



Computing Resources Review Board

CERN-C-RRB-2005-011
18 July 2005

Minutes of the 7th Resources Review Board Meeting Held at CERN on 19th April 2005

Present:

Europe:

J. Lemonne (FWO, Brussels) ; J. Sacton (FNRS, Brussels)
M. Lokajicek (Academy of Science, Praha), V. Vbra; M. Chvojka (Ministry of Education, Youth and Sports, Praha)
J. Dines Hansen (Danish Natural Science Research Council, Copenhagen), H. Boggild
D.O. Riska (Helsinki Institute of Physics, Helsinki)
M. Raidal (NICB, Tallin, Estonia)
F. Etienne (IN2P3, Paris); J. Zinn Justin (CEA-Saclay, Gif-sur-Yvette), M. Jacquemet, J. Ernwein
J. Richter (BMBF, Bonn), D. Müller (GSI, Darmstadt), K.P. Mickel (FZK, Karlsruhe),
V. Gülzow (DESY, Hamburg), S. Bethke (MPI, Munchen)
G. Vesztergombi (KFKI-RMKI, Budapest)
U. Dosselli (INFN, Roma), F. Ferroni, F. Ferrini
F. Linde (NIKHEF, Amsterdam), A. J. Van Rijn
S. Irgens-Jensen (Norwegian Research Council, Oslo), B. Jacobsen
M. Turala (Ministry of Science and Information, Warsaw)
F. Bello (ICCTI, Lisboa)
N.V. Zamfir (Institute of Atomic Physics, Bucharest), L. Puscaragiu
Y.F. Kozlov (Ministry of Science, Moscow), V.I. Savrin
A.N. Sissakian (JINR, Dubna), A.S. Vodopianov
D. Espriu (MEC, Madrid), M. Delfino
L. Gidefeldt (Swedish Research Council, Stockholm), A.C. Lagerkvist
A. Clark (CHIPP, Genève), U. Kanganegger
R. Wade (PPARC, Swindon), R. Jones

N. America:

I. Blain (NSERC, Ottawa), R. Orr
J. O'Fallon (DOE, Washington), T. Ferbel, S. Gonzalez
J. Whitmore (NSF, Washington); D. Green (Fermilab, Batavia); J. Shank (University of Boston)

Asia:

Y. Zhang (NNSFC, Beijing), W. Shen, J. Peiwen
R.S. Mundada (BARC, Mumbai)
T. Kawamoto (ICEPP, Tokyo), S. Terakado ; S. Iwami (KEK, Tokyo)
S. Park (Ministry of Science and Technology, Korea), G.N. Kim, D.W. Kim, D.H. Kim
S.C. Lin (Academia Sinica, Taipei)

Australia:

S. Tovey (AUSHEP, Melbourne)

CERN:

R. Aymar (Director General), J. Engelen (Chairman), C. Jones (Secretary)
J. Fergusson, P. Geeraert, D. Jacobs, A.J. Naudi, D. Schlatter, E. Tsesmelis, E. Van Hove

LCG:

L. Robertson, K. Bos, C. Eck

ALICE:

J. Schukraft, C. Carminati, Y. Schutz

ATLAS:

P. Jenni, D. Barberis, F. Gianotti

CMS:

M. Della Negra, D. Stickland, L. Taylor

LHCb:

T. Nakada, N. Brook

7th Meeting of the Computing Resources Review Board RRB, 19th April 2005

Documents can be found at the URL <http://committees.web.cern.ch/Committees/LHCRRB/> and at <http://lcg.web.cern.ch/LCG/boards/crrb.html>

1. Introduction

J. Engelen, Research Director

J. Engelen welcomed RRB delegates to this 7th session. He introduced Chris Jones as the new scientific secretary of the RRB.

2. Approval of the Minutes of the 6th Meeting (CERN-C-RRB-2004-102)

The minutes of the 6th meeting, CERN-C-RRB-2004-102, were **approved** with no corrections. The minutes of the plenary session, CERN-RRB-2004-110, were also approved without comment. J. Engelen thanked D. Jacobs for having exceptionally taken both these minutes. There were no matters arising.

3. Status of the LCG Project

L. Robertson, Project Leader

Paper CERN-C-RRB-2005-002

Presentation CERN-C-RRB-2005-008

L. Robertson reported on the status of the LCG Project. He first noted that LCG now had an accounting system in operation, developed by the Rutherford Laboratory. Currently there were about 65 sites reported in this system, which represented approximately half of the sites considered to have a capacity interesting for LHC.

