



Minutes of the 24th Resources Review Board Meeting Held at CERN on 23rd April 2007

Present:

Europe

C.-E. Wulz (Repr. Bundesministerium für Bildung, Wissenschaft und Kultur, Wien)
J. Lemonne (FWO, Brussels), G. Wilquet (FNRS, Brussels)
D. Denegri (Repr. Ministry of Science and Technology, Zagreb)
M. Raidal (NICPB, Tallinn, Estonia)
D.O. Riska (Helsinki Institute of Physics, Helsinki), J. Tuominiemi
J. Zinn-Justin (CEA, France), M. Dejardin
F. Le Diberder (IN2P3, France), C. Diaconu, F. Sevin, Y. Sirois
K. Ehret (BMBF, Germany), H. Bojahr (DESY, Germany), T. Hebbeker (RWTH, Aachen)
E. Gazis (National Technical University of Athens, Greece)
G. Vesztergombi (KFKI-RMKI, Budapest)
F. Ferroni (INFN, Italy), F. Ferrini (Italian Mission, Geneva), M. Diemoz (INFN, Roma)
J. Królikowski (Repr. Ministry of Science and Higher Education, Warsaw)
G. Barreira (LIP, Portugal)
V. Savrin (Skobeltsyn Inst. of Nuclear Physics, Moscow), Y. F. Kozlov (Federal Agency for Science and Innovations), R. Lednicky (JINR, Dubna), I. Golutvin
P. Adzic (Vinca Institute of Nuclear Sciences, Belgrade)
T. Rodrigo (IFCA-Univ. of Cantabria, Spain)
K. Baltensperger A. Rubbia (ETH, Zurich), C. Adusumalli, F. Pauss,
Q. Ingram (PSI, Villigen)
R. Wade (STFC, United Kingdom), R.M. Brown (RAL, Didcot)

North America

J. O'Fallon (DOE, USA), T. Ferbel, S. Gonzalez, J. Butler (FNAL)
M. Pripstein (NSF, Washington), D. Marlow (Princeton), R. Cousins (UCLA)

Asia

X. Fu (Ministry of Science and Technology, China), S. Hu, C. Jiang (IHEP, Beijing)
Y. Zhang (National NSF, China), Q. Chang, R. Qiao
C.V. Ananda Bose (Department of Atomic Energy, India), A. Gurtu (Tata Institute, India)
N-J. Cho (Ministry of Science and Technology, Korea), Y. Choi, S. Kim
R. Mukhtar (Pakistan Atomic Energy Commission)
S.C. Lin (Academia Sinica, Taipei), Y.B. Hsiung (National Taiwan University, Taipei)

CERN

R. Aymar, J.-J. Blaising (chairman), C. Jones (secretary), S. Lettow, J. Salicio Diez, P. Geeraert,
D. Jacobs, S. Schmeling, E. Tsesmelis, E. Van Hove, F. Sonneman

CMS

T. Virdee, A. Ball, P. Bloch, L. Foà, A. Petrilli, G. Tonelli

G. Lafferty (Chairman of the M&O Scrutiny Group)

24th Meeting of the CMS Resources Review Board RRB, 23rd April 2007

1. Introduction

J-J. Blaising, PH Department Head

The acting Chairman, J-J. Blaising, welcomed the delegates in the name of J. Engelen, whose plane was delayed. He welcomed G. Lafferty as the new Chairman of the Scrutiny Group. He welcomed also the new delegates from Korea, Pakistan and Belgium.

2. Approval of the Minutes of the 23rd Meeting (CERN-RRB-2006-126)

The minutes of the 23rd meeting were **approved** with no comments. J-J. Blaising thanked C. Jones for having taken these minutes. There were no matters arising.

3. Status and Financial Plan of the Experiment, T. Virdee, Spokesperson

Papers CERN-RRB-2007-023

Presentation CERN-RRB-2007-046

3.1 Collaboration News

T. Virdee noted that a new group had been voted full membership of CMS, namely the University of Tennessee, Knoxville, USA. The Technical University of Eindhoven, Netherlands, had been made an Associate Member. There were two new applications for full membership from the University of Ghent in Belgium and from Lithuania.

