Canada and the ATLAS Experiment

NSERC - Large Projects Day

NSERC 4th February 2005

CERN Situation: LHC, ATLAS

ATLAS Schedule

Canadian Projects (Update from Review)

Financial Issues

- **M&O, C&I, Construction Completion**
- **Operating: Travel, Salaries**

R. S. Orr

ATLAS Canada

Alberta
Carleton
McGill
Montréal
Simon Fraser
Toronto
TRIUMF
UBC
Victoria
York

33 University/Lab.physicists Over 88 people, including Engineers, Technicians, Students

Includes 4 IPP Research Scientists

Educational Role

20 UG Summer Students
21 Graduate Students
13 Post Docs

Focus on Liquid Argon Calorimetry

- 4 NSERC Funded Construction Projects

Endcap Hadronic Calorimeter

Forward Hadronic Calorimeter

Front-End-Board Electronics

Endcap Signal Cryogenics Feedthroughs

Construction completed last year

End of Installation this year

Commissioning in 2006

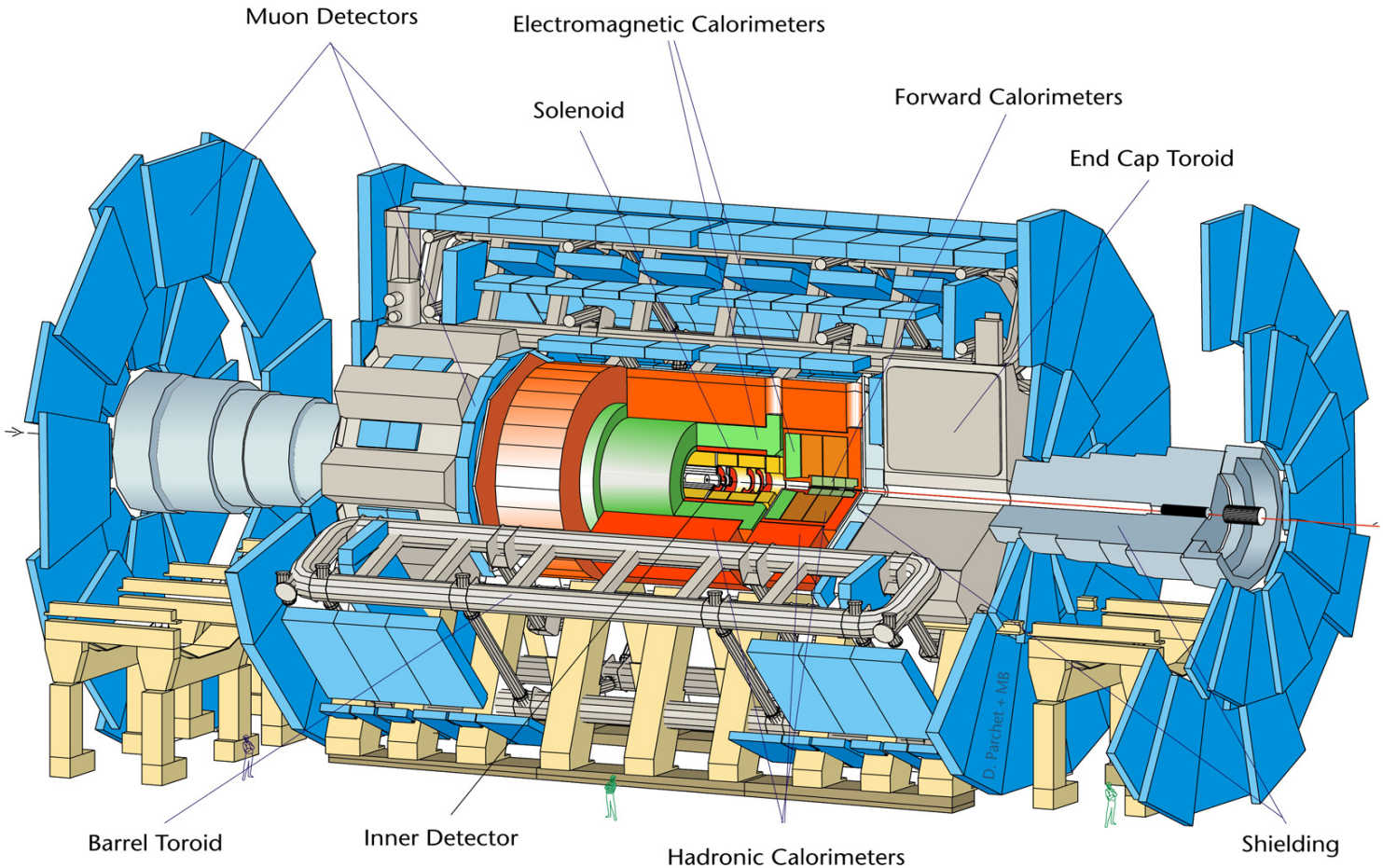
- Ongoing/Future Activities

Analysis of Beam Tests
Calorimeter Calibration
Preparation for Physics
Event Filter Processor Farm
Computing - soft/hard

Beam Condition Monitors

Construction Status of the Main ATLAS Detector Systems

D712/mb-26/06/97



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

LHC machine Status

Dipole Cold Masses

Superconducting Cables

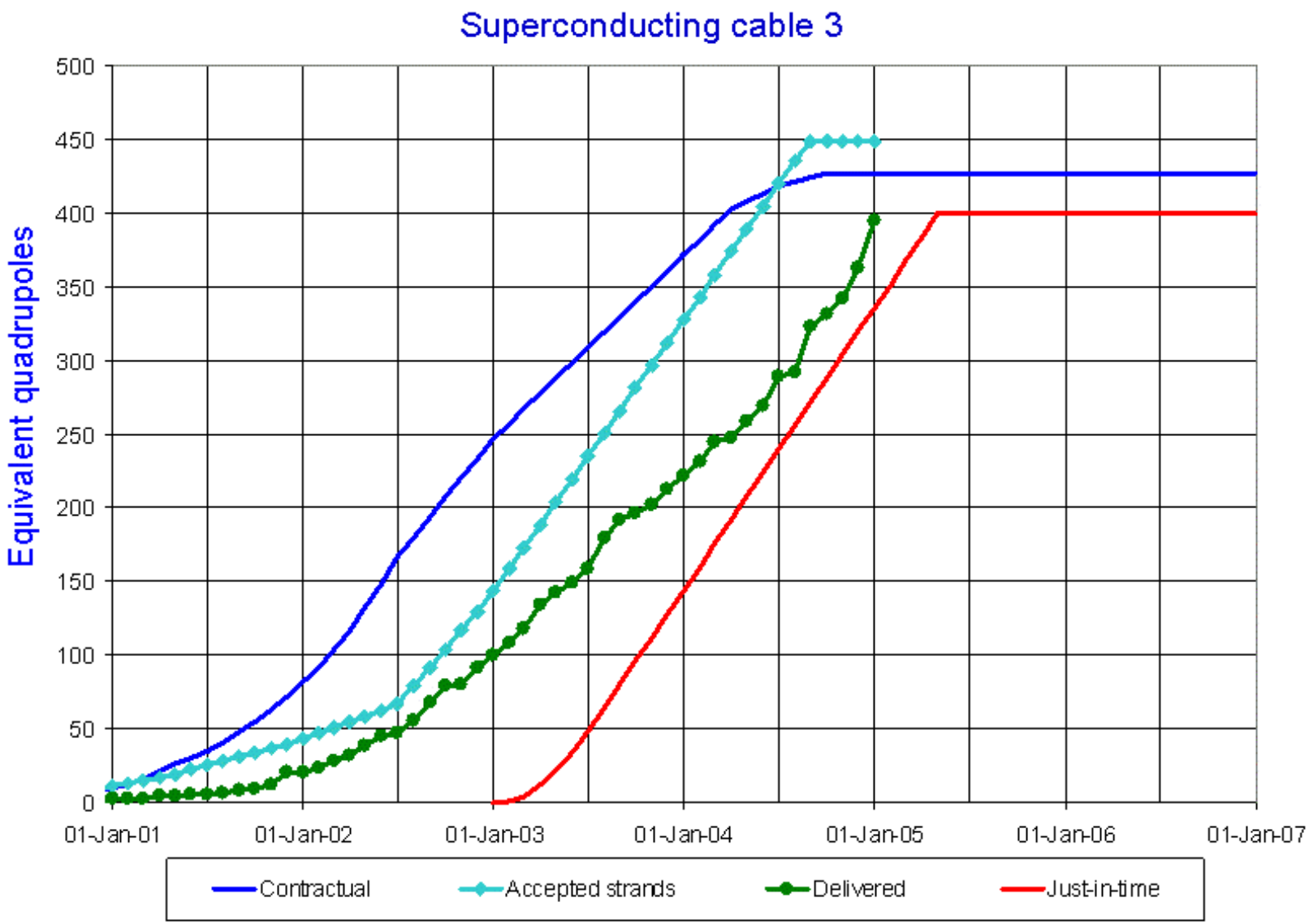
- At Review Last Year
  - Nominal production rates attained by all suppliers
  - Steady performance achieved and maintained

    critical current >6% above specification
    transverse dimensions within tolerance of +/- 6 μm
    strand magnetization and contact resistance under control