An important step had been a data recording challenge in March 2005, in collaboration with the ALICE experiment, which used a new version of the CASTOR mass storage system. Although this had been late, they managed to achieve the target of 450 MB/s sustained for one week.

Using data taken from the Computing Model papers written by the experiments, which had been reviewed by the LHCC in January, he showed the distribution of resources foreseen amongst the regional centres in 2008. This revealed the importance of the Tier 1 centres in providing the computing resources needed to process and manage the LHC data. In order that these centres be ready in time for physics it was important to address the issues covered by the MoU to be discussed later.

The capability to transfer data from CERN to the Tier 1 centres at high rate was extremely important. Hence there was a planned programme of further service challenges, with the aim of having the service operational by October 2006. Service Challenge 2 in April 2005 had been planned to sustain a data transfer of 500 MB/s from CERN to at least five of the Tier 1 sites (disk to disk) for one week. In practice this had run for 10 days, and had involved seven instead of five of the Tier 1 centres, with an average rate of 600 MB/s.

A Working Group had been set up by the Grid Deployment Board to bring together the Tier 1 centres, the national and the regional research centres in order to plan for the LHC. The recent technology change of using light paths to connect sites had come at a good time. Most Tier 1 centres would be connected with light paths at 10 Gbits/s by the end of 2005. Many NRENs, as well as the GEANT European backbone were participating actively in this process. L. Robertson showed a diagram of the planned connectivity.

The two final service challenges, SC3 this year and SC4 in 2006, would include CERN, all of the Tier 1 centres and the major Tier 2 centres. Both would be conducted in two phases. There would first be a “set-up” phase in which one checked out the infrastructure, before the full involvement of the experiments, in order to achieve a stable set-up before entering into the “service phase”. The aim was to have solid fixes for any problems encountered. The service phase should thus provide a long stable service in which the experiments could check out their computing models and their software chain. He described the aims and components of SC3 and SC4 in some detail (see presentation) and how they planned to ramp up the service for full physics.

Discussion

J. Engelen asked for any comments either on this presentation or on the paper on LHCC Deliberations which had been provided after the LHCC had reviewed the LCG Project.

M. Turala asked whether the accounting system would take into account valid resources or just resources used. L. Robertson replied that the accounting system would report which resources were available and those which were being used in a given site. If multiple Virtual Organisations were using the same facility then a further discussion and development was necessary. The present accounting system was just a first step.

S. Lin commented that progress in the Asia-Pacific region towards availability of 10 Gb/s light paths was not so advanced as in Europe and the USA.

M. Delfino noted that the web pointer to the LHCC report provided by P. McBride should be changed as this report was no longer a draft.

There being no further questions the Chairman thanked the speaker for his presentation.

4. LHCC Deliberations (papers only) E. Tsesmelis, LHCC Scientific Secretary Paper CERN-C-RRB-2005-003, CERN-C-RRB-2005-006

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

5. Status of Common Project Accounts P. Geeraert, Head, CERN Finance Dept. Paper CERN-C-RRB-2005-004 Presentation CERN-RRB-2005-057

J. Engelen noted that this point covered the accounts of Phase 1 of the LCG Project at CERN including the voluntary contributions from Funding Agencies. Hence these accounts gave a very limited view of the entire project finances, even though they were an important part of that project.

P. Geeraert had no recent financial transactions to update the information in the paper that he had provided. He drew the attention of the RRB to the second page where they could see that the expected contributions amounted to 21.5 MCHF, and that so far they had received 17.56 MCHF. On the CERN budget, up to the end of 2004, they had spent 33.44 MCHF on materials and 42.3 MCHF on personnel. For 2005 these two numbers were 7.7 MCHF and 11.9 MCHF respectively.

L. Gidefeldt noted that he had difficulty in making the numbers presented agree with his own notes and also with the numbers to be presented later by the resource Coordinator. Nonetheless he felt that this would be best discussed outside the meeting.

There being no comments on these numbers, the RRB **took note** of this financial report.

