CMS 29 August 2011

Minutes of the 32nd LHC Resource Review Board Meeting (CERN, Geneva, 11th April 2011)

Present:

C.-E. Wulz (Institute for High Energy Physics, Austria)J. Lemonne (FWO, Belgium)
J. Sacton (FNRS, Belgium)
Q. Chang (National Natural Science Foundation, China)
Y. Zhang (National Natural Science Foundation, China)
C. Jiang (IHEP Beijing, China)
M. Raidal (NICPB, Estonia)
D-O. Riska (Helsinki Institute of Physics, Finland)
P. Eerola (University of Helsinki, Finland)
E. Augé (CNRS/IN2P3, France)
U. Bassler (CEA, France)
Ph. Rebourgeard (CEA Saclay, IRFU/DIR, France)
Y. Sirois (IN2P3, France)
M. Nagel (BMBF, Germany)
K. Ehret (BMBF, Germany)
H. Mahlke (BMBF, Germany)
M. Fleischer (DESY, Germany)
P. Schleper (BMBF, Hamburg University, Germany)
G. Vesztergombi (KFKI-RMKI, Hungary)
K. Mazumdar (Tata Inst of Fundamental Research, India)
R. Iyer (Government of India, Department of Atomic Energy, India)
M. Diemoz (INFN-Sezione di Roma, Italy)
F. Ferroni (INFN, Italy)
A. Bernotas (Lithuanian Academy of Sciences, Lithuania)
J. Królikowski (Ministry of Science and Higher Education, University of Warsaw, Poland)
G. Barreira (LIP, Portugal)
D. Filatov (Ministry of Education and Science, Russia)
Y.V. Kozlov (Ministry of Education and Science, Russia)
M. Itkis (JINR, Russia)
I. Golutvin (JINR, Russia)
G. Kozlov (JINR, Russia)
V. Matveev (Russian Academy of Science, Russia)
V. Savrin (SINP Moscow State University, Russia)
A. Petrov (Russian Mission, Russia)
J. Alcaraz (CIEMAT, Spain)
G. de Cordoba (Ministry Science and Innovation, Spain)
F. del Aguila (National Contact Physicist, Spain)
Q. Ingram (PSI, Switzerland)
T. Nakada (CHIPP EB member, Switzerland)
G.W.S. Hou (National Taiwan University, Taiwan)
G. Hall (Imperial College London, United Kingdom)
A. Medland (STFC, United Kingdom)
J. Butler (FNAL, United States of America)
S. Gonzalez (DOE, United States of America)
G. Crawford (DOE, United States of America)

S. Bertolucci, H. De Groot, R. Heuer, T. Lagrange, S. Lettow, R. McLaren, J. Salicio Diez, C. Saitta, E. Tsesmelis, E. Van Hove

CMS
A.Ball, D. Bonacorsi (replacing I. Fisk), A. Charkiewicz, J. Incandela, A. Petrilli, T. Rodrigo, G. Tonelli

Resources Scrutiny Group
B. Loehr (chairman), S. Schmeling

Apologies

R.C. Shellard (RENAFAE/CBPF, Brazil)
A. Ioulianos (Research Promotion Foundation, Cyprus)
E. Gazis (NTU-Athens, Greece)
D.J. Chung (Ministry of Education, Science and Technology, Republic of Korea)
U.K. Yun (NRF, Republic of Korea)
J. Lee (NRF, Republic of Korea)
I. Park (University of Seoul, Republic of Korea)
P. Adzic (Belgrade University, Serbia)
M. Goldberg (National Science Foundation, United States of America)
M. Pripstein (National Science Foundation, United States of America)
R. Heuer (CERN)

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 RRB.

2. Approval of the minutes of the last meeting. S. Bertolucci, Director of Research and Scientific Computing.
CERN-RRB-2011-002 (report)
The minutes of the last RRB were approved without comments.

3. Status of the experiment, including Financial Plan. G. Tonelli, Spokesperson
CERN-RRB-2011-008 (report). Slides of this presentation can be consulted on the RRB Agenda page.

G. Tonelli presented the results of the physics at CMS. He showed the results of operations for p-p and Pb-Pb collisions, with a list of the CMS publications. He summarised the mid-term goals as :

- Efficient re-start of the operation and good understanding of the new conditions
- Capability to cope with higher luminosities (exceeding 1exp 33)
- Flagship papers for the Winter Conferences (using the full 2010 dataset)
    - SUSY (papers from several RA)
    - W' preliminary result
    - Z' preliminary result
    - Follow-up of the "ridge"

- W/Z+jets
- Top cross section using full statistics for dileptonic +lepton+jets events.
- Top mass preliminary measurement? Searches (BH, stopped gluinos, leptoquarks etc)
- Single top
- Heavy ion preliminary results on the search for QGP
- First results on the search for Higgs in CMS

He then gave details of the work during the 2010-2011 Extended Technical Stop, presented the CMS performance in 2011 and spoke of the new challenge: the pileup. He continued with reports on the DAQ/L1/HLT. Later he gave preliminary details of the work foreseen during the 2013-2014 and 2017-2018 shutdowns.

