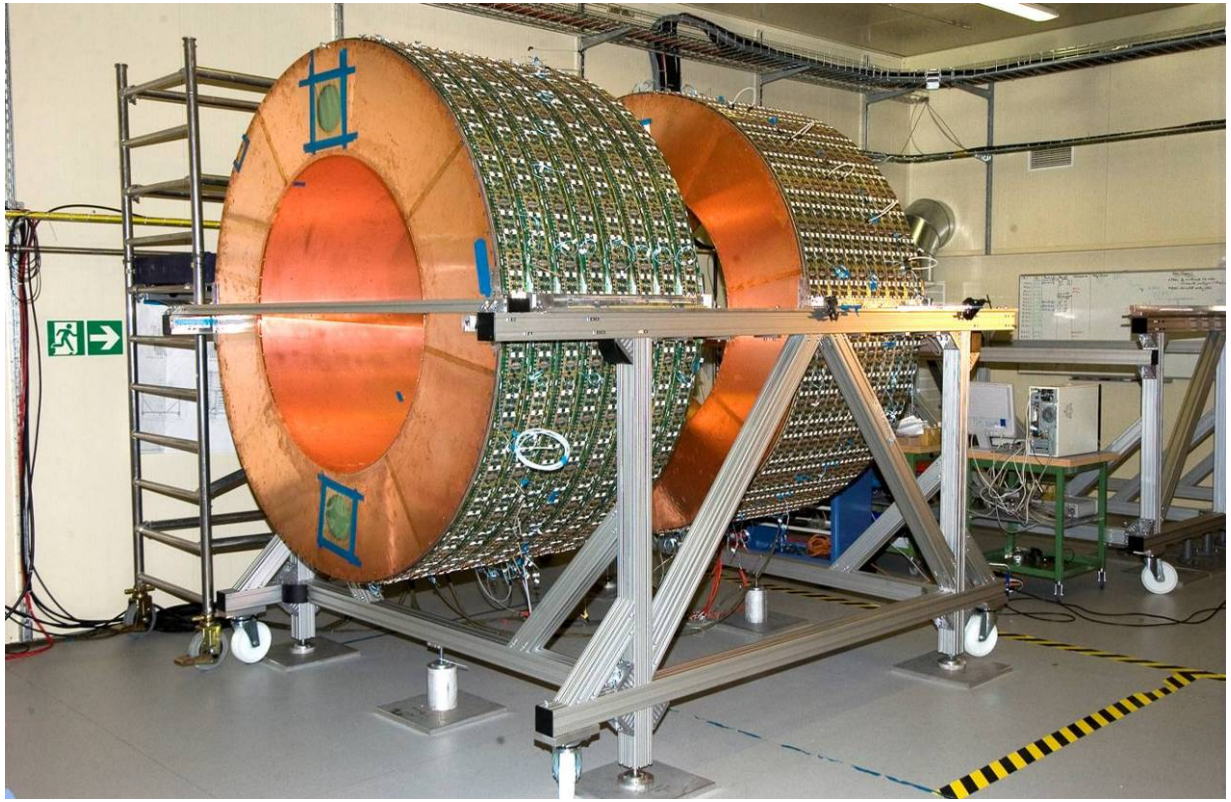
(Pictures taken by a famous photographer, P. Ginter, as art-work…)

Transition Radiation Tracker (TRT)

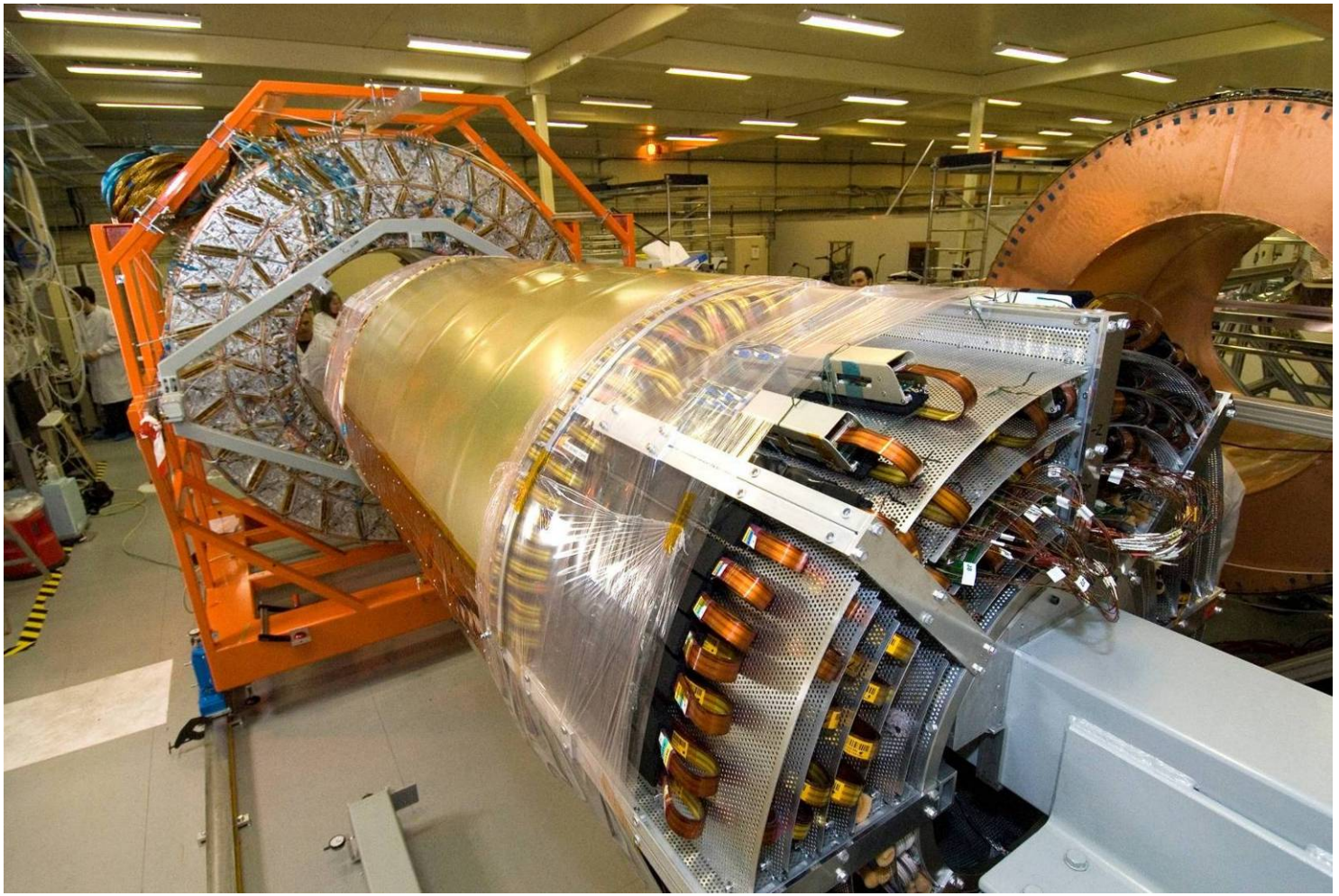
The module construction for the TRT is complete

The barrel integration has been finished since about a year, a repair action is still ongoing to replace leaking manifold on cooling lines on the end-faces

The first end-cap side (A and B wheels) has been stacked, the second side will be ready in May 2006, they are now being equipped with services



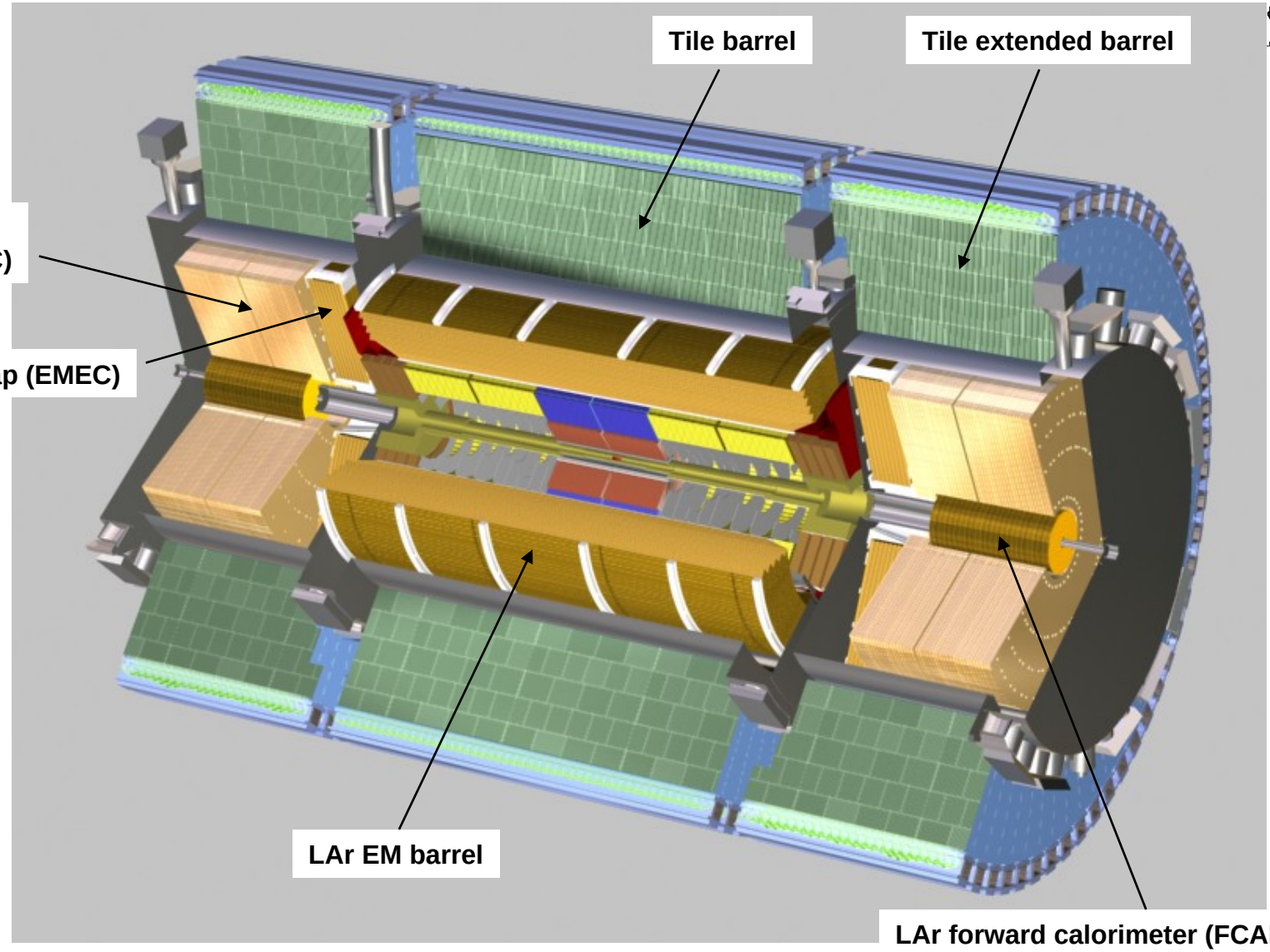
The first of the two end-cap TRTs (A and B type wheels) fully assembled



