



ATLAS

20 August 2012

**Minutes of the 34th LHC Resource Review Board Meeting
(CERN, Geneva, 24 April 2012)**

Present:

G. Taylor (University of Melbourne, Australia)
 I. Blain (National Research Council (NSERC) of Canada, Ottawa, Canada)
 R. McPherson (University of Victoria, Canada)
 G. Dong (National Natural Science Foundation, China)
 Y. Zhang (National Natural Science Foundation, China)
 N. Tarabová (Ministry of Education, Youth and Sports, Prague, Czech Republic)
 V. Vrba (Institute of Physics, ASCR, Czech Republic)
 P. Hansen (Niels Bohr Institute, Copenhagen, Denmark)
 P. Rebougeard (CEA Saclay, IRFU/DIR, France)
 L. Serin (CNRS/IN2P3, France)
 D. Fournier (LAL Orsay, France)
 C. Guyot (CEA Saclay, IRFU/DIR, France)
 D. Vilanova (CEA Saclay, IRFU/DIR, France)
 H. Prasse (Federal Ministry of Education and Research, Bonn, Germany)
 S. Bethke (Max Planck Institut fuer Physik, Germany)
 K. Ehret (BMBF, Germany)
 K. Jacobs (Albert-Ludwigs-Universitaet Freiburg, Germany)
 H. Mahlke (BMBF, Germany)
 P. Mattig (BMBF/University of Wuppertal, Germany)
 M. Fleischer (DESY, Germany)
 E. Rabinovici (Hebrew University, Jerusalem, Israel)
 G. Mikenberg (Weizmann Institute, Rehovot, Israel)
 A. Zoccoli (INFN, Italy)
 L. Rossi (Università & INFN - Sezione di Genova, Italy)
 K. Tokushuku (KEK, Tsukuba, Japan)
 H. Kamiyama (Permanent Mission of Japan, Geneva)
 A. Van Rijn (NIKHEF, Amsterdam, Netherlands)
 B. Jacobsen (The Research Council of Norway, Oslo, Norway)
 B. Wosiek (HNIN, Polish Academy of Sciences, Poland)
 G. Barreira (LIP - Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal)
 F.D. Buzatu (Institute of Atomic Physics, Bucharest, Romania)
 C. Alexa (IFIN-HH National Institute of Physics and Nuclear Engineering, Bucharest, Romania)
 Y.V. Kozlov (Ministry of Education and Science, Moscow, Russia)
 N. Krylova (Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia)
 R. Lednicky (JINR, Dubna, Russia)
 V. Savrin (Institute of Nuclear Physics, Moscow State University, Moscow, Russia)
 Z. Hlavacikova (Ministry of Education, Science, Research and Sports, Bratislava, Slovak Republic)
 J. Antos (Institute of Experimental Physics, Kosice, Slovak Republic)
 M. Mikuz (University of Ljubljana & Jozef Stefan Institute, Ljubljana, Slovenia)
 D. Adams (Department of Science and Technology, Pretoria, South Africa)
 V. Spannenberg (Funding Agency alt., Ithemba LABS, South Africa)
 F. del Aguila (Ministry Economy and Competitiveness - U. Granada, Spain)
 E. Higon-Rodriguez (IFIC, University of Valencia, Spain)
 P. Karlsson (Swedish Research Council, Stockholm, Sweden)
 T. Ekelof (Uppsala University, Sweden)
 O. Schneider (CHIPP, Lausanne, Switzerland)
 A. Clark (Université de Genève, Switzerland)
 S.-C. Lee (Academia Sinica, Taipei, Taiwan)
 I. Koca (Turkish Atomic Energy Authority, Ankara, Turkey)
 A. Medland (STFC, United Kingdom)
 D. Tovey (University of Sheffield, United Kingdom)
 H. Gordon (Brookhaven National Laboratory, Upton, NY, United States of America)
 S. Rajagopalan (Brookhaven National Laboratory, Upton, NY, United States of America)
 S. Gonzalez (DOE, United States of America)
 M. Procaro (DOE, United States of America)
 S. Rolli (DOE, United States of America)

