



ATLAS

10th September 2013

**Minutes of the 36th LHC Resource Review Board Meeting
(CERN, Geneva, 16th April 2013)**

Present:

G. Taylor (University of Melbourne, Australia)
 D. Wayner (National Research Council (NSERC), Ottawa, Canada)
 Y. Fang (Institute of High Energy Physics (IHEP), China)
 N. Fejksová (Ministry of Education, Youth and Sports, Prague, Czech Republic)
 J. Ridky (Institute of Physics, ASCR, Czech Republic)
 A. Kupco (Institute of Physics, ASCR, Czech Republic)
 P. Chomaz (CEA Saclay, IRFU, France)
 L. Serin (CNRS/IN2P3, France)
 E. Lançon (CEA Saclay, IRFU, France) (replacing C. Guyot)
 D. Vilanova (CEA/IRFZ, France)
 I. Wingerter (CNRS/IN2P3, France)
 H. Prasse (Federal Ministry of Education and Research, Bonn, Germany)
 H. Mahlke (BMBF, Germany)
 K. Jakobs (Albert-Ludwigs-Universitaet Freiburg, Germany)
 M. Fleischer (DESY, Germany)
 E. Rabinovici (Hebrew University, Jerusalem, Israel)
 G. Mikenberg (Wizmann Institute, Rehovot, Israel)
 A. Zoccoli (INFN, Italy)
 L. Rossi (Università & INFN – Sezione di Genova, Italy)
 F. Bedeschi (INFN, Italy)
 A. Di Ciaccio (University of Roma Tor Vergata, Italy)
 T. Kawamoto University of Tokyo, ICEPP, Japan)
 A. Van Rijn (NIKHEF, Amsterdam, Netherlands)
 F. Ould-Saada (University of Oslo, Norway)
 J. Krolkowski (University of Warsaw, Poland)
 F.D. Buzatu (Institute of Atomic Physics, Bucharest, Romania)
 C. Alexa ((IFIN-HH National Institute of Physics and Nuclear Engineering, Bucharest, Romania)
 V. Savrin (Institute of Nuclear Physics, Moscow State University, Russia)
 V. Shevchenko (Kurchatov Institute, Russia)
 A. Petrov (Permanent Mission of Russia in Geneva)
 Z. Hlavacikova (Ministry of Education, Science, Research and Sports, Bratislava, Slovak Republic)
 D. Bruncko (Institute of Experimental Physics SAS, 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. Higón-Rodriguez (IFIC, University of Valencia, Spain)
 P. Karlsson (Swedish Research Council, Stockholm, Sweden)
 B. Lund-Jensen (Lund University, Sweden)
 P. Burkhard (Swiss National Science Foundation, Switzerland)
 G. Iacobucci (University of Geneva, Switzerland)
 S.-C. Lee (Academia Sinica, Taipei, Taiwan)
 G. Blair (STFC, United Kingdom)
 A. Medland (STFC, United Kingdom)
 S. Gonzalez (National Science Foundation (NSF), United States of America)
 A. Patwa (Department of Energy (DoE), United States of America)
 M. Procaro (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, B. Di Girolamo, B. Heinemann, T. Wengler
CERN: S. Bertolucci, P. Bloch, S. Foffano, T. Lagrange, S. Lettow, R. McLaren, J. Salicio-Diez, E. Tsesmelis, E. van Hove
Resources Scrutiny Group: C. Touramanis, E. Iacopini
Excused: F. Linde (NIKHEF, Amsterdam, Netherlands), B. Jacobsen (The Research Council of Norway, Oslo, Norway)

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-2013-003 were approved without comment.

3. Status of the experiment. D. Charlton, Spokesperson.
CERN-RRB-2013-025 (report). CERN-RRB-2013-026 (presentation).

D. Charlton's presentation focussed on three main areas:

- Collaboration and management matters
- The status of ATLAS, accomplishments since the last RRB
- Preparations for running in 2015, and the HL-LHC physics programme
- Conclusions

The RRB endorsed the admission of Louisiana Tech University into the ATLAS Collaboration bringing the total number of Institutions with voting rights in the CB to 177.

