



## ATLAS

11 March 2013

**Minutes of the 35th LHC Resource Review Board Meeting  
(CERN, Geneva, 29th October 2012)**

**Present:**

M. T. Dova (Universidad Nacional de La Plata, Argentina)  
 A.K. Maciel (RENAFAE, Brazil)  
 D. Delanoe (National Research Council (NSERC) of Canada, Ottawa, Canada)  
 R. McPherson (University of Victoria, Canada)  
 Y. Zhang (National Natural Science Foundation, China)  
 Z. Ren (Chinese Cluster in ATLAS, China)  
 P. Patiño (Colciencias, Colombia)  
 M. Losada (Universidad Antonio Nariño (UAN), Colombia)  
 N. Fejksová (Ministry of Education, Youth and Sports, Prague, Czech Republic)  
 J. Ridky (Institute of Physics, ASCR, Czech Republic)  
 P. Hansen (Niels Bohr Institute, Copenhagen, Denmark)  
 P. Chomaz (CEA Saclay, IRFU, France)  
 L. Serin (CNRS/IN2P3, France)  
 C. Guyot (CEA Saclay, IRFU, France)  
 D. Fournier (LAL Orsay, 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)  
 M. Fleischer (DESY, Germany)  
 E. Rabinovici (Hebrew University, Jerusalem, Israel)  
 G. Mikenberg (Wiezmann Institute, Rehovot, Israel)  
 A. Zoccoli (INFN, Italy)  
 L. Rossi (Università & INFN - Sezione di Genova, Italy)  
 F. Bedeschi (INFN, 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)  
 F. Ould-Saada (University of Oslo, Norway)  
 J. Krolikowski (University of Warsaw, Poland)  
 A. Olszewski (INP PAN, 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)  
 V. Matveev (Institute for Nuclear Research, Russian Academy of Science, Russia)  
 N. Rusakovich (JINR, Dubna, Russia)  
 N. Zimine (JINR, Dubna, Russia)  
 V. Savrin (Institute of Nuclear Physics, Moscow State University, Russia)  
 A. Petrov (Permanent Mission of Russia in Geneva)  
 Z. Hlavacikova (Ministry of Education, Science, Research and Sports, Bratislava, Slovak Republic)  
 M. Mikuz (University of Ljubljana & Jozef Stefan Institute, Ljubljana, Slovenia)  
 J. Antos (Institute of Experimental Physics, Kosice, Slovak Republic)  
 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. Higón-Rodríguez (IFIC, University of Valencia, Spain)  
 E. Olsson (Swedish Research Council, Stockholm, Sweden)  
 T. Ekelof (Uppsala University, Sweden)  
 O. Schneider (CHIPP, Lausanne, 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)  
 S. Gonzalez (National Science Foundation (NSF), United States of America)  
 R. Ruchti (National Science Foundation (NSF), United States of America)

G. Crawford (Department of Energy (DoE), United States of America)  
S. Rolli (Department of Energy (DoE), United States of America)  
J. Sowinski (Department of Energy (DoE), United States of America)  
J. Stone (Department of Energy (DoE), United States of America)  
J. Cochran (Iowa State University, United States of America)  
S. Rajagopalan (Brookhaven National Laboratory, Upton, NY, United States of America)  
M. Tuts (Columbia University, United States of America)

ATLAS: M. Bosman, D. Charlton, F. Dittus, F. Gianotti, A. Lankford, M. Nessi, M. Nordberg  
CERN: S. Bertolucci, S. Foffano, R. McLaren, C. Saitta, J. Salicio-Diez, E. Tsesmelis, E. van Hove  
Resources Scrutiny Group: B. Loehr, E. Iacopini, S. Schmeling, C. Touramanis  
Excused: I. Blain (National Research Council (NSERC) of Canada, Ottawa, Canada), E. Gazis (NTU Athens, Greece), F. Linde (NIKHEF, Amsterdam, Netherlands), P. Bloch (CERN), R. Heuer (CERN), S. Lettow (CERN)

Documents can be found in the RRB indicio pages; accessible via the LHC-RRB home page  
<http://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.  
CERN-RRB-2012-061

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

**Formal Agreement on Implementation of the New Operating Arrangements.** Sergio Bertolucci. CERN-DRC-2012-043 (letter)

S. Bertolucci asked the delegates to approve the Implementation of the New Operating Arrangements as communicated in the above letter. Several Funding Agencies had requested signed letters and these would be sent. No objections were raised and the proposal was accepted.