T. Virdee showed the current organisational chart. CMS was reorganising its structures adiabatically in view of the upcoming data taking phase. They had established a full chain of tasks that needed to be coordinated CMS-wide. The sub-detector projects would continue to exist, albeit with altered missions, and should be responsible for the maintenance and operation of their respective sub-detectors. They were establishing internal CMS Memoranda of Agreement for "service" work.

T. Virdee outlined the CMS objectives. By November 2007 there would be an initial CMS detector ready to take data using cosmic rays and/or collisions at 900 GeV. They would use this to commission and operate the detector and to prepare the Collaboration for data taking and analysis. This initial detector would be without EE and pixels.

In the case of 14 TeV Collisions in June 2008 there would be a low luminosity CMS detector, including EE and pixels, commissioned and ready for efficient physics data taking, with the CMS Collaboration trained and ready for analysis of data at 14 TeV.

They were following strongly two parallel paths:

1. Detector Installation, Commissioning and Operation,
2. Preparation of Software, Computing and Physics Analysis.

3.2 Construction Progress

T. Virdee summarized the very significant progress that CMS had made over the last 6 months. The main highlights were:

- i) The detector could be closed and opened quite fast (1 week/end).
- ii) MTCC: the magnet could be run stably at the design field of 4T. Field mapped at 2.0, 3.0, 3.5, 3.8 & 4.0 T to a precision of 1 part in 10000.
- iii) MTCC: all the detectors, electronics, trigger, DAQ, software and computing could function as a real experiment.
- iv) CSA06: data could be distributed out from CERN-T0 to all 7 T1s and 25 T2s at the rate of over 25% of what is expected in 2008.
- v) The Physics TDR vol. II had demonstrated the great physics potential.

- vi) The first phase of the heavy lowering of the elements of the experiment into the underground cavern, including that of the heaviest element, the YB0, had been successfully completed.
- vii) All of the silicon strip tracker had been integrated into the Tracker Support Tube and cosmic ray muon tracks were being recorded.
- viii) Barrel crystals production had been completed. Assembly of Bare barrel supermodules had been completed. Endcap crystals production had started and the last contract for the remaining endcap crystals was being finalized.
- ix) The installation of services on the YB0 had started and was proceeding well.

T. Virdee then illustrated this progress with some more detailed slides, including some impressive photos of the lowering and installation of the experiment, and this information is not repeated here. He continued with the perspectives until the end of 2007, and the current CMS schedule v35.3 (slides 38 to 43). In anticipation of physics of 1 fb^{-1} , T. Virdee outlined some of the discoveries that could be made and for which they needed to be ready.

3.3 Conclusion

In conclusion, CMS had made substantial “across the board” progress over the last 6 months. The Tracker and ECAL were continuing to make good progress. The next “key” milestone was the installation of the Tracker in UX by the end of August. In situ commissioning was picking up pace with end-to-end tests of increasing functionality and complexity. Preparations were being made for CSA07 and selected physics analyses in 2007. CMS was holding to the v35.3 schedule leading to CMS being ready to close by mid-October 2007.

The Initial CMS would be ready for data taking using cosmic rays and/or collisions at 900 GeV in the last quarter of 2007. The Low Luminosity CMS detector was on track to be ready for data taking using collisions at design energy expected in mid-2008. One was entering a pivotal period in HEP. The CMS Collaboration was eagerly looking forward to analyzing data from design energy collisions.

Discussion

J-J. Blaising thanked T. Virdee for this comprehensive coverage of the current status of CMS and asked for questions at this stage before covering the financial matters. He asked delegates to include in their comments the information presented in the LHCC Deliberations paper (point 4 on the agenda below).

R. Wade was encouraged by the progress made after some worries at previous meetings. Was it correct that CMS was now happy to proceed on the current machine schedule? T. Virdee replied that this was correct and that there had been close contact and discussions with those scheduling the LHC machine. He noted that the LHCC deliberations had contained the following statement: “Progress since the previous meeting of the CMS Resources Review Board in October 2006 has been excellent. The schedule to complete the initial CMS detector for the LHC run later in 2007 remains very tight but credible.”

T. Ferbel asked for more details concerning the contribution of the University of Ghent to Phase 3 since this was still under discussion. T. Virdee replied that Ghent would contribute to the forward RPCs and that it was necessary for some people to work on this already. The forward region would definitely need effort in order to get to the design luminosity detector as in the TDRs.