- This year we can see the effect of that
- SC Cables no longer a critical item

LHC Progress Dashboard

Accelerator Technology Department

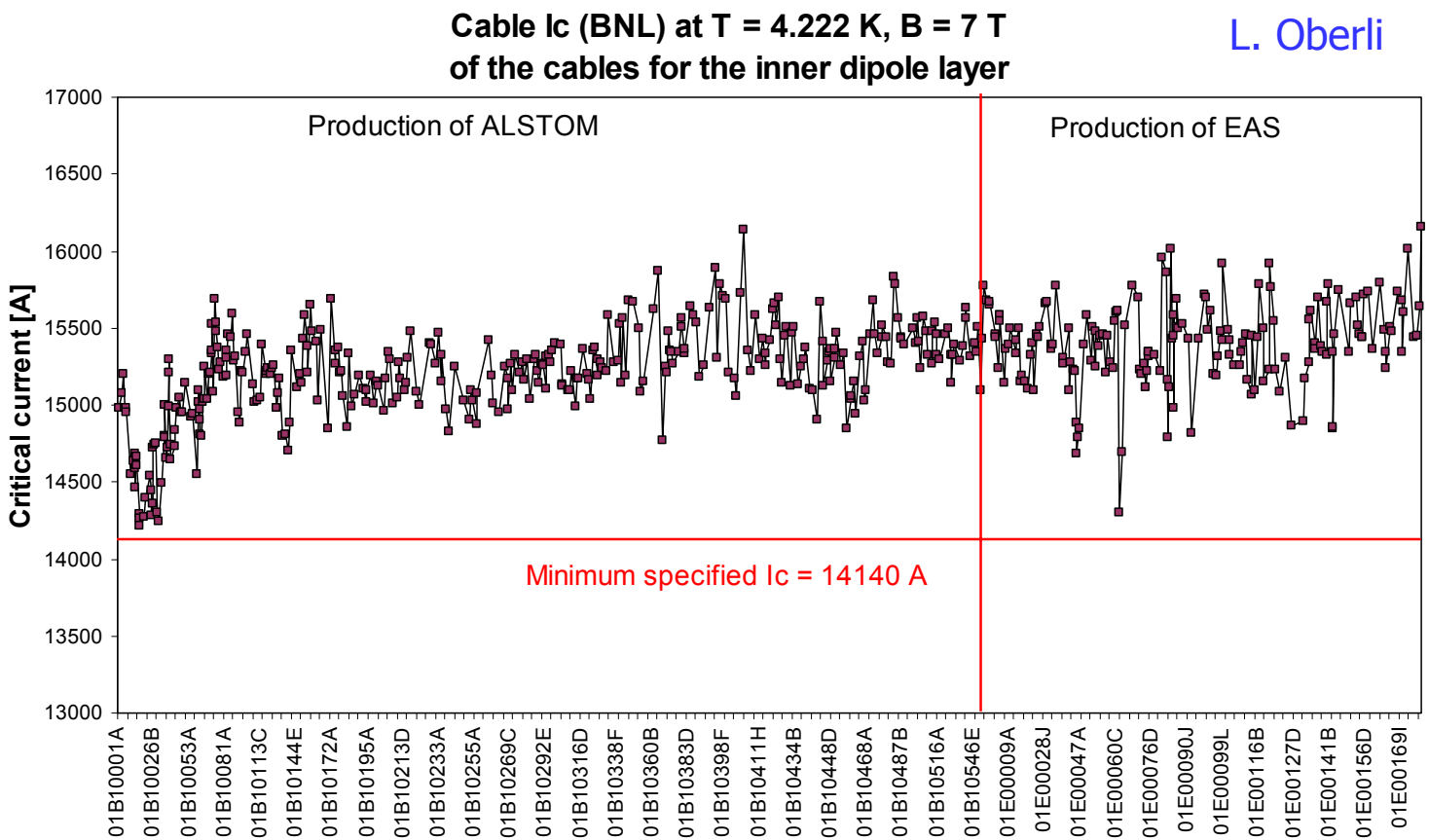


Updated 31 Dec 2004

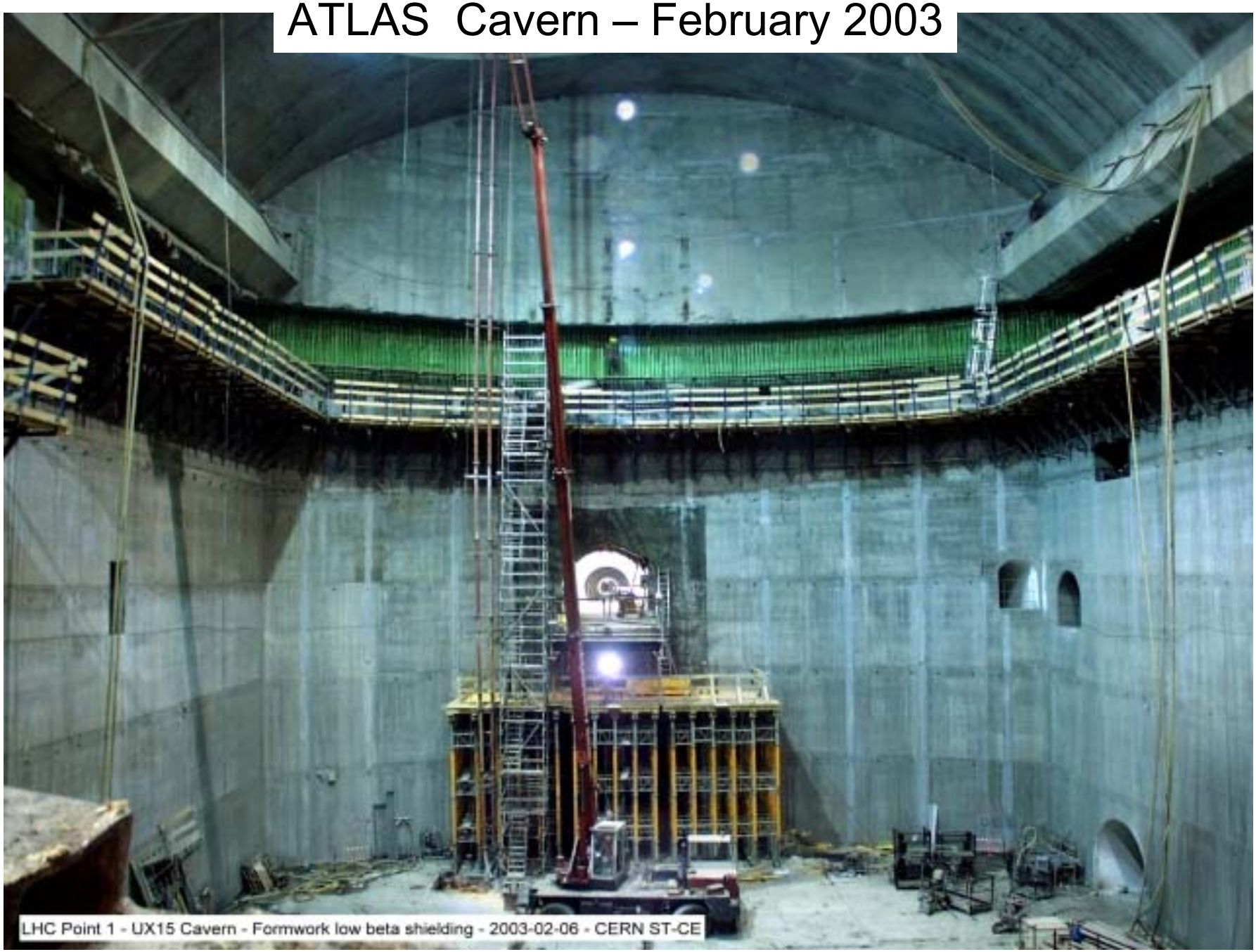
Data provided by A. Verweij AT-MAS

Critical Current
=> ultimate field, low-field remanance

L. Oberli

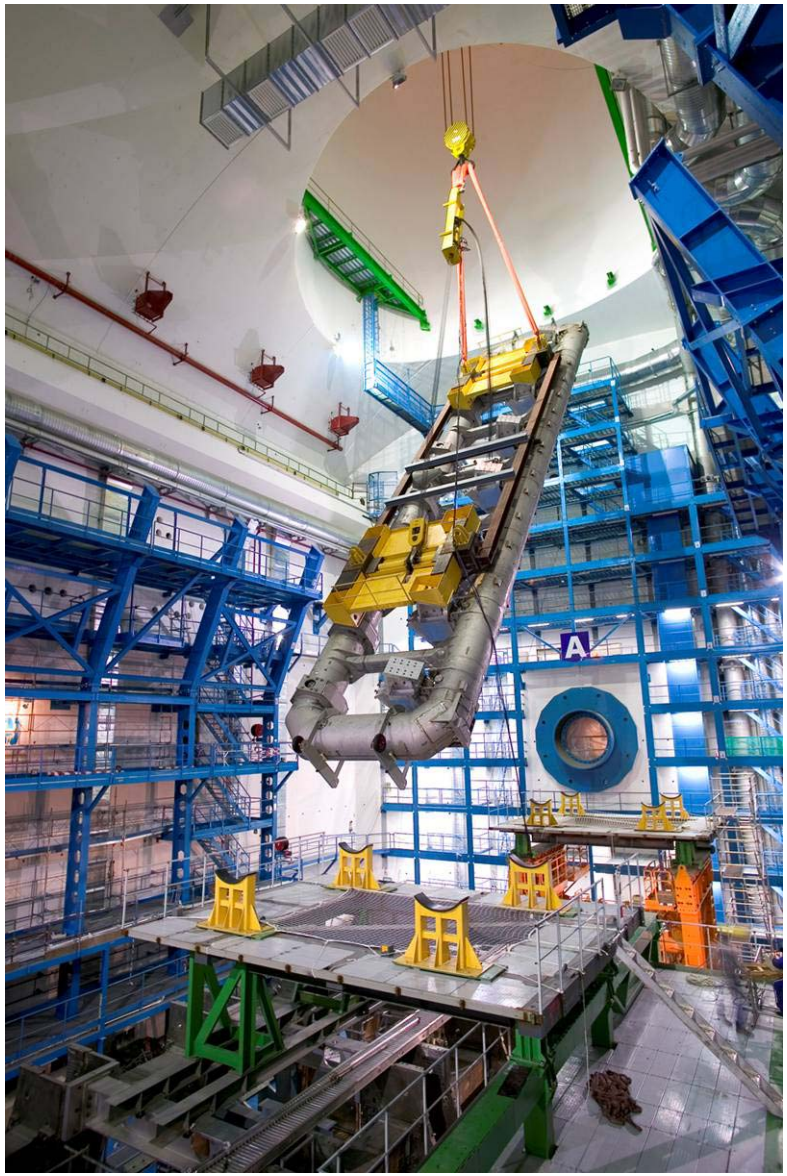


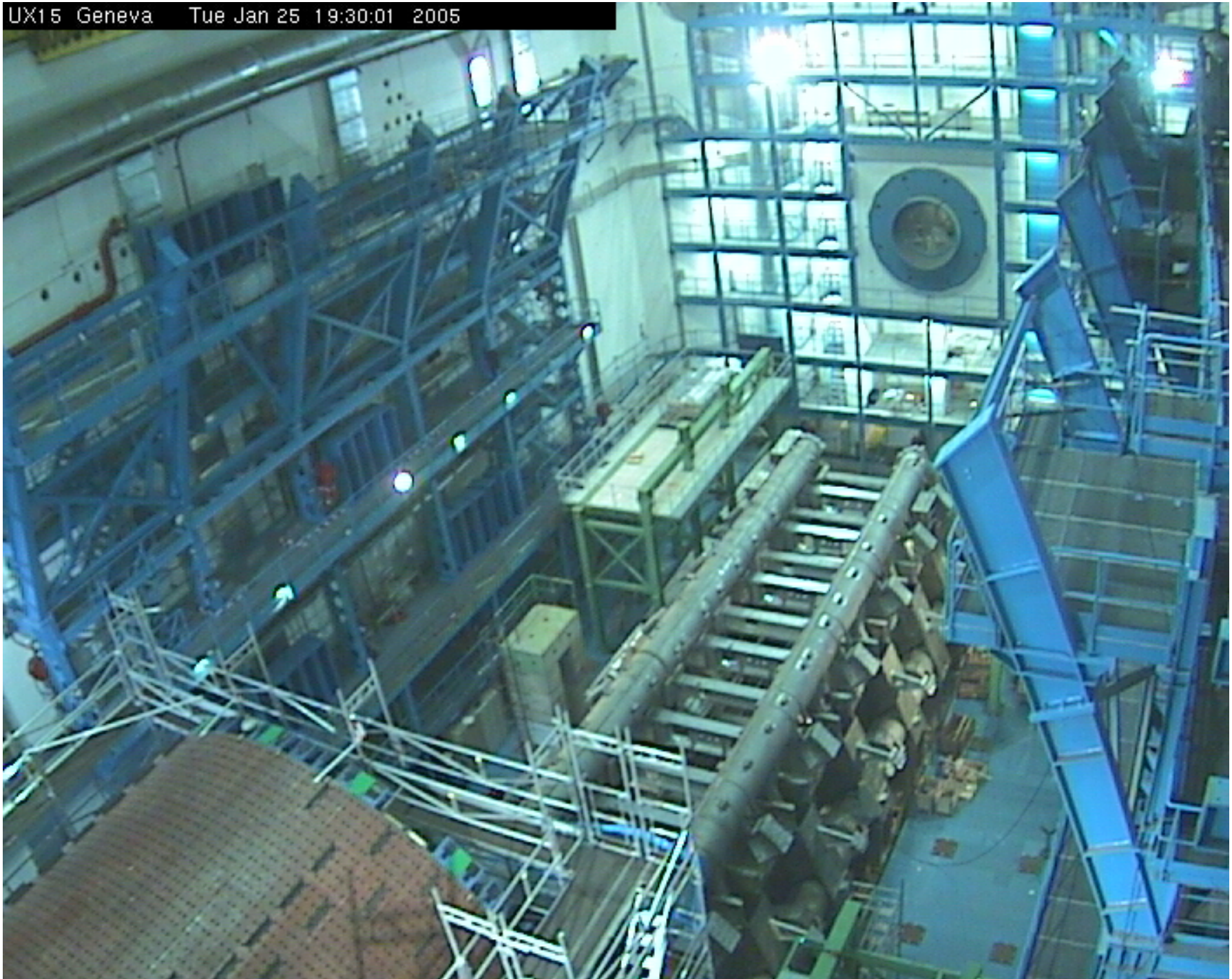
ATLAS Cavern – February 2003



ATLAS Cavern – November 2004

BT-1 installation in the cavern

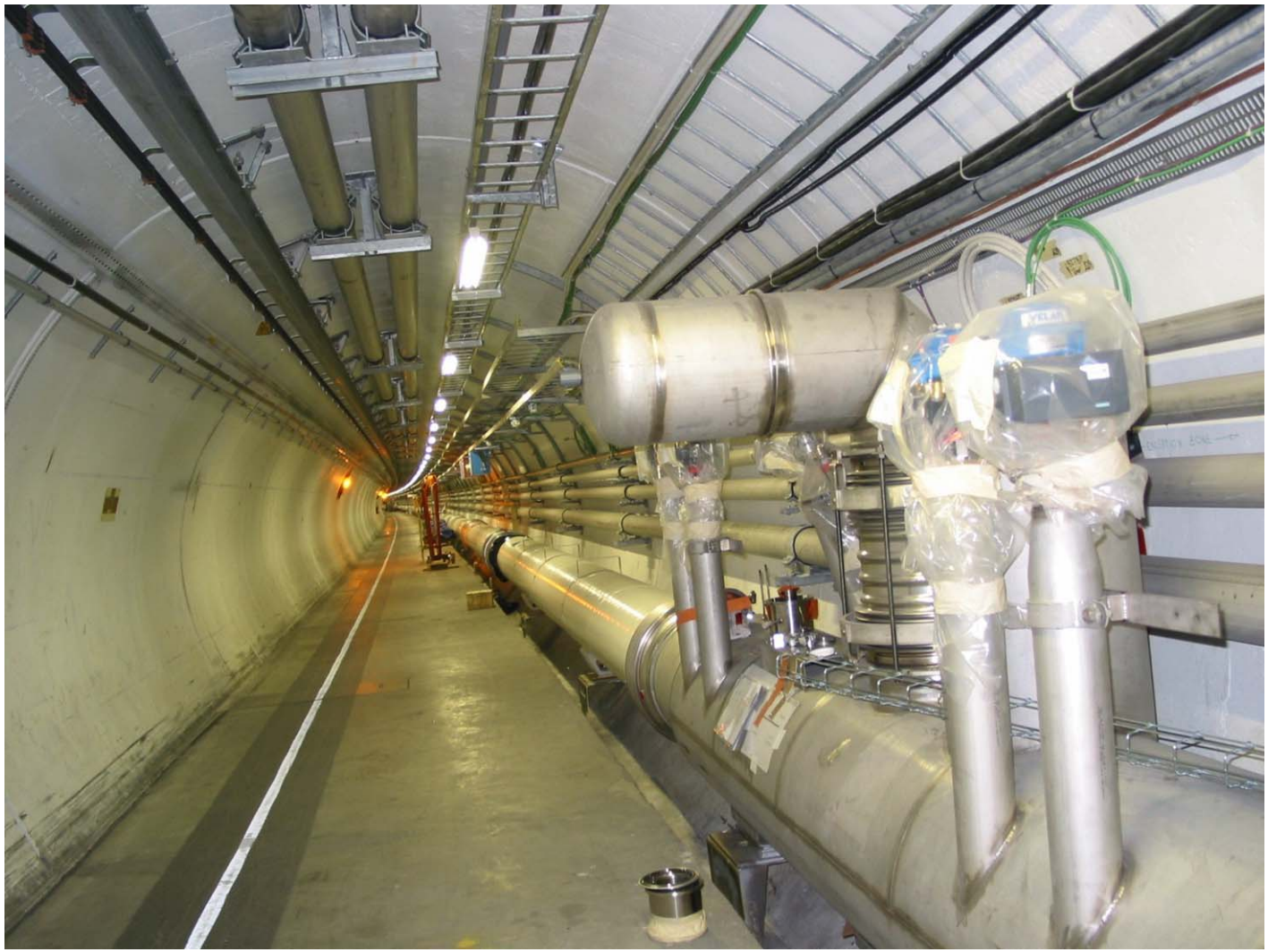



UX15 Geneva Tue Jan 25 19:30:01 2005

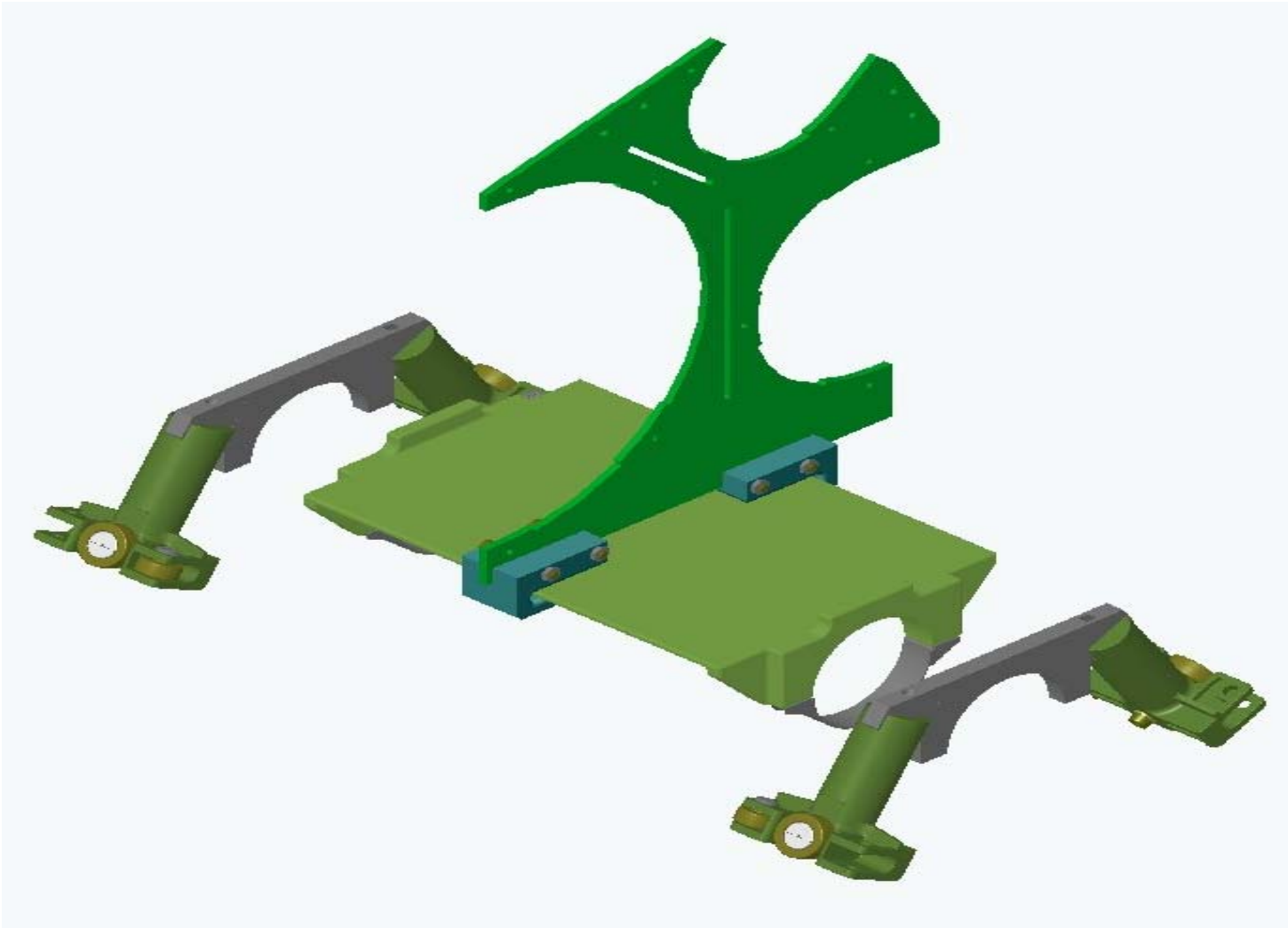
Cryoline (QRL) History

- Early June 2004 – leak detected on a pipe element. Extraction of pipe bundle mid-June revealed damaged tables.
- End of June 2004 – endoscopic examination revealed damaged tables in many pipe elements and service modules.
- CERN investigation revealed that tables are not moulded in conforming material. Resistance to shock an order of magnitude too low.
- July 2004 – CERN task force to verify QRL design. Production Restart Review 15 September 2004.
- Installation was scheduled to be restarted beginning of November 2004.

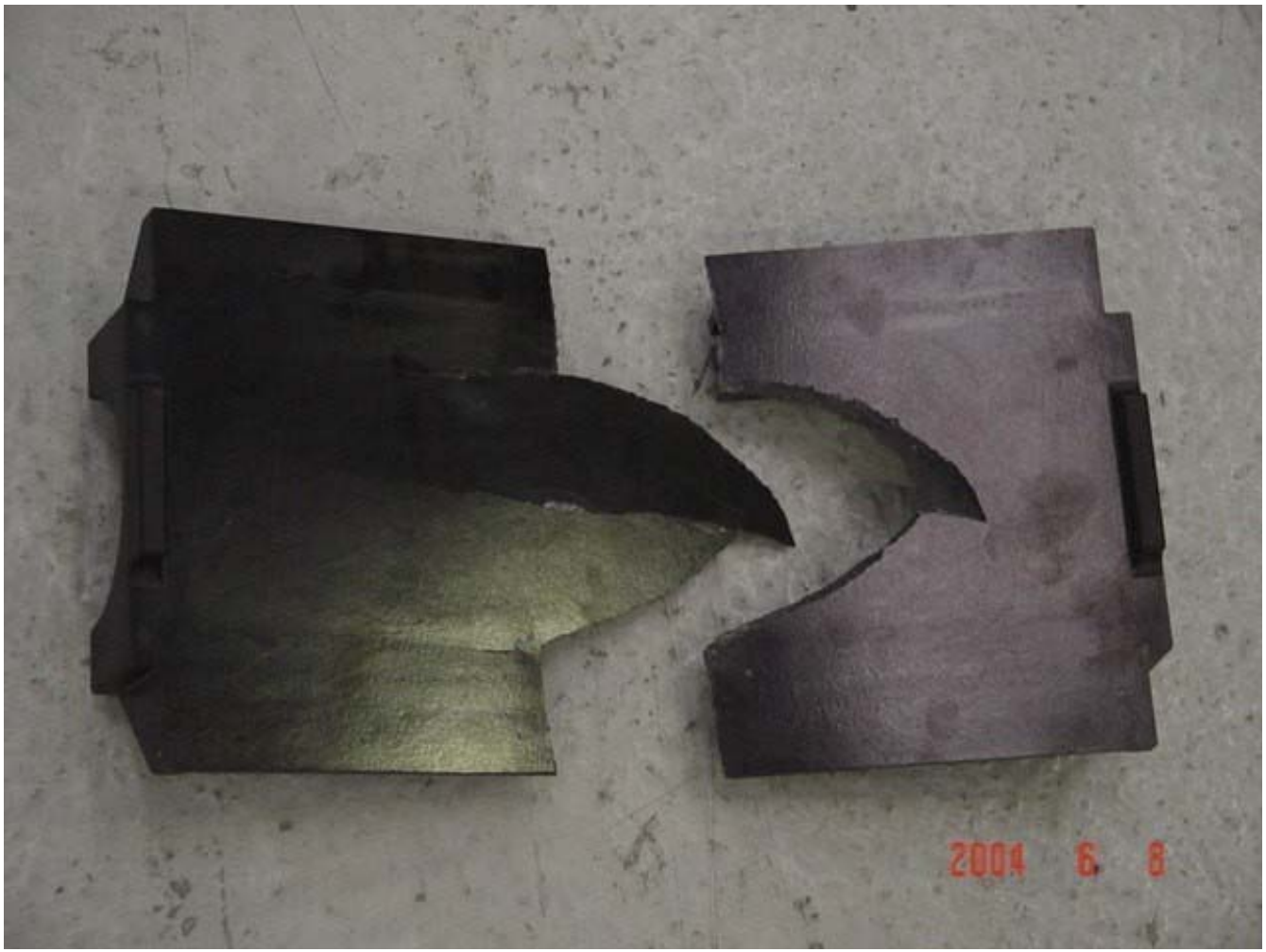
QRL Service Module



Sliding Table



Sliding Table



Cryoline (QRL) History

- 90 units out of 263 already repaired at CERN. Repairing 25 pipe elements per week. Expect completion by end of March 2005.
- Installation of repaired QRL started on 15 November 2004. Before Xmas one shift per day was completing 4 joint welds/day *cf.* six required. Two shifts instituted
- Weld quality extremely good at 2.5% failure
- Installation re-started 3 Jan with three teams. Expect sub-sector of 428m completed by early Feb and two more sub-sectors by mid-March.
- QRL should be finished before 3 Q of 2006 and last tested magnet available end of 2006.

Figure 2 : The pipe element workshop in building 927.