ATLAS: D. Charlton, F. Gianotti, A. Lankford, G. Mornacchi, M. Nessi, M. Nordberg
CERN: S. Bertolucci, S. Foffano, Th. Lagrange, S. Lettow, R. McLaren, J. Salicio-Diez, E. Tsesmelis, E. van Hove
Resources Scrutiny Group: S. Schmeling, B. Loehr, E. Iacopini, S. Haider, D. Espriu
Excused: E. Gazis (NTU Athens, Greece)

Documents can be found in the RRB indico pages; accessible via the LHC-RRB home page
<http://committees.web.cern.ch/committees/all/welcomeLHCRRB.html>

1. Introduction. S. Bertolucci, Director of Research and Scientific Computing.
S. Bertolucci welcomed delegates to the meeting of the ATLAS LHC Resource Review Board.

2. Approval of the minutes of the last meeting. S. Bertolucci, Director of Research and Scientific Computing.

The minutes of the last RRB CERN-RRB-2012-004 were approved without comment.

3. Detector consolidation and upgrade. M. Nessi, Technical Coordinator.

Slides of this presentation are on the RRB Agenda page

M. Nessi began with a summary of the data taking efficiency after the winter shutdown and listed the challenges of running at $L \sim 0.5 \cdot 10^{34} \text{ cm}^{-2} \text{ sec}^{-1}$ and 50ns. He then gave a detailed presentation of the short, medium and long term plans, with the objectives and strategy, for each phase:

- Phase 0: To nominal energy and nominal peak Luminosity
- Phase 1: To ultimate peak Luminosity : $2 \times$ nominal peak Luminosity
- Phase2: To HL-LHC mode : $5 \times$ nominal peak Luminosity + Luminosity levelling, to maximize the integrated Luminosity ($\sim 300 \text{ fb}^{-1}/\text{year}$)

There were no questions arising from this presentation.

4. Status of the experiment. F. Gianotti, Spokesperson.

CERN-RRB-20112-023 (report). Slides of this presentation are on the RRB Agenda page.

F. Gianotti's presentation focussed on four main areas:

- Collaboration and Management matters
- Status of ATLAS and recent accomplishments
- The 2012 run (preliminary achievements and challenges)
- Conclusions

She concluded that:

- ATLAS has recorded $\sim 5.2 \text{ fb}^{-1}$ of pp data at $\sqrt{s} = 7 \text{ TeV}$ in 2011 and $\sim 0.8 \text{ fb}^{-1}$ in the recently-started 2012 run at $\sqrt{s} = 8 \text{ TeV}$
- The whole experiment works very well, from smooth and efficient operation of the detector, trigger and computing to the fast delivery of physics results
- Excellent physics achievements so far included:
 - 141 papers published or submitted for publication

- Huge number of precise measurements of Standard Model processes
Some now challenge the theory and compete with previous machines
- Searches for new physics extend well into the few-TeV region for many scenarios; pair-produced SUSY particles excluded for gluino masses up to ~ 1.5 TeV in simplest models
- ATLAS has looked for a SM Higgs boson over the mass region 100-600 GeV, in 12 channels, using the full 2011 dataset:
 - most of the region 110-122.5 GeV and the full region 129-539 GeV excluded at 95% CL
 - if the SM Higgs exists, it is most likely in the region ~ 122 -129 GeV
 - excess observed at $m_{\text{H}} \sim 126$ GeV with local significance : 2.5σ ($\sim 2.9\sigma$ expected from SM)
 - The SM Higgs question should be settled in 2012
- It's crucial to maintain this performance in the exciting-but-even-more-challenging 2012 run, in order to exploit in the best way the physics prospects offered by the projected large integrated luminosity, before a long shut-down:
 - Lot of work/progress invested/made to cope with the harsher 2012 pile-up with minimal impact on physics
 - M&O funds (THANKS !!) and Computing Resources (THANKS !!) have been (and will be) essential for these accomplishments and have been (and will be) well used
- Sustained efforts by the Collaboration (~ 1000 FTE needed to operate ATLAS including shifts and personnel at Tiers) will continue to be crucial
- The FUTURE: upgrade planning and activities are progressing with vigour: (see Marzio's and Markus' talks)
 - Phase-0: 2013-2014 shut-down (LS1): mostly devoted to consolidation; planning well advanced and IBL on schedule; financially covered within the present funding plan; IBL MoU submitted for endorsement at this RRB
 - Phase-1: 2018 shut-down (LS2): LoI submitted (positive feedback from LHCC); preliminary plans and cost estimates presented at previous and this RRB. Goal is to submit financial framework for endorsement at October RRB
 - Phase-2: 2021-2022 shut-down (LS3): main upgrade is Inner Detector; LoI is planned for beginning 2013; very preliminary plans and cost estimates presented at previous and this RRB