The University of Cape Town, Cape Town, South Africa and ITIM, Cluj Napoca, Romania have joined existing "cluster" Institutions: (SA-cluster and Bucharest). This does not change the composition of the CB nor the number of votes.

The spokesperson then presented the ATLAS Organisation, highlighting the new members of the management and announced other changes since the last RRB.

He then reported in detail on the accomplishments since the last RRB

Looking forward D. Charlton focussed on the trigger and offline preparations for 2015+ data-taking and the physics goals of the HL-LHC programme, beyond 2022.

He summarised that:

The LHC “Run-1” is complete and has been very successful

- The LHC, and ATLAS, performed superbly
- The Higgs boson moved from discovery to measurement

There are many new analysis results, and many more to come – 2013 will be a bumper year

- New measurements of the Higgs boson decay modes, e.g.
 - A broad set of coupling measurements
 - 3σ evidence of VBF Higgs-production
 - Limits on invisible Higgs decays and rare decays ($\mu\mu$, $Z\gamma$)
- The new particle continues to look like a Higgs boson, e.g. J^P very consistent with 0^+
- A wide range of searches are exploring more challenging and complex signatures
- Detailed precision measurements in QCD, EW and top sectors continue to challenge theoretical predictions

A big programme of work for LS1, both at point-1 and offline, is under way to maintain and enhance our physics capabilities for the 13-14 TeV data

Substantial progress on upgrade preparations in 2013

- Exciting physics prospects through to the end of the 2020's at least
- Phase-1 and Phase-2 status → B Di Girolamo and F Dittus' talks

In conclusion, D. Charlton expressed his gratitude for the support of the ATLAS Funding Agencies over the last >20 years that had been fundamental to the success of ATLAS, and will continue to be so in future.

4. Detector consolidation and upgrade. B. Di Girolamo, Technical Coordinator.
CERN-RRB-2013-042 (presentation)

B. Di Girolamo presented:

- Detector Status
- LS1 detector consolidation
- Repairs and new and staged elements
- LS1 safety
- Upgrade:
 - strategy,
 - progress
 - schedule

He summarised that:

- LS1 work in the cavern and outside was proceeding well
- LS1 safety is a test bench for the future
- LS2/Phase 1 upgrades
 - The TDR year: four TDRs will be presented this year
 - Organization is in place for the new projects
- LS3/Phase 2 upgrades

- The letter-of-intent is submitted and well received
- The next steps will be followed as for the Phase 1 upgrade
- A wealth of R&D is ongoing

P. Chomaz congratulated ATLAS for their impressive results. Returning to issues discussed in previous RRBs, he asked that the Upgrades for Phase 1 and Phase 2 should be globally addressed and that requests for funding of detectors, computing and R&D should fit into financial scenarios.

Phase 1. This has already been started and R&D in progress. We should look at the funding profile and schedule to ensure that we can achieve our goals. The physics case is clear; it is just a matter of implementation

Phase 2. We need to look at the real implementation. As presented this is very ambitious (275 MCHF) in scale and schedule. We must look at global picture and get organised in case we have to assign priorities. For some Funding Agencies, it is difficult to present Phase 1 now and then, a few years later, Phase 2 (15% then 85%)

D. Charlton replied that the purpose of circulating the Phase 2 LoI was to define the global strategy going towards Phase 2. Phase 1 is a small project, in the order of 5-7% of the construction cost. He was not enthusiastic about coupling Phase 1 and Phase 2. Phase 1 has clear requirements and ATLAS has the means to meet those requirements. The LoI for Phase 2 is the best estimate of the cost of the upgrade. ATLAS is working hard to reduce the options and investigating new technologies to reduce costs.

P. Chomaz stated that at the previous RRB S. Bertolucci had clearly stated that coupling of Phase 1 and 2 was not a good idea and it was not his intention to revisit the discussion.

A. Zoccoli added that he saw no major problem for Phase 1. It was important to bear in mind that the funding is fixed and the budget will be used to support Phase 1, computing and R&D for Phase 2. Care was needed to organise and prioritise. He appreciated the publication of the LoI; this is an important starting point for discussions. However, the amount of money is not trivial; if the current situation in Italy would be extrapolated to five years in the future, it was unclear that Italy could fund its share. It is important to discuss how to cope with boundary conditions in the budget and to discuss priorities.