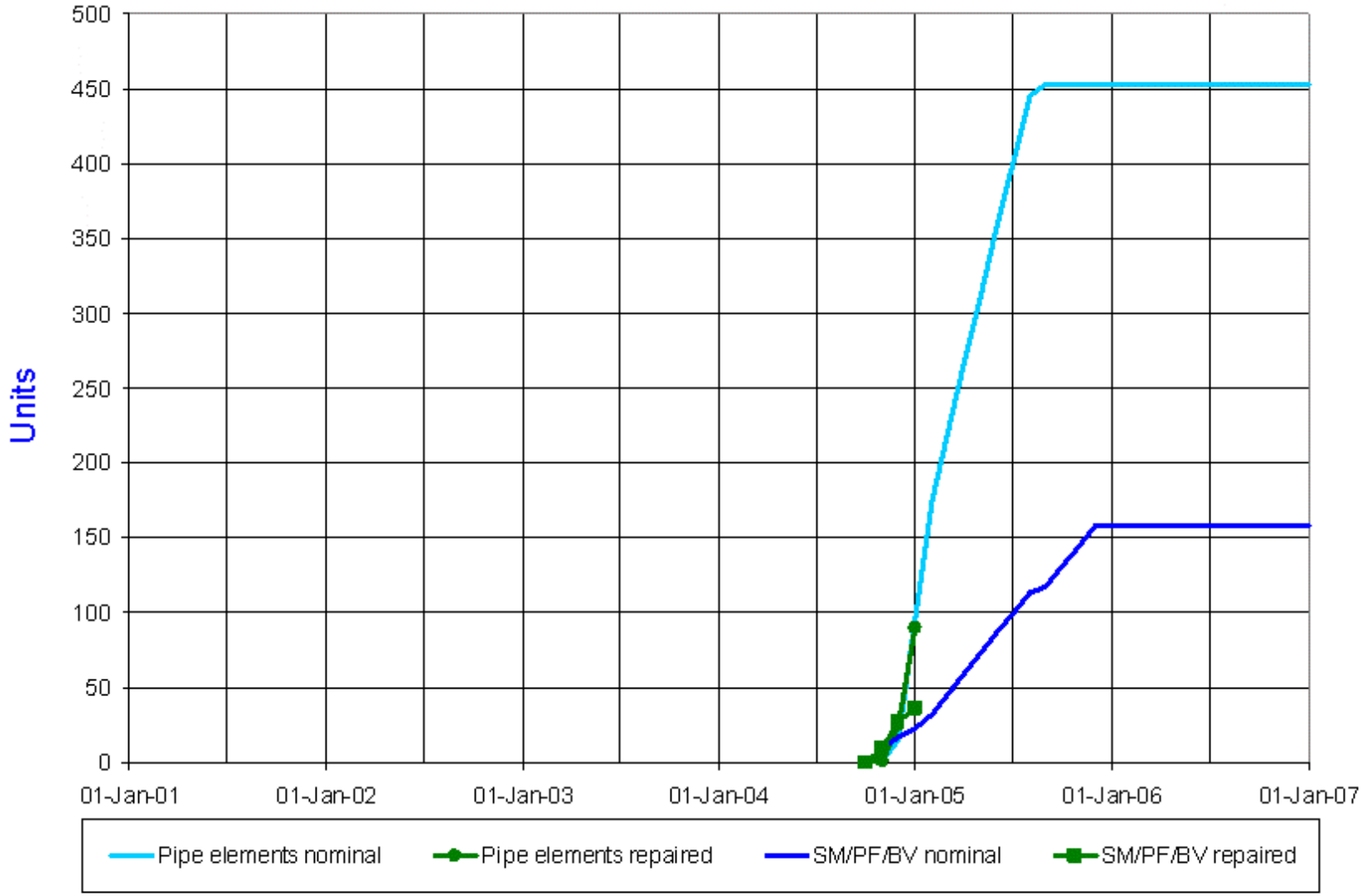
Figure 1 : QRL installed in sector 8-1

LHC Progress Dashboard

TS-MME

Accelerator Technology Department

Cryogenic distribution line repair

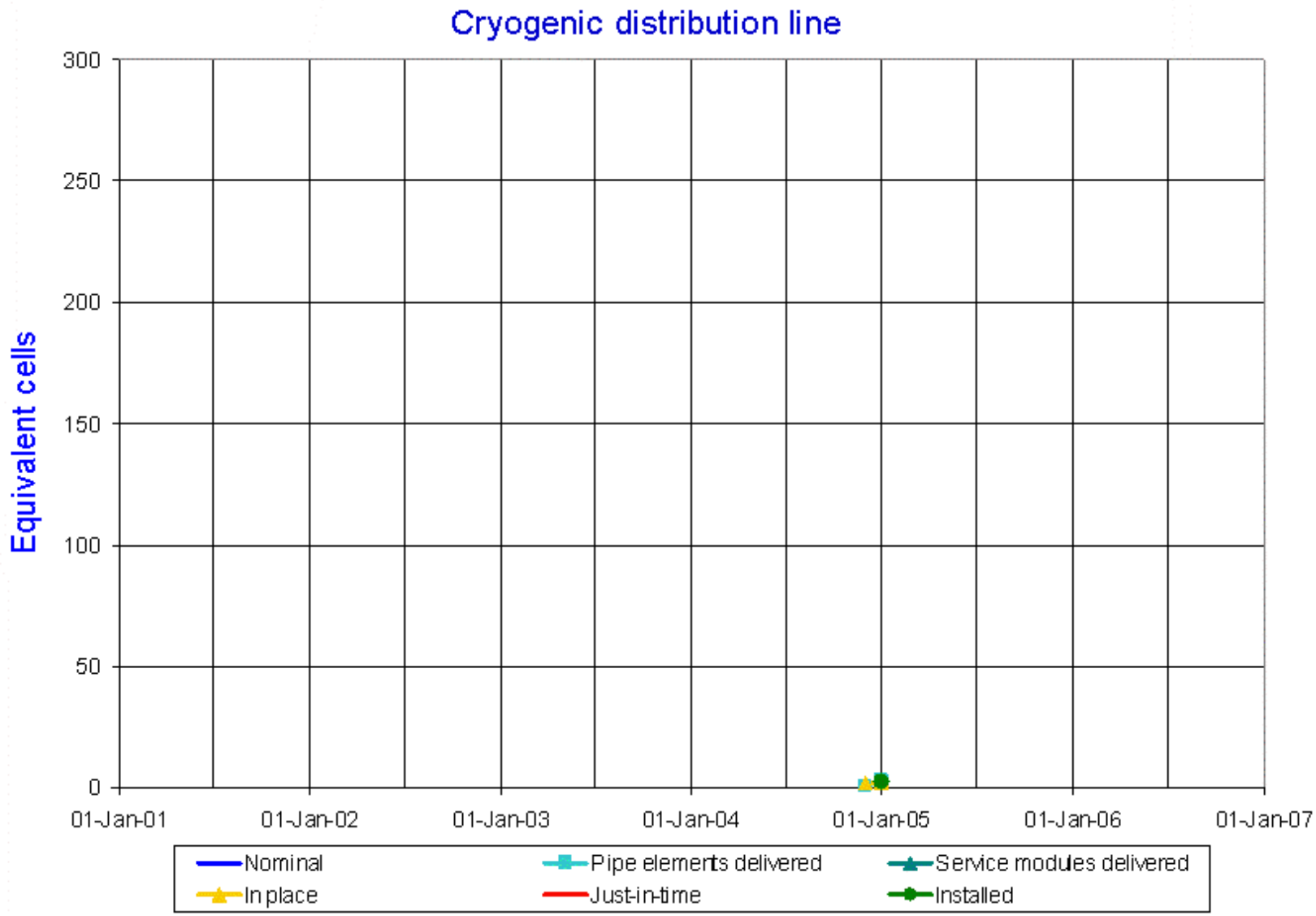


Updated 31 Dec 2004

Data provided by G. Riddone AT-ACR

LHC Progress Dashboard

Accelerator Technology Department



Conclusions

- Component delivery is proceeding at a rate compatible with a startup of the machine in summer 2007.
- The new QRL problems have caused delays in installation. The delay will be of order 3 months.
- LHC has re-ordered tasks to minimize effect on schedule. For example, local cabling is now being done before QRL installation. A new contractor has been brought in to remove repair and re-install damaged QRL.
- Increase rate of component manufacture to install 2 (maybe 3) sectors in parallel
- In New Year talk to CERN staff, Aymar said that CERN was committed to an LHC physics startup in summer of 2007 – and that this was in accord with the schedule.

From Commissioning to Physics

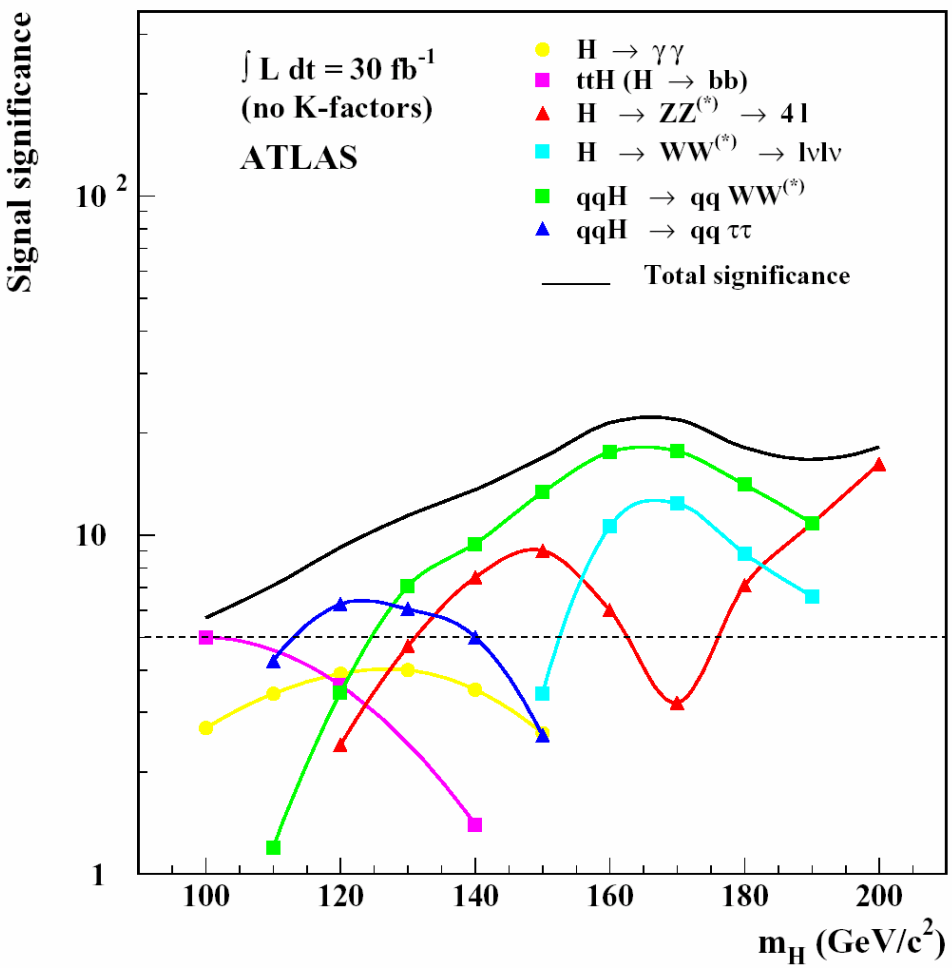
- Now that calorimeters have been built and delivered, the group's next major effort will consist of commissioning those systems.

- Our group's hardware, software and commissioning expertise will be used to help us lead some of the early physics analyses

First step:

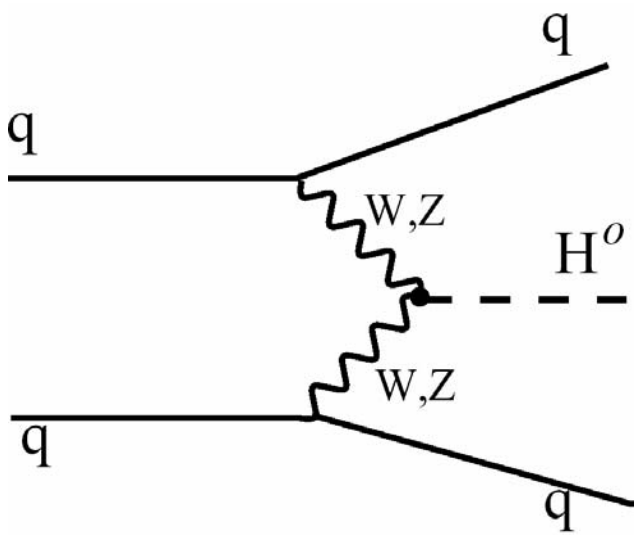
- Collect samples to be used for calibrations and measure various efficiencies:
  - minimum bias events
  - jets with various trigger thresholds
  - Z, W bosons
  - photon + jets
  - top?!
- Use these to tune detector simulation
- Important baseline measurements can be made with samples above (multiplicity distributions, W, Z boson cross sections)

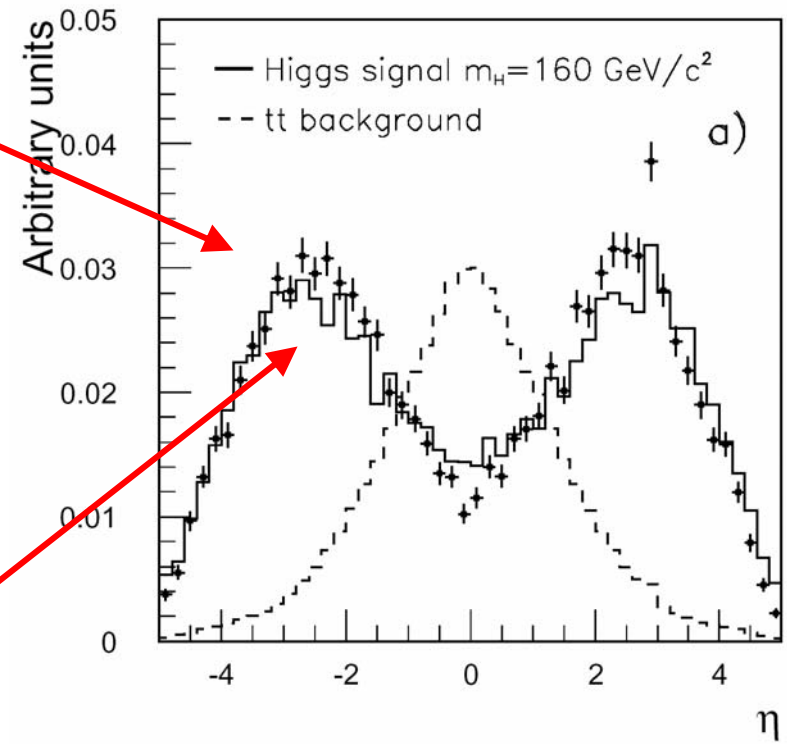
Intend to be Active in High Profile Physics
Higgs Boson

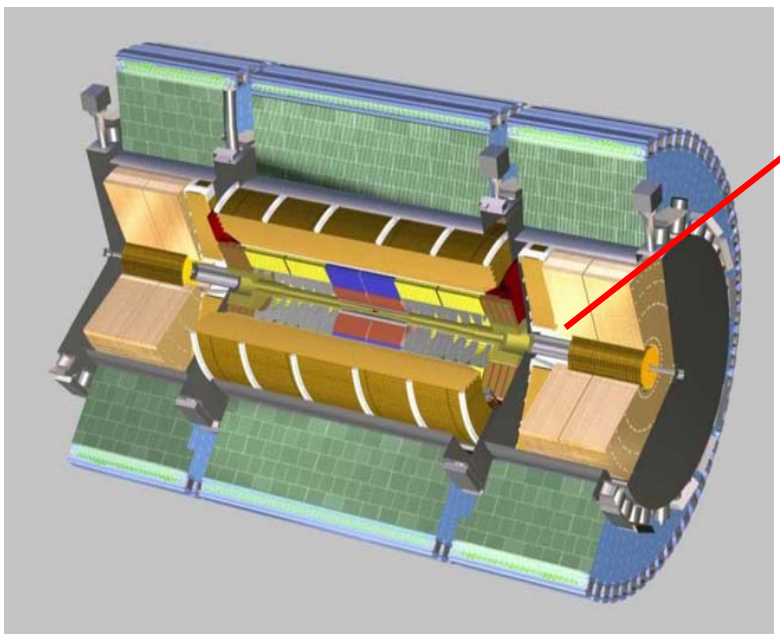


- Vector boson fusion dominates favoured Higgs mass range
- Relies on tagging forward jets
- Extensive VBF studies performed by Canadian group (including 2 theses)
- WW → lν lν analysis performed by Canadians at Fermilab

Forward Jet Identification





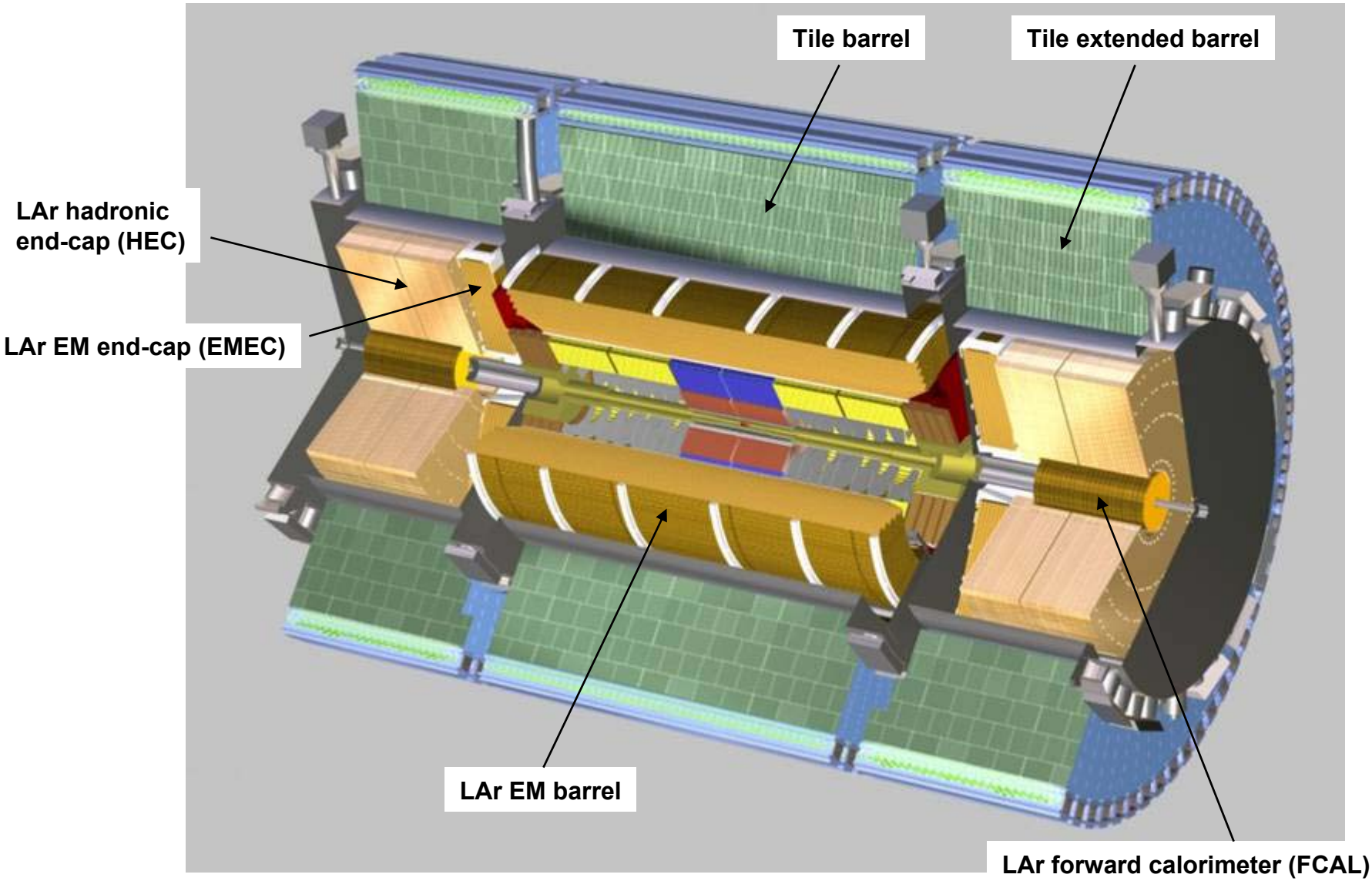


Commissioning and calibration of endcap + forward calorimeters and understanding forward jet reconstruction constitute first steps in these analyses

Getting Organized

- Calorimeter commissioning will involve large fraction of Canadian group
- Natural for this effort to evolve into early physics measurements
- High-profile analyses will be very competitive but we can compete as a group if we are well organized
- Already have Canada-wide meetings (e.g. testbeam analysis meeting)
- Frequency of meetings, travel within Canada likely to increase. We are discussing how to most efficiently use our resources

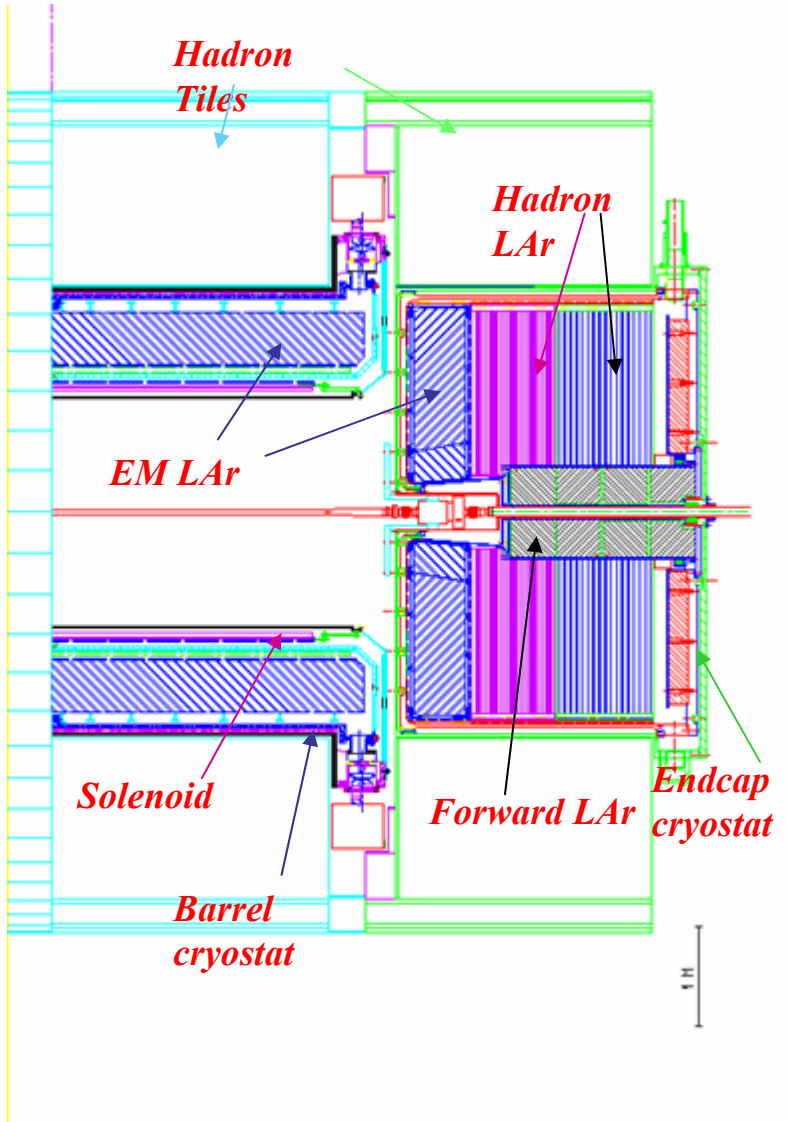
LAr and Tile Calorimeters



Liquid Argon Calorimetry

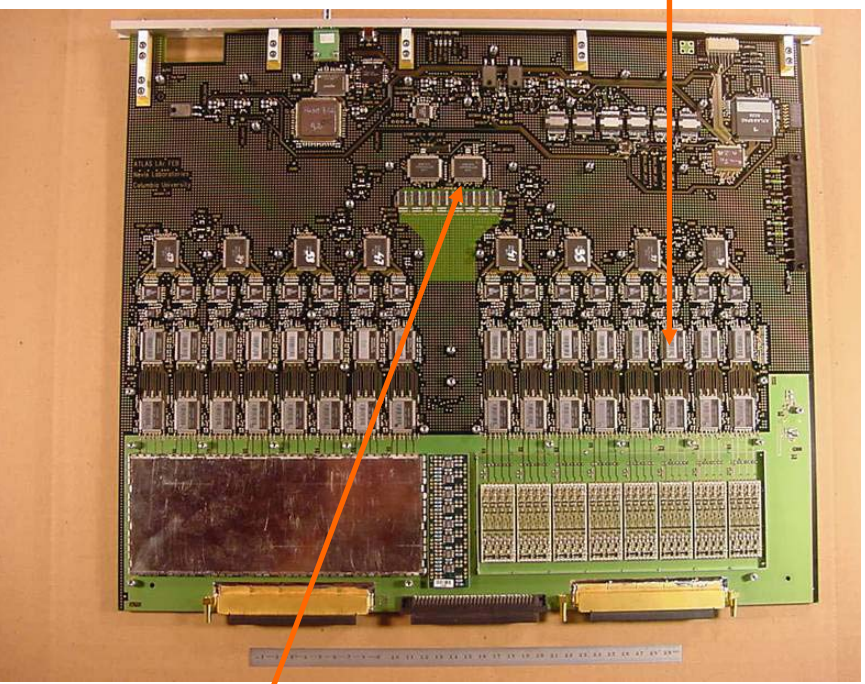
The LAr calorimetry (pre-samplers, EM, hadronic end-caps, and forward calorimeters)