Korea asked about the schedule of CSA07. T. Virdee explained that this would have two phases with some preparation and generation of the data for the physics analysis in July and then there would be a dedicated 30 day run in September.

3.4 Financial Plan

T. Virdee turned to the financial matters (starting at slide 48 of his presentation). He reminded delegates that at in October 2006, (RRB 23), “Upon the recommendation of the CERN management, CMS prepared a global financial plan up to 2010, evaluating not only the shortfall for the low luminosity detector, but also the funds needed to introduce the staged items for the design luminosity ($10^{34} \text{ cm}^{-2}\text{s}^{-1}$). The items under consideration were presented in a prioritized way in 3 steps.”

The current status for each Funding Agency was shown in Tables 2 and 3, (slides 49 and 50 – reproduced below), with comments in each case. There was a complete range of replies, some of the money having already arrived at CERN, whilst others were at the stage of discussion or of having to make application some time in the future.

	Step 1	Step 2	Step 3	Comment
Austria				Discussing
Belgium-FNRS	136	56		Request made (likely OK)
Belgium-FWO				Awaiting Response
Brazil	Not Applicable			
Bulgaria				Awaiting response
CERN	4,569	297	1,119	
China	Endcap RPC	Endcap RPC	Endcap RPC	Forward RPC
Croatia	15			Awaiting response (likely OK for Step 1)
Cyprus				Awaiting response
Estonia	5	8		Include in next year's budget
Finland	272	49		Funding in 2010 and 2011
France-CEA				Discussing
France-IN2P3	Not Applicable	2,000	Not Applicable	
Germany BMBF	919	51		Step 1 & partial Step 2 OK, Rest - Await
Germany DESY	Not Applicable	2,000	Not Applicable	New Agency
Greece				Awaiting response
Hungary				Discussing
India	Endcap RPC	Endcap RPC	Endcap RPC	Forward RPC
Iran	Endcap RPC	Endcap RPC	Endcap RPC	Forward RPC
Ireland	Not Applicable			Awaiting response
Italy	2,500			Step 1 likely to be partially covered
Korea	Endcap RPC	Endcap RPC	Endcap RPC	Forward RPC
Mexico	Not Applicable			
New Zealand	Not Applicable			Discussing
Pakistan	Endcap RPC	Endcap RPC	Endcap RPC	Forward RPC
Poland	132	49	181	Awaiting response
Portugal				Awaiting response, likely OK for Steps 1&2
RDMS-DMS				Discussing
RDMS-Russia				Discussing
Serbia				Discussing
Spain	344	140		Responded-likely OK for Steps 1 & 2
Switzerland	Not Applicable	124	486	Apply in Sept 2007 for 2008
Taipei	121	45		Awaiting response, likely OK for Steps 1&2
Turkey				Awaiting response
United Kingdom	575	202	762	
USA-DoE/NSF	5,252	1,722		
Sum	14,840	6,743	2,448	
Requested	17,530	8,400	16,600	
% covered	85%	80%	15%	

He summarized the situation as follows:

- The completion of the CMS detector was imminent. Commitments had to be taken before the next RRB on the remaining elements and any shortfall would cause highly undesirable delays. These delays must therefore be avoided.
- The Chairman of the RRB had sent letters to many of the Funding Agencies requesting that the RRB delegates be prepared to make commitments as requested at the forthcoming RRB meeting.
- CMS was very grateful to the several agencies that had already made commitments.
- CMS now urgently requested the others to make commitments to at least Steps 1 and 2.

CERN had kindly indicated its willingness to help with issues of cash-flow up to and including 2010.

Discussion of the Financial Plan

T. Virdee then returned to the table giving the status of the additional funding for steps 1, 2 and 3 (slide 50 reproduced on the previous page of these minutes). He wished to give delegates a chance to comment on the status as recorded.

Austria reported that there was goodwill to pay all the stages but there had been a recent change of Minister and the details of when they could pay were still to be worked out.

The FNRS is considering a contribution in accordance with the requests made by CMS with part of step 1 possibly made available in 2007. The FWO is considering the possibility to pay its contributions to steps 1 and 2 as early as 2007. However, no decisions are expected to be taken before June.