Turning to budgetary matters, G. Tonelli showed the budgetary implications of running in 2011-2012 and the difference between a shutdown and a running year. He warned that the model has been built on figures for 2009 and 2010, which were special years. Adding experience of 2011 will refine the model.

He continued with the preliminary M&O-A Budget for 2012, illustrating the budget evolution from 2002 to 2013 and spoke of the challenges in computing for Tier-1 and Tier-2. He then outlined the actions foreseen to mitigate the impact and gave a summary of the computing resources for 2011 until 2013.

Turning to the subject of Upgrades, G. Tonelli presented the draft deliberations of the LHCC on the Technical Proposal for the Upgrades and outlined the process to fund the upgrades. He then went into the details of the 64.5 MCHF project which includes upgrades for :

- Muon forward system
- New phototransducers for our Hadron Calorimeters
- New-4 layer-low mass pixel detector
- Improved DAQ and trigger
- Improved infrastructures
- + many other, although smaller, very important items.

And gave preliminary estimates of the costs and expressions of interest from the Funding Agencies.

G. Tonelli concluded by saying that:

- After the Winter Technical Stop CMS was ready for the 2011 data taking that started very well.
- So far it looks that we will be able to cope with the challenges of running two years with instantaneous luminosity exceeding 1E33 and <n> interactions per crossing larger than 10.
- The harvesting of results on 2010 data has been timely and extremely successful.
- Prospects for SUSY, Higgs and Exotica searches in 2011-12 appear to be very promising.
- Signals of New Physics might appear any moment as soon as LHC will deliver us ~100pb^{-1}.

- J. Incandela would be the CMS Spokesperson for 2012-2013

J. Lemonne commented that the conclusion of the CASTOR review was that it could remain in place in 2011 and asked what was planned for 2012. G. Tonelli replied that the decisions in 2012 would depend on the luminosity and the measurements. If it was decided to remove CASTOR, this could take place during the technical stop in 2011.

D-O. Riska congratulated CMS on their impressive progress and thanked the management for producing projected costs for the upgrade even though the TDR was not frozen. Commenting on the preliminary costs from 2011-2016, he stated that the 2012 budget for Finland was being frozen now. After 2012, there would be a new four-year budgeting period and he hoped to come with a positive statement in the October RRB. G. Tonelli remarked that there were many projects with different timescales and was sure that solutions could be found.

Replying to a question from P. Eerola concerning the replacement of CPU farms, G. Tonelli stated that the CPUs would be replaced at the last moment.

E. Augé commented that 60% of the IN2P3 budget in 2011 was invested in M&O and 40% into physics groups. He appreciated the efforts to flatten peaks.

4. LHCC deliberations (paper only). E. Tsesmelis, LHCC Scientific Secretary
CERN-RRB-2011-010

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.

5. Financial matters. T. Lagrange, Head of CERN Finance and Procurement Department
CERN-RRB-2011-011 (report).

T. Lagrange presented the changes with respect to the report on the 28th February.

He gave a summary of planned and received cash income for Steps 1, 2 and 3. The total planned was 43.68 MCHF and the total received was 25.8 MCHF.

The additional contributions for M&O A received as from 1 March 2011 totaled to 1.7 MCHF.
The outstanding contributions for Member States for 2011 is 3.5 MCHF. For the non-Member States, the outstanding contributions before 2011 were 30 kCHF and 5.5 MCHF for 2011.

6. M&O Budgets. A. Charkiewicz, Resources Manager
CERN-RRB-2011-013, CERN-RRB-2011-041, CERN-RRB-2011-014 (presentation)

A. Charkiewicz reported on the M&O-A 2002-2010 Contributions, noting that the budget years up to 2009 are now fully paid and for 2010 there is only one outstanding contribution of 30 kCHF, which will be fully paid soon. CMS thanked all Funding Agencies for their timely payments to the 2010 M&O-A.

He gave an overview of expenditures of M&O-A 2010 noting that:

- Expenditures in 2010 were expected to show an overspend of some 1.1 MCHF corresponding to the bushing replacement cost and this was reflected in actual expenditures as per the initial estimate.
- Although some of the items showed lower expenditure than estimated, other areas, mainly gas and cryogenic fluid consumption, were overspent.
- The total expenditure (excluding Power) in 2010 was 12'291 kCHF as compared to a budget of 11'911 kCHF. Thanks to savings in other areas (Video equipment, DAQ, Outreach) the actual total overspend was reduced to only 380 kCHF.
- Some of the costly investments made in 2010 (e.g. high capacity Liquid Nitrogen and CO2 storage tanks or CF4 Gas recuperation facility) will produce significant savings in coming years.

He then presented a breakdown of expenditures by subsystem.