C-End: Integration complete, cold test underway ready for pit May 2005 (Move Sept 2005)
A-End: Integration well-advanced, cold test in summer 2005,ready for pit November 2005



Front-End Board Schedule

Switched Capacitor Array



SCA Controller

- Light Blue is schedule before Delay at Bottom

- 2003 October: full 14 board test.
- 2004 March: start of front-end board production
- 2004 November: begin front-end board installation (1.25 days/crate)
- Stopped late summer due to QPLL problems
- Solution found – mezzanine board
- Resume Production Feb 2005
- Six Month Delay

No Final Schedule at present for Installation
Not affected by production delay

- Jan 05 – Aug 05: Phase 1 – EM barrel at truck
- Aug 05 – Sep 05 : Phase 2 – EM Barrel at IP
- Dec 05 – Jul 06: Endcap C
- Feb 06 – Aug 06: Endcap A

Installation of the Barrel Cryostat on 28th October 2004 in the pit onto the lower part of the Barrel Tile Calorimeter

EndCap Integration Summary

EndCap C

- Cryostats preparations
  - Feed throughs, pedestals, warm cables installation
  - Finished in spring 2003
- Electromagnetic EndCap insertion
  - PS installation in June 2003
  - EM wheel insertion in Aug. 2003
- Hadronic EndCap insertion
  - HEC1 insertion in Sept. 2003
  - HEC2 insertion in Oct. 2003
- Forward calorimeter insertion
  - FCal insertion in Aug. 2004
- Final closing of the cryostat
  - Final closing and welding of cold vessel July – Oct. 2004
  - Closing warm vessel Oct. 2004
- Cool down for the cold commissioning
  - Started Nov 2004
  - Cool down scheduled to take 8 weeks
- Delivery to the pit
  - Planned for Sept. 2005

EndCap A

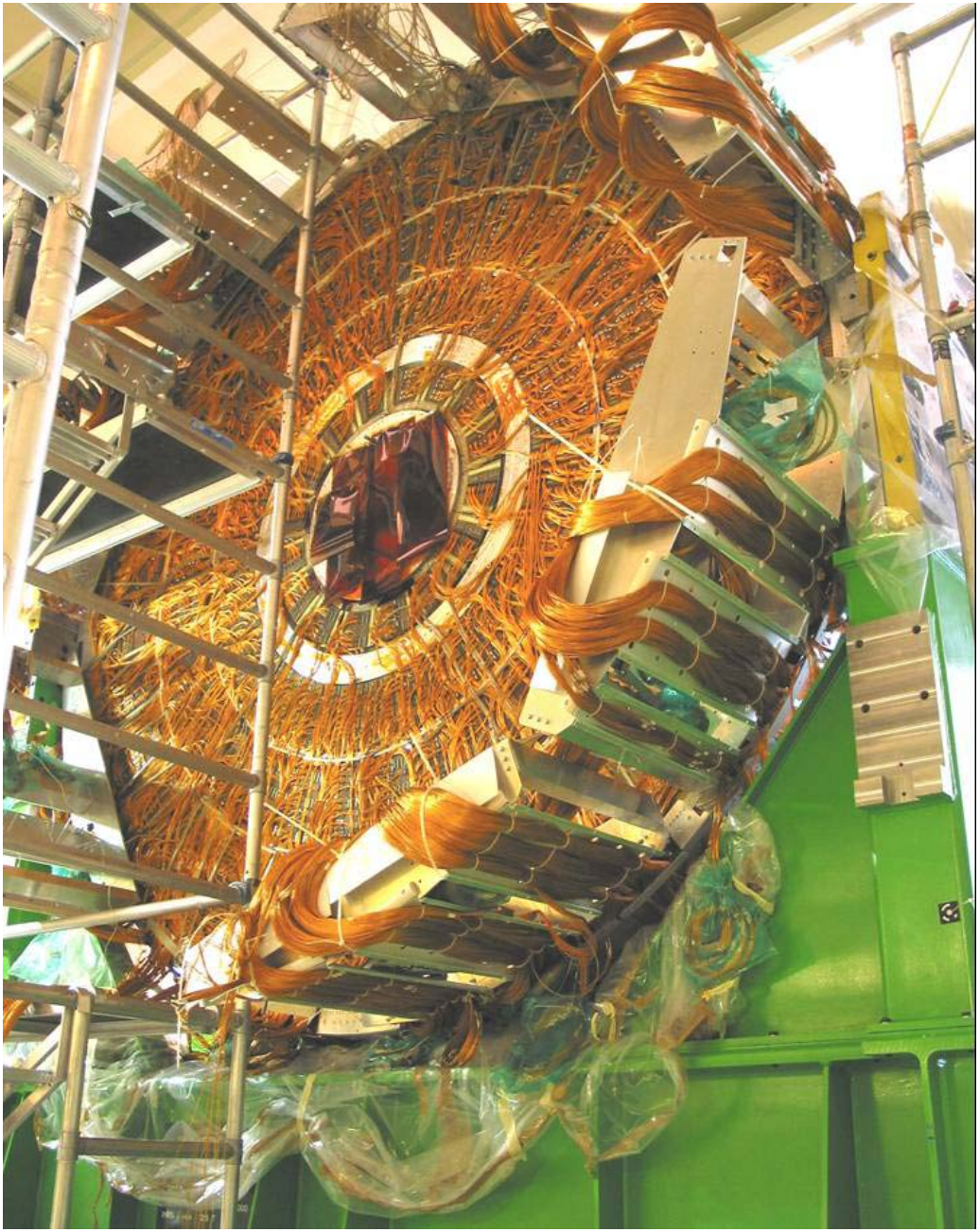
- Cryostats preparations
  - Feed throughs, pedestals, warm cables installation
  - Finished in fall 2003
- Electromagnetic EndCap insertion
  - PS installation in May 2004
  - EM wheel insertion in July 2004
- Hadronic EndCap insertion
  - HEC1 insertion in Aug. 2004
  - HEC2 insertion in Sept. 2004
- Forward calorimeter insertion
  - FCal insertion planned for Jan. 2005
- Final closing of the cryostat
  - Final closing and welding of cold vessel planned for Dec. 2004 – Feb. 2005
  - Closing warm vessel planned for Feb. 2005
- Cool down for the cold commissioning
  - Planned to start in May 2005
  - Cool down scheduled to take 8 weeks
- Delivery to the pit
  - Planned for Nov. 2005

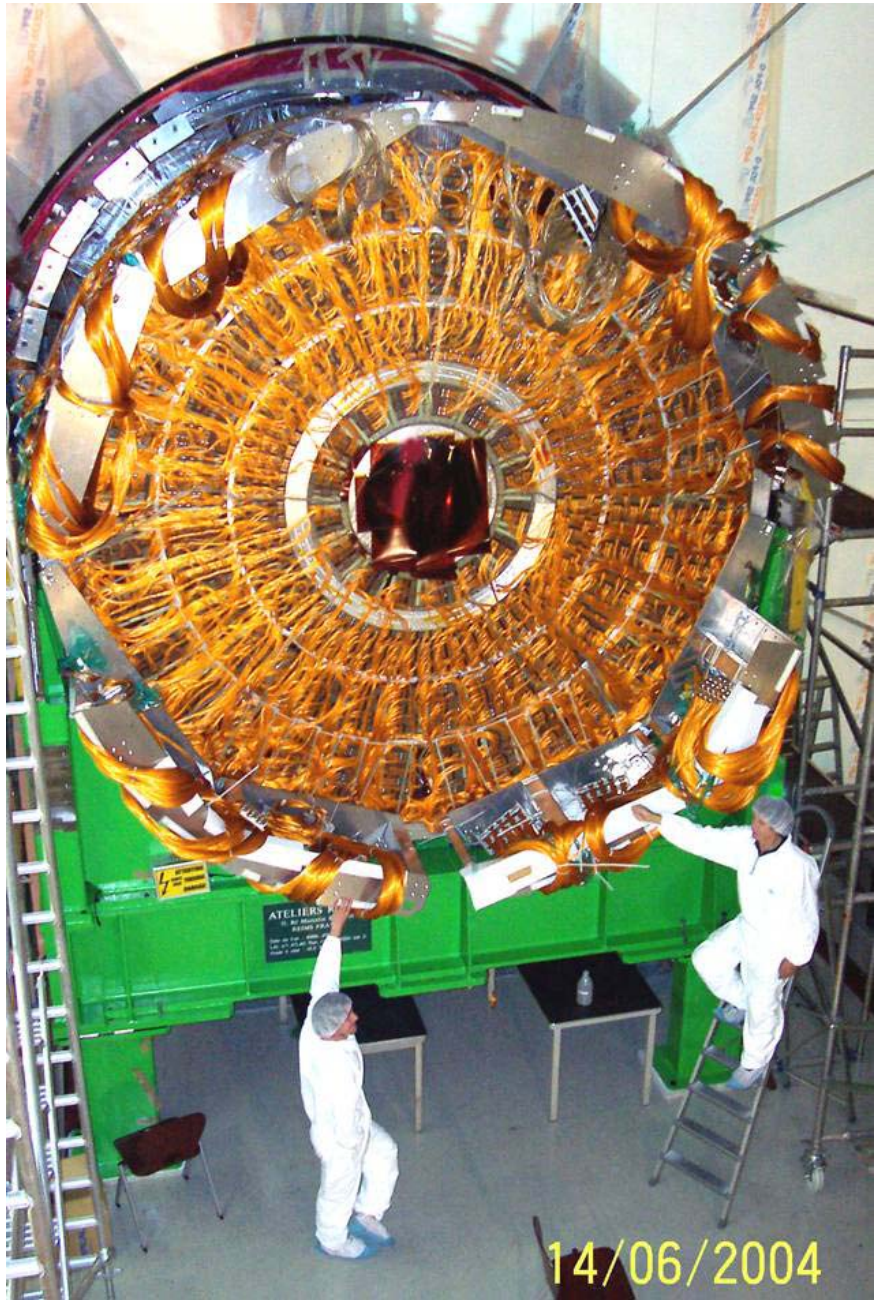
EC Cryostat Preparation

- Cryostat preparation:
  - Feedthrough Installation
  - Pedestal installation, warm cabling, testing
- Rotation
- Pressure test of the empty cryostat
  - ECA pressure test winter 2004
  - Leak of interior large Ω-seal at 2.6bar
    - below working pressure (2.7bar)
  - Exterior large Ω-seal started to leak at 2.8bar
  - Leak re-disappeared at lower pressures

ECC rotated with all feedthroughs installed, Mar 2003

EM EndCap A wheel on the insertion stand, May - June 2004





LAr Forward Calorimeters

- C end in Cryostat
- A end assembled into support tube

- FCAL C assembly into tube – Fall 2003

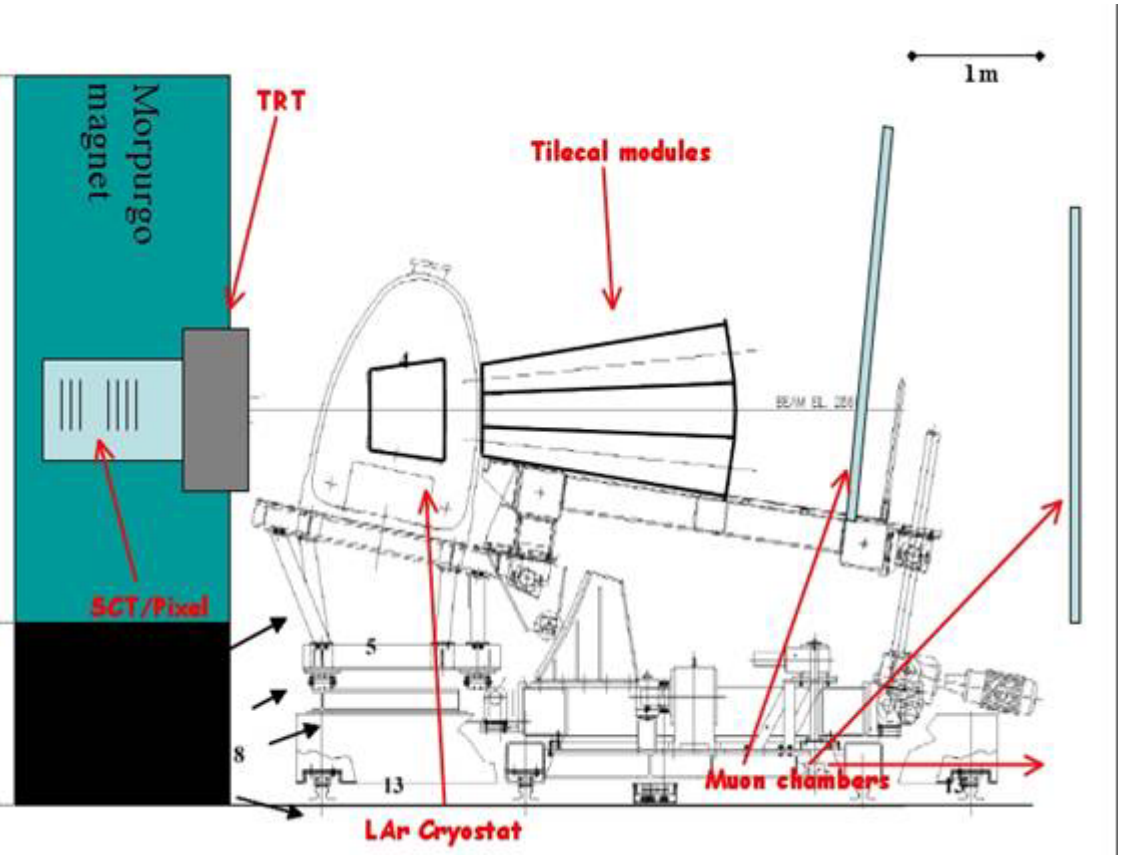
End Cap Cold Commissioning

- End cap C cold commissioning is planned to start in Jan. 2005
- End cap A cold commissioning is planned to start in July 2005

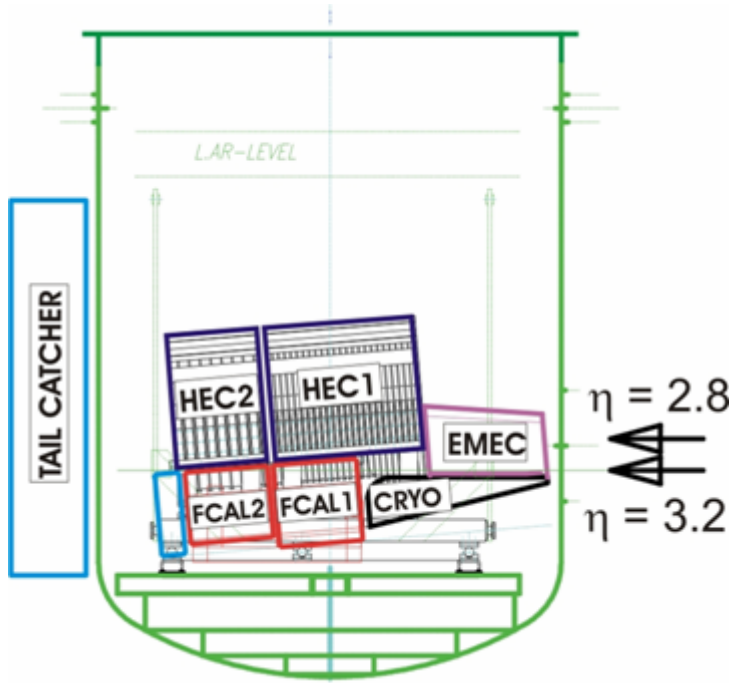
	EMEC	FCAL	HEC
Week 1	HV test		
Week 2	HV test		
Week 3	HV test	HV test	
Week 4	HV test		HV test
Week 5	TPA, LC, Rcal		Ramp, delay, x-talk
Week 6	TPA, LC, Rcal	Reflection test	Ramp, delay, x-talk
Week 7	TPA, LC, Rcal	Tests with calib.p.	TDR test
Week 8		FEC test	
Week 9	FEC test		
Week 10			FEC test

Combined Beam Tests

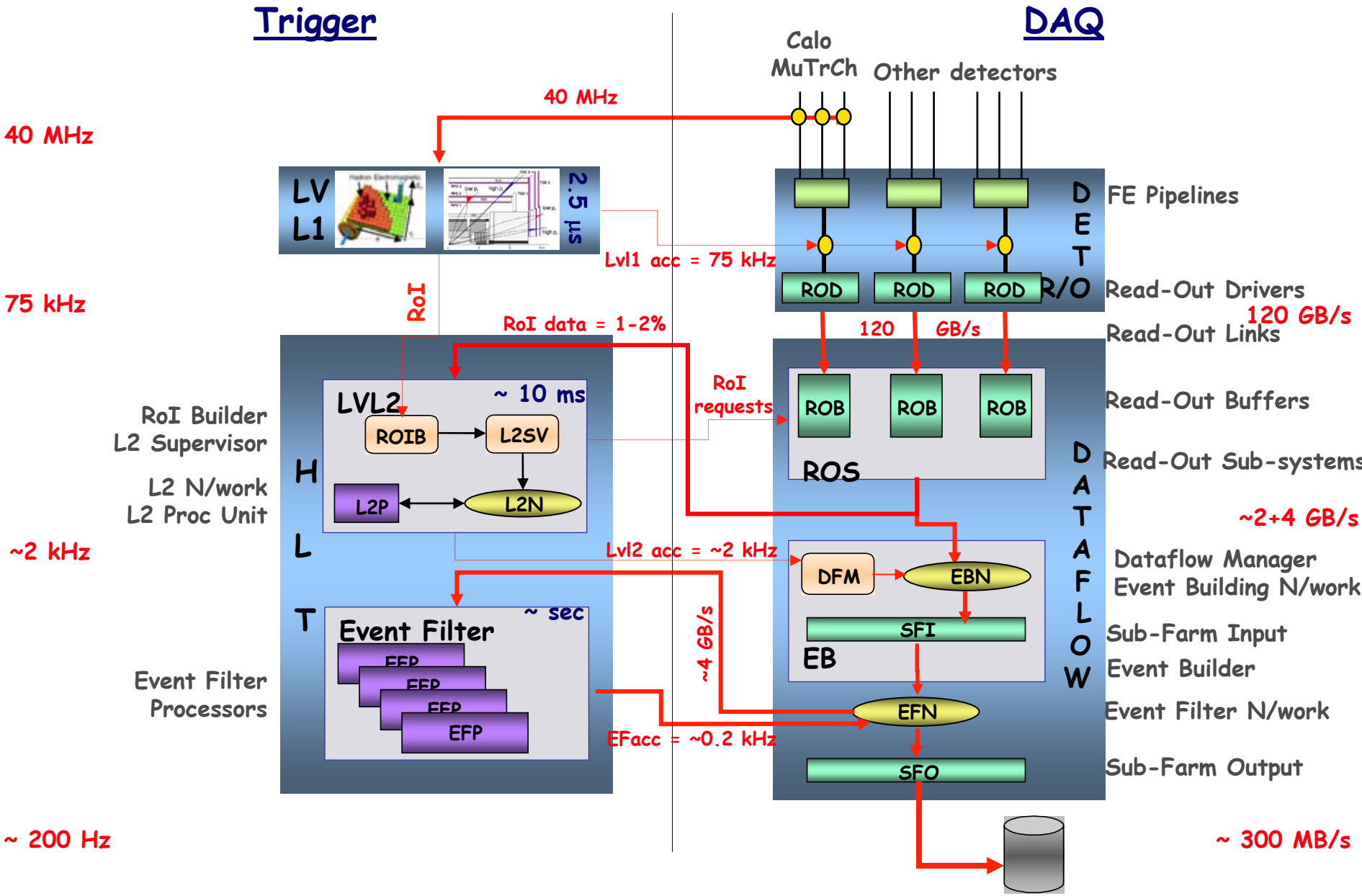
H8 beam
General ATLAS multi-system test beam