F. Gianotti thanked the Funding Agencies for their fundamental contributions to the success of the experiment and for their continuous support during more than 20 years.

The RRB endorsed the admission of Kyushu University, Japan and University of Warwick, UK. There were no questions arising from this presentation.

5. LHCC deliberations (paper only). E. Tsesmelis, LHCC Scientific Secretary
CERN-RRB-2012-036

The LHCC considers that ATLAS has made excellent progress in all aspects of the experiment and the Committee congratulates the ATLAS Collaboration on its achievements.

There were no questions arising from this presentation.

6. Financial matters. T. Lagrange, Head of CERN Finance and Procurement Department CERN-RRB-2012-012 (report). Slides of this presentation are on the RRB Agenda page.

T. Lagrange presented the Updates to Financial Report. Concerning contributions for Common Fund, Construction Commissioning & Integration, contributions are outstanding from Brazil (1999-2008) 62'500, Morocco (1999-2009) 62'500 and Russia (1996-2010) 1'666'170.

Cash contributions for M&O A, received after 1st March totalled 4.3 MCHF. Outstanding contributions from the Member States totalled 2.7 MCHF and 8.8 MCHF for Non-Member States.

There were no questions arising from this presentation.

7. Full Design Luminosity Detector. M. Nordberg, Resources Coordinator. CERN-RRB-2012-028 (report). CERN-RRB-2012-028 (addendum 01). Slides of this presentation are on the RRB Agenda page.

M. Nordberg presented the 2011 final payments for the TDAQ, the Insertable b-layer (IBL), the forward luminosity detectors and the Pixel SQP repairs. He also presented the 2012 FDL Budget update. The Resources Coordinator concluded by giving the current status of expression of interest in Phase 1 sub-projects. He proposed to present an update of the framework for endorsement in the October RRB.

T. Medland asked for a clarification on the order of the steps towards the FDL, what extra information would the October update contain and would the Funding agencies be asked for a firm commitment? M. Nordberg replied that no firm commitments were expected, the emphasis was on setting up the framework.

8. M&O Budgets. M. Nordberg, Resources Coordinator. CERN-RRB-2011-026 (report). Slides of this presentation are on the RRB Agenda page.

Referring to 2011 M&O A final payments, M. Nordberg highlighted the cost drivers that resulted in total payments of 16.6 MCHF. M&O B final payments totalled 6.4 MCHF. He then presented the preliminary estimates for 2013: 17.8 MCHF for M&O A and 5.2 for M&O B and illustrated the cost evolution of M&O from 2002-2018. M. Nordberg then concluded with the status of outstanding M&O A and B contributions.

B. Loehr thanked the ATLAS collaboration for their clear definition of Phase 0 consolidation projects and the Upgrade projects in Phase 1 and 2.

He added that preliminary 2013 requests are the same as last October. These numbers are based on a model with 4 year replacement cycle for TDAQ equipment. The SG considers this to be an interim agreement until experiments have concluded negotiations with vendors and a document, specifying the length of the replacement cycle, has been approved.

The RRB subsequently:

- Approved 2011 FDL Payments (#28, Table 1)

- Took note of the 2012 FDL Status (#28, Table 2)
- Took note of status of Phase-1 financial plan (#028 Table 3)
- Approved M&O 2011 Payments(#26, Table 1, 2)
- Took note of M&O 2013 Preliminary Budget Estimates (#26, Tables 4, 5)

9. Summary. S. Bertolucci, Director of Research and Scientific Computing.

S. Bertolucci summarised that the experiment was performing admirably and that the plans for the future looked solid. He hinted that some pleasant surprises may await the delegates in the October RRB.