



CMS

9<sup>th</sup> September 2013

**Minutes of the 36<sup>th</sup> LHC Resource Review Board Meeting  
(CERN, Geneva, 15<sup>th</sup> April 2013)**

**Present:**

C. -E. Wulz (Institut fuer Hochenergiephysik /HEPHY, Austria)  
 J. Lemonne (FWO, Belgium)  
 J. Sacton (FNRS, Belgium)  
 C. Jiang (IHEP, Beijing, China)  
 D. Denegri (MSES, Croatia)  
 J. Äystö (Helsinki Institute of Physics, Finland)  
 P. Eerola (University of Helsinki, Finland)  
 U. Bassler (CEA Saclay, IRFU, France)(representing P. Chomaz)  
 L. Serin (CNRS/IN2P3, France)  
 Y. Sirois (IN2P3, France)  
 D. Vilanova (CEA/IRFU, France)  
 H. Mahlke (BMBF, Germany)  
 H. Prasse (Federal Ministry of Education and Research, Germany)  
 M. Fleischer (DESY, Germany)  
 A. Stahl (RWTH Aachen, Germany)  
 C. Fountas (University of Ioannina, Greece)  
 T. Csorgo (Wigner RCP-RMKI, Hungary)  
 G. Vesztergombi (Wigner RCP-RMKI, Hungary)  
 K. Mazumdar (TIFR, Mumbai, India)  
 A. Singh Gill (Permanent Mission of India, Geneva)  
 A. Zoccoli (INFN, Italy)  
 F. Cervelli (INFN, Italy)  
 F. Bedeschi (INFN, Italy)  
 N. Pastrone (INFN, Italy)  
 S. Choi (University of Seoul, Korea)  
 B. Lee (Sogang University, NRF, Korea)  
 A. Bernotas (Lithuanian Academy of Sciences, Lithuania)  
 J. Królikowski (University of Warsaw, Poland)  
 A. Petrov (Russian Mission, Geneva)  
 V. Savrin (Moscow State University, Russia)  
 I. Golutvin (RDMS-DMS, Dubna, Russia)  
 F. del Aguila (Ministry Economy and Competitiveness - U. Granada, Spain)  
 J. Alcaraz Maestre (CIEMAT, Madrid, Spain)  
 P. Fischer (Swiss National Science Foundation, Switzerland)  
 R. Wallny (IPP, ETH Zurich, Switzerland)  
 B. Kilminster (University of Zurich, Switzerland)  
 Q. Ingram (PSI, Switzerland)  
 G. W-S. Hou (National Taiwan University /NTU, Taiwan)  
 A. Medland (STFC, United Kingdom)  
 G. Hall (Imperial College London, United Kingdom)  
 S. Gonzalez (National Science Foundation, United States of America)  
 J. Stone (Department of Energy, United States of America)  
 M. Procaro (Department of Energy, United States of America)  
 A. Patwa (Department of Energy, United States of America)  
 J. Butler (Fermilab, United States of America)  
 V. O'Dell (Fermilab, United States of America)

D. Marlow (Princeton University, United States of America)

CMS: A. Ball, T. Camporesi, A. Charkiewicz, I. Fisk, J. Incandela, A. Petrilli, J. Varela

CERN: S. Bertolucci, P. Bloch, S. Foffano, S. Lettow, R. McLaren, C. Saitta, J. Salicio Diez, E. Tsesmelis, E. Van Hove

Scrutiny Group: C. Touramanis, S. Schmeling,

Excused: A. K. Maciel (RENAFAE, Brazil), I. Shipsey (CMS)

Documents can be found in the RRB indicio 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 CMS LHC Resource Review Board.

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

CERN-RRB-2013-004 (report)

The minutes of the last RRB were approved without comments.

**3. Status of the experiment, including Financial Plan.** J. Incandela, Spokesperson

CERN-RRB-2013-009 (report), CERN-RRB-2013-045 (Upgrade). CERN-RRB-2013-010

(presentation).