H6 beam
EMEC-HEC-FCAL test



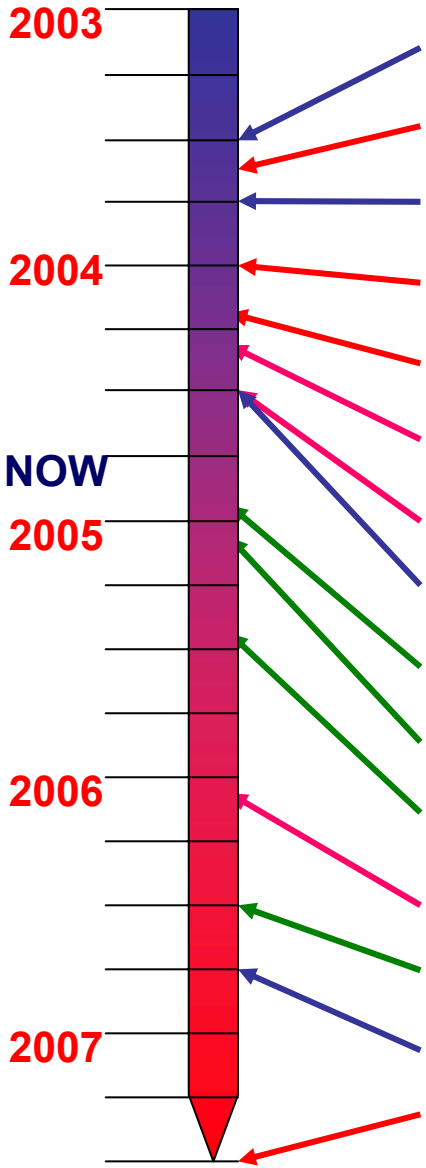
Trigger, DAQ and Detector Control



High Level Trigger

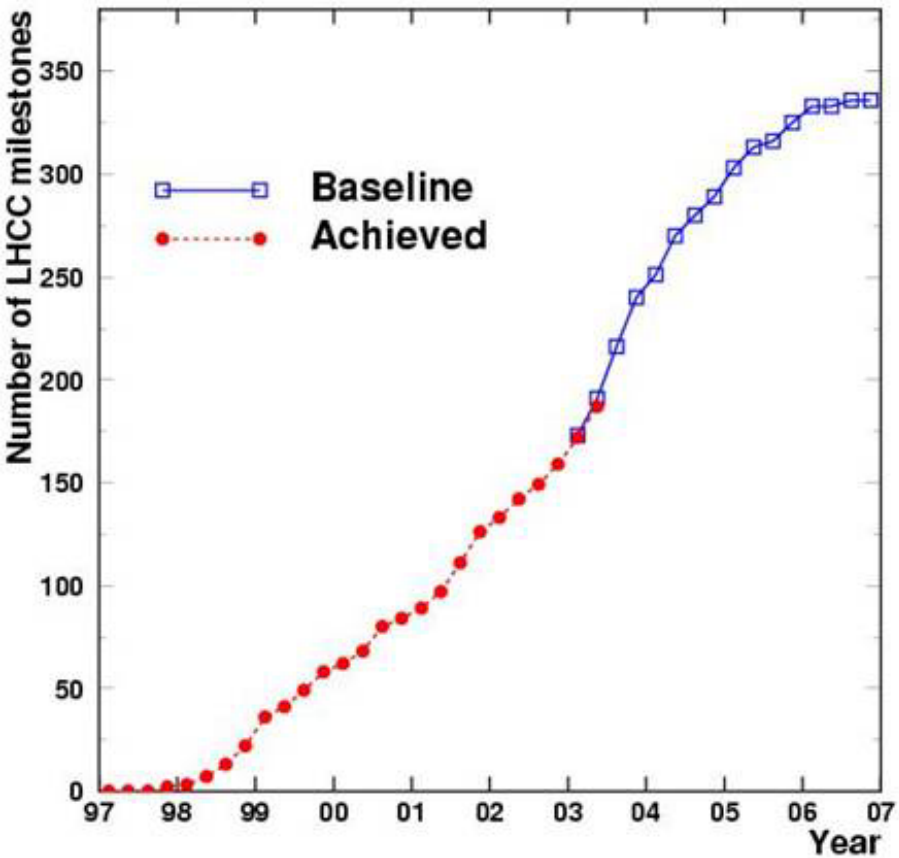
- Principal focus Combined Testbeam
  - LVL2 muon slice fully integrated in H8 combined testbeam
    - μFast LVL2 μ reconstruction, and detector description infrastructure integrated
    - TrigMoore EF μ reconstruction integrated
    - Steering of TrigMoore from LVL2 result implemented
    - These integration tests are the first demonstration of a complete HLT chain with algorithms in an online setup, reading out directly detectors
  - ID LVL2 tracking algorithms integrated and run in the testbeam
  - CaloRec in EF
- Timing algorithm & data preparation timing studies
- Extensive testing of the event selection steering component
- Online histogramming

ATLAS Computing Timeline

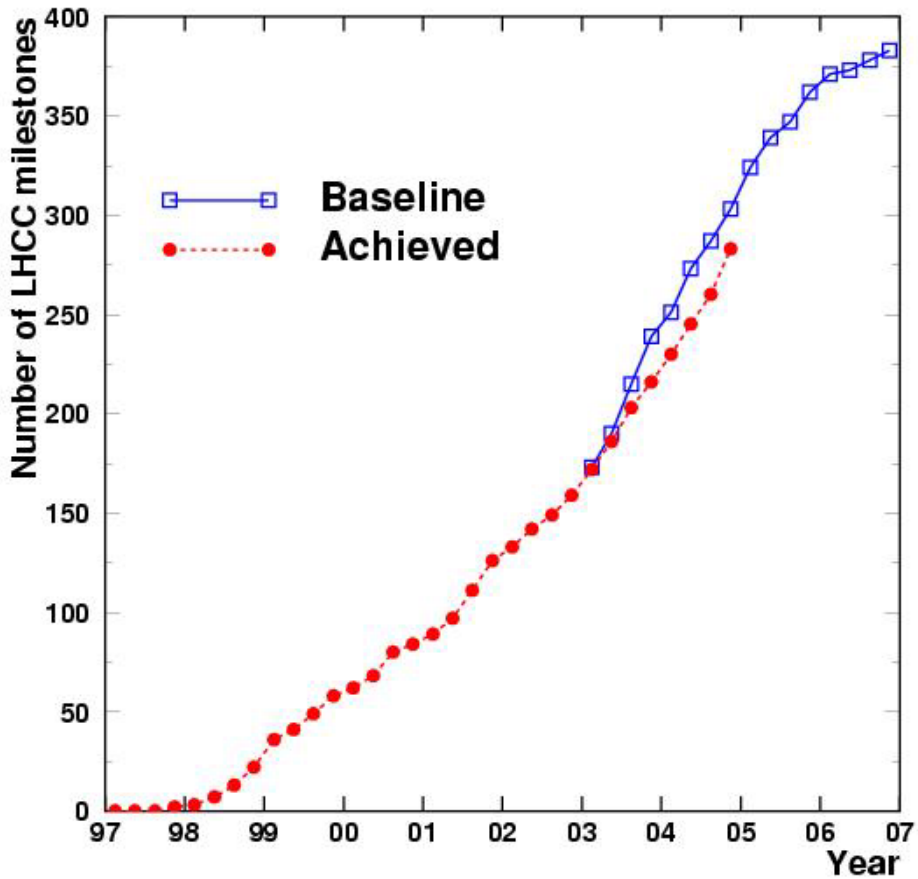


- POOL/SEAL release (done)
- ATLAS release 7 (with POOL persistency) (done)
- LCG-1 deployment (done)
- ATLAS complete Geant4 validation (done)
- ATLAS release 8 (done)
- DC2 Phase 1: simulation production (in progress)
- DC2 Phase 2: intensive reconstruction (the real challenge!) ***late***
- Combined test beams (barrel wedge) (in progress)
- Computing Model paper
- Computing Memorandum of Understanding
- ATLAS Computing TDR and LCG TDR
- DC3: produce data for PRR and test LCG-n
- Physics Readiness Report
- Start commissioning run
- **GO!**

LHCC Milestones



Last Review for Comparison

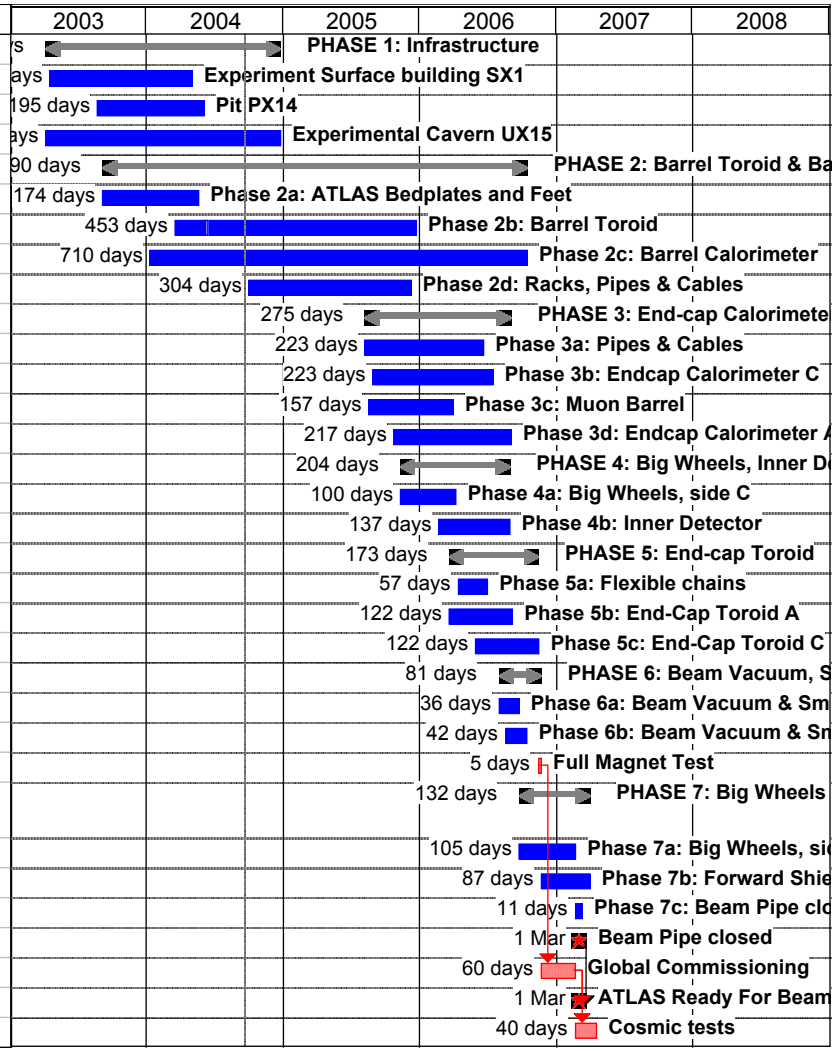


Integrated LHCC milestones
LHCC November 2004

ATLAS Installation Schedule (working version 6.24, not baselined)

Technical Coordination is working on optimizing and updating the schedule taking into account the by now better known and consolidated BT construction schedule

Name	Start	Finish
PHASE 1: Infrastructure	4 Apr '03	21 Dec '04
Experiment Surface building SX1	15 Apr '03	27 Apr '04
Pit PX14	19 Aug '03	31 May '04
Experimental Cavern UX15	4 Apr '03	21 Dec '04
PHASE 2: Barrel Toroid & Barrel Calorimeter	3 Sep '03	13 Oct '06
Phase 2a: ATLAS Bedplates and Feet	3 Sep '03	17 May '04
Phase 2b: Barrel Toroid	15 Mar '04	18 Dec '05
Phase 2c: Barrel Calorimeter	7 Jan '04	13 Oct '06
Phase 2d: Racks, Pipes & Cables	29 Sep '04	7 Dec '05
PHASE 3: End-cap Calorimeters & Muon Barrel	3 Aug '05	30 Aug '06
Phase 3a: Pipes & Cables	3 Aug '05	19 Jun '06
Phase 3b: Endcap Calorimeter C	24 Aug '05	11 Jul '06
Phase 3c: Muon Barrel	16 Aug '05	30 Mar '06
Phase 3d: Endcap Calorimeter A	21 Oct '05	30 Aug '06
PHASE 4: Big Wheels, Inner Detector	8 Nov '05	28 Aug '06
Phase 4a: Big Wheels, side C	8 Nov '05	4 Apr '06
Phase 4b: Inner Detector	16 Feb '06	28 Aug '06
PHASE 5: End-cap Toroid	17 Mar '06	14 Nov '06
Phase 5a: Flexible chains	12 Apr '06	29 Jun '06
Phase 5b: End-Cap Toroid A	17 Mar '06	4 Sep '06
Phase 5c: End-Cap Toroid C	29 May '06	14 Nov '06
PHASE 6: Beam Vacuum, Small Wheels, Start closing	31 Jul '06	21 Nov '06
Phase 6a: Beam Vacuum & Small Wheels, side A	31 Jul '06	19 Sep '06
Phase 6b: Beam Vacuum & Small Wheels, side C	17 Aug '06	13 Oct '06
Full Magnet Test	15 Nov '06	21 Nov '06
PHASE 7: Big Wheels A, Forward Shielding & End wall chambers	19 Sep '06	30 Mar '07
Phase 7a: Big Wheels, side A	19 Sep '06	21 Feb '07
Phase 7b: Forward Shielding & End wall Chambers	22 Nov '06	30 Mar '07
Phase 7c: Beam Pipe closing and bake-out	22 Feb '07	8 Mar '07
Beam Pipe closed	1 Mar '07	1 Mar '07
Global Commissioning	22 Nov '06	21 Feb '07
ATLAS Ready For Beam	1 Mar '07	1 Mar '07
Cosmic tests	22 Feb '07	18 Apr '07



Conclusion

- CERN Committed to LHC Startup in 2007
- ATLAS Detector on Schedule for 2007 Startup
- Canadian Projects have proceeded in timely fashion

ATLAS Canada Project Request

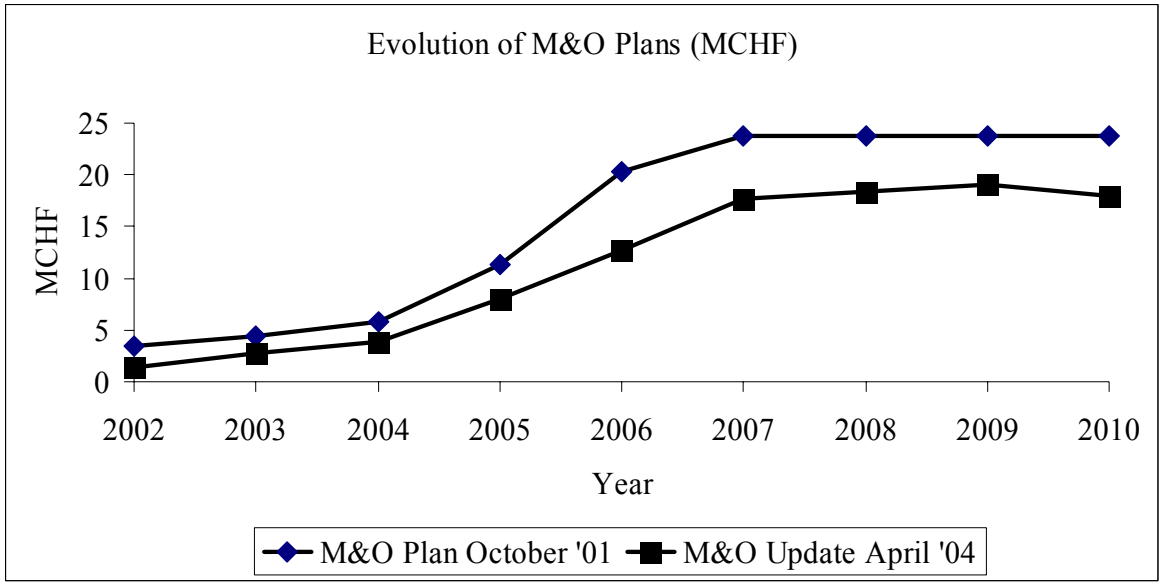
Specific Issues

- Purpose of Request
- Financial Summary
- Student Support
  R.A. Salaries

Funds Requested

	Summary of Requested Budget	2005-06	2006-07	2007-08
	Salaries	$1,335,294	$1,562,126	$1,827,603
	Travel	$1,006,274	$1,174,690	$1,451,835
	Operations, Maint., Supplies	$168,381	$213,516	$179,051
CERN				
	Maintenance & Operations (A)	$160,000	$234,667	$391,111
	Maintenance & Operations (B)	$57,000	$111,150	$427,928
Total Request		**$2,726,950**	**$3,296,149**	**$4,277,528**

M&O Component



COMMON COSTS					
ATLAS OPERATING GRANT REQUEST					
OPERATING					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
	2003-04	**2004-05**	**2005-06**	**2006-07**	**2007-08**
Equipment or facility					
Purchase rental or user fees					
ATLAS M&O (A)	$76,482	$100,694	$160,000	$234,667	$391,111
ATLAS M&O (B)	$34,989	$16,000	$57,000	$111,150	$427,928
Subtotal	**$111,471**	**$116,694**	**$217,000**	**$345,817**	**$819,039**
Material and supplies					
FCAL Completion	$55,000				
Subtotal	**$55,000**				
TOTAL	**$166,471**	**$116,694**	**$217,000**	**$345,817**	**$819,039**

ATLAS M+O (A) and (B) Payments in 2005 (kCHF)

Item & Cost Driver (by RRB SG Headings)	Cat. A M&O	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Cat. B M&O	Item & Cost Driver (by RRB SG Headings)
Detector related costs	2,197					100	5	60	165	Mechanics & Gas & Cooling & Cryogenics
Cooling systems, power supplies										Gases (ID, Tiles, Muons)
Magnet Cryo. Op. in Point 1										
Secretariat	205					100	90	80	270	Standard electronics
2 FTE charged to ATLAS										Crates, electronics pool rentals
Publications, consumables										
Communications	15								0	Detector controls
GSM phones										
Computer network connections										
On-line computing	435	140	55	110	760	50			1,115	Areas
Detector controls										Installation, system integration (ID)
Software licences										
Test beams	440								0	Communications
Magnet Cryo Op. in B180										
On-line computing support										
TDAQ common electronics										
Laboratory operations	115					45			45	Store items
Assembly areas, workshops										Cables, connectors (LAr)
TDAQ laboratory equipment										
General services	2,102								0	Sub-detector spares
Electricity										(Critical spares dealt with separately)
Heavy handling										
Technical support, storage										
Survey										
Outreach										
TOTAL	5,509	140	55	110	760	295	95	140	1,595	(Excluding hired manpower for Category B)
Hired manpower at CERN (in kCHF)	ncl. above					275		100	375	
Institute manpower (in FTE)	0					15	1	2	18	
TOTAL M&O FOR A	5,509	140	55	110	760	570	95	240	1,970	TOTAL M&O FOR B