M. Fleischer asked if it was possible to split the Upgrade into smaller sub-projects; these could be more easily managed by the Funding Agencies. D. Charlton replied that there was constant discussion with Funding Agencies in this sense. However, some detectors e.g. the tracker replacement are very difficult to split into smaller projects.

A. Medland echoed the previous comments concerning funding uncertainties. He stated that the funding may not be available at the level or on the timescales required by the experiments. He encouraged CERN and the experiments to explore and identify priorities and options. This would result in a coherent, well defined and global plan. He appreciated the clear and reassuring presentation of the plans for LSI and asked if there was flexibility in the current schedule which could cope with unforeseen problems. B. Di Girolamo replied that contingencies were built into the overall schedule.

H. Prasse pointed out that the first upgrade will result in an increase in data volume (double in 2015) and a consequent increase in computing costs. This will impact on the money available for the Phase 2 upgrade. D. Charlton did not expect that M&O costs would rise, however higher data rates could impact on the cost of computing.

5. LHCC deliberations (paper only). E. Tsesmelis, LHCC Scientific Secretary
CERN-RRB-2013-027

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 further understanding of the recently discovered new particle that is consistent with a Higgs boson.

The LHCC welcomed the LoI, which provides excellent guidance for the required R&D and which is well motivated by the required physics capability of the detector. The Committee fully endorses the strategy outlined and recognises the urgency for R&D on the technologies, both because of sheer scope and because of their innovative character.

There were no questions arising from this presentation.

6. Financial matters. T. Lagrange, Head of CERN Finance and Procurement Department
CERN-RRB-2013-028 (report). CERN-RRB-2013-050 (presentation))

T. Lagrange presented the Updates to the Financial Report.

Concerning contributions for Common Fund, Construction Commissioning & Integration, a contribution had been received from Brazil (63 kCHF). Amounts are outstanding from Morocco (1999-2009) 62.5 KCHF and Russia (1996-2010) 1'345 kCHF.

Cash contributions for M&O-A, received after 1st March totalled 3.3 MCHF. Outstanding contributions from the Member States totalled 3.5 MCHF and 5.7 MCHF for Non-Member States.

A. Medland asked if these figures were comparable with previous years. T. Lagrange replied that they were about 4% less.

7. Budgets F. Dittus, Resources Coordinator.
CERN-RRB-2013-043 (report). CERN-RRB-2013-053 (report). CERN-RRB-2013-054 (presentation).

F. Dittus began with the Closing Report for 2012 and the Status Report for 2013 for the Full Design Luminosity Detector Activities. He then presented the Phase 1 Financial Framework as a matrix of Funding Agencies and the sub-projects in which they are participating. He stated that all Funding Agencies were expected to contribute their fair share to the ATLAS phase-1 upgrade and that Common Items (Common Fund) would be handled separately.

Turning to M&O, F. Dittus presented the 2012 final payments for the M&O-A and M&O-B illustrating the Cost Drivers by activity. He explained the new, proposed in-kind contribution to M&O 2013.

The Resources Coordinator then gave the Preliminary estimates for 2014 M&O-A and –B including the Evolution of M&O from 2002 until 2018 and the proposed sharing by Funding Agency.

F. Dittus concluded his presentation with the status of due contributions.

The RRB subsequently:

- Approved 2012 FDL Payments (CERN-RRB-2013-043 Table 1)
- Took note of 2013 FDL Status (CERN-RRB-2013-043 Table 2)
- Took note of work plan for phase-1 upgrade (CERN-RRB-2013-043 Table 3)
- Approved 2012 M&O Payments (CERN-RRB-2013-053 Tables 1, 2)
- Approved the new M&O 2013 in-kind contribution (CERN-RRB-2013-053 Part 2)
- Took note of Preliminary 2014 M&O Budget Estimates (CERN-RRB-2013-053 Tables 4, 5, 6)

8. 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 28th -30th October 2013.