6. Status of Resources and Financial Plan C. Eck, Resources Coordinator Paper CERN-C-RRB-2005-005 Presentation CERN-C-RRB-2005-009

6.1 Common project resources

C. Eck began by noting that this presentation would concentrate on the common resources of the LCG project at CERN. Further details could be found in his written paper. In the last year spending on materials for the prototype of the LCG project at CERN came to 5.469 MCHF which was higher than planned, largely because they had paid already for items budgeted during 2005. The overall cost stayed within 1% of the number presented during the Computing RRB during October 2004.

Looking at the costs and funding for Physics Computing, in terms of materials, and for the first time, they could foresee a balanced budget at the end of the project in 2005. The biggest part of this improvement in the financial situation came in 2004. This included both an additional million

from the CERN budget as well as increased income from tape media sales. In balancing the budget it had been important to keep the costs constant. Small increases in external money and additional CERN funding were enough to cover the deficit of 0.5 MCHF.

C. Eck turned to Phase 2 of the LCG Project. Table 7 in the paper showed a detailed update of the corresponding table shown in the October 2004 RRB. The materials cost for Physics Operation and the LCG Project at CERN, (Tier 0 and the CERN Analysis Facility), were now covered by available funds. However, the personnel budget forecast for Phase 2 still showed a total deficit of 15.7 MCHF over the four years 2005-2008.

He directed the RRB at the tables summarizing the state of external funding for Phase 2 at CERN. For the base programme there were commitments for 10.1 FTEs and 272 kCHF from Germany, Italy, Spain and Taipei. For the extended programme Italy had committed 16.8 FTEs.

J. Engelen suggested that discussions of Phase 2 manpower would be taken under point 7 of the agenda.

6.2 Resources in Regional Centres

K. Bos, Grid Deployment Board Chair

Presentation CERN-C-RRB-2005-010

K. Bos showed a list of the Tier 1 centres. This had changed little over time and was thus becoming clear. D.O. Riska noted that the table should be completed inasmuch as the Nordic Data GRID Facility would support the CMS experiment. K. Bos noted that the list of Tier 2 centres was incomplete and there was a great need to improve our knowledge, especially about the level of resources they would be able to provide. It was hoped that this understanding would improve over the summer of 2005. He asked the RRB for their help by providing as much information as possible in order to progress.

K. Bos showed the requirements of the experiments by year, deduced from the Computing Model papers discussed earlier, for resources from the Tier 1 centres. J. Engelen noted that there was a substantial difference between ATLAS and CMS, and that this was an artefact of the way of counting the numbers. K. Bos pointed out that ATLAS had included the needs of running in 2007 and CMS did not. This had been the first attempt to collect these numbers and the procedures would evolve. J. Engelen considered that the needs of ATLAS and CMS for computing were probably very similar. D. Stickland agreed that the needs were very similar and that there was an accounting difference that needed to be fixed.

Looking at the resources that were available in the external Tier 1 centres for 2008, K. Bos noted that the CPU power covered almost exactly the requirements of the experiment, as did the tape capacity. This was not true for the disk capacity which was approximately 25% low. Whilst this was not a huge difference, it was probably a result of a recent increase in the demand by the experiments that had not yet fed back into the planning cycles of the Tier 1 centres.

A. Clark wondered if the results would not be a factor two worse if they were scaled according to the real needs as defined by ATLAS. J. Engelen pointed out that if one increased the CMS requirement up to the level of ATLAS it would add not a factor two, but rather 15 to 20%.

K. Bos noted that the same graphs shown for 2009 showed larger discrepancies than 2008. There were several reasons. In cases where the sites had no planning numbers for 2009 they had simply taken the numbers from 2008 which was a likely underestimate. In addition it was probable that the Tier 1 centres had not yet appreciated the consequences of a doubling of data on a yearly basis.

Finally he showed the Tier 1 capacity broken down by experiment, and resources. Given that this was the first time that one attempted to make a match between the predicted requirements and resources, the result was rather encouraging and the differences were small.

The Chairman thanked K. Bos for his presentation.

7. Funding of Tier 0 Manpower at CERN (LCG Phase 2) J. Engelen

J. Engelen introduced this topic. He referred back to the presentation of C. Eck, which pointed to a shortage of manpower at CERN in LCG Phase 2 amounting to a little less than 16 MCHF over the three year period up to and including 2008. CERN had been discussing in principle with all Funding Agencies. It was not yet clear whether they could solve the problem by working together.