Notes:

1. Category A are common items charged based on the number of authors. Category B is system-specific and is based on CORE sharing

Construction Completion Request

Funds Requested				
	2005	**2006**	**2007**	**2008**
Construction Completion (A)	$287,464	$287,464	$287,464	$287,464
Construction Completion (B)	$45,429	$45,429	$45,429	$45,429
Commissioning & Integration (A)	$84,801	$84,801	$84,801	$84,801
Commissioning & Integration (B)	$39,119	$39,119	$39,119	$39,119
Membership Fee from 2003 RTI		($88,839)	($88,839)	
Carryover from 2003 RTI	($44,000)			
Request	**$412,812**	**$367,974**	**$367,974**	**$456,812**

Payment Profile (CHF)							
	2002	***2003***	**2004**	**2005**	**2006**	**2007**	**2008**
Construction Completion (A)				284,750	284,750	284,750	284,750
Construction Completion (B)	*32,000*	*177,000*		45,000	45,000	45,000	45,000
Commissioning & Integration (A)				84,000	84,000	84,000	84,000
Commissioning & Integration (B)		*71,000*		38,750	38,750	38,750	38,750
Total	***32,000***	***248,000***	**0**	**452,500**	**452,500**	**452,500**	**452,500**

Priorities During this Grant Period

- Transition from Construction > Commissioning > Physics
    - RA's and Students based at CERN
    - Initially focus on calorimeter calibration - test beam
    - Cosmic and Single beam running
    - Planning for Analysis
- TRIUMF Computer Centre & University Installations
    - Grid development
    - Data Challenges
    - New CFI requests
- Event Filter
    - Strong group of committed people
- Beam Condition Monitor
    - Ties nicely with commissioning

Grant Holders

	ATLAS FTE PROFILE			
		2005	2006	2007
A. Astbury	Victoria	1.00	1.00	1.00
D. Axen	UBC	1.00	1.00	1.00
G. Azuelos	Montreal	0.75	0.75	0.75
D. Bailey	Toronto	1.00	1.00	1.00
S. Bhadra	York	0.10	0.10	0.20
G. Couture	Montreal/UQAM	0.50	0.50	0.50
D. Gingrich	Alberta/TRIUMF	0.75	0.90	1.00
R. Keeler	Victoria	1.00	1.00	1.00
R. Kowalewski	Victoria	0.10	0.20	0.40
P. Krieger	Toronto/IPP	1.00	1.00	1.00
M. Lefebvre	Victoria	1.00	1.00	1.00
C. Leroy	Montreal	1.00	1.00	1.00
M. Losty	TRIUMF	1.00	1.00	1.00
J.-P. Martin	Montreal	0.30	0.30	0.50
R. Moore	Alberta	0.25	0.50	0.75
R. McPherson	Victoria/IPP	1.00	1.00	1.00
G. Oakham	Carleton	1.00	1.00	1.00
D. O'Neil	Simon Fraser	0.25	0.50	0.75
C. Oram	TRIUMF	1.00	1.00	1.00
R. Orr	Toronto	0.90	1.00	1.00
J. Pinfold	Alberta	0.65	0.70	1.00
S. Robertson	McGill/IPP	0.20	0.50	0.70
P. Savard	Toronto/TRIUMF	0.20	0.60	0.80
P. Sinervo	Toronto	0.30	0.50	0.70
R. Sobie	Victoria/IPP	0.50	0.50	0.50
R. Tafirout	TRIUMF	1.00	1.00	1.00
W. Taylor	York	0.10	0.25	0.50
I. Trigger	TRIUMF	1.00	1.00	1.00
W. Trischuk	Toronto	0.50	0.50	0.75
B. Vachon	McGill	0.40	0.60	0.90
M. Vetterli	Simon Fraser/TRIUMF	0.75	0.85	0.90
M. Vincter	Carleton	0.90	0.90	1.00
A. Warburton	McGill	0.10	0.20	0.50
TOTAL		**21.50**	**23.85**	**27.10**

New Grant Eligible Group Members

Robert Kowalewski Commissioning, Calibration, Software.

Roger Moore Event Filter

Steven Robertson Event Filter

Pierre Savard Commissioning, Calibration, Software.

Reda Tafirout TRIUMF/ATLAS Computing Centre

Wendy Taylor Event Filter

Isabel Trigger Commissioning, Calibration, Software

Brigitte Vachon Event Filter

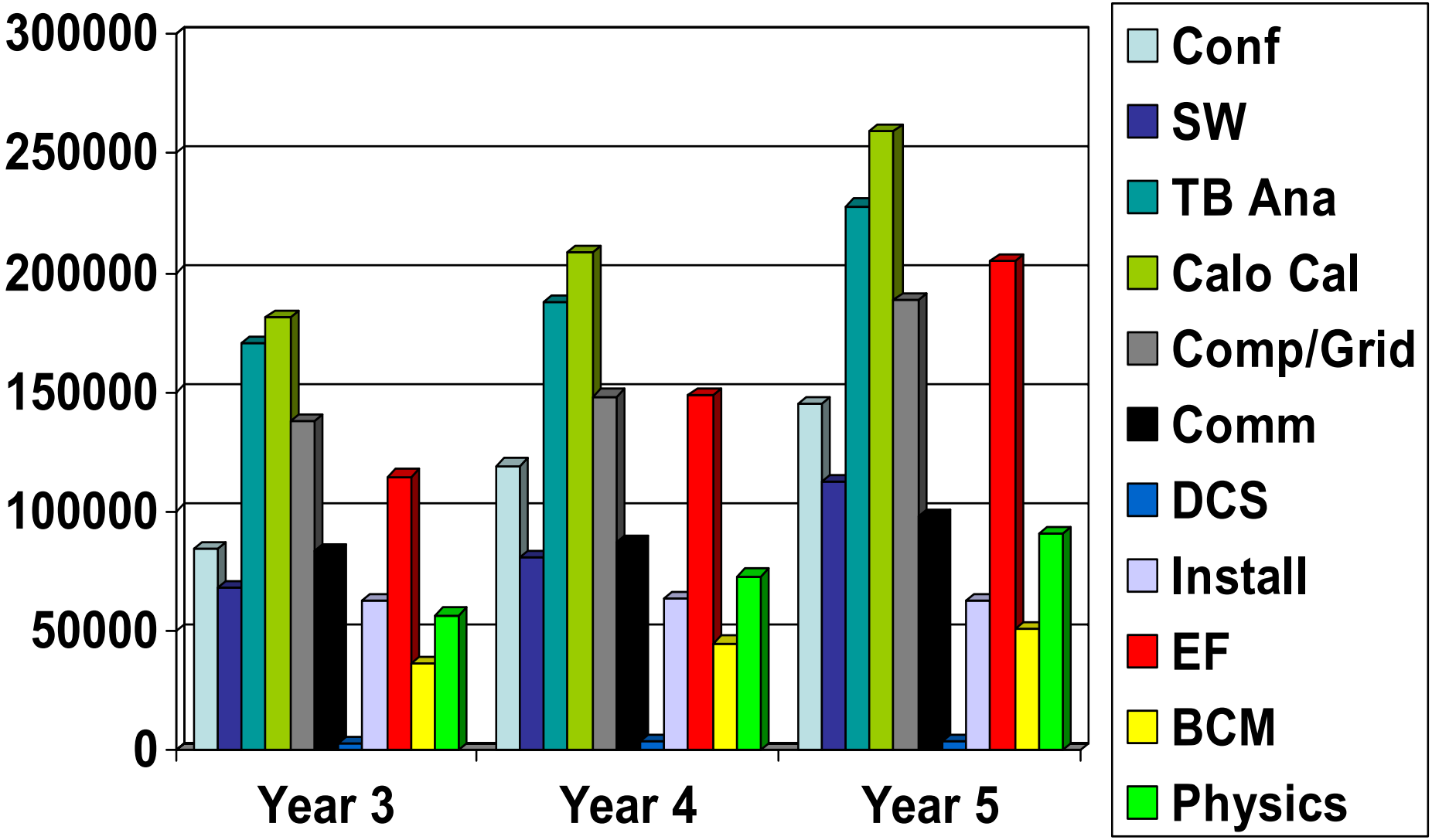
Andreas Warburton Event Filter

Red = New Hire @ Institution since last request

Group Member Actvities

		Offline Software	Test Beam Analysis	Calorimeter Calibration	Computing Grid	Commissioning	Detector Controls	Installation	Event Filter	Beam Monitor	Physics Simulation
Faculty											
A. Astbury	Victoria		0.50	0.50							
D. Axen	UBC										1.00
G. Azuelos	Montreal			0.30	0.10	0.10					0.50
D. Bailey	Toronto		0.50	0.50							
S. Bhadra	York								0.50		0.50
G. Couture	Montreal/UQAM										1.00
D. Gingrich	Alberta/TRIUMF					0.50		0.50			
R. Keeler	Victoria		0.75	0.25							
R. Kowalewski	Victoria			0.50	0.25	0.25					
P. Krieger	Toronto/IPP		0.50	0.40				0.10			
M. Lefebvre	Victoria	0.15	0.25	0.50		0.10					
C. Leroy	Montreal									0.70	0.30
M. Losty	TRIUMF		0.50		0.30	0.20					
J.-P. Martin	Montreal									1.00	
R. Moore	Alberta								1.00		
R. McPherson	Victoria/IPP	0.15	0.30	0.30		0.20	0.05				
G. Oakham	Carleton		0.50	0.20	0.20			0.10			
D. O'Neil	Simon Fraser			0.50	0.50						
C. Oram	TRIUMF				0.20			0.80			
R. Orr	Toronto		0.40	0.40	0.10	0.10					
J. Pinfold	Alberta	0.15				0.20			0.50		0.15
S. Robertson	McGill/IPP								1.00		
P. Savard	Toronto/TRIUM	0.50		0.50							
P. Sinervo	Toronto			0.20	0.80						
R. Sobie	Victoria/IPP				1.00						
R. Tafirout	TRIUMF	0.30			0.70						
W. Taylor	York								0.80		0.20
I. Trigger	TRIUMF	0.15	0.50		0.35						
W. Trischuk	Toronto									1.00	
B. Vachon	McGill								0.80		0.20
M. Vetterli	SFU/TRIUMF		0.25	0.25	0.50						
M. Vincter	Carleton	0.30	0.30	0.30							0.10
A. Warburton	McGill								0.80		0.20
Research Associates											
B. Caron	Alberta	0.20			0.20				0.60		
S. Chekulaev	TRIUMF						0.80	0.20			
P.A. Delsart	Montreal	0.10	0.30	0.30							0.30
M. Finke-Keeler	Victoria		0.25	0.75							
P. Gorbunov	Toronto		0.50	0.50							
M. Khakzad	Carleton	0.40	0.20	0.20							0.20
S. Liu	Alberta					0.50		0.50			
R. Mazini	Toronto			1.00							
R. Mehdiyev	Montreal									0.50	0.50
R. Seuster	Victoria	0.20		0.40	0.40						
R. Soluk	Alberta								1.00		
K. Voss	Victoria		0.30	0.30		0.40					
R. Walker	SFU				1.00						
Total		**2.60**	**6.80**	**9.05**	**6.60**	**2.55**	**0.85**	**2.20**	**7.00**	**3.20**	**5.15**

Travel Broken Down by Task $$.



Management Involvement in this Period

- Georges Azuelos
  - Convener of exotics physics studies

- Chris Oram
  - Elected Deputy Chair of Collaboration Board
    - *(Chair in 2006 - 2007, return to Deputy for 2008)*
  - Ex-Officio member of Executive Board

- R.S. Orr
  - National Contact Physicist

- Rob McPherson
  - Offline Commissioning Coordinator
  - Member of Computing Management Board

- Randy Sobie & Mike Vetterli
  - LHC Grid Deployment Board

- Mike Vetterli
  - ATLAS International Computing Board

Student Support

	Note No.	Year 1 2003-04	Year 2 2004-05	Year 3 2005-06	Year 4 2006-07	Year 5 2007-08
Alberta						
Li Chen (Gingrich)		$8,597	$7,905			
Claudiu Cojocaru (Vincter)		$4,962	$6,271			
J-P Archambault (Vincter)			$1,752			
Jeff de Jong (Pinfold)		$10,439	$19,000			
Andrew Hamilton (Pinfold)	1)	$8,771	$9,500	$9,500		
Wei-Yuan Ting (Pinfold)	2)	$4,821	$19,000	$19,000	$9,500	
Yushu Yao (Pinfold)	3)	$4,683	$5,947	$8,000	$8,000	$8,000
Ahmed Hossain (Gingrich)	3)			$8,000	$8,000	$8,000
TBA (Moore)	3)				$8,000	$8,000
Kevin Chan (Moore)	3)					$8,000
TBA (Pinfold)	3)					$8,000
Carleton						
Malachi Schram	1)	$15,527	$16,038	$15,380	$16,038	$16,038
J.P. Archambault	1)		$8,554	$15,000	$15,000	$16,038
C Cojocaru	1)		$8,887	$15,500	$15,500	$16,038
M.Sc. student (TBA)	1)			$8,000	$15,000	$15,000
Montreal						
R. Mazini (Ph.D.)	1)	$1,400				
P-H Beauchemin (PhD)	2)	$8,400	$8,400	$0	$0	$0
C. Lebel (PhD, NSERC)	3)	$4,000	$4,000	$16,800	$8,400	$0
M-H Genest (PhD, NSERC)	4)	$4,000	$4,000	$4,000	$16,800	$8,400
J. Ferland (MSc)	5)	$3,600	$14,400	$14,400	$16,800	$16,800
S. Charron (MSc)	6)	$0	$8,400	$14,400	$16,800	$16,800
J. Idarraga (MSc)	7)			$14,400	$14,400	$16,800
2 TBA	8)					$28,800
McGill						
NSERC TBA Student 1 (Vachon)	1)			$5,000	$5,000	$5,000
NSERC TBA Student 2	1)				$5,000	$5,000
TBA Student 3	1)				$11,300	$13,200
TBA Student 4	1)					$11,300
TBA Student 5	1)					$11,300
Simon Fraser						
Marco Bieri	1)	$5,956	$0	$16,500	$19,000	$19,000
M.Sc student 2 (TBA)	2)		$0	$16,500	$16,500	$19,000
Future students (2)	3)			$9,625	$26,125	$37,000

Student Support						
	Note No.	Year 1 2003-04	Year 2 2004-05	Year 3 2005-06	Year 4 2006-07	Year 5 2007-08
Toronto						
Kalen Martens (Ph.D.)	1)	$10,500	$18,000	$9,000		
Yan Guo	1)		$10,000	$14,900	$14,900	$16,560
Robert Dumoulin	1)		$10,000	$14,900	$14,900	$16,560
TBA M.Sc./Ph.D.	1)			$10,000	$14,900	$14,900
TBA M.Sc./Ph.D.	1)				$10,000	$14,900
TBA M.Sc./Ph.D.	1)				$10,000	$14,900
TBA M.Sc./Ph.D.	1)					$10,000
TBA M.Sc./Ph.D.	1)					$10,000
TBA M.Sc./Ph.D.	1)					$10,000
Victoria						
Tayfun Ince (MSc Sep 01, PhD Sep 04)	1)	$17,665	$17,700	$18,000	$18,500	$19,000
Tamara Hughes (M.Sc. Sep 02)	2)	$17,665	$17,700			
Warren Shaw (M.Sc. Sep 03)	3)	$10,335	$17,700	$18,000		
Dan Vanderster (M.Sc. Sep 03)	4)	$6,117	$2,283	$9,600		
TBA (M.Sc./Ph.D. Sep 05)	5)			$10,000	$18,500	$19,000
TBA (M.Sc./Ph.D. Sep 05)	5)			$10,000	$18,500	$19,000
TBA (M.Sc./Ph.D. Sep 06)	6)				$18,500	$19,000
TBA (M.Sc./Ph.D. Sep 06)	6)				$18,500	$19,000
TBA (M.Sc./Ph.D. Sep 07)	7)					$19,000
		$147,438	**$235,437**	**$324,405**	**$408,363**	**$533,334**

MFA Paid Staff Activities

During Construction Period Several Institutions MFA staff heavily Involved

Focus of Activities are again shifting

MFA Paid Staff Future Activites

Alberta

Jan Soukup 60% of his time will go on HEC associated work and studies of heat flows in ATLAS detector.

Patrick Price 30% of his time will go on tasks associated with Installation of Front end electronics.

Replacement for Herb Coombes 20% on electronics for up grades of ATLAS.

Carleton

Phillipe Gravelle 30% on FCAL installation related work. Falling off at end of period.

Computer Support TBA 40% on ATLAS Grid Computing

MFA Paid Staff Future Activites

Montreal

Gaetan Richard 50% mechanical work on Beam Condition Monitor.

Yanik Landry 100% electronic work on Beam Condition Monitor.

Toronto

Kenneth Vincent 10% on FCAL installation related work.
60% mechanical and electronics for Beam Condition Monitor.
Rest on neutrino experiment.

Mircea Cadabeschi 90% on ATLAS Technical Coordination work
From January 2005 design and manufacture of ATLAS cable schleppers
10% on design of BCM support structure.

Leslie Groer 60% on ATLAS Grid Computing, 40% CDF.

MFA Paid Staff Future Activites

Victoria

Ashok Agarwal 25% on computing: ATLAS, Grid Canada, LCG interface To TRIUMF and Grid Canada.

Paul Poffenberger 20% hadron calorimeter modeling in GEANT4.

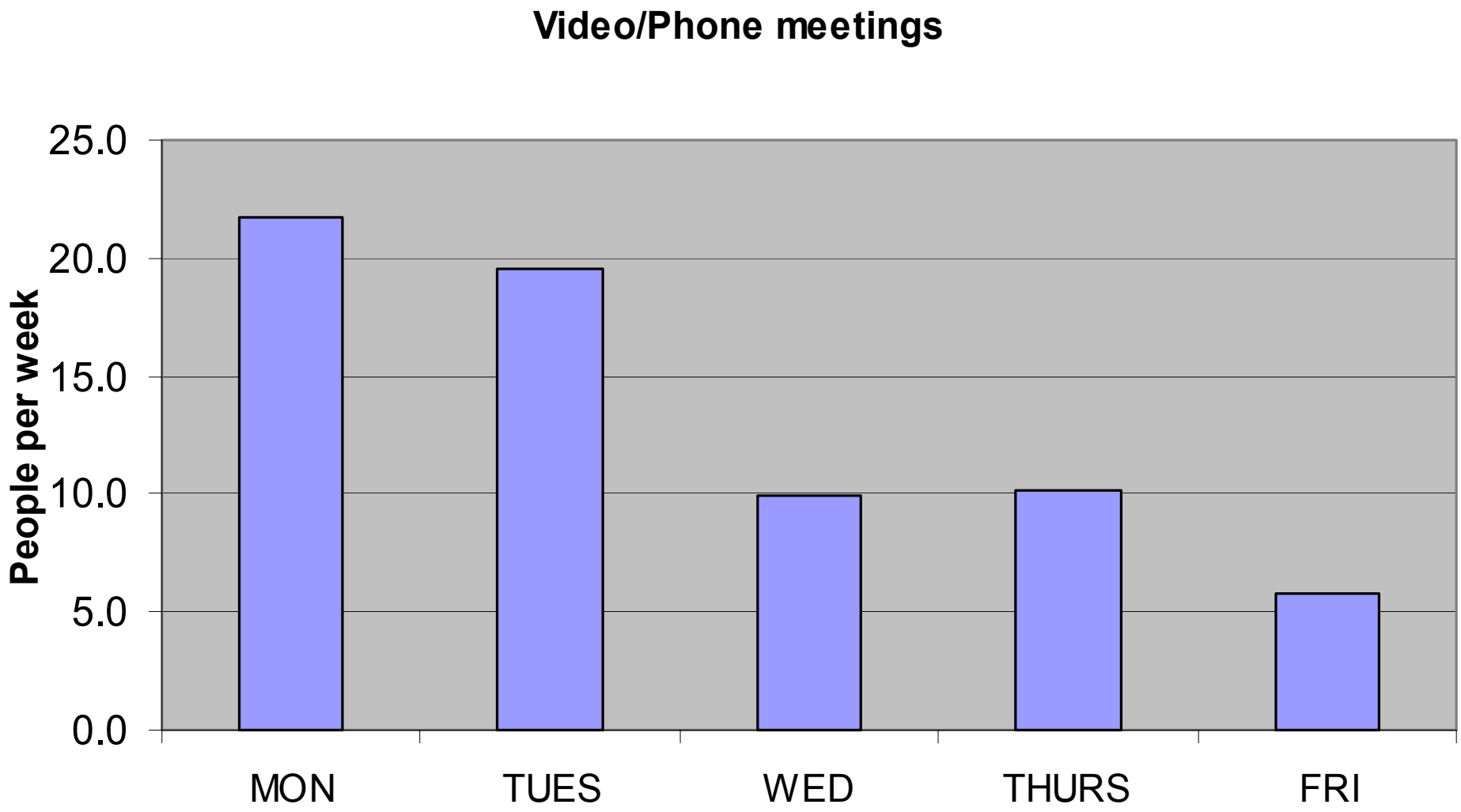
David Bickel (HEPNET) 100% as HEPNET project manager.