End of February 2006 the barrel SCT was inserted into the barrel TRT, and this component will be ready for the final installation in ATLAS in June 2006 after further commissioning at the surface with cosmics

Integrations of the two end-caps (SCT and TRT) are expected for June and August 2006

LAr and Tile Calorimeters



Barrel LAr and Tile Calorimeters

Since the last RRB the barrel calorimeters have been moved to their final position at the ATLAS detector centre, and the work has concentrated on the FE electronics and services installations

The final cool-down of the LAr cryostat has started just before Easter, the first *in-situ* operation is planned for end of May 2006

Calorimeter barrel after its move into the center of the detector (4th November 2005)

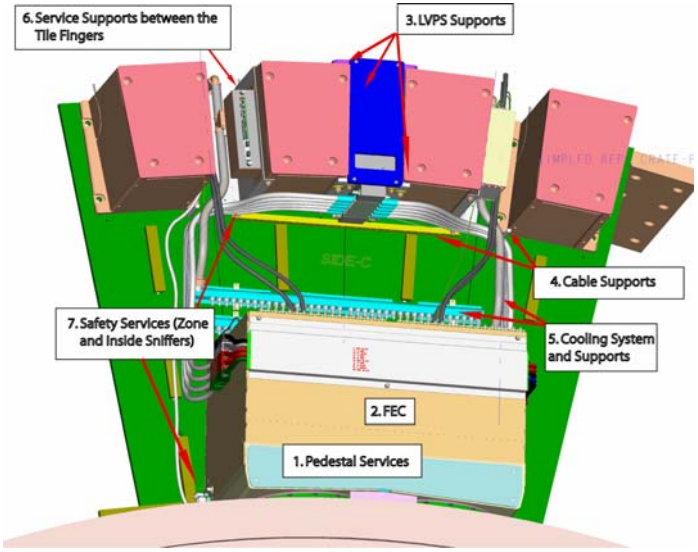
End-Cap LAr and Tile Calorimeters

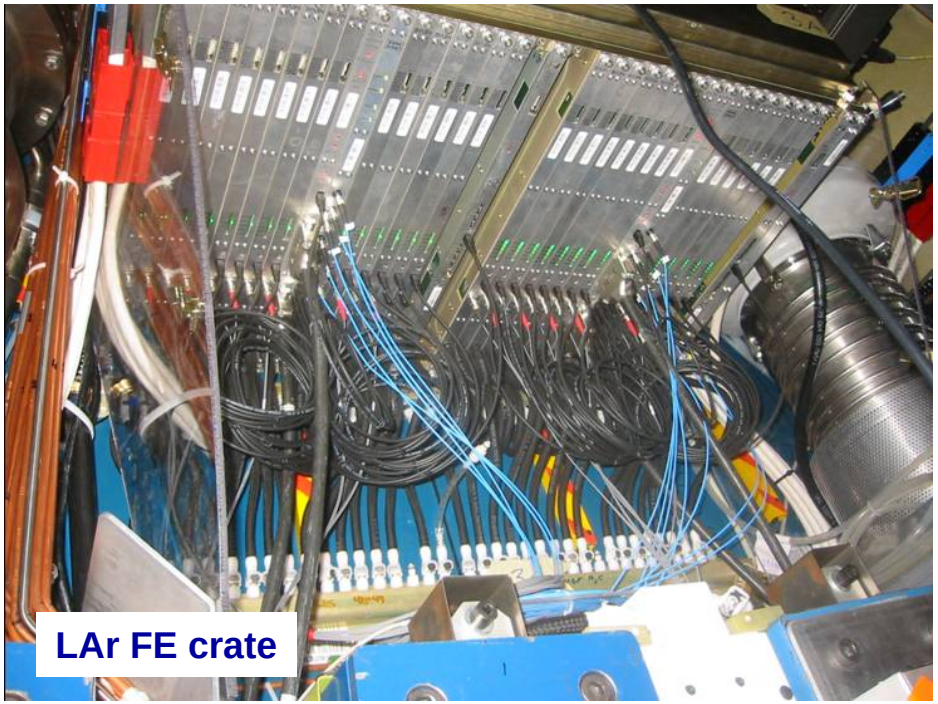
The end-cap calorimeters on side C were assembled in the cavern by end of January 2006, and then moved partially into the ATLAS detector centre, in order to free the space under shaft C for muon end-cap installation

The installation of the second end-cap is in full swing

Completed end-cap calorimeter side C, just before, and after, the partial insertion into the detector

Calorimeter electronics





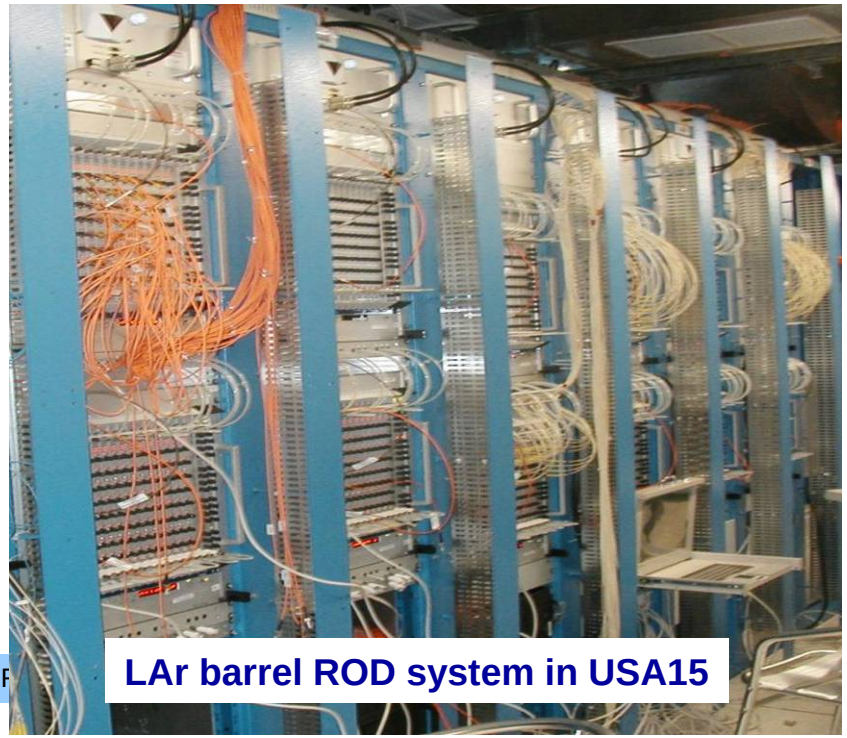
LAr FE crate

The installation of the LAr Front End (FE) electronics on the detector, as well as of the Back End (BE) read-out electronics in the control room, is proceeding to plans

A particular concern are still the low and high voltage LAr power supplies, where a large effort is made with the vendors to improve the reliability

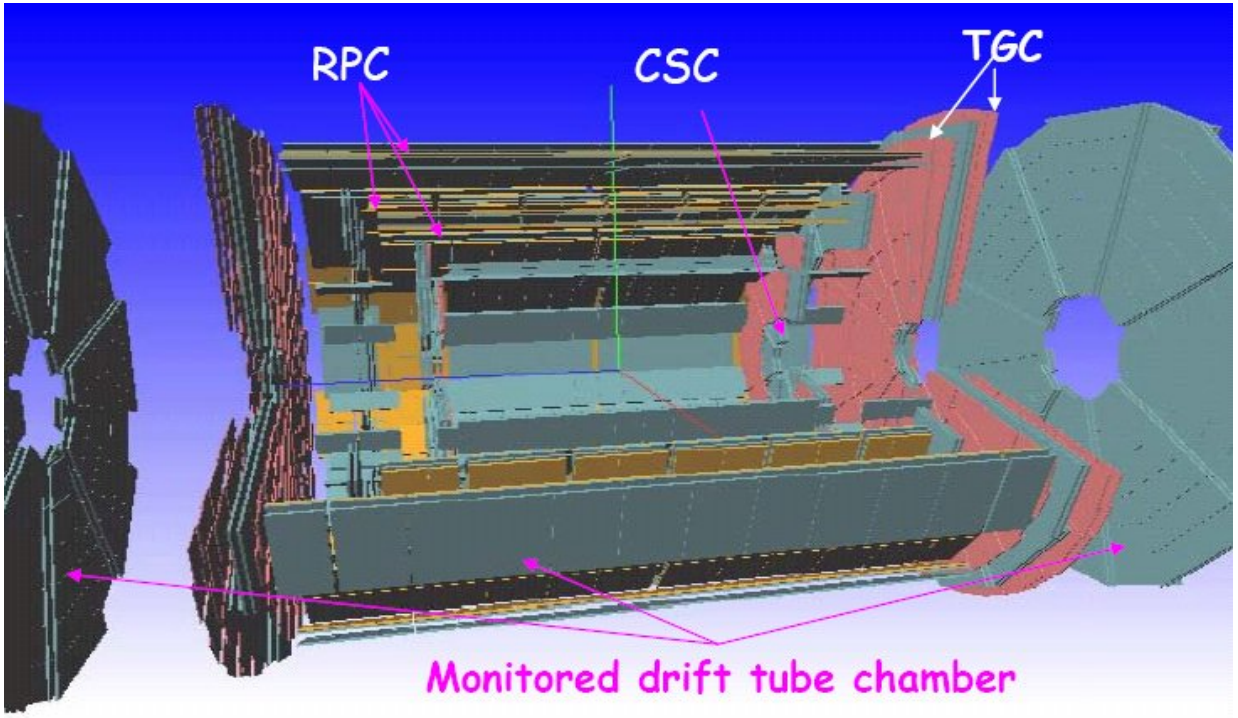
(The situation is improving for the LV, but not yet for the HV, for which alternative suppliers are investigated)

For the Tile Calorimeter, a control problem for the low voltage supplies has been understood, and a corrective action is being implemented



LAr barrel ROD system in USA15

Muon Spectrometer Instrumentation



The Muon Spectrometer is instrumented with precision chambers and fast trigger chambers

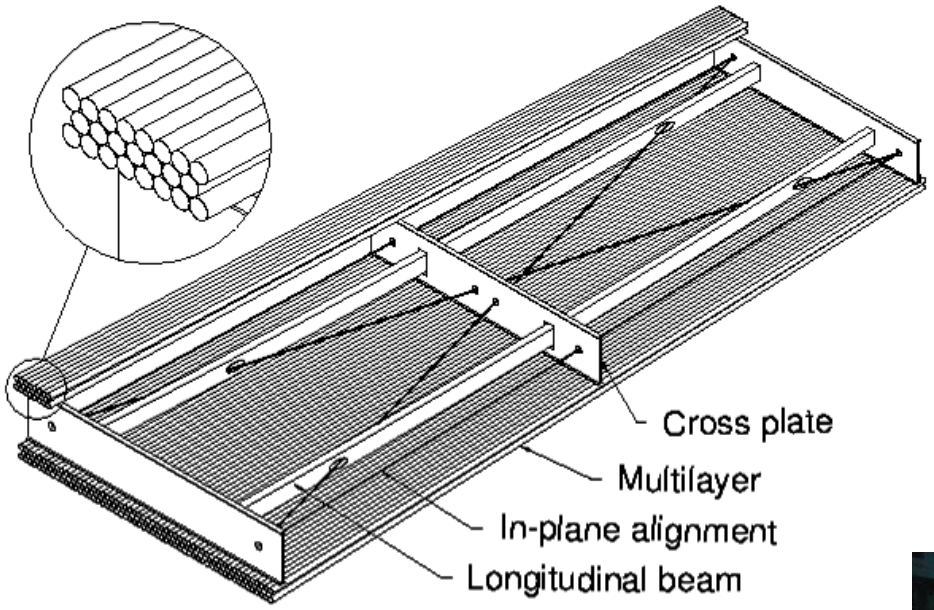
A crucial component to reach the required accuracy is the sophisticated alignment measurement and monitoring system