He had received a number of replies from some of the Funding Agencies that he fully understood, but which did not necessarily help the situation. A typical reply of this form was that a given country had decided to build a Tier 1 centre at home and they would spend all their resources on that centre at home. This was indeed an absolutely essential way of contributing to the LHC Computing Grid. On the other hand, the architecture of the Grid was such that it was based, right from the beginning, on a big Tier 0 centre with very big capacity at CERN. The Tier 1 centres were necessary and fully acknowledged, but there was also an essential need for a Tier 0 at CERN which needed resources.

CERN needed to know now, or at the latest after the next RRB, the size of the shortfall and how it could be managed. They had given themselves until October to understand the magnitude of the problem.

Discussion

U. Dosselli was surprised by the numbers. Italy was making a big effort for a Tier 1 centre. Indeed Italy felt that the LCG was a very important project that had to be ready and available for the experiments when they needed to analyse the data. Italy had made a specific proposal for Phase 2 which had been described in the previous presentation as the “extended programme”. He wished to understand the differences between the base and the extended programmes. If the extended programme was not necessary then he could direct these resources elsewhere.

J. Engelen agreed that it was important to have the discussion clear. How much of the INFN proposal could be counted against the shortfall? L. Robertson replied that overall there were roughly 100 FTEs missing. Italy had made a very important offer, partly providing essential support for the experiments. As a result, only part of the Italian offer could be counted against the current baseline programme of the LCG project. J. Engelen considered the Italian proposal as very positive and that further discussion was necessary.

I. Blain pointed to a particular problem in Canada of fragmentation of funding. NSERC and TRIUMF planned to meet in May to discuss priorities. Hence it was a little premature to make any statement.

R. Wade noted that the discussion was not surprising given the similar discussions that had taken place in previous RRBs. The UK position was that, in 2000 and 2002 PPARC had received substantial new funding for e-Science, and hence they had been able to make an important and fundamental contribution to this project. The recent UK Comprehensive Spending Review had been considerably less generous. One important issue that needed to be clearly understood was that, in practice, the number of Funding Agencies contributing to the project at CERN was quite small, whereas the number of people attending the RRB was large enough to cause seating problems around the table. The list of Tier 1 centres was also quite small, and the RRB should recognise that the countries that were providing those centres were making a big contribution towards providing a service for the whole community. He felt it was time to look around the table and to consider which resources each country was providing to the computing project as a whole, such that some of the other countries might step up to the plate. He was extremely sorry that they were not able to make the contribution which was expected from them for Phase 2. However, he did not feel embarrassed at the overall UK contribution to the project.

J. Engelen replied that he had made some important points. He noted that the LCG was discussed in a number of other committees outside the RRB and that perhaps discussions in a smaller arena might be useful to prepare for a constructive discussion at the next RRB.

F. Bello commented that he had been instructed that Portugal would contribute with an average of 8 to 10 engineers per year to this project. Portugal would also qualify as a Tier 2 centre.

L. Gidefeldt wanted to know the position of the largest player, which was clearly CERN. J. Engelen replied that he had not yet accepted that the situation was static. His understanding was that discussions were still taking place in various countries, but that he did not yet understand why these had not yet led to any result. It was obvious that the LHC Computing GRID had to be operational at the end of 2006. The present discussion focussed on whether additional voluntary contributions at the level of 15 to 20% of the total could be secured or not. If this was not possible then there was a problem. In other financial matters before these RRBs it was clear that CERN was being asked to help in smoothing the cash flow situation, with the aim of ensuring that the LHC and the experiments would be ready on-time. One might consider also adding this shortfall to the CERN deficit. However it was of the utmost importance that this deficit be reduced as soon as possible, since it would be a very great handicap in the planning for future scientific projects.

J. O'Fallon wished to avoid the perception that the silence of the DoE indicated that they were unwilling to help in solving this problem. They were working to clarify their position. They were supporting two Tier 1 centres, and they would also do what they could to help this issue. When their position had become clear they would communicate it to the Chairman.

S. Tovey asked whether this missing manpower had to be based in CERN or could they work in their home country. L. Robertson replied that a paper had been produced, CERN-C-RRB-2004-114, which specified the jobs that needed to be done and what effort was missing. They were very open to proposals as to how these things could be done elsewhere.