**3. Status of the experiment.** F. Gianotti, Spokesperson.  
CERN-RRB-2012-075 (report), CERN-RRB-2012-076 (slides).

In her presentation F. Gianotti covered the following topics:

- Collaboration and Management matters
- Status of ATLAS and recent accomplishments (in particular since last RRB)
- A few words about the future (input to the European Strategy for Particle Physics)

She concluded that:

- Superb performance of the LHC accelerator, experiments and Computing Grid has been achieved in less than 3 years of operation.
- ATLAS has recorded  $\sim 5.2 \text{ fb}^{-1}$  at  $\sqrt{s} = 7 \text{ TeV}$  in 2011 and  $\sim 17 \text{ fb}^{-1}$  at  $\sqrt{s} = 8 \text{ TeV}$  so far in 2012.
- The whole experiment works very well in all its components, from smooth and efficient operation of detector, trigger and computing to the fast delivery of physics results: the first results for ICHEP with the full 2012 dataset were available less than

one week from data-taking, with a fraction of good-quality data used for physics of  $\sim 90\%$  of the delivered luminosity.

- M&O and Computing resources, as well as sustained dedication of people to the full spectrum of Operation Tasks, have been crucial for these achievements. F. Gianotti thanked the FA for their commitment.
- The huge ATLAS physics output is covered in  $>200$  papers and  $>400$  Conference notes covering a wealth of measurements and searches.
- In July 2012 ATLAS reported the discovery of a new Higgs-like boson:
  - with significance  $\sim 6\sigma$ , driven by  $H \rightarrow \gamma\gamma$ ,  $4l$ , with contributions also from  $H \rightarrow \tau\nu\tau\nu$
  - with signal strength:  $1.4 \pm 0.3$  of the Standard Model Higgs expectation
  - with mass:  $126 \pm 0.4$  (stat)  $\pm 0.4$  (syst) GeV
  - with couplings consistent with SM within the (large) uncertainties of the present measurements
- The era of precise “Higgs measurements” has started. In parallel, the quest for New Physics at the TeV scale is more and more motivated by a light Higgs. This is just the start in the exploitation of the immense physics potential of the LHC and its high-luminosity upgrade.

F. Gianotti concluded that ATLAS is very grateful to the Funding Agencies for their fundamental contributions to the success of the experiment, already rewarded by a ground-breaking discovery, for their strong efforts and for their continuous commitment over more than 20 years.

F. Gianotti also mentioned that this RRB meeting is the last one of the current ATLAS Management, which reaches the end of their mandate on 28 February 2013. On behalf also of her Management colleagues, F. Gianotti extended her warmest thanks to the delegates for the very fruitful and pleasant interactions, and for their invaluable help and support.

*S. Bertolucci thanked F. Gianotti for her excellent leadership of ATLAS and invited the delegates to join him in a round of applause.*

*E. Rabinovici added his congratulations and asked about the typical number of revisions of papers by journals. F. Gianotti replied that usually there is only one cycle of comments.*

*T. Ekelof expressed the opinion that young people should be recognised for contributions not only to data analysis but also to developing the instrument, running the experiment, and running the data analysis systems. F. Gianotti supported this statement strongly.*

**Detector consolidation and upgrade.** M. Nessi, Technical Coordinator.  
CERN-RRB-2012-077 (Slides)

M. Nessi reported on the data-taking efficiency and status of the detectors and TDAQ, noting that all subdetectors have operational fractions in the upper 90's. During the year some channels (maximum of 5% in the Pixels) had been lost but most of them would be fixed during LS1.

Looking ahead, he reminded delegates of the aims of the next three phases:

- Phase 0: To nominal energy and nominal peak Luminosity
- Phase 1: To ultimate peak Luminosity :  $2 \times$  nominal peak Luminosity

- Phase 2: To HL-LHC mode : 5 x nominal peak Luminosity + Luminosity leveling, to maximize the integrated Luminosity ( $\sim 300 \text{ fb}^{-1}/\text{year}$ )

He then presented the ATLAS strategy and plans for the detector consolidation and upgrade during the above three phases. Planning for Phase-1 is well advanced, with TDRs for the main projects expected in the first 9-10 months of 2013. He also reported the progress on R&D and layout definition for the Phase-2 tracker.