Brazil was not present.

China had the information concerning a contribution to the forward detector and would discuss with CMS and their authorities.

Croatia confirmed that for step 1 it was OK, and for step 2 there would have to be a discussion over the summer and a confirmation was probable at the October 2007 RRB.

Bulgaria was not present and T. Virdee reported that J. Engelen had recently sent a letter to the Minister with as yet no response.

Cyprus was not present.

Estonia did not expect to have problems.

Finland operated with 3 year budget plans, and there was no allocation for this within the current budget which ended in 2009, they could make a reservation for two equal instalments for steps 1 and 2 in 2010 and 2011. This had been confirmed to the spokesperson by email.

France CEA was discussing with the collaboration how they could provide the corresponding support. France IN2P3 noted that their commitment, as recorded, remained.

Germany BMBF reported that they had already paid step 1 and part of step 2 and there was a clear commitment for the remaining part of step 2 and step 3. It was not clear yet when exactly the latter could be paid, but at the latest 2009/2010. For DESY there was a clear commitment to provide 2 MCHF.

Greece had discussed this matter in their committees and with the funding agency but they had no answer as yet. It was hoped to have news in the October RRB meeting.

Hungary reported a difficult situation as their Funding Agency was under reorganization and it was not possible to obtain a firm answer.

India has submitted this request to the Funding Agencies at the end of 2006 and he hoped that by the October RRB some answer could be given.

Italy confirmed that their entry in the table was correct.

Korea reported that the Funding Agency was negative at present but they would continue discussions.

Neither Mexico nor New Zealand was represented.

Pakistan had already made the commitment.

Poland had sent a letter saying that step 1 and 2 was confirmed for 2008. They could not pay before because the 2007 money had all been committed. For step 3 there was a positive attitude but the exact amount would have to be discussed. T. Virdee noted that in the table in the handouts there was an error in the column for Poland under step 3 which should be deleted. It was correct as displayed on the screen in the meeting.

Portugal had made a proposal to the Minister to include steps 1 and 2 in the budget for next year. They hoped to have an answer in the next couple of weeks. For step 3 things were still under discussion.

Russia RDMS had not foreseen additional money but if there was a request submitted to them they could discuss it. Russia had similarly not foreseen additional funding and awaited a request which could then be discussed. T. Virdee agreed that both of these needed to be followed up outside the meeting.

Serbia was still in discussion with the Ministry and hopefully next time they could be more specific.

Spain considered that the funds would be available but not before 2008.

Switzerland had informed their Funding Agencies and they would apply for the money in September 2007, with a response most likely to be forthcoming in March 2008. The table entry for step 3 should be 466 as opposed to 486 kCHF, and the comment next to it was not correct. T. Virdee agreed that the comment referred to the next line of the table.

Taipei considered that the earliest that they could have the money for steps 1 and 2 would be 2009/2010.

The UK understood that they had already paid.

The USA confirmed that the numbers on the table were correct and the money was in the pipeline and would be staged.

T. Virdee considered that there had been more positive responses than had been recorded in the table and they now had to update this table as well as to follow up one or two leads that had been indicated. He thanked all the Funding Agencies.

4. LHCC Deliberations (paper only)

Paper CERN-RRB-2007-040

LHCC Scientific Secretary, E. Tsismelis

Delegates had no further comments to make and the RRB **took note** of the report of E. Tsismelis.

5. Financial matters

Paper CERN-RRB-2007-009

Head, CERN Finance Dept., P. Geeraert

Presentation CERN-RRB-2007-014

P. Geeraert presented an update to the financial situation reported in the above paper, in which the information was correct to the end of February 2007. The full details can be found in his slides and in his paper.

New contributions for the Common Fund and C&I had been received from Switzerland, Finland, Belgium FNRS and Croatia for a total of 239 kCHF, whilst new payments had been made for 641 kCHF. The remaining common funds amounted to 117 kCHF but with outstanding commitments of 3.41 MCHF such that a cash flow problem was imminent. He was happy to report that for the Common Fund there were no outstanding contributions for the years up to the end of 2006.

New contributions to the M&O-A budget amounting to 1.253 MCHF had been received from 15 Funding Agencies (details slide 4), making a total M&O-A income for 2007 of 2.55 MCHF.