D. Espriu commented that the sooner this problem was solved the better, and that it should not be on the table of the RRB much longer. Spain was ready to pledge additional support by way of sending technical trainees, as they had done in the past. Some of these would work for Grid technologies. However they would not commit that their share of the shortfall could be covered in this way, and hence he was reluctant to quantify their support further. Spain had made a big investment in Grid technologies. They had participated in phase 1, fully honouring their commitments. They were also committed to funding a Tier 1 and several Tier 2 centres as well as contributing to deploying the grid within the experiments in which Spain was participating. He hoped that he had shown that Spain was fully contributing to the LCG. Spain definitely thought that it would be better for the future of LHC and LCG if we were to revert to a more regular way of funding, and if LHC computing were properly integrated into CERN's medium and long term plans.

G. Vesztergombi announced that Hungary expected to contribute to this project and had made the necessary application. A decision had been expected in the summer but the Finance Minister had been removed the day before. Hence they did not know what would happen to this application.

J. Sacton noted that Belgium had contributed to phase 1 but that it had been unable to contribute in manpower. They had understood that they were not being asked to contribute more to phase 2. There were active discussions in Belgium about the possibility of a Tier 2 centre. However he did not think that Belgium would be able to contribute to LCG phase 2.

The Director General agreed that it was a pity that this funding had not been included normally in the full budget of CERN. This decision had been made quite long ago and he had no possibility to change it. They were trying to understand how to solve this issue. He understood that there had to be an analysis of the relative priorities of the manpower necessary, the computer capacity required and the networking needs. This year they had taken the decision to realign good people that were

working on phase 1 so that they would remain in CERN for the next phase. CERN would like to take advantage of the possibility offered by some agencies to provide people at home, even though the difficulties of organising this in a software project were understood. He considered that it was wrong to reduce the level of service provided, but that it would be perhaps possible to reduce the level of material purchased. One solution might be that not all of the equipment that had been planned would be provided at first. He had proposed certain measures in the plenary session which would increase the CERN deficit, but these concerned the funding of the detectors and he considered that this computing issue was slightly different. The hardware that was needed for Phase 2 might be reduced, for example by not purchasing all of the tape media, and this was not a negligible cost. In the past a good part of the tape media had been at the cost of the experiments.

J. Engelen thanked all the delegates for their remarks.

**8 Memorandum of Understanding for Collaboration in the Deployment and
Exploitation of the LHC Computing Grid** **D. Jacobs, Task Force Chair**
Paper CERN-C-RRB-2005-001

J. Engelen noted that this new Memorandum of Understanding was a major step forward in trying to clarify whether the services and the capacity for this worldwide GRID, essential for LHC physics, were available and secured in the sense that one did not wish to have to renegotiate, each six months, the contribution to computing for each of the LHC experiments. This MoU had been drafted by a Task Force, led by David Jacobs, which had interacted very intensively over the past year or so.

D. Jacobs noted that the MoU covered the provision of computing resources to the LHC experiments. There had been a strong and conscious effort in the drafting to distinguish this MoU from the question of which software might be used underneath in order to connect these resources together. Hence he wished to stress that this was an MoU for the provision of resources and not an MoU for a particular flavour of GRID software.

The text of the MoU had not changed greatly in the past six months, and in the present form had been available to the RRBs for about three weeks. Comments were requested, and the few such that were received were requests for clarification or for additional details, notably about attendance or who would represent the various centres towards the collaboration that would be set-up through this memorandum. Perhaps the greatest change in the past 6 months had been the completion of the material in the annexes. In this area the progress had been quite dramatic, inasmuch as they started with almost no information, and yet they had now something which was, for a first open-ended pass, a very satisfactory view of the plans of the major centres. The Tier 1 centres were well known, whilst the Tier 2 centres were in a more fluid situation, with more centres appearing regularly.

He hoped that, baring perhaps an additional clarification of the relationship of this collaboration to the LCG project, and the completion of the numbers of the individual agencies concerned, there could be agreement at this meeting that this document had now reached a state where one could move towards the signatures by the agencies.

J. Engelen thanked D. Jacobs for his clear introduction and opened the floor for questions and discussion.

Discussion

R. Wade stated that, from the UK perspective, and subject to the qualifications mentioned by D. Jacobs, they were happy to sign the MoU in its present form. He noted that the RRB should be aware that the MoU represented a long term commitment, and that therefore this had to be on a best effort basis, inasmuch as the exact budgets for the future were as yet unknown. In the short term they were happy to sign up to the numbers in the annexes. J Engelen thanked him for his clear statement.