*P. Chomaz expressed concern on the lack of a global view of the upgrade including Phase-1 and Phase-2. If all the details of Phase I and Phase 2 were known now, then a plan could be drawn up to cope with possible reductions in the budget. However, if the global plans are unknown, parts may be implemented in Phase I that are then made redundant by budget cuts during Phase 2I.*

*S. Bertolucci was of the opinion that drawing up a detailed plan for Phase 2 was not possible today; R&D for Phase 2 had only just begun.*

*F. Gianotti commented that the global strategy of the experiment is outlined in the Letters of Intent. The Phase-1 LoI has been already submitted to the RRB and the Phase-2 LoI will be available by the next RRB meeting (April 2013). For Phase I the planning is well defined and M. Nordberg will present a table of cost sharing for endorsement in his presentation*

*P. Chomaz was also concerned that the Funding Agencies would receive two requests; one of 15% closely followed by another of 85%. M. Nessi suggested that a broad picture of Phase 2 would be available by beginning 2013 with the Phase-2 LoI.*

#### **4. LHCC Deliberations (paper only).** E. Tsesmelis, LHCC Scientific Secretary. CERN-RRB-2012-085

E. Tsesmelis reported that 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. The highlight of the recent period has been the discovery of a new particle consistent with a Higgs boson.

As reported during the previous presentation, the LHCC endorses the LOI for the Phase-1 Upgrade and encourages the collaboration to present its plans to the RRB and FAs and to proceed to the next step of detailed TDR's for each upgrade.

#### **5. Financial matters.** C. Saitta, CERN Finance and Procurement Department CERN-RRB-2012-082 (report), CERN-RRB-2012-083 (slides)

C. Saitta presented the changes with respect to the above mentioned report.

Construction Common Fund, Commissioning & Integration:  
Outstanding Contributions from Non-Member States total 1.6 MCHF

Maintenance & Operations - Category A:  
Additional Contributions received as from 1 September 2012 amounted to 3.7 MCHF  
Outstanding contributions from the member states amount to 686 kCHF and 475 kCHF for non-member states.

**6. Budgets.** M. Nordberg, Resources Coordinator.

CERN-RRB-2012-078 (report), CERN-RRB-2012-080 (report), CERN-RRB-2012-079 (slides)

M. Nordberg began with the Full Design Luminosity (FDL); presenting the 2012 FDL Budget update (Table 1, for information) and the 2013 FDL Budget update (Table 2, for endorsement).

He continued with an explanation of the Phase 1 financial framework; with Table 3 illustrating the interest of each Funding Agency in the various sub-projects. He also explained the process for approval of sub-projects, the financial framework and the handling of the Common Fund.

*T. Medland stated that he had not received a copy of the IBL MoU agreement. M. Nordberg replied that the National Contact Physicists were supposed to share it with the FA. He will follow up. T. Medland referred to the FDL target figure of 36 MCHF and asked what options have been considered for the case where the optimum funding was unavailable on the required timescales. M. Nessi stated that, in this case, new partners would be involved or the project would be made less ambitious. M. Nessi reminded the delegates that funding challenges took place during the construction and that solutions were found.*

*M. Fleischer asked about technology options and their effect on the funding. M. Nordberg stated that the level of funding of some agencies would depend on the technology choice; as was done for the IBL. M. Nessi added that this effect was expressed in his presentation.*

Turning to the 2013 M&O-A, M. Nordberg presented the Budget request of 15.4 MCHF and listed the cost drivers by activity. He then discussed in-kind contributions.

*M. Fleischer requested that in-kind contributions per Funding Agency should be added to the contributions table. M. Nordberg agreed*

For 2013 M&O B, the budget request was 5.1 MCHF and M. Nordberg again gave a breakdown of the cost drivers by activity.

He continued with an illustration of the evolution of M&O between 2002-2018 and gave the status of due M&O-A and M&O-B contributions.

*The RRB:*

- *Took note of 2012 FDL Payments Status (#078 Table 1)*
- *Approved 2013 FDL Payments (#078 Table 2)*
- *Approved Phase-1 Financial Framework and Guidance (#078 Table 3)*
- *Approved M&O 2013 Budgets (#080 Tables 1, 2) and proposed in-kind contributions*

**7. Summary.** S. Bertolucci, Director of Research and Scientific Computing.

*There being no further business, S. Bertolucci thanked the delegates and closed the meeting. The proposed dates for the next RRB are April 15<sup>th</sup>-17<sup>th</sup> 2013.*