Turning to the overview of expenditures of M&O-B, the Resources Manager reported that the Task Force on M&O-B cost sharing had made specific recommendations to the Finance Board to further formalize the M&O-B budgetary process with a view to ensuring transparency and coherence between the different CMS Sub-systems. These recommendations have been taken into account by all Sub-systems and are being gradually implemented. One of the main recommendations was to ensure that all CMS member countries participate in the M&O-B budget and this is also being realized following contacts with representatives of concerned Funding Agencies.

He summarized by inviting the RRB to take note of the present expenditure report and asking the Funding Agencies to ensure that payments, especially outstanding contributions, are made as early as possible.

A. Charkiewicz then presented the Status of M&O MoU Signatures.

He then moved on to present, for information only, the M&O Preliminary Draft Budget for 2012. The cost sharing presented in document CERN-RRB-2011-013 is preliminary (based on the latest PhDs list available in October 2010) and would change for the October 2011 RRB. The M&O-A costs would 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.

He then explained why the M&O-A cost estimates have changed with respect to the October 2010 RRB meeting. Some of these changes have already been signaled at the October 2010 RRB.

A. Charkiewicz presented a breakdown, by subsystem, of the M&O-A Preliminary Draft Budget for 2012, which has a grand total, including power, of 16.7 MCHF.

Turning to the 2011 M&O-B Preliminary Draft Budget, he commented that M&O-B costs had been partially reviewed by the CMS Collaboration. The request would be further updated before being presented to the Scrutiny Group.

He then presented a breakdown, by subsystem, of the M&O-B Preliminary Draft Budget for 2011.

A. Charkiewicz summarized that:

- The M&O-A Preliminary Draft Budget 2012 amounts to 16.7 MCHF
- The M&O-B Preliminary Draft Budget 2012 amounts to 6.8 MCHF and some 8 FTEs of Collaborating Institutes manpower.

He concluded by inviting the RRB to take note of the present, unscrutinised, cost estimates for M&O-A and M&O-B.

F. Ferroni commented that safety was reported in Cat A and C. S. Bertolucci replied that there were some safety expenses paid by CERN and some paid by the experiments. General infrastructure, for example the fire services, is paid by CERN, personnel safety is paid by the experiments. These are reviewed by the Scrutiny Group. B. Loehr added that the old safety item (level 2) concerned detector safety; i.e. to protect the hardware of the experiment. A list of items was presented at the last RRB.

J. Lemonne asked if there were M&O B estimates for CASTOR. A. Charkiewicz replied that it was not included in the document as there was insufficient information.

R. Iyer enquired about the excess expenditure in 2010; what was the cost element when addressing risk and how could unexpected capital investment costs be managed. She asked if the Scrutiny Group would be able to address these issues in 2011, 2012. A. Charkiewicz responded that the Scrutiny Group had been fully informed of excess expenditure. B. Loehr remarked that, in 2010, when looking at unforeseen costs, CMS and the Scrutiny Group decided to defer some costs to the 2011 budget, others remained. He also reminded delegates that, during the previous RRB, the SG had proposed a mechanism to cope with "exceptional repairs".

F. Ferroni asked for examples of the risks. A. Ball replied the examples had been covered in the presentation of A. Charkiewicz. He gave the example of risks taken if core manpower, for example crane drivers, welders, were not retained.

B. Loehr asked for clarification on the basis for the 2012 budgets; had the fact that 2012 was now a running year been taken into consideration in producing the budgets? A. Charkiewicz answered that the plan was based on 2012 being a running year. A. Ball emphasised that costs in 2012 would also include preparations for an extended shutdown.

S. Bertolucci reminded the delegates that, following a decision of the last RRB, the Scrutiny Group would also be looking into M&O B and new members were essential. Loehr added that scrutinising M&O B required a detailed knowledge of the detectors; it would helpful the SG could be reinforced with technical experts.

P. Eerola raised a question concerning the power bill. A. Charkiewicz replied that more running experience was required.

E. Augé requested that, since there were a number of uncertainties surrounding M&O, early information should be presented to the Funding Agencies well in advance of the October RRB. A. Charkiewicz replied that up-to-date information could be obtained via the Linkpersons to the FB, which meets at monthly intervals. E. Augé felt that there needed to be time for consultation between

Funding Agencies. G. Tonelli suggested that this information, if requested, could be provided prior to the final meeting of CMS with the RRB Scrutiny Group in August.

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

S. Bertolucci received the approval of the RBB for the proposal to extend the current construction MoU for five years and to add Upgrade projects to the MoU through dedicated Addenda.

K. Ehret suggested that existing annexes could also be updated.

S. Bertolucci reiterated the request of B. Loehr for two new members, specializing in detectors, for the Scrutiny Group. He stated that one new member from the USA would be particularly welcome. B. Loehr explained that there were currently ten members, eight of whom were "active". Two new members were needed to cover the five experiments.