Precision chambers:
- **MDTs in the barrel and end-caps**
- **CSCs at large rapidity for the innermost end-cap stations**

Trigger chambers:
- **RPCs in the barrel**
- **TGCs in the end-caps**

At the end of February 2006 the huge and long effort of series chamber production in many sites was completed for all chamber types

Barrel MDTs



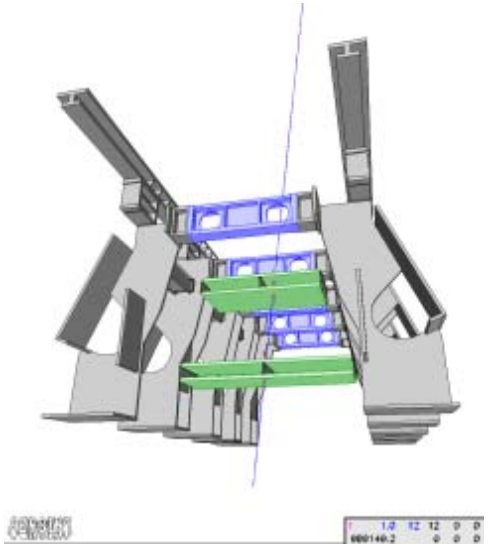
Installation of barrel muon station

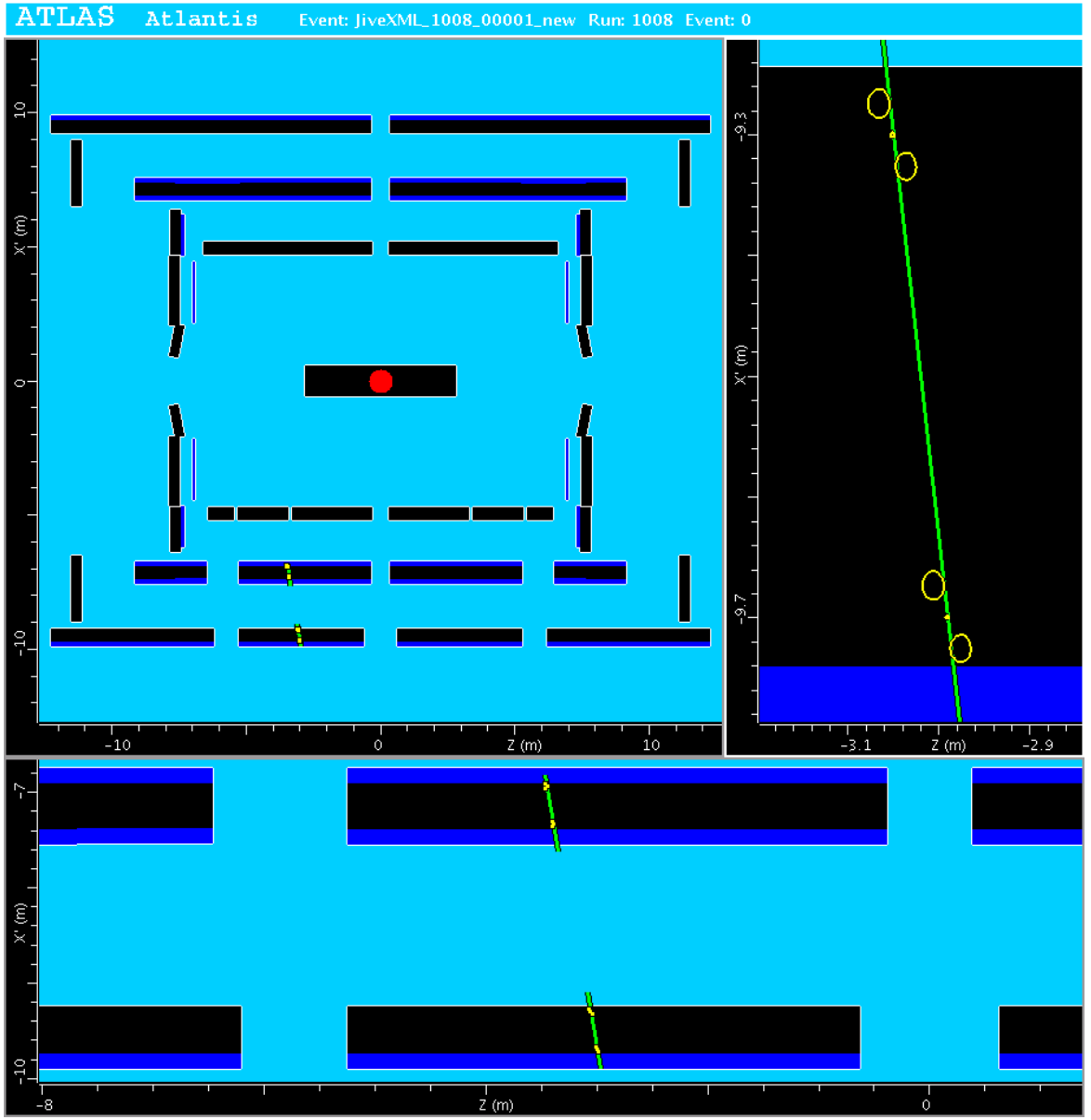
A major effort is spent in the preparation and testing of the barrel muon stations (MDTs and RPCs for the middle and outer stations) before their installation in-situ

The electronics and alignment system fabrications for all MDTs are on schedule

Just before Christmas:

First cosmics muons registered in the stations installed in the bottom sector of the spectrometer





End-cap muon chamber sector preparations

‘Big Wheel’ end-cap MDT sector

72 TGC and 32 MDT ‘Big-Wheel’ sectors have to be assembled

This work is in full swing in the Hall 180 where previously the Barrel Toroid and the LAr integration and tests were done

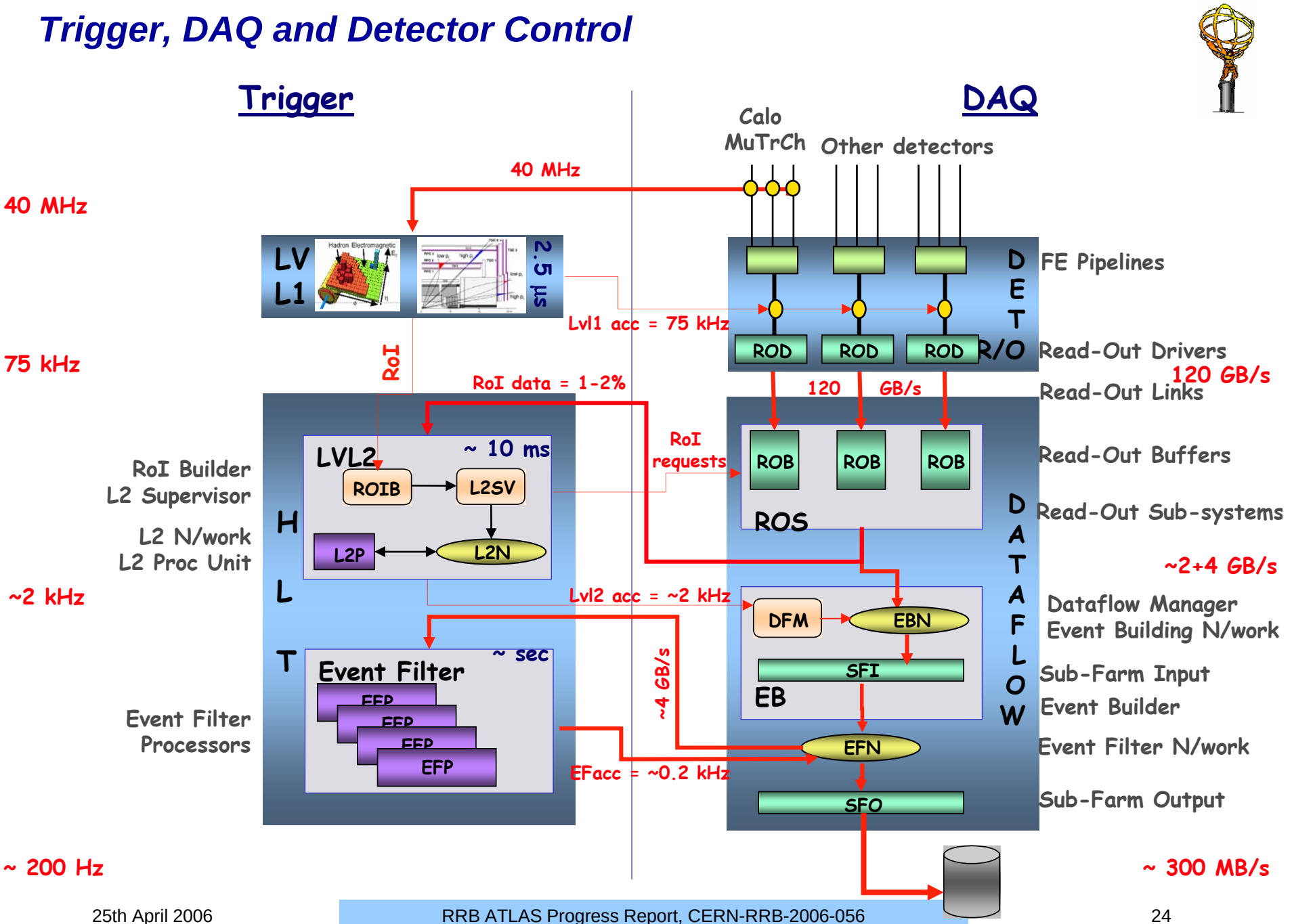
‘Big Wheel’ end-cap TGC sector

Mid-April all sectors for the first (of total six) TGC Wheel have been assembled, and 12 out of the 32 MDT sectors are completed