J. Incandela presented the major challenges on different fronts between now and first physics results ca. 2015, showed the data certified for analysis and the CMS Results for Moriond EW and QCD.

He continued with an in-depth review of selected physics highlights, including beyond Standard Model searches and displayed a graph illustrating the increase in the number of publications.

The Spokesperson then turned to the technical aspects of the Upgrades, looking at LS1/Phase1 and Phase 2. Funding of the Phase 1 Upgrades was also examined with specifics of Project costs and Common Items. J. Incandela expressed his appreciation to the Funding Agencies for their support of the Upgrade Project and extended special thanks to Funding Agencies who have already made contributions to the Upgrades Common Fund.

He concluded by stating that:

- There are many big challenges in the years ahead
  - No break in the foreseeable future
- Results for full Run 1 dataset are flowing now
  - For the Moriond, LHCP, LP, and EPS Conferences and then into final publications ...
  - Beautiful results, more to come in the next months
- Phase 1 upgrades had started

- Refinement of plan/costs for Phase 2 is underway

A. Singh Gill requested clarification on the definition of “typical” and “major” for treatment of cost increases for Phase 1 upgrades. J. Incandela replied that historically there have only been small deviations from the Technical Proposal. “Typical” would cover small changes, within the contingency. “Major” changes would have to be discussed with the Funding Agencies.

A. Medland reminded CERN and the Collaboration of the issue raised at the October RRB meetings associated with the need for more coordinated planning and prioritisation of the overall upgrade programme, and in particular the strategy for Phase 2 HL-LHC. He stated that the financial situation for most Funding Agencies remains constrained. It will therefore become increasingly difficult when the LHC starts running at design luminosity in 2015 to maintain funding levels of M&O plus computing support and, in addition, invest significant funds in the upgrades, particularly for the Phase 2 upgrades, which appear costly.

J. Incandela replied that the information was available for Phase 1. Planning is well advanced and details are being refined. For many projects, the profile is available and even more details will be presented at the next RRB. For Phase 2, it is difficult to be precise concerning the exact work required, but the focus must stay on producing physics. Simulation will help clarify requirements. We can then optimise the technology to reduce the cost.

S. Bertolucci commented that Phase 1 has been discussed and scrutinised, time is short and work must go ahead. For Phase 2, study, experience and R&D will allow us to make decisions.

A. Zoccoli shared the view of the U.K; Funding Agencies are obliged to consider the global picture. This includes the running of the current experiments and future Upgrades. The overall financial envelope is fixed and discussions should take place on how best to optimise the available resources both in terms of scope and schedule.

S. Bertolucci commented that the RRB does not make decisions on the Upgrades. Upgrades are proposed by the experiments and scientific committees scrutinise and decide on their merit. National contact points serve as a link between the experiments and their Funding Agencies. Phase 1 has been scrutinised and agreed. Phase 2 depends on the accelerator as well as the experiments.

J. Incandela reiterated that the Phase 1 was essential. A. Ball announced that for Phase 1 “the train has left the station” and we are in the middle of the journey. Phase 1 should be viewed as consolidation at the 10% level to allow CMS to exploit past investments.

H. Prasse stated that with the current difficult economic situation, Phase 2 would have to be carefully scrutinised. J. Incandela promised to minimise costs wherever possible.

A. Medland asked how CMS would manage if funding could not be made available at the level or on the timescales that the experiments would like and suggested that options for dealing with this need to be investigated. He emphasised that priorities have to be identified for the detector upgrades to ensure coherent scientific and technical scenarios are developed which can be adapted to likely funding availability and that these requirements needed to be based on a well-defined global plan. Furthermore, for Phase 2, he requested that the “train didn’t leave the station” before the Funding Agencies had a clear understanding of the global priorities and resources.

H. Prasse agreed with the points made by the other Funding Agencies and stated that the German Agencies would need a few years to agree on the funding; she suggested that discussions start as soon as possible.