TBA (HEPNET) 50% development and deployment of Grid tools.

Conclusion

We believe that we have a realistic plan to make the transition to active physics analysis by LHC Turn-on

Phone/Video Meeting Attendance



University Graduate Student Expectations

University	Total GS		New GS 3 - Year Sum	
	HEP Exp. (recent avg)	ATLAS Grant (by 2008)	HEP Exp. (last years avg)	ATLAS grant (05-08 TBA)
Alberta	13	5	9	2
Carleton	8	4	6	3
McGill	11	5	15	5
Montreal	16	6	7.5	2
SFU	4	5	4.5	4
Toronto	11	8	6	6
Victoria	13	6	8.4	5
York	6	2	4.5	2
Sum	82	41	61	29

- New faculty hires should improve both ATLAS and HEP recruitment, but this is neglected here
- Project $\approx$ ½ of new HEP experimentalist students at ATLAS institutes to join ATLAS.
- The TBA graduate students in the ATLAS request are probably low

ATLAS C+I (A) and (B) Payments in 2005 (kCHF)

Item & Cost Driver (by RRB/LHCC SG Headings)	Cat. A C&I	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Cat. B C&I	Item & Cost Driver (by RRB/LHCC SG Headings)
Detector related costs	2,095					100	25	140	265	Mechanics & Gas & Cooling & Cryogenics
Magnet assembly in B180 (gas, controls)										Gases (ID, Tiles, Muons)
External cryogenics in Point 1										
General integration tasks (TCn)										
Gen. Technical support										
Integration and survey										
Secretariat						95	100	70	265	Standard electronics
										FE electronics (Muons)
Communications									0	Detector controls
										DCS replacements for ID
On-line computing	30			125	1,245	30			1,400	Areas
										SR-building operation (ID)
Test beams	255					5	5	5	15	Communications
Magnet Cryo consumables in B180										GSM phones
Laboratory operations	590					60	4		64	Store items
Assembly areas										Store materials (metal sheet, cables, connectors, components)
General services	550								0	Sub-detector spares
Heavy transport, crane operations										
TOTAL	3,520	0	0	125	1,245	290	134	215	2,009	(Excluding hired manpower for Category B)
Hired manpower at CERN (in kCHF)	cl. above					130	100	235	465	
Hired institute manpower (in kCHF)						160	480		640	
Institute manpower (in FTE)	0					5	5	30	40	
TOTAL C&I FOR A	3,520	0	0	125	1,245	580	714	450	3,114	TOTAL C&I FOR B
Anticipated budget carry-over from 2004	580	0	0		695	100	281	600	1,676	
TOTAL PLANNED PAYMENTS (A)	4,100	0	0	125	1,940	680	995	1,050	4,790	TOTAL PLANNED PAYMENTS (B)

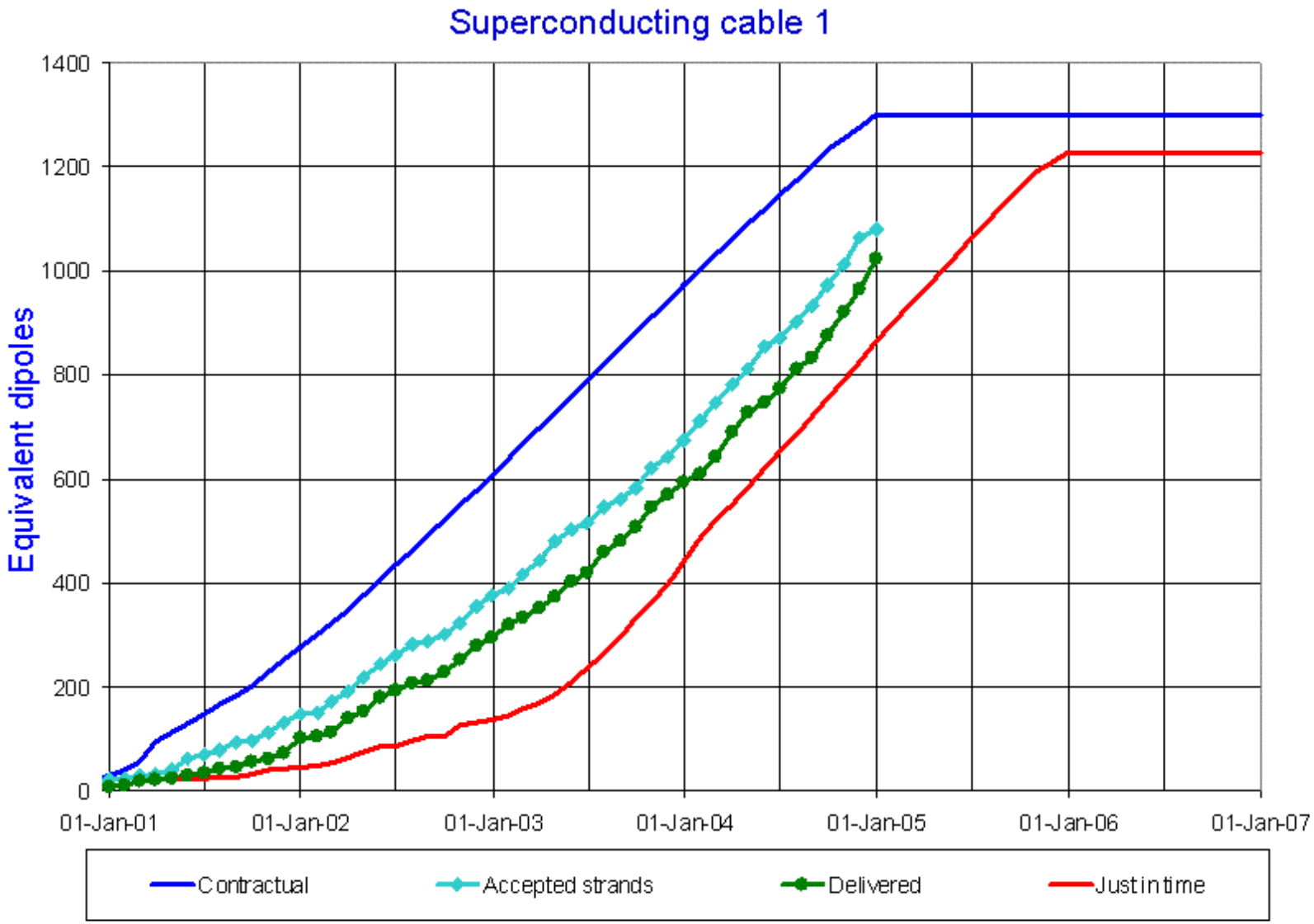
MIG Accounting

Expenditure k$	F97/98	F98/99	F99/00	F00/01	F01/02	F02/03	F03/04	F04/05	F05/06	*Spent*
HEC (1+2)	662	720	991	1,527	548	898	314	96		*5,756*
FCAL	281	259	793	905	510	417	110			*3,275*
Electronics	67	38	10	24	256	177	555	326	28	*1,481*
Feedthroughs	249	584	1,293	960	450	200	185	116		*4,037*
ATLAS Membership	80	107	74	123	80	97	94	93	93	*841*
Total	***1,339***	***1,708***	***3,160***	***3,539***	***1,844***	***1,788***	***1,258***	***631***	***121***	**15,390**
Income k$										
MIG Grant	*1,384*	*1,623*	*3,208*	*3,188*	*1,496*	*388*	*520*	*414*		*12,221*
Second Wheel			*63*	*252*	*192*	*898*	*500*			*1,905*
FCAL Additional		*183*	*76*	*225*		*320*	*50*			*854*
Electronics RTI								*173*	395	*568*
Total	***1,384***	***1,806***	***3,347***	***3,665***	***1,688***	***1,606***	***1,070***	***587***	***395***	***15,548***
									Project Contingency	***158***

BACKUP SLIDES

LHC Progress Dashboard

Accelerator Technology Department

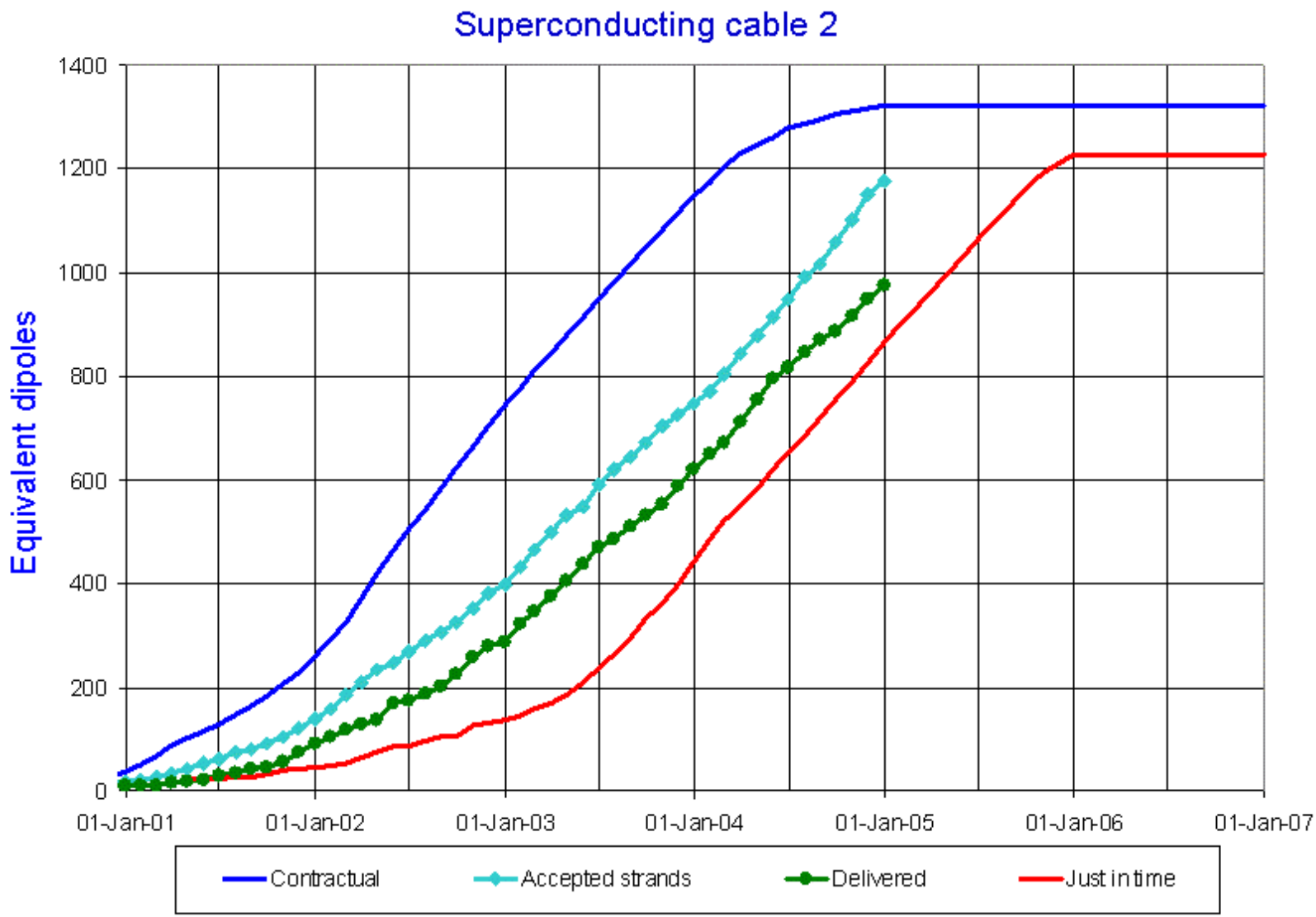


Updated 31 Dec 2004

Data provided by A. Verweij AT-MAS

LHC Progress Dashboard

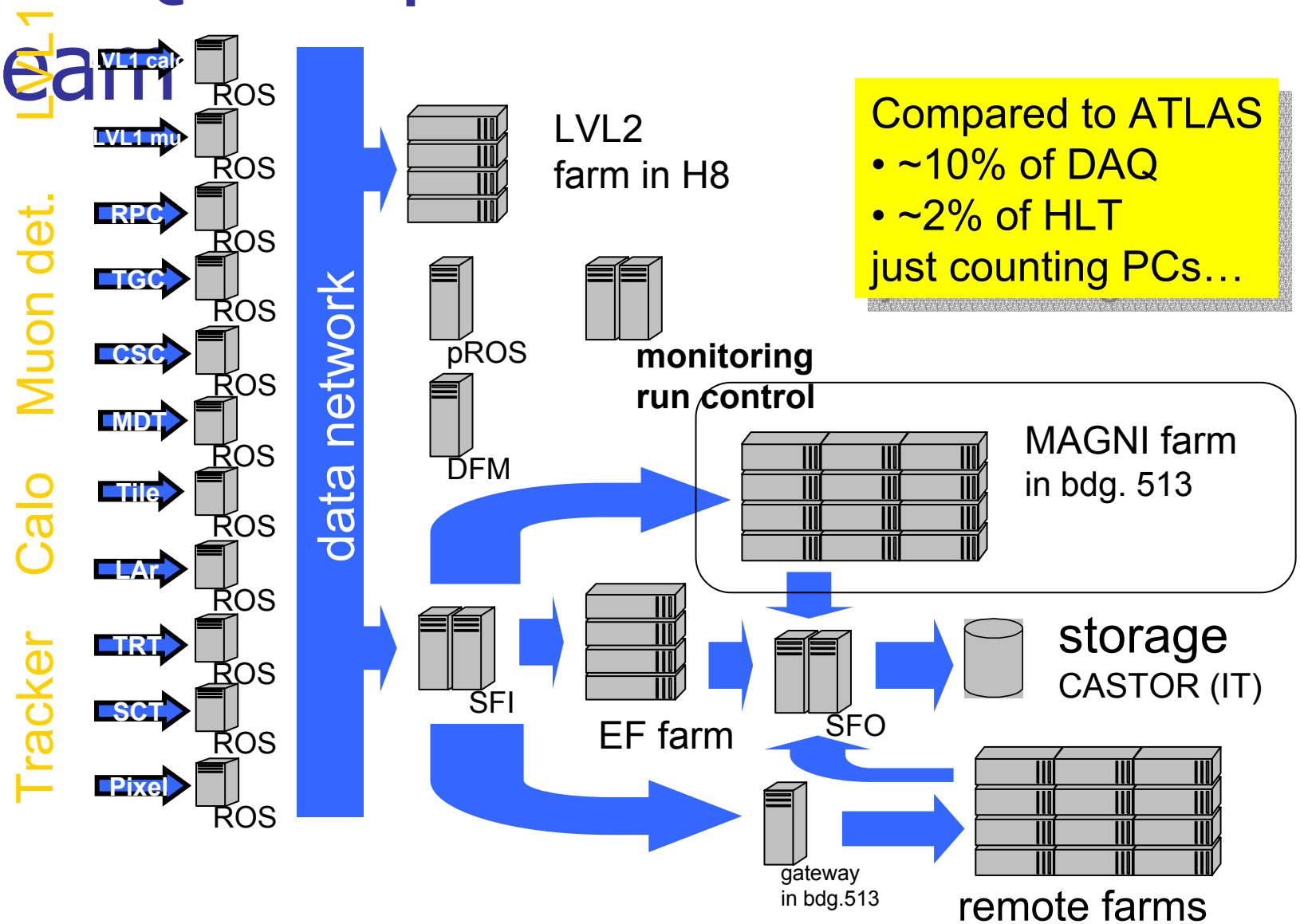
Accelerator Technology Department



Updated 31 Dec 2004

Data provided by A. Verweij AT-MAS

TDAQ Setup in Combined Test Beam



Compared to ATLAS
- ~10% of DAQ
- ~2% of HLT

just counting PCs…

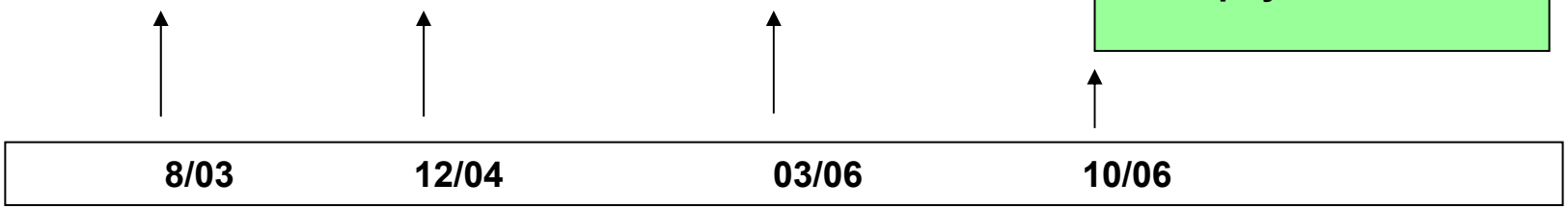
Commissioning

Phase A
System at ROD level.
Systems for LVL1, DCS and DAQ.
Check cable connections.
Infrastructure.
Some system tests.

Phase B
Calibration runs on local systems.

Phase C
Systems/Trigger/DAQ combined.

Phase D
Global commissioning.
Cosmic ray runs.
Initial off-line software.
Initial physics runs.



Travel Broken Down by Task $$.

Category	YEAR		
	Year 3 2005-2006	Year 4 2006-2007	Year 5 2007-2008
Conference	84500	119175	144635
Offline Software	67658	80448	112577
Testbeam Analysis	170256	187719	228037
Calorimeter Calibration	181549	208844	259070
Computing/Grid	137837	148248	188246
Commissioning	83304	87222	97949
Detector Controls	2430	3086	3344
Installation	62653	63524	62234
Event Filter	114573	148970	204850
Beam Monitor	35938	44632	50238
Physics Simulation/prep.	56475	72824	90655
Sum	997274	1164690	1441835

Research Associate Salaries

In previous years we classified Research Associates in terms of Detector Responsibilities.

From now, this makes less sense in that the focus of all R.A.s is Commissioning and Preparations for Data Taking.

RAs are just listed by institution.