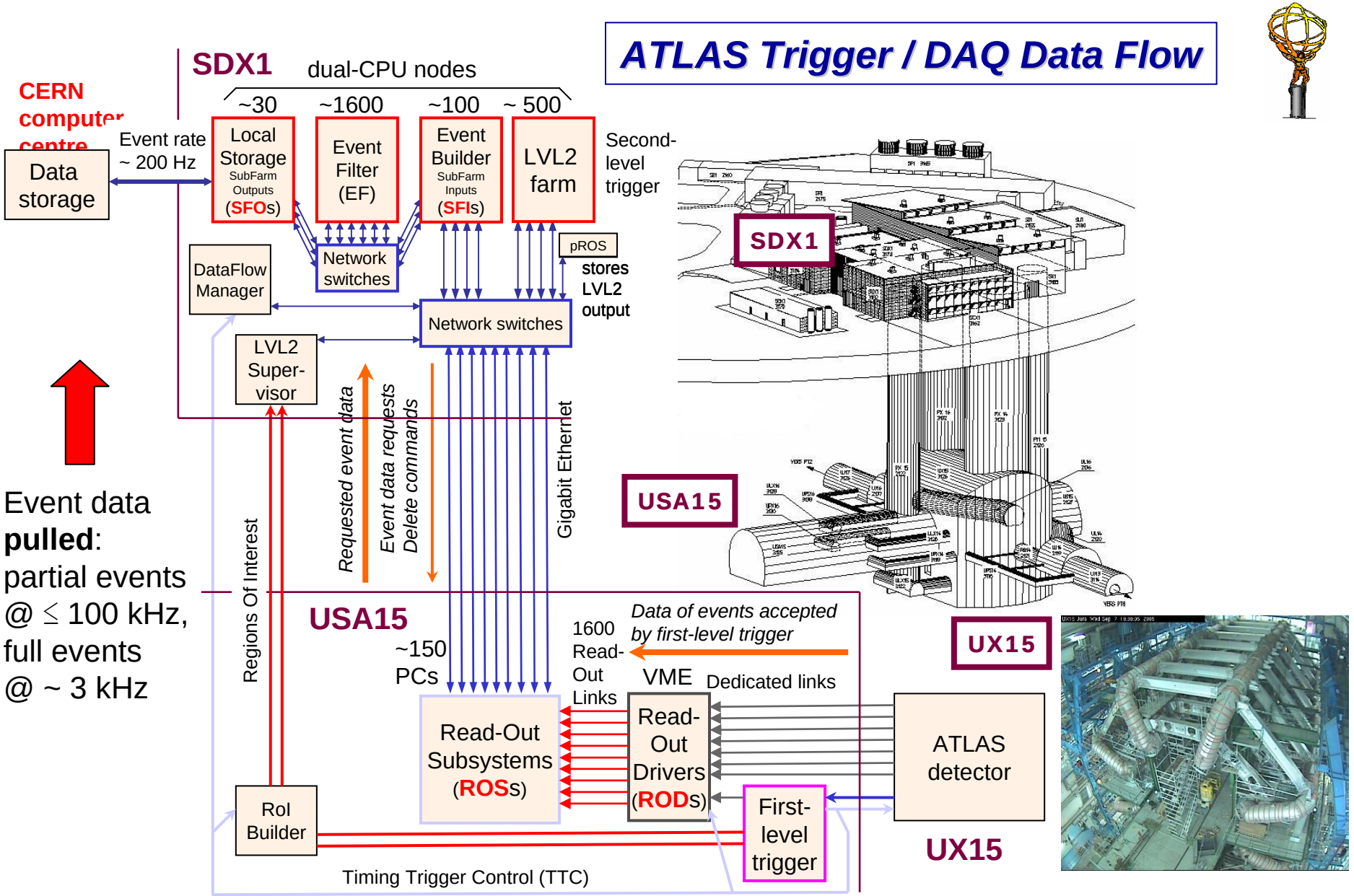
TGC sector assembly and testing activities in hall 180

A corrective action, utilizing more manpower, has been implemented to achieve on-time assembly, and complete installation in the cavern of side C by the end of 2006 and of side A by June 2007

Trigger, DAQ and Detector Control



ATLAS Trigger / DAQ Data Flow



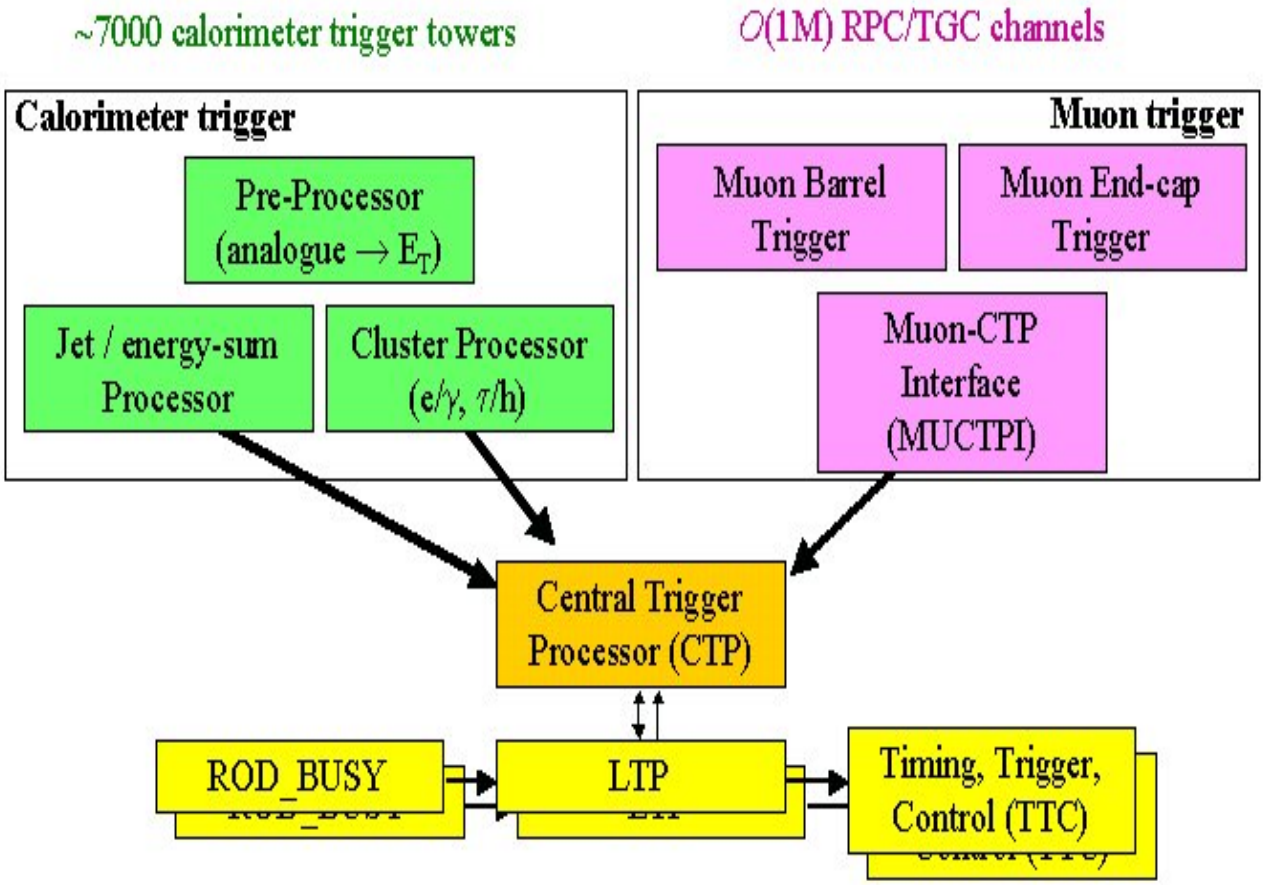
Event data **pulled**:
partial events
@ ≤ 100 kHz,
full events
@ ~ 3 kHz

Event data **pushed** @ ≤ 100 kHz,
1600 fragments of ~ 1 kByte each

Level-1

The level-1 system (calorimeter, muon and central trigger logics) is in the production and installation phases for both the hardware and software

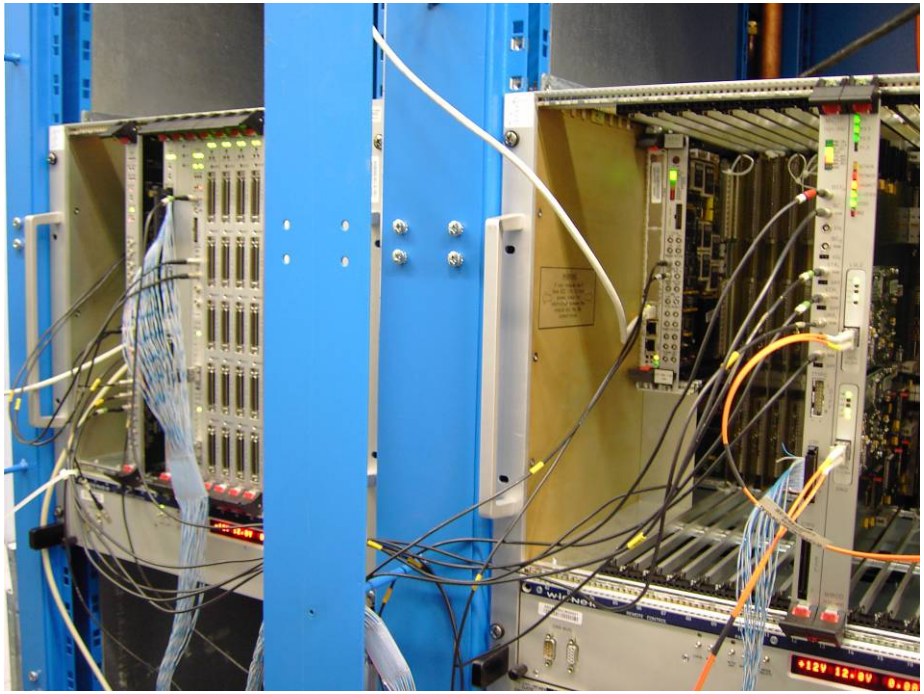
The muon trigger sub-system faces a very tight schedule for the on-chamber components as reported previously, but is now proceeding satisfactorily