*S. Bertolucci reminded the delegates that CERN was a Funding Agency and had also to find the resources.*

*A. Zoccoli asked about  $\gamma\gamma$  signal sensitivity. J. Incandela replied that the sensitivity had remained constant within statistical expectations.*

*Referring to the Phase 1 table, A. Zoccoli remarked that Italian funding had been secured for the Systems Items but not yet for the Common Items and questioned if this situation was shared by other Funding Agencies. A. Charkiewicz replied that 75% of the Funding Agencies had paid, or agreed to pay for the Common Fund which was around 6.5 MCHF; 2 MCHF has been received, 4 MCHF has been promised. For the Common Items, 16 MCHF is required, 4 MCHF is missing.*

**4. LHCC deliberations** (paper only). E. Tsesmelis, LHCC Scientific Secretary  
CERN-RRB-2013-013

The LHCC considers that CMS has made excellent progress in all aspects of the experiment and the Committee congratulates the CMS 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.

**5. Financial matters.** C. Saitta, Deputy Head of CERN Finance and Procurement Department  
CERN-RRB-2013-014 (report), CERN-RRB-2013-047 (presentation).

C. Saitta presented the changes with respect to the Financial report.

Maintenance & Operations – Category A: Additional Contributions received as from 1 March 2013 amounted to 1.6 MCHF. The sum of the outstanding contributions for Member States for 2013 is 4.7 MCHF. For the non-Member States, the outstanding contributions total 6.9 MCHF.

**6. M&O Budgets.** A. Charkiewicz, Resources Manager  
CERN-RRB-2013-011, CERN-RRB-2013-046, CERN-RRB-2013-012 (presentation)

A. Charkiewicz reported on the M&O-A 2002-2012 Contributions, noting that the budget years up to 2011 are now fully paid. For 2012 there are outstanding contributions which amount to 848 kCHF and this was complemented by a table of outstanding contributions for 2002-2012. On behalf of CMS, he thanked all Funding Agencies for their timely payments to the 2012 M&O-A.

He gave an overview of expenditures of M&O-A 2012 noting that:

- Overall M&O-A expenditures in 2012 were in line with the allocated Budget
- There is an overspending in some areas and under-spending in others. A detailed explanation of each budget item where there is significant divergence between the allocation and expenditure is provided in the document 'Summary of Expenditure for CMS M&O for the year 2012' (CERN-RRB-2013-046)

- The main areas where some overspending occurred were:
  - Gas consumption, which was higher due to the fact that CF4 recuperation has not yet been optimized to the anticipated level
  - Expenditures related to ensuring readiness for Long Shutdown 1 (LS1) mainly the completion of the Operations Support Centre (OSC), cabling activities and engineering design work
  - Secretarial assistance cost increased mainly due to the need for maternity leave replacement
- The actual amount of expenditures for Online hardware was 490 kCHF. However the total allocation of 2.8 MCHF is considered as spent as the balance has been transferred to the special DAQ Account approved by the RRB in October 2011. This will be used at the most appropriate time for DAQ hardware purchase, most likely at the end of 2013
- Expenditures on electrical power reported in Annex 1 are significantly lower than the allocated budget. This is due to the fact that power costs are not invoiced to FAs which belong to CERN Member States and hence not reported as expenditures. Discussions are underway with the RRB SG concerning the allocation for Power with the objective of proposing a reduction for the 2014 budget
- Due to the fact that overspending has been compensated by under-spending in other areas (e.g. cooling fluids, external cryogenics) the overall balance of the M&OA (without power) is only slightly negative. This global over-spending represents only 85 kCHF which represents only 0.6% of the budget

The Resources Manager concluded his overview of M&O-A expenditures with a breakdown of payments by main budget category.