Details of activities of existing RAs are in Group Member table

Proposed RAs are generally focused on the new activities

Research Associate Salaries

	Note No.	Year 1 2003-04	Year 2 2004-05	Year 3 2005-06	Year 4 2006-07	Year 5 2007-08
Alberta						
Sarah Wheeler (EF)		$25,284				
Shengli Liu (electronics)	4)	$55,239	$55,589	$27,795		
Richard Soluk (PESA tau + physics)		$21,758	$41,250	$45,000	$47,500	$50,000
TBA (electronics + physics)	4)			$27,794	$47,500	$50,000
TBA (PESA Etmiss + physics)				$23,250	$47,500	$50,000
Carleton						
Mohsen Khakzad	2)	$58,825	$59,003	$61,953	$65,051	$68,303
R.A. (TBA)	2)	$0	$10,000	$55,000	$57,750	$60,638
McGill						
TBA	2)			$27,500	$57,000	$59,000
Montreal						
R. Mehdiyev	9)	$62,900	$67,131	$67,131	$67,131	$67,131
K. Benslama/P.-A. Delsart	10)	$55,000	$56,100	$56,985	$56,985	$56,985
Simon Fraser						
Rod Walker		$18,333	$6,164	$60,500	$60,500	$60,500
TBA RA (JES & Calo calib)						$50,000
Toronto						
Petr Gorbanov	2)	$53,333	$65,619	$66,931	$66,931	$66,931
Rachid Mazini	3)	$22,049	$30,000	$30,000	$60,000	$60,000
Hugo Ruiz	4)		$25,000	$55,000	$55,000	$60,000
R.A. (TBA)						$25,000
TRIUMF						
Sergey Chekuleav	1)	$59,583	$66,584	$68,582	$70,639	$72,758
Denice Deatrich	3)		$34,368	$17,184		
TRIUMF Post-Doc (Physics/Computing)	4)		$15,000	$59,003	$ 60,773	$ 62,596
TRIUMF Post-Doc (Physics/Computing)	5)			$29,502	$ 60,773	$ 62,596
Victoria						
Naoko Kanaya		$36,913				
Margret Fincke-Keeler	8)	$53,885	$57,808	$58,000	$59,000	$60,000
Monika Wielers		$10,362	$40,799			
Kai Voss	9)		$20,437	$49,050	$50,000	$51,000
Rolf Seuster	10)		$25,500	$51,000	$52,000	$53,000
TBA RA (Sept 2007)	11)					$26,500
Salary Total		**$533,462**	**$676,351**	**$937,159**	**$1,042,033**	**$1,172,939**

Regular ATLAS-related Tele-Meetings I

- Physics Coordination (3 months)
  - Azuelos
- Jet / ETmiss / tau (2 wks)
  - Azuelos,Delsart,Lefebvre, McPherson, Seuster, Voss
- Exotics group (every 2 months)
  - Azuelos, Delsart, Leroy
- SUSY group (monthly)
  - McPherson, Voss
- Physics MC production (monthly)
  - Azuelos
- Canada DC2 physics (monthly)
  - Azuelos,Caron,Krieger, Lefebvre,Mazini, Orr,Pinfold, Oakham,Vetterli, ...
- ATLAS Testbeam SW coord. (3 wks)
  - McPherson
- LAr SW & Performance (2 wks)
  - Lefebvre, McPherson, Voss
- EC TB Analysis meeting (2 wks)
  - Agarwal, Archambault, Kakzad, Cojocaru, Schram, Galt, Vetterli, Keeler, Hughes, Ficke, Shaw, Ince, Lefebvre, Poffenberger, Seuster, Bieri, Vincter, Orr, Krieger, Oakham, Astbury
- Canadian EC TB meeting (monthly)
  - (same as above)
- Endcap coldtest meetings (monthly)
  - Krieger, Oakham
- FCAL meetings as needed
  - Kakzad,Krieger,Oakham, Orr,Schram
- Beam conditions monitor (2 wks)
  - Trischuk

Regular ATLAS-related Tele-Meetings I

- ATLAS Computing Management Board (weekly)
  - McPherson
- LHC Grid Deployment Board (monthly)
  - Tafirout, Vetterli
- LHC Grid phase 2 WG (monthly)
  - Vetterli
- LHC Grid service challenge (monthly)
  - Tafirout, McDonald
- ATLAS International Computing Board (3 months)
  - Sobie, Vetterli
- ATLAS Tier 1 coordination (monthly)
  - Tafirout, Vetterli
- LCG Tier 1 services for Tier 2 WG (weekly)
  - Vetterli
- ATLAS Data Challenges (weekly)
  - Caron,Groer,Oakham,Tafirout,Walker
- ATLAS Canada computing (2 wks)
  - Agarwal, Azuelos, Bickle, Caron, Deatrich, Groer, Hong, Losty, Lu, Mazini, Oakham, Orr, Sobie, Tafirout, Vanderster, Vetterli, Walker, ...
- Grid Canada / GridX1 (weekly)
  - Agarwal, Caron, Groer,Hong, Lu, Orr, Sobie, Vanderster
- HEPNet (weekly)
  - Caron, Hong, Sobie
- ATLAS HLT remote farms (2 weeks)
  - Caron, Moore, Pinfold
- HLT Pesa algorithms (monthly)
  - Caron, Pinfold, Robertson, Soluk, Vachon, Warburton
- Calorimeter trigger sw (monthly)
  - Pinfold, Soluk
- ATLAS Software (weekly)
  - Caron

Cost to Completion Funding Planning (kCHF)

Funding Agency	Cost to Completion proposed sharing			Member fee 2004-6 (included in Constr. Comp.)	New funding (cat1) incl. member fee	Remaining Proposed Commitment (cat 2)
	Total	Constr.	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*	*564*	*1526*
China NSFC+MSTC	143	99	44	38	141	
Czech Republic	316	196	120	113	316	
Denmark	423	291	132	38	48	375
France IN2P3	5890	4176	1714	225	4260	1630
France CEA *)	1940	1379	561	38	1089	
Georgia	43	38	5	38	38	
Germany BMBF	4529	3250	1279	338	3617	912
Germany MPI	1093	761	332	38	1093	
Greece	260	172	88	113	113	147
Israel	739	497	242	113	739	
Italy	6639	4651	1988	450	4000	
Japan	4362	3029	1333	563	4362	
Morocco	58	47	11	38	41	
Netherlands	1934	1368	566	75	1934	
Norway	581	391	190	75	581	
Poland	137	94	43	75	80	57
Portugal	446	265	181	38	339	107
Romania	141	85	56	38	140	
Russia	2991	1995	996	263	1141	212
JINR	1066	660	406	38	521	
Serbia					300	
Slovak Republic	70	52	18	38	82	
Slovenia	223	152	71	38	223	
Spain	1706	1109	597	113	1706	
Sweden	1692	1122	570	150	1692	
Switzerland	2372	1701	671	75	1560	812
Taipei	445	318	127	38	445	
Turkey	85	75	10	75	75	
United Kingdom	4386	3063	1323	450	3134	1252
US DOE + NSF	12243	8437	3806	1238	6200	
CERN	8451	5767	2684	38	13700	
Total	68176	47270	20906	5563	54680	7268

ACTUAL & PLANNED INCOME FOR ATLAS C&I (kCHF)

Funding Agency	C&I (A)						Calc.	C&I (B)						Calc.	Invoice	Calc.
	2002	2003	2004	2005	2006	Total	Total	2002	2003	2004	2005	2006	Total	Total	Total	G.Total
Armenia	0	0	0	0	0	0	5	3	4	0	0	0	7	13	7	18
Australia	0	0	0	0	0	0	56	13	17	0	0	0	30	59	30	115
Austria	0	5	6	4	0	15	15	0	0	0	0	0	0	0	15	15
Azerbaijan	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Belarus	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	10
Brazil	0	0	0	0	0	0	4	1	0	0	0	0	1	11	1	15
Canada	*0*	*0*	*0*	*0*	*0*	*0*	*336*	*0*	*71*	*0*	*0*	*0*	*71*	*226*	*71*	*562*
China NSFC+MSTC	0	7	8	5	0	20	20	0	10	9	3	0	22	22	42	42
Czech Republic	2	9	15	5	0	31	31	14	33	21	21	0	89	89	120	120
Denmark	0	0	0	0	0	0	71	10	0	0	0	0	10	60	10	131
France IN2P3	0	0	0	135	188	323	865	54	40	238	125	125	582	850	905	1715
France CEA	0	0	0	0	0	0	295	0	0	0	0	0	0	265	0	560
Georgia	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Germany BMBF	252	0	18	0	0	270	724	253	0	183	119	2	557	557	827	1281
Germany MPI	0	44	69	54	0	167	167	36	34	45	44	1	160	165	327	332
Greece	0	0	0	0	0	0	36	0	0	0	0	0	0	52	0	88
Israel	0	0	0	71	35	106	107	14	72	50	0	0	136	135	242	242
Italy	0	350	206	205	205	966	1007	0	418	93	190	262	963	980	1929	1987
Japan	0	0	412	271	0	683	683	0	0	524	126	0	650	650	1333	1333
Morocco	0	0	0	0	0	0	4	0	0	0	0	0	0	6	0	10
Netherlands	0	118	141	82	0	341	341	34	65	83	43	0	225	225	566	566
Norway	0	32	38	22	0	92	92	23	29	26	20	0	98	98	190	190
Poland	0	0	0	0	0	0	20	2	0	0	0	0	2	22	2	42
Portugal	0	0	27	11	6	44	46	3	0	60	58	14	135	135	179	181
Romania	0	0	0	15	0	15	15	0	0	29	11	0	40	40	55	55
Russia	150	320	0	0	0	470	408	28	122	96	60	0	306	588	776	996
JINR	0	0	0	0	0	0	117	48	78	136	70	0	332	289	332	406
Serbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slovak Republic	0	0	0	0	0	0	11	10	36	0	0	0	46	8	46	19
Slovenia	0	0	0	0	36	36	36	0	0	0	0	35	35	35	71	71
Spain	0	0	163	53	0	216	220	22	55	211	93	0	381	381	597	601
Sweden	0	83	99	57	0	239	239	45	90	87	107	1	330	330	569	569
Switzerland	0	0	0	0	0	0	433	3	0	0	0	0	3	238	3	671
Taipei	0	22	27	16	0	65	65	8	26	12	15	0	61	61	126	126
Turkey	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	10
United Kingdom	0	0	250	250	232	732	764	0	269	174	116	0	559	559	1291	1323
US DOE + NSF	0	0	0	0	0	0	1807	51	25	0	0	0	76	2001	76	3808
CERN	111	5485	0	0	80	5676	1428	199	1081	0	0	0	1280	1260	6956	2688
total	515	6475	1479	1256	782	10507	10496	874	2575	2077	1221	440	7187	10410	17694	20906
calculated total	865	2775	4341	2515	0	10496	0	1405	2770	3375	2825	35	10410			
					%		100					%	69			
Actual payments	332	1425					1757	376	1710					2086		
Income-actual payments	183	5050					5233	498	865					1363		

ACTUAL & PLANNED INCOME FOR ATLAS CONSTRUCTION COMPLETION (kCHF)

Annex

Funding Agency	CC (A)							Calc.	CC (B)							Calc.	Invoice	Calc.
	2002	2003	2004	2005	2006	2007	Total	Total	2002	2003	2004	2005	2006	2007	Total	Total	Total	G.Total
Armenia	0	0	12	13	13	0	38	38	0	0	0	0	0	0	0	10	38	48
Australia	0	0	25	25	25	0	75	190	10	14	11	0	0	0	35	52	110	242
Austria	0	12	14	13	13	0	52	52	0	0	0	0	0	0	0	0	52	52
Azerbaijan	0	0	12	13	13	0	38	38	0	0	0	0	0	0	0	0	38	38
Belarus	0	0	25	25	25	0	75	75	0	0	0	0	0	0	0	0	75	75
Brazil	0	0	12	13	13	0	38	38	2	0	0	0	0	0	2	9	40	47
Canada	*0*	*0*	*284*	*0*	*0*	*0*	*284*	*1139*	*32*	*177*	*0*	*0*	*0*	*0*	*209*	*389*	*493*	*1528*
China NSFC+MSTC	0	25	18	13	13	0	69	69	0	9	13	6	2	0	30	30	99	99
Czech Republic	22	98	0	0	0	0	120	113	16	33	26	1	0	0	76	83	196	196
Denmark	0	0	12	13	13	0	38	242	0	0	0	0	0	0	0	49	38	291
France IN2P3	0	730	345	1005	75	0	2155	2935	569	0	225	282	124	0	1200	1241	3355	4176
France CEA	0	300	712	13	13	0	1038	1001	21	30	0	0	0	0	51	379	1089	1380
Georgia	0	0	12	13	13	0	38	38	0	0	0	0	0	0	0	0	38	38
Germany BMBF	1992	0	0	0	0	0	1992	2452	430	368	0	0	0	0	798	798	2790	3250
Germany MPI	122	290	0	100	58	0	570	570	61	51	82	2	0	0	196	191	766	761
Greece	0	0	37	38	38	0	113	121	0	0	0	0	0	0	0	52	113	173
Israel	0	0	37	38	38	250	363	363	6	128	0	0	0	0	134	134	497	497
Italy	80	350	80	160	151	0	821	3418	14	393	323	267	253	0	1250	1233	2071	4651
Japan	0	0	1771	458	188	0	2417	2417	0	0	482	130	0	0	612	612	3029	3029
Morocco	0	0	12	13	13	0	38	38	0	0	0	0	3	0	3	9	41	47
Netherlands	0	0	1107	25	25	0	1157	1157	22	34	101	41	13	0	211	211	1368	1368
Norway	0	187	18	25	41	40	311	311	22	33	21	4	0	0	80	80	391	391
Poland	0	0	25	25	25	0	75	75	3	0	0	0	0	0	3	19	78	94
Portugal	0	0	24	13	13	0	50	155	0	0	73	9	28	0	110	110	160	265
Romania	0	15	12	13	12	0	52	52	0	0	17	16	0	0	33	33	85	85
Russia	0	0	87	88	88	0	263	1381	36	12	0	0	54	0	102	614	365	1995
JINR	0	0	12	13	13	0	38	397	3	76	59	0	13	0	151	263	189	660
Serbia	0	163	45	45	47	0	300	0	0	0	0	0	0	0	0	0	300	0
Slovak Republic	0	0	15	15	1	0	31	39	5	0	0	0	0	0	5	14	36	53
Slovenia	0	0	0	0	60	61	121	121	0	0	0	0	19	12	31	31	152	152
Spain	0	0	606	98	38	0	742	738	58	54	242	13	0	0	367	367	1109	1105
Sweden	0	441	213	107	50	0	811	811	45	131	99	29	7	0	311	311	1122	1122
Switzerland	0	1213	212	25	25	0	1475	1475	21	61	0	0	0	0	82	226	1557	1701
Taipei	0	134	59	18	13	0	224	224	10	42	27	12	4	0	95	95	319	319
Turkey	0	0	25	25	25	0	75	75	0	0	0	0	0	0	0	0	75	75
United Kingdom	0	0	453	453	462	0	1368	2590	137	195	121	21	0	0	474	474	1842	3064
US DOE + NSF	0	1830	1185	413	413	0	3841	6129	156	914	778	319	116	0	2283	2308	6124	8437
CERN	978	4523	0	0	0	0	5501	4527	294	949	0	0	0	0	1243	1243	6744	5770
total	3194	10311	7518	3367	2066	351	26807	35604	1973	3704	2700	1152	636	12	10177	11670	36984	47274
calculated total	9550	11900	9350	4700	100	0	35600	4	2510	2945	4035	1645	535	0	11670	0		
						%	75							%	87			
Actual payments	8415	4608					13023		1126	1007					2133			
Income-actual payments	-5221	5703					482		847	2697					3544			

2005 C&I Contributions (kCHF)

Funding Agency	Cat. A items	Category B item contributions							Total Cat. B	Total A+B	Total Calc.+
		Pixel	SCT	TRT	IDGen	LAr	TileC	Muon			
Armenia									0	0	6
Australia									0	0	31
Austria	4								0	4	5
Azerbaijan									0	0	2
Belarus									0	0	3
Brazil									0	0	5
Canada									*0*	*0*	*185*
China NSFC+MSTC	5					3			3	8	13
Czech Republic	5				4		17		21	26	36
Denmark									0	0	48
France IN2P3	135				10	69	46		125	260	552
France CEA									0	0	170
Georgia									0	0	2
Germany BMBF					65	16		38	119	119	366
Germany MPI	54				25	11		8	44	98	96
Greece									0	0	22
Israel	71								0	71	62
Italy	205				40	18	8	124	190	395	567
Japan	271				60			66	126	397	370
Morocco									0	0	3
Netherlands	82				13			30	43	125	159
Norway	22				20				20	42	51
Poland									0	0	14
Portugal	11						58		58	69	58
Romania	15						11		11	26	18
Russia						30	30		60	60	321
JINR						70			70	70	120
Serbia											
Slovak Republic									0	0	6
Slovenia									0	0	19
Spain	53				11		82		93	146	188
Sweden	57			30	28	13	36		107	164	188
Switzerland									0	0	198
Taipei	16				8	7			15	31	37
Turkey									0	0	3
United Kingdom	250				116				116	366	372
US DOE + NSF									0	0	1170
CERN	972			124	84	49	120	15	392	1364	887
total contributions	2,228	0	0	154	484	286	408	281	1,613	3,841	6,357
other income*	1,843				1456	394	587	769	3,206	5,049	
total payments	4,100			125	1940	680	995	1050	4,790	8,890	

ATLAS CC-B Payments in 2005 (kCHF)

Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Cat. B CC	Item & Cost Driver (by LHCC CORE Headings)
			552	214			766	Non-CORE Infrastructure
								Storage, test areas, modifications, repairs
462	200	160		313	100	700	1,935	Additional CORE
								Tooling, test-stations, detector equipment
			200	263			463	Non-covered CORE
								Detector equipment
462	200	160	752	790	100	700	3,164	Total
103	200	60	228	430	320	310	1651	Anticipated budget carry-over from 2004
565	400	220	980	1,220	420	1,010	4,815	TOTAL CC FOR B

2005 CC-B Contributions

Funding Agency	Category B item contributions							Total	Total
	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	Cat. B	Calc.+
Armenia								**0**	1
Australia								**0**	2
Austria								**0**	0
Azerbaijan								**0**	0
Belarus								**0**	0
Brazil								**0**	1
Canada								***0***	***77***
China NSFC+MSTC					2		4	**6**	8
Czech Republic	1							**1**	6
Denmark								**0**	6
France IN2P3	30			10	52	30		**122**	206
France CEA								**0**	87
Georgia								**0**	0
Germany BMBF	59			6	24		30	**119**	139
Germany MPI		1		1				**2**	33
Greece								**0**	16
Israel								**0**	41
Italy	80			5	35	7	140	**267**	261
Japan		7		8			115	**130**	121
Morocco								**0**	2
Netherlands		1		1			39	**41**	51
Norway		2		2				**4**	3
Poland								**0**	2
Portugal						9		**9**	6
Romania						16		**16**	2
Russia								**0**	112
JINR								**0**	43
Serbia								**0**	
Slovak Republic								**0**	3
Slovenia								**0**	1
Spain		1				12		**13**	35
Sweden		1	9	3	11	5		**29**	33
Switzerland								**0**	18
Taipei	7				5			**12**	14
Turkey								**0**	0
United Kingdom		10		11				**21**	20
US DOE + NSF	43	4	23	10	126		113	**319**	397
CERN					22			**22**	171
total contributions	220	27	32	57	277	79	441	**1,133**	**1,919**
other income*	345	373	188	923	943	341	569	**3,682**	
total payments	565	400	220	980	1220	420	1010	**4,815**	
balance								0	

Why Does ATLAS Want to Bring Forward Deferred Funds?

PROJECTED EVOLUTION OF ATLAS BUDGET POSITION (MCHF)

PAYMENTS	95-01	2002	2003	2004	2005	2006	2007	Total	Ref.
Baseline + CC(A)	229	71	56	70	54	18	4	504	504
of which deferrals					*-4*	*-8*	*-2*	-14	-14
C&I (A+B)	0	1	3	4	9	4		21	21
CC (B)		1	1	3	5	2		12	12
TOTAL	**229**	**73**	**60**	**77**	**64**	**16**	**2**	**522**	**522**

INCOME	95-01	2002	2003	2004	2005	2006	2007	Total	Ref.
Baseline + CC(A)	250	65	55	60	42	13	11	494	494
C&I (A+B)		1	9	4	3	1		18	17
CC (B)		2	4	4	1	0		10	11
TOTAL	**250**	**68**	**68**	**67**	**45**	**14**	**11**	**522**	**522**

BUDGET BALANCE	**20**	**-5**	**7**	**-10**	**-18**	**-2**	**8**	0

CUMULATIVE	**20**	**15**	**23**	**12**	**-6**	**-8**	**0**

CUMULATIVE (APRIL 2004)	21	15	23	7	-10	-6	0