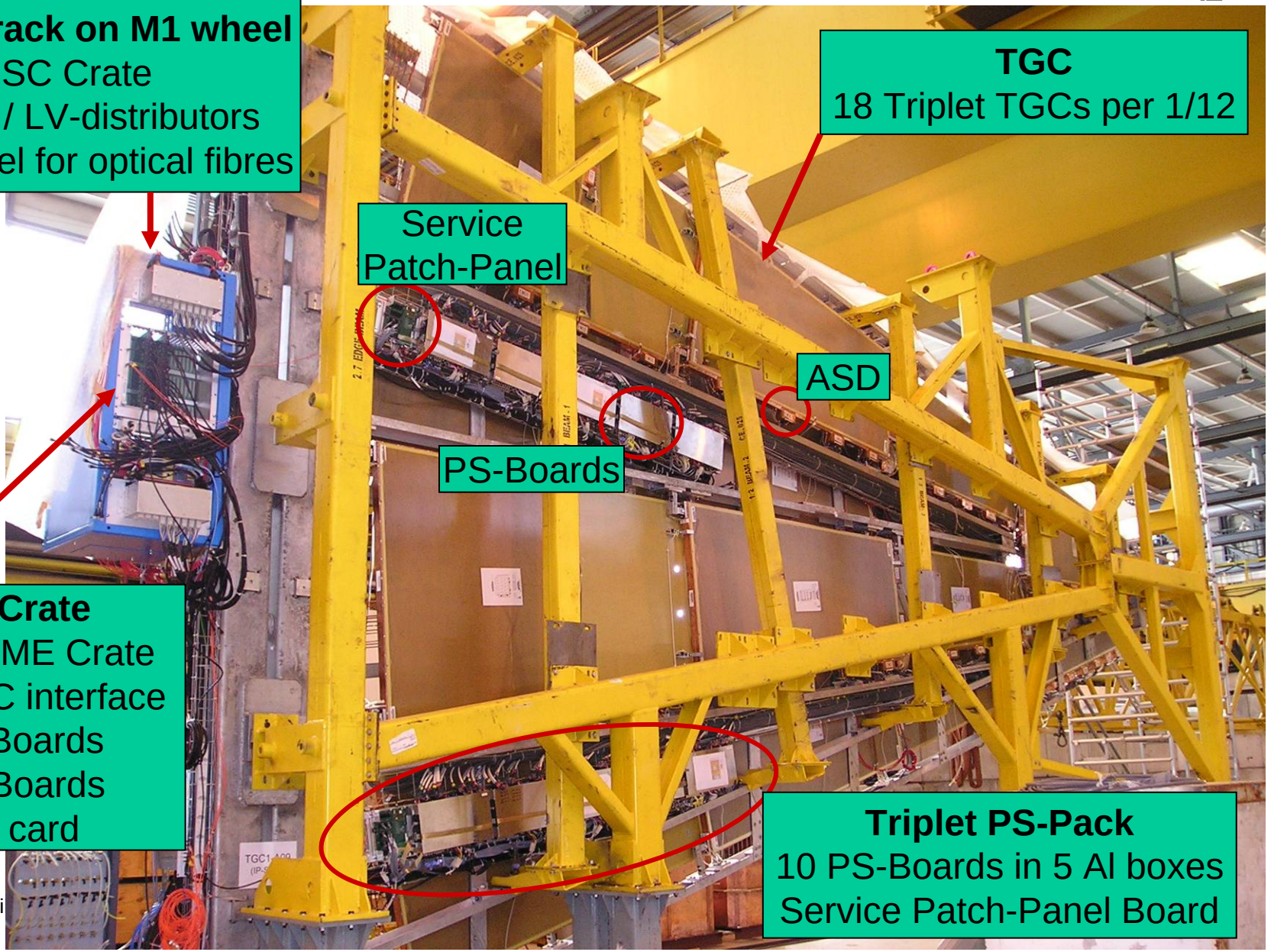
Examples of level-1 component installation in the USA15 underground cavern

Cabling of calorimeter trigger

CTP and MUCTPI crates



End-cap Muon Trigger System at TGC Big-Wheel Assembly Site



HLT/DAQ/DCS

The High Level Trigger (HLT), Data Acquisition (DAQ) and Detector Control System (DCS) activities have continued to proceed according to plans

Large scale system tests, involving up to 800 nodes, have further demonstrated the required system performance and scalability

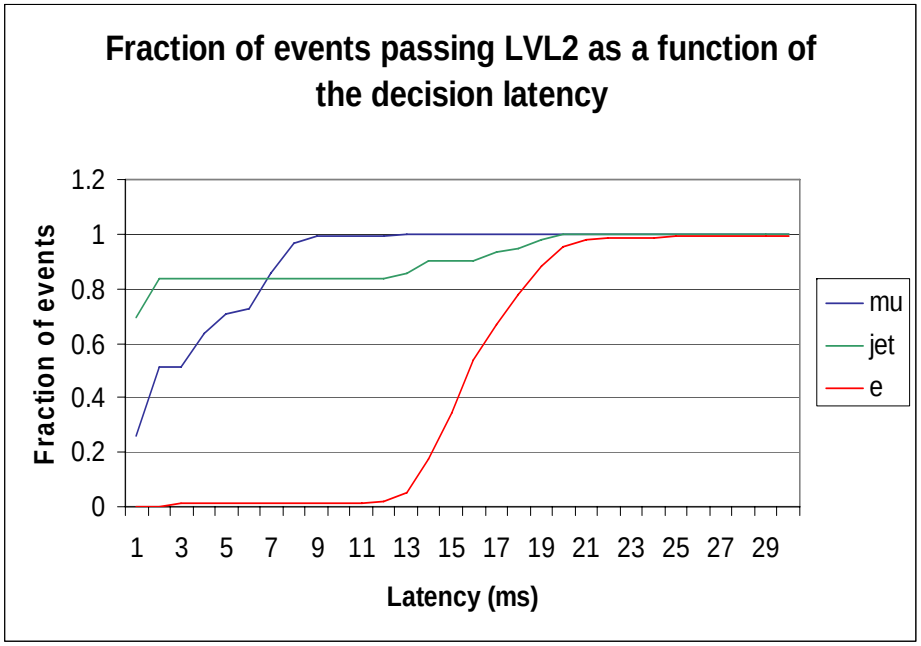
Scalability is particularly important for staging needs during the initial running of ATLAS

A major emphasis was put on all aspects of the HLT and DAQ software developments

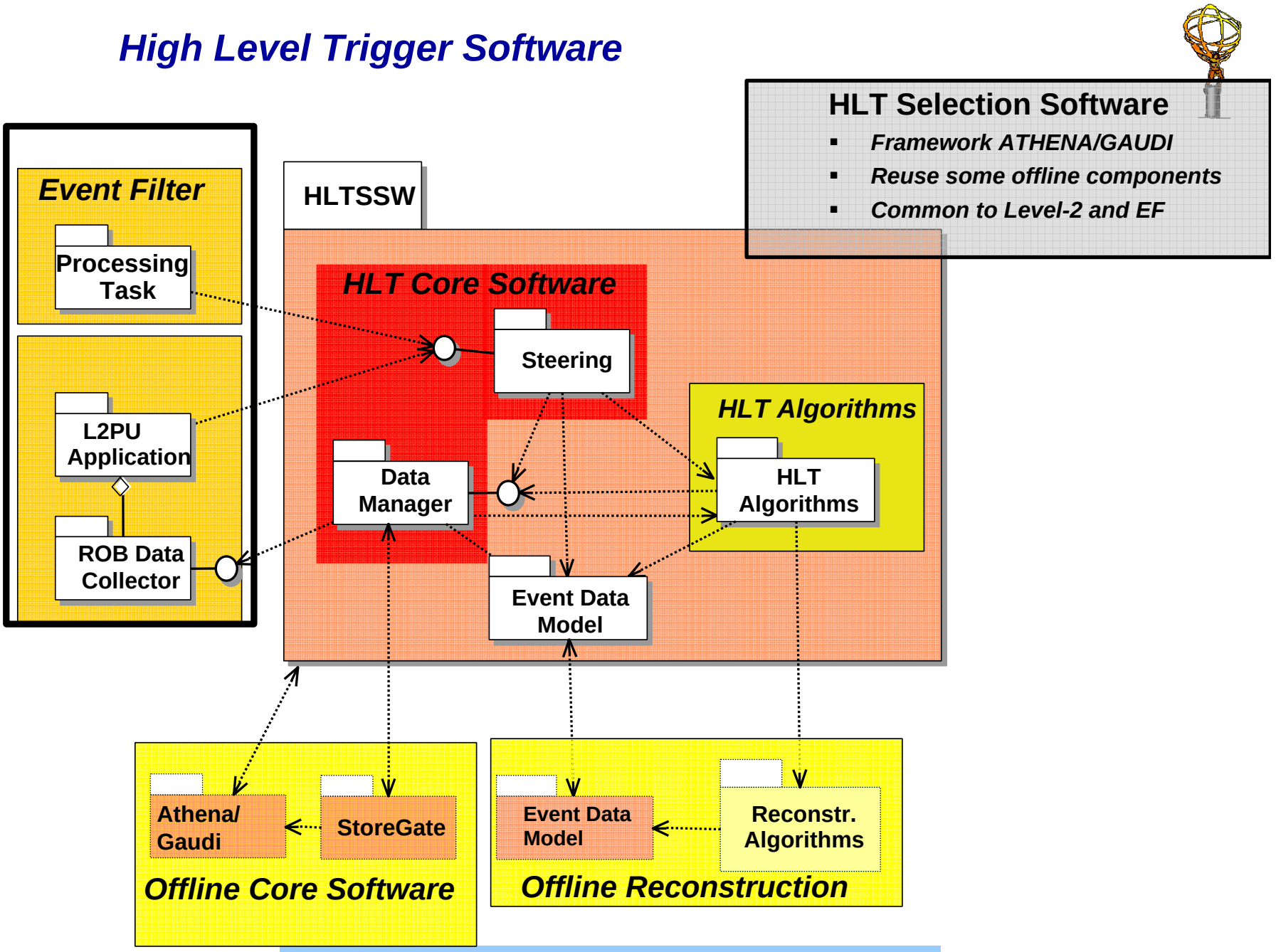
Components of the DCS are in fabrication or already finished (ELMB), and are already widely used, and the s/w components are available

The DCS is one of the first systems already in operation at Pit-1

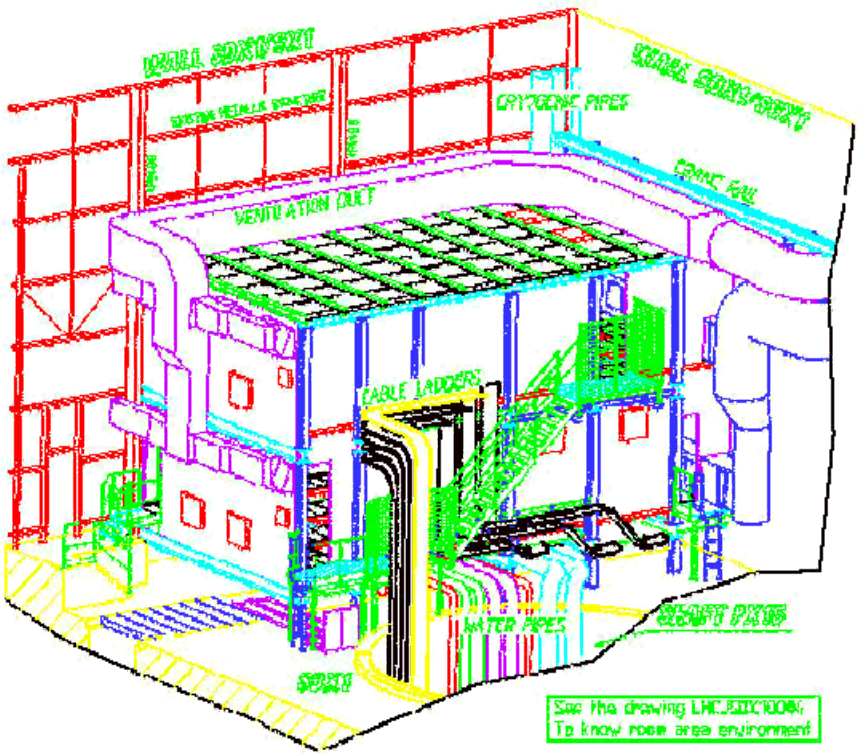
Example of performance optimization



High Level Trigger Software



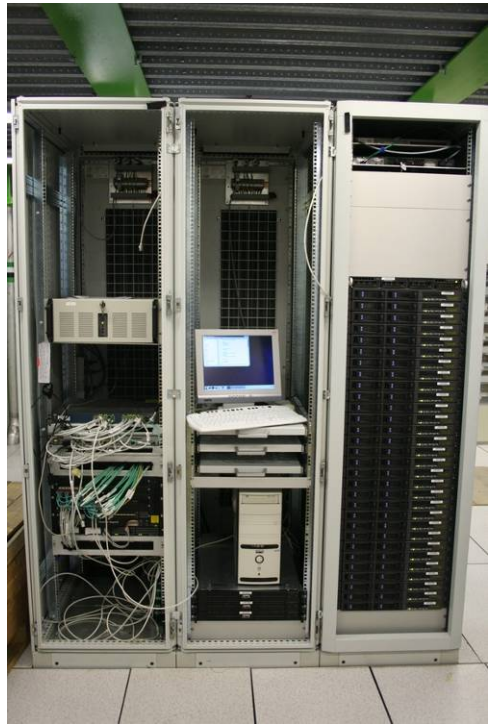
Trigger/DAQ farm at the surface at Point-1