There were outstanding contributions to M&O-A prior to 2006 from Member States Bulgaria and Italy amounting to 119 kCHF. For 2006 there were payments outstanding from Bulgaria, Cyprus, Korean Universities, Mexico, and Dubna amounting to 440 kCHF. The outstanding contributions for 2007 totalled 6.8 MCHF, giving a total outstanding of 7.36 MCHF. He asked for these outstanding contributions to be settled as soon as possible.

New payments against the M&O-A budget since February amounted to 353 kCHF, leaving a total balance of 1.74 MCHF. Outstanding commitments were 1.21 MCHF.

J-J. Blaising thanked him for this presentation. There were no questions.

6. Construction BudgetsPapers CERN-RRB-2007-024
CERN-RRB-2007-025**Resources Manager, A. Petrilli**

Presentation CERN-RRB-2007-047

6.1 Expenditure 1995-2006

A. Petrilli showed an overview of the expenditure commitments and payments from 1995 until 2006. The current level of commitment was 520 MCHF which represented 95% of the cost estimate, and the payments made amounted to 486 MCHF which was 89% of the cost estimate.

A large fraction of the Funding Agencies had committed most of their funding under MoU and CtC by the end of 2006. For the remaining ones, commitments were taking place during 2007. There were no foreseen problems with the MoU and CtC funding. Funding for steps 1,2, and 3 was detailed in the CMS Status Report (cf. CERN-RRB-2007-023)

6.2 Preliminary Draft Budget for 2008

A. Petrilli summarized the preliminary funding requirements for all the payments planned in 2008 to follow the CMS construction schedule. In 2008, all sub-detectors would be in the integration and commissioning phase. This preliminary draft budget for the year 2008 was based on the overall planning as presented in the CMS Status Report (cf. CERN-RRB-2007-023). The present estimates for all payments in 2008 added up to 10 MCHF. Together with the payments made by the end of 2006 (486 MCHF) and the 2007 budget planned payments (40 MCHF), the total estimated payments by the end of 2008 would total some 536 MCHF. This was 100% of the funding requested under MoU, CtC and Step 1.

The Preliminary Draft Budget was based on the breakdown of items in the CMS Construction MoU and its All-Silicon Tracker amendment. As for the past, all figures shown as *Payments expected in 2008* were to be considered as best estimates at this time because the actual expenditure would depend, case by case, on commercial tenders received, contract negotiations, currency fluctuations and actual payments during 2007. A. Petrilli showed in slide 14 the overview of the 2008 Construction Budget by sub-detector. In this Preliminary Draft Budget some 10.3 MCHF were not covered and hence the budget was not balanced. All the Step 1 requested funds were needed to cover the foreseen deficit. These funds had to be committed in 2007 and were needed for payment in 2008 to maintain the construction schedule.

Annex 10 of CERN-RRB-2007-025 summarized the Preliminary Draft Budget for 2008 by Funding Agency and by subsystem. The exact request for 2008 would be presented at the October RRB meeting. The RRB was invited to take note of this preliminary budget request.

Discussion

J-J. Blaising thanked him for this presentation. There were no questions on the Construction Budget.

7. M&O Budgets

Papers CERN-RRB-2007-026
CERN-RRB-2007-027

Resources Manager, A. Petrilli

Presentation CERN-RRB-2007-048

7.1 Expenditure for 2006

A. Petrilli presented the M&O-A contributions from 2002 to 2006 in agreement with the report of P. Geeraert. The outstanding contribution over all years for M&O-A was 559 kCHF.

The expenditure budget was 6.952 MCHF and they had made payments for 6.673 MCHF. The income was such that they ended up with a negative balance of 50 kCHF at the end of the year. The situation with outstanding payments had improved (slide 6) but there was clearly work still to do.

As CMS did not centrally invoice for M&O-B, the Collaboration was reporting qualitatively on these expenses. The arrangements made in 2006 worked satisfactorily. There are no reports of Institutes not participating to their fair share of M&O-B costs.

They kindly asked Funding Agencies to ensure that payments were made as early as possible. They urgently asked Funding Agencies with outstanding contributions for the previous years to make these payments as soon as possible. With the help of CERN, they kept working on reducing the outstanding contributions.