U. Dosselli announced that, in the same spirit, this version of the MoU was adequate. He noted that, although they were convinced that the exact needs for computing of the experiments were not yet known, and the experiments were still on the road of understanding which was the best way to make the analysis, and hence exactly how many resources were really needed, it was time, by the end of this year, to have a more exact picture of the available resources and their deployment over time. INFN would try, before the next RRB, to provide a more exact picture of the resources available in the Tier 1 centre and written in the annexes. Concerning the Tier 2 centres, they would also be working to define which centres were concerned in Italy, and which resources, including infrastructure and manpower would be available. The Chairman thanked him for this statement.

J. O'Fallon stated that, subject to the clarifications that D. Jacobs had mentioned and the filling in of the details in the annexes, the US found the MoU acceptable. J. Engelen thanked him.

K.P. Mickel stated that Germany also found the MoU acceptable but they had still to discuss some very small details. The Chairman noted that there was time until October.

F. Etienne announced that IN2P3 found the MoU acceptable and would now work upon the numbers to be filled in. J. Engelen thanked him.

F. Bello noted that Portugal was in agreement with the MoU but still needed to work out what to include in the annexes.

D. Espriu announced that Spain also found the MoU acceptable and that they would seek approval from their authorities. J. Engelen thanked him.

D.O. Riska stated that, in order to move forward, Finland was prepared to sign a statement at this moment that they intended to be a signatory to the MoU. A process was ongoing in Finland to create a Tier 2 centre, with a national committee mandated by the Minister for Science to make a proposal by September 15th 2005, after which the political bodies would start the decision process. This might take up to one year. J. Engelen replied that this would be a perfectly acceptable procedure.

S.C. Lin asked the size limit which was necessary in order to qualify as a Tier 2 centre and what was the procedure for them to participate. D. Jacobs noted that the conditions for qualifications were defined in the annexes. If there were new centres not yet included, their names should be sent to him. M. Delfino added that it was also necessary for the experiment concerned to agree.

A. Clark had a number of comments which concerned Switzerland. He had some detailed remarks for the MoU which he would communicate outside the meeting. The planned Tier 2 facility for Switzerland was for three experiments, and corresponded well to the requirements document set out by P. McBride. Their problem was not their intention to sign but rather, given the particular funding structure, to know who should or could sign. This had created problems over many years and could well continue. J. Engelen thanked him for his comments which he took as an agreement to this MoU.

U. Dosselli asked for clarification on how to proceed. Should the Funding Agencies continue to work on the numbers until October when a document would finally be ready for signature or should they start signing different versions? J. Engelen noted that this MoU was on a best effort basis and that he was willing to accept some error margin. He did not wish to hold up signature just because they needed to be sure about the last 20%. D. Jacobs added that, because of the large number of Funding Agencies involved, it would be preferable if each Funding Agency could themselves decide when their planning figures or pledge was at a sufficient level to sign, rather than waiting until the last agency was ready before any of them signed.

U. Dosselli noted it would be nice to have a table where the best efforts were recorded and this could take a long time. The Italian numbers that should be taken should be the ones written in the document that they would sign in the future. He hoped that this would be in October.

The Chairman concluded that the Task Force did its homework well and the preparation of this discussion was also well done, partly because of the many interactions before the final version. He thanked the Task Force for their work and the delegates for their positive reactions.

9 Summary, Future Activities & A. O. B. J. Engelen

The Chairman noted that this very large and important project was going ahead well. The overall project, as reported by the Grid Deployment Board, was growing impressively. The Tier 0 shortfall at CERN was discussed. He assumed that, as a result of the reactions received, the Project Leader would continue bilateral discussions, leading to a clear and final picture of the remaining problem in October.

As the Director General had commented, CERN was very committed to providing its part of the LHC Computing GRID. However, he had stated clearly that the option of adding the shortfall to the CERN deficit was an option that he did not prefer. If it turned out, by October, that there was still a shortfall, they might have to transfer funds foreseen for material into personnel. He trusted that everyone would make all possible efforts.

<p>The next RRB meetings in 2005 will take place at CERN on Monday 17th, Tuesday 18th and Wednesday 19th October 2005</p>

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

Appendix 1

For this 7th Meeting the following papers are available at the Web Site:

C-RRB Meeting of April 19, 2005

[CERN-C-RRB-2005-007](#)

Draft Agenda - J. Engelen

CERN-C