About 100 racks on two floors in building SDX1 for the Level-2, Event Filter and Event Builder processors

HLT/DAQ pre-series system in SDX1

EB, EF, file server and monitoring



Level-2 sub-farm, network switches

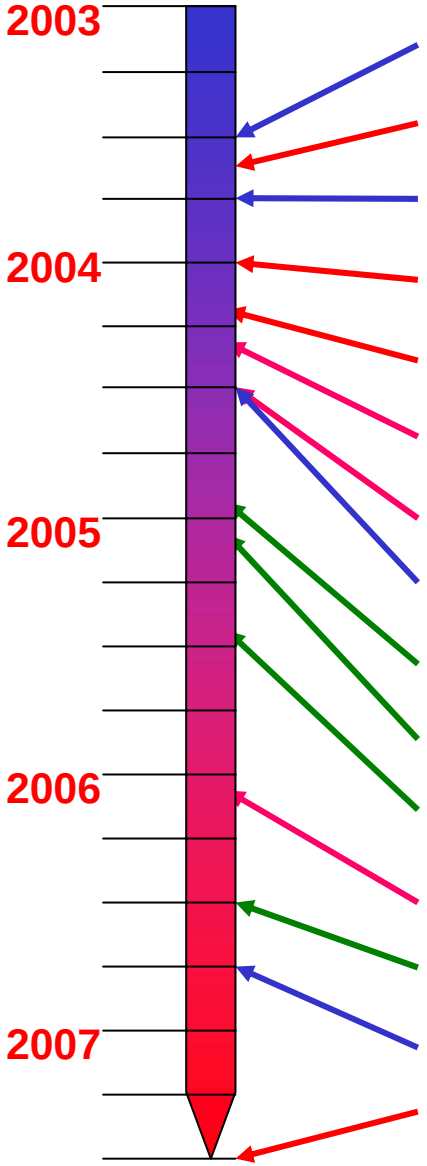
Almost 1/3 of the final Read Out System (ROS) has been installed and commissioned in the underground control room USA15

The infrastructure at Point-1 is now fully active (including central file server and a number of local service machines with standard DAQ software, system administration, and networking)

ROS racks for the LAr

The pre-series of the final system at Point-1 (10% of final dataflow) mentioned at the last RRB is now in operation at Point-1

ATLAS Computing Timeline



- POOL/SEAL release (done)
- ATLAS release 7 (with POOL persistency) (done)
- LCG-1 deployment (done)
- ATLAS complete Geant4 validation (done)
- ATLAS release 8 (done)
- DC2 Phase 1: simulation production (done)
- DC2 Phase 2: intensive reconstruction (re-scheduled)
- Combined test beams (barrel wedge) (done)
- Computing Model paper (done)
- Computing Memorandum of Understanding (done)
- ATLAS Computing TDR and LCG TDR (done)
- Start of Computing System Commissioning (in progress)
- Physics Readiness Documents
- Start cosmic ray run
- GO!

The computing and software suite has progressed on a very broad front, with a particular emphasis to make it as accessible as possible to the user community

Examples:

- **GRID production tools**
- **Software infrastructure**
- **Detector Description and graphics**
- **Framework and Event Data Model**
- **Simulation**
- **Tracking (ID and Muons) and calorimeters (LAr and Tiles)**
- **Database and data management**
- **Reconstruction and Physics Analysis tools**
- **Distributed analysis**

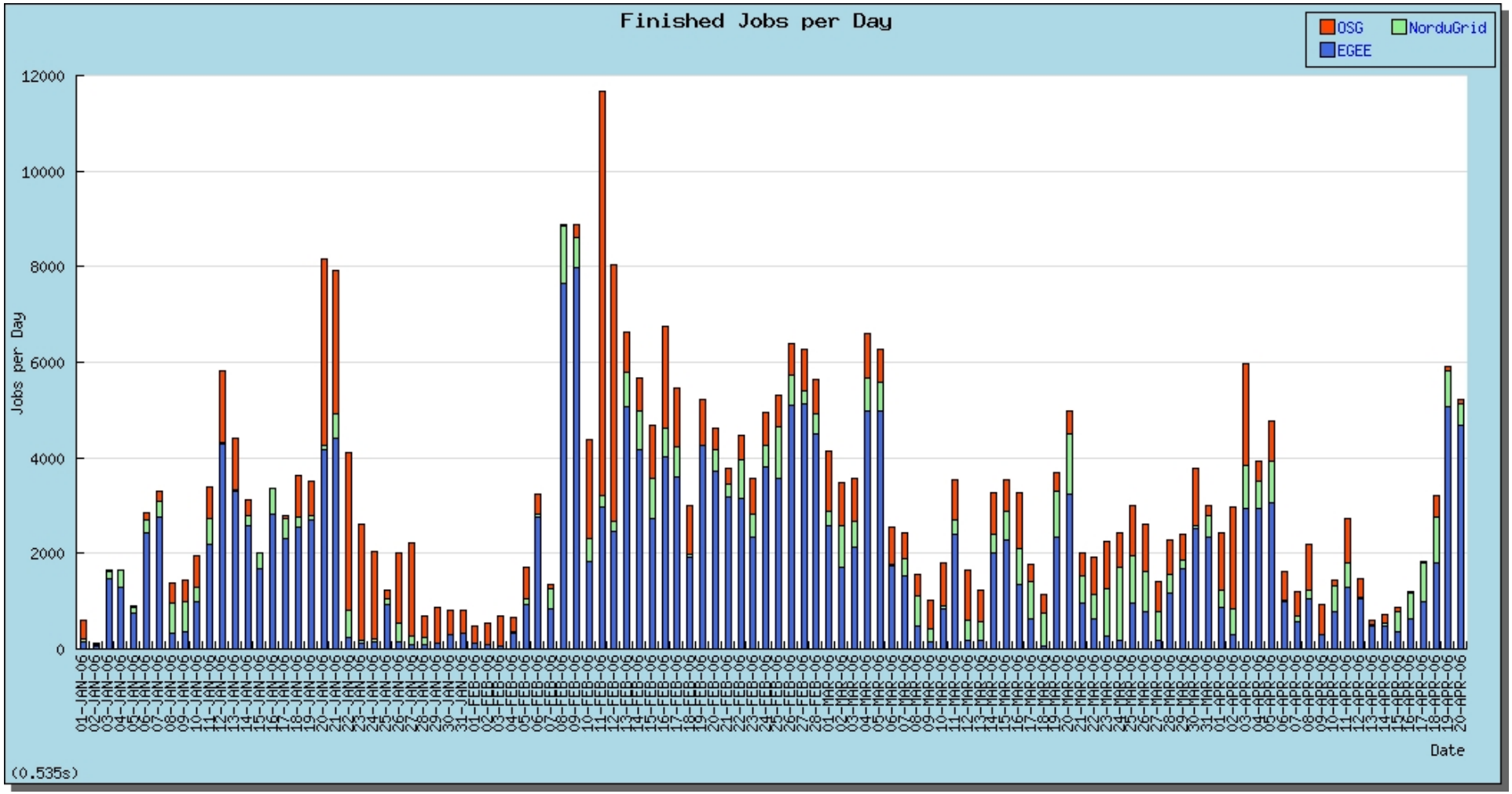
Computing System Commissioning along sub-system tests with well-defined goals, preconditions, clients and quantifiable acceptance tests

Examples:

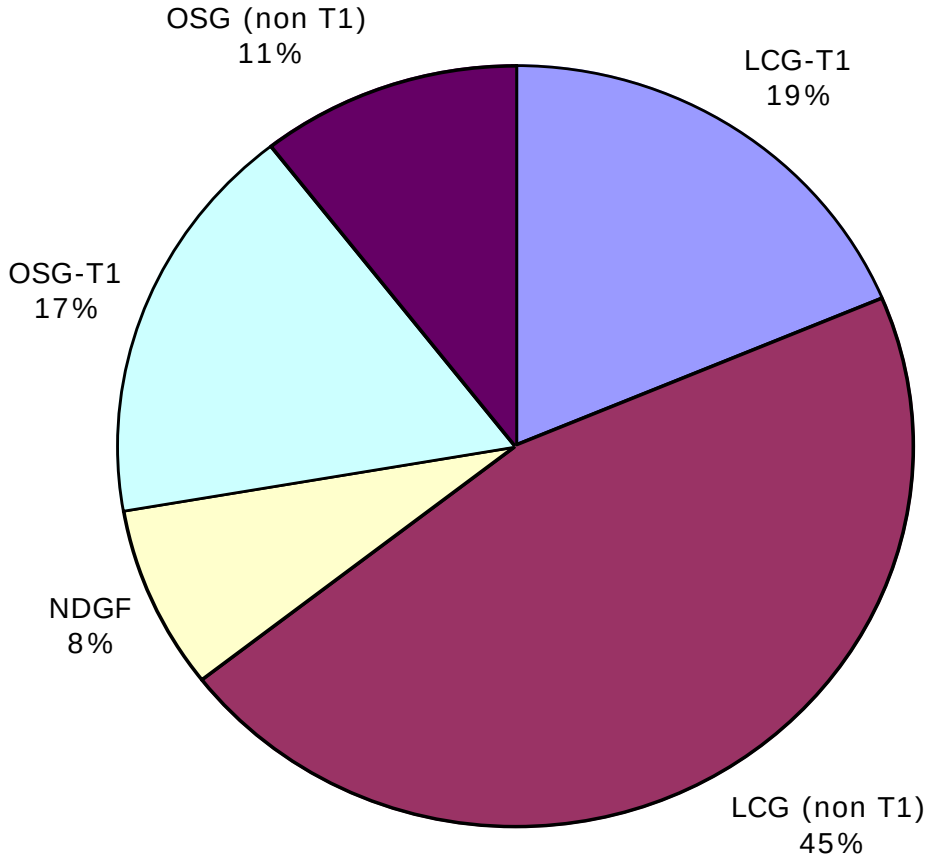
- **Full Software Chain**
  - **From generators to physics analysis**
- **Tier-0 Scaling**
- **Calibration & Alignment**
- **Trigger Chain & Monitoring**
- **Distributed Data Management**
- **Distributed Production (Simulation & Re-processing)**
- **(Distributed) Physics Analysis**
- **General ‘rehearsal’ of TDAQ/Offline data flow and analysis**