The RRB was invited to take note of the present expenditure report.

7.2 Status of M&O MoU Signatures

A. Petrilli reported that there had been no changes to the signatories of the M&O MoU since that announced during the October 2006 RRB, namely that of Korea.

7.3 Preliminary Draft Budget for 2008

The CMS Collaboration presented, as last year, a preliminary draft Budget Request both for Category A and Category B M&O for information only. The cost sharing presented here was also for information only and would probably change. Further input from the Scrutiny Group would be taken into account in the October M&O Draft Budget.

M&O-A costs would be reviewed by the CMS Finance Board prior to being submitted to the Scrutiny Group. The M&O-A cost estimates had changed with respect to the October 2006 RRB meeting with a total increase in the cost estimates of some 3%. The M&O-A sharing was based on the latest PhDs list available in September 2006 (cf. CERN-RRB-2006-027), this list would be updated for the October 2007 RRB.

A. Petrilli then showed on slide 15 the 2008 M&O-A preliminary draft budget overview, with a grand total of 11.96 MCHF.

M&O-B costs had been reviewed by the CMS Collaboration. This budget request would be further updated before submission to the Scrutiny Group. The M&O-B cost sharing presented was the same as the one presented in October 2006. The sharing presented here was subject to changes.

The overview of the M&O-B PDB was shown in slide 17. The total was 6.4 MCHF with 150 FTEs of which around 100 were for core computing within CMS institutes.

The Collaboration was preparing Memoranda of Agreement (MoA) to fully account for the effort of all CMS members towards service work. To ensure full coherence between the MoA and the M&O budgets, the itemisation of the M&O expenses might change. The RRB would be kept informed of the MoA status.

The RRB was invited take note of the present, un-scrutinized, cost estimates for M&O-A and M&O-B.

Discussion

Korea referred to slide 4 of the presentation which showed two entries, one for Korea and one for Korean Universities. A. Petrilli clarified that he had recorded the M&O-A due for the years 2002-2004 prior to the signature of the MoU, namely 126 kCHF, as money to be recuperated from the Korean Universities. The 120 kCHF recorded against Korea was that due for the period 2005-2006 after the signature of the MoU and this had been paid by the Ministry. T. Virdee agreed that this would be further discussed with Korea outside of the RRB.

F. Ferroni noted that Italy had requested that the M&O-C be also presented and he had not seen that in the presentation. Secondly, Italy had also requested that the M&O-A expenditure be presented at least to level 2, such that the agencies could look at them. A. Petrilli replied that this was presented in the paper accompanying his talk. J-J. Blaising took note of the request for the presentation of M&O-C. F. Ferroni agreed to check the document for the M&O-A expenditure.

8. Extension of the MoU for Construction J-J. Blaising

J-J. Blaising noted that the delegations should all have received an email from the CSO suggesting that they should agree to the extension of the period of the existing construction MoU which would otherwise expire at the end of 2007. It was clear that the construction of the detector would now take a little longer than this and it was necessary to keep the framework in place until 2010 to cover this period. It was not the case that this implicitly implied new money, as he had been asked by one delegation. He suggested that, in the absence of any comments at this meeting, that they could agree at this point to the extension in this meeting and record that in the minutes.

The opinions of the Funding Agencies around the table were requested. Although a few delegations were not sure that they had received the email and others felt that they did not yet have formal approval so they could only give provisional approval, there was general agreement to this extension.

The USA stated that they needed to discuss the details of this proposal to extend with J. Engelen and they would defer their decision until such time as they had had time to discuss.

There were no further comments and this extension was **agreed** by all Funding Agencies except the USA at this stage.

9. Summary, Future Activities & A. O. B. J-J. Blaising

J-J. Blaising concluded that there had been significant progress since the previous RRB. CMS had a plan which allowed them to close CMS on the 15th October if requested, and also plans for a later closure if appropriate. R. Aymar clarified that during May 2007 a schedule would be agreed between the experiments and the LHC machine people.

<p>The next RRB meetings in 2007 will take place at CERN on Monday 22nd, Tuesday 23rd and Wednesday 24th October 2007</p>

There being no questions and no further business, the Chairman thanked the participants and closed the meeting.

C. Jones
May 2007