Turning to M&O-B, A. Charkiewicz noted that:

- As CMS does not centrally invoice for M&O-B, the Collaboration is reporting qualitatively on these expenses. A large part of these expenses are in-kind contributions from participating institutes
- The overall Subsystem arrangements made in 2012 worked satisfactorily
- Almost all Funding Agencies now participate in the M&O-B budget and for a few formal arrangements for recognizing their contribution to Subsystems are being finalized
- No major problems have been encountered by the Subsystems in obtaining funding for their M&O-B budgets
- The sharing of costs in Subsystems is largely in line with the principle of reflecting current responsibility of Funding Agencies/Institutes
- As requested by the RRB, the M&O-B expenditures will undergo formal scrutiny by the RRB Scrutiny Group as in the previous two years

A. Charkiewicz closed the first part of his presentation by inviting the RRB to take note of the expenditure report and, in view of the operational nature of the CMS expenses; he requested that Funding Agencies ensure that payments are made as early as possible.

He then moved on to present the M&O Preliminary Draft Budgets (PDB) for 2014 noting that:

- The CMS Collaboration is presenting, as last year, a preliminary draft Budget Request both for Category A and Category B M&O for information only
- The cost sharing presented in document CERN-RRB-2013-011 is preliminary and for information only (based on the latest PhDs list from September 2012) and will change for the October 2013 RRB
- The M&O-A costs will be reviewed by the CMS Finance Board and further input from the Scrutiny Group will be taken into account in the October M&O Draft Budget

For Category A, he commented that:

The M&O-A cost estimates have changed only slightly with respect to the October 2012 RRB meeting. The only change is a request of 20 kCHF for website maintenance (A.3 Communications).

- The total estimated budget for M&O-A excluding power is 13'676 kCHF
- The total estimated budget for M&O-A with power is 15'426 kCHF
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This budget request may be revised further before being presented to the October 2013 RRB taking into account discussions at the CMS Finance Board and input from the RRB Scrutiny Group

- The budget projection up to the year 2017 shows that, as agreed with the RRB, the total M&O-A allocation decreases after LS1 remains at a flat level in following years

The Resources Manager concluded his overview of M&O-A PDB with a breakdown, by main budget category, of the draft budget request.

Turning to M&O-B Preliminary Draft Budget, A. Charkiewicz commented that:

- M&O-B costs have been partially reviewed by the CMS Collaboration. This will continue via an internal scrutiny process with dedicated Internal Scrutiny Groups (ISG) set up for each Subsystem
- This budget request will be further updated before being presented to the October 2013 RRB taking into account input from the RRB Scrutiny Group
- As requested by the RRB, the M&O-B budget request will undergo formal scrutiny by the RRB Scrutiny Group as in the previous two years
- Some modifications have been made in the M&O-B cost sharing as compared to the one presented in October 2012
- With respect to the forecast of the M&O-B budget for 2014 as presented at the October 2012 RRB the budget has increased slightly from 5'983 kCHF to 6'097 kCHF
- The total M&O-B budget for 2014 is higher by 182 kCHF as compared to the 2013 budget of 5'915 kCHF. This is mainly due to maintenance and repair work necessary in Sub-detectors during LS1
- The forecast for the next four years shows a decrease of the M&O-B budget as of 2015 after the end of LS1 and remaining at a reduced flat level

The Resources Manager concluded his overview of M&O-B PDB with a breakdown, by subsystem, of the draft budget.

A. Charkiewicz concluded that:

- The total M&O-A Preliminary Draft Budget 2014 amounts to 15.4 MCHF
- The M&O-B Preliminary Draft Budget 2014 amounts to 6.1 MCHF and some 8 FTEs of Collaborating Institutes manpower

The RRB took note of the present, unscrutinized, cost estimates for M&O-A and M&O-B.

*M. Fleischer noted that the DAQ expenses were presented as 2.8 MCHF whilst the Finance department had reported 3.5 MCHF. A. Charkiewicz replied that this was due to savings from 2011 and 2012. M. Fleischer requested that these savings be presented in a separate table.*

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

*There being no further business the Chairman closed the meeting. The next RRB will take place on the 28<sup>th</sup>-30<sup>th</sup> October 2013.*