ATLAS computing is fully embedded in, and committed to, the LCG framework

ATLAS Production from January – April 2006 (number of jobs per day)



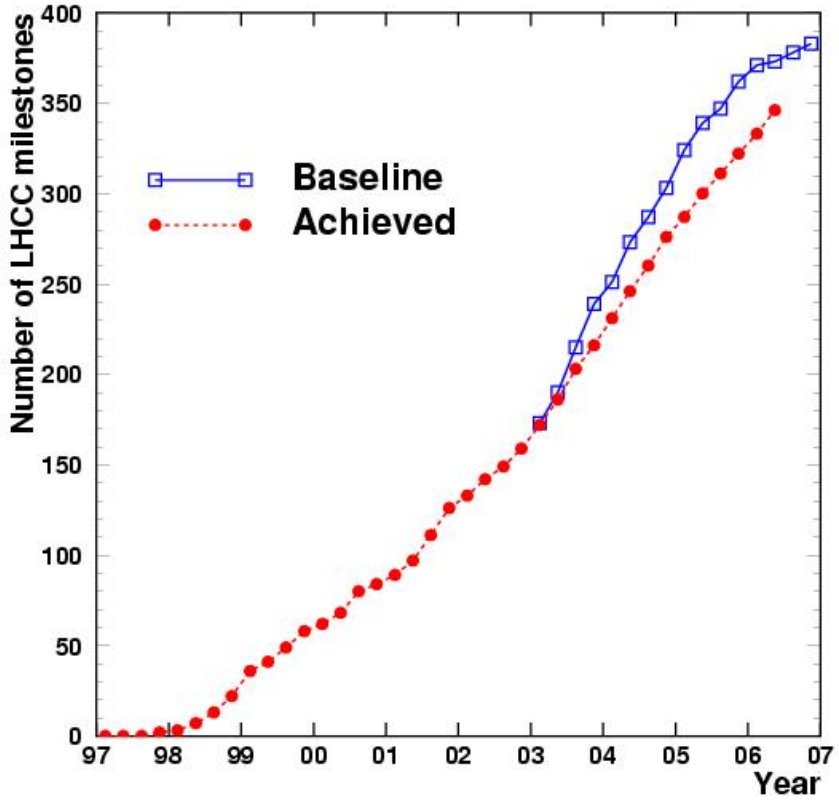
ATLAS Production (January - April 2006)



Input from 350 k jobs

138 sites in 29 countries

LHCC Milestones as followed-up at the EB



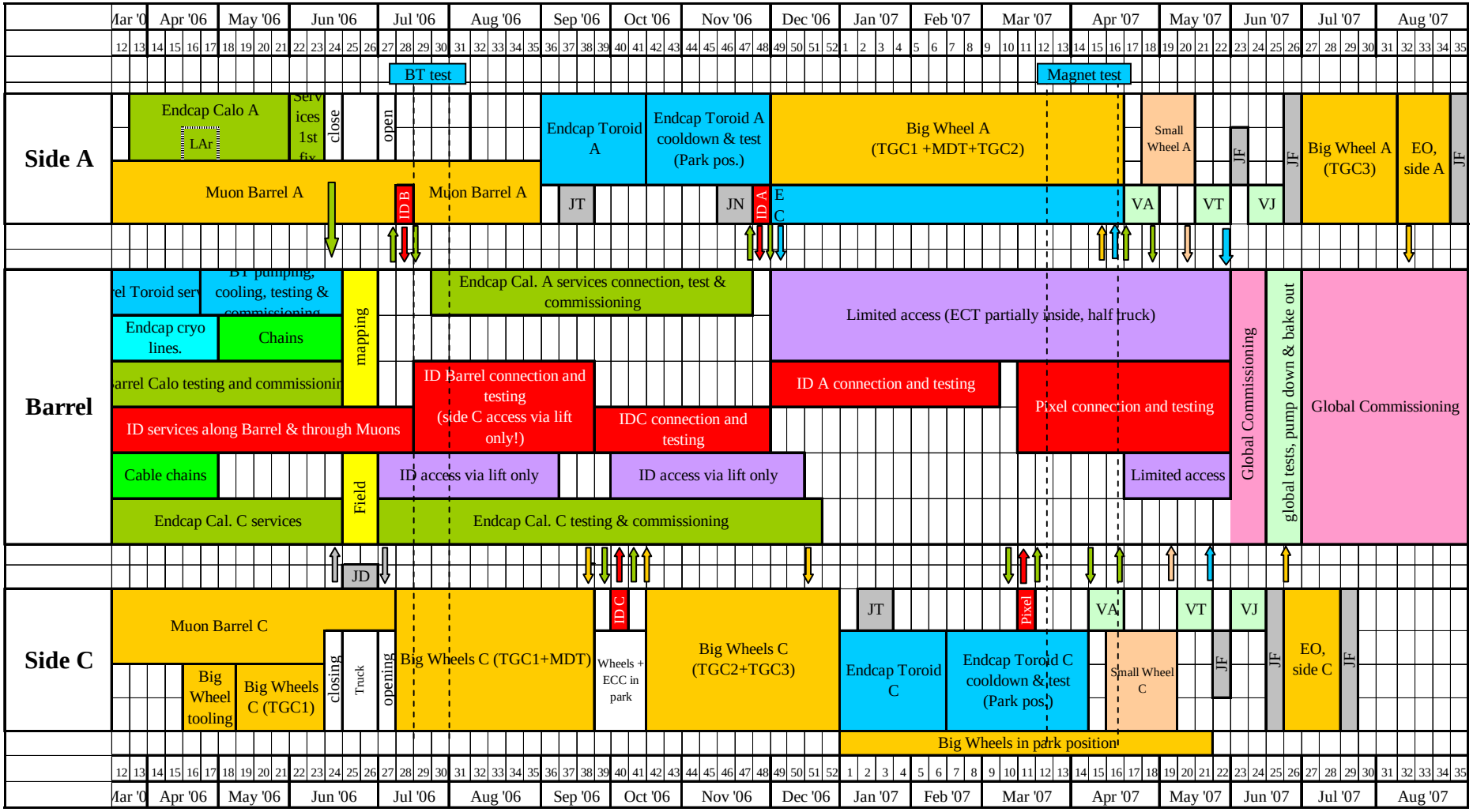
Construction issues and risks ('Top-Watch List')

A list of these issues is monitored monthly by the TMB and EB, and it is publicly visible on the Web, including a description of the corrective actions undertaken:

http://atlas.web.cern.ch/Atlas/TCOORD/TMB/

Summary representation of the installation activities (version 7.11) in the experimental cavern at Point-1

(will be discussed by Marzio Nessi in the following presentation)



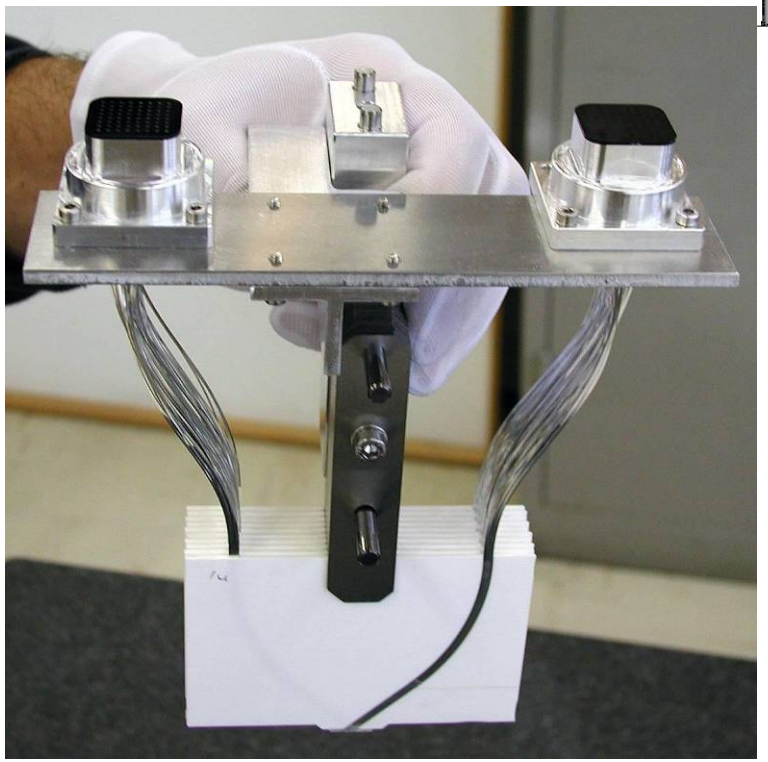
Luminosity and Forward Detectors

Roman Pot (RP) detectors and LUCID (Cherenkov light luminosity monitor)

- **New collaborators for RP**
  - **Tracker: Lisbon, Giessen, CU Prague**
  - **Electronics: Orsay and Lund**
- **New collaborators for LUCID**
  - **Electronics: Bologna**
- **Prototypes built both for RP tracker and LUCID**
- **Beam test of both prototypes at DESY Oct-Nov 2005, and scheduled for CERN in 2006**

Both are part of the LHCC LoI, which was encouraged to be worked out towards a TDR

Infrastructure is being prepared for installation



10 planes prototype fibre tracker for the RP

Zero degree calorimeter

- **Welcome collaboration with LHCf**
- **Interest to complement it with radiation-hard devices for centrality tagging in heavy ion runs (discussions ongoing with new US collaborators)**

Longer term plans

- **R&D initiative from ATLAS/CMS physicists for future detectors further away from the IP (FP420) is progressing**

ATLAS organization to steer R&D for upgrades

ATLAS has put in place a structure to steer its planning for future upgrades, in particular for R&D activities needed for possible luminosity upgrades of the LHC (SLHC')

The main goals are to

Develop a realistic and coherent upgrade plan addressing the physics potential

Retain detector experts in ATLAS with challenging developments besides detector commissioning and running

Cover less attractive (but essential) aspects right from the beginning

The organization has two major coordination bodies

Upgrade Steering Group
(Existing since June 2004, and now evolving with representatives from systems, R&D projects, and relevant Technical Coordination areas)

The present Coordinator (S Tapprogge, Mainz) will end his term of office in May 2006, and N Hessey (NIKHEF) will take over

Project Office
(New body, fully embedded within the Technical Coordination)

D Lissauer (BNL) has been appointed as PO Leader

Areas to be addressed by project office

- overall mechanical design, drawings and layout control
- reviews
- planning of services
- electronics coordination
- installation scenarios, scheduling
- radiation, shielding, activation
- interface to machine

Engineers/technicians in project office expected to be part-time active in ATLAS operations

Define work packages to be taken up by groups outside of CERN (under project office coordination)

ATLAS SLHC R&D projects

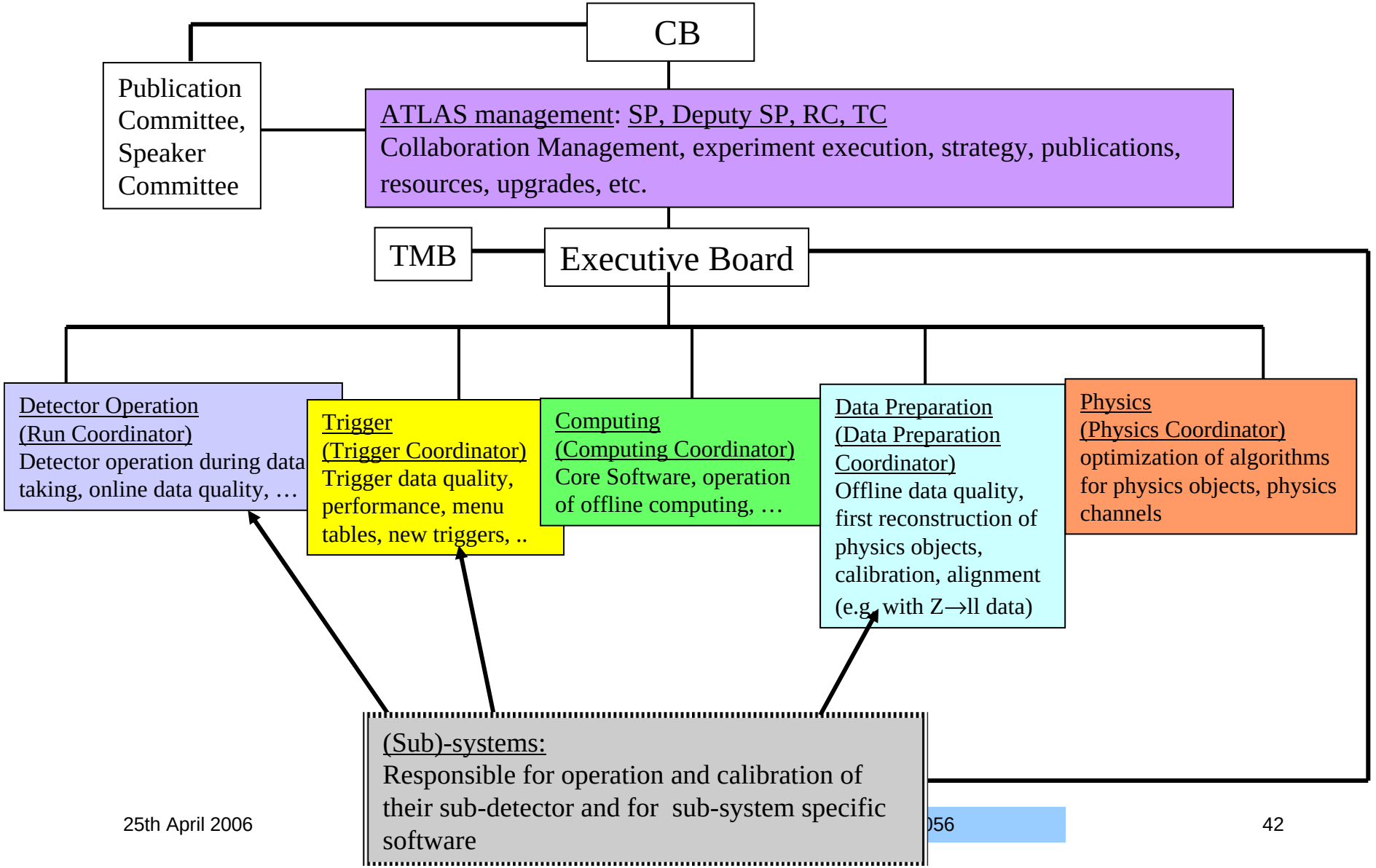
There is a reviewing and approval procedure in place, and first proposals have been submitted and others are in the pipe-line

There is good communication to CMS upgrade studies to benefit from common approaches

However, there is no ambiguity, ATLAS' priority is to complete, commission and exploit the TDR detector !

The Collaboration has endorsed the broad guidelines for an 'Operation Model' for the data-taking phase which is being implemented

(Details can be found at http://uimon.cern.ch/twiki//bin/view/Main/OperationModel)



Steps towards the gradual implementation of the Operation Model (OM)

Setting up of the five activity areas:

Detector operation	**Will evolve from the present commissioning organization which is functional and growing**
Trigger	**Will evolve from the present TDAQ system and physics-related trigger activities, and the TDAQ management changes underway anticipate the reorganization**
Computing	**Basically existing, OM adaptations being implemented**
Data Preparation	**Is being set up now, will regroup many present activities**
Physics	**Basically existing, OM adaptations being implemented**

An important step is the introduction of explicit combined Trigger and Physics Weeks driving this central activity for preparing the data taking era

Both the cosmic ray running, gradually starting at Point-1, and the forthcoming large-scale 'Calibration Data Challenge' simulations are seen as important shake-down actions for the OM implementation

The Collaboration has also initiated a major effort to define the fair sharing of all operation tasks between all the Institutions, and to review the M&O sharing for the running phase

This will include a definition of obligations for new Institutions joining ATLAS in this new phase

Cost to Completion, and initial staged detector configuration

As a reminder from previous RRB meetings:

The Cost to Completion (CtC) is defined as the sum of Commissioning and Integration (C&I) pre-operation costs plus the Construction Completion (CC) cost in addition to the deliverables

The following framework was accepted at the October 2002 RRB (ATLAS Completion Plan, CERN-RRB-2002-114rev.):

CtC 68.2 MCHF (sum of CC = 47.3 MCHF and C&I = 20.9 MCHF)

Commitments from Funding Agencies for fresh resources (category 1) 46.5 MCHF
Further prospects, but without commitments at this stage (category 2) 13.6 MCHF

The missing resources, 21.7 MCHF, have to be covered by redirecting resources from staging and deferrals

The funding situation will be reviewed regularly at each RRB, and is expected to evolve as soon as further resources commitments will become available

The physics impact of the staging and deferrals was discussed in detail with the LHCC previously

It has to be clearly understood that the full potential of the ATLAS detector will need to be restored for the high luminosity running, which is expected to start only very few years after turn-on of the LHC, and to last for at least a decade

ATLAS has pursued, since the October 2002 RRB, the initial detector construction within the accepted framework of the ATLAS Completion Plan, CERN-2002-114rev.

Many constructive interactions continue to take place with Funding Agencies, and the national communities continue actions to secure the funding required to complete the detector

Gradually the overall funding situation has slowly improved, even though ATLAS is still short to meet its initial detector requirements, and therefore will be forced to start up with a significantly staged initial configuration

Since the last RRB report (CERN-RRB-2005-088) France IN2P3, INFN Italy, Poland, Russia and Switzerland have made highly appreciated commitments to secure further CtC resources

The present status of the Completion Funding planning is given in the updated table (CERN-RRB-2006-027)

The Collaboration is very grateful to all the Funding Agencies that have already agreed to the category 1 completion funding and found new resources, and ATLAS hopes very much that the others will be able to support the CtC as well in the future

Updated Cost to Completion Funding Planning (all in kCHF, CERN-RRB-2006-027)

Funding Agency	Cost to Completion proposed sharing Constr.			Member fee 2004-6 (included in Constr. Comp.)	New funding (category 1) including member fee	New funding requests as prospects (category 2) without commitment from FA
	Total	Comp.	C&I		Total	Total
Armenia	**66**	48	18	38	**45**	
Australia	**357**	242	115	75	**140**	238
Austria	**67**	52	15	38	**67**	
Azerbaijan	**43**	38	5	38	**38**	
Belarus	**85**	75	10	75	**75**	
Brazil	**64**	47	17	38	**41**	
Canada	**2090**	1528	562	263	**2090**	0
China NSFC+MSTC	**141**	99	42	38	**141**	
Czech Republic	**316**	196	120	113	**316**	
Denmark	**422**	290	132	38	**58**	375
France IN2P3	**5890**	4176	1714	225	**5890**	0
France CEA *)	**1940**	1379	561	38	**1334**	
Georgia	**42**	37	5	38	**38**	
Germany BMBF	**4531**	3250	1281	338	**4531**	0
Germany MPI	**1093**	761	332	38	**1093**	
Greece	**261**	173	88	113	**113**	148
Israel	**739**	497	242	113	**739**	
Italy	**6638**	4650	1988	450	**6288**	
Japan	**4362**	3029	1333	563	**4362**	
Morocco	**57**	47	10	38	**41**	
Netherlands	**1934**	1368	566	75	**1934**	
Norway	**581**	391	190	75	**581**	
Poland	**136**	94	42	75	**102**	34
Portugal	**446**	265	181	38	**339**	107
Romania	**140**	85	55	38	**140**	
Russia	**2991**	1995	996	263	**1759**	
JINR	**1066**	660	406	38	**521**	
Serbia					**300**	
Slovak Republic	**72**	53	19	38	**82**	
Slovenia	**223**	152	71	38	**223**	
Spain	**1706**	1109	597	113	**1706**	
Sweden	**1691**	1121	570	150	**1691**	
Switzerland	**2372**	1701	671	75	**2372**	0
Taipei	**445**	318	127	38	**445**	
Turkey	**85**	75	10	75	**75**	
United Kingdom	**4387**	3063	1324	450	**3133**	1254
US DOE + NSF	**12245**	8438	3807	1238	**6200**	
CERN	**8452**	5770	2682	38	**13700**	
Total	**68176**	47272	20904	5563	**62743**	2156

*) The commitment shown does not include a 1 MCHF additional engineering contribution provided on the initial BT contract (see MoU Annex 8.A)

The ATLAS Collaboration has proceeded with its project since 2002 within the initially defined CtC envelope

With the construction now approaching completion, and with extended experience now at hand for the installation and commissioning efforts needed to meet the schedule, the ATLAS management has started to re-assess the resources needed to have the initial detector ready for turn-on in summer 2007

Some corrections to the initial CtC estimates may be required in the areas of the magnet system, the LAr cryogenics, and the infrastructure and installation activities (additional manpower to meet the schedule)

At this stage it is premature to state any figure, and to conclude whether these additional costs can be managed within the full 2002 CtC envelope or not

The plan is to make a statement, and its possible consequences, at the October RRB

There is also a serious issue of cash flow, mainly due to late contributions to the baseline MoU Common Fund construction funding, which will be addressed in the budget discussion later on by Markus Nordberg

For the successful implementation of the Completion Plan it is furthermore very important that the funds for deferred items will be made available early on, documented to the RRB based on ATLAS agreements specifying in a transparent way the corresponding accounting

Conclusions

The ATLAS project is proceeding within the framework of the accepted Completion Plan

Component construction is (nearly) complete for the sub-systems, and emphasis has shifted further to pre-assembly, integration, installation and commissioning

The remaining technical concerns are regularly reported to, and reviewed with, the LHCC referees

M Nessi will report on the evident progress for the large Common Project systems, and on the general installation status and activities in the cavern

Very major software and computing activities proceed according to plans

The detector commissioning has started, and the global planning for the early physics exploitation is well underway with the implementation of an Operation Model

ATLAS remains on track for LHC physics in 2007

To really make it, a great effort is still required from all partners in terms of financial and manpower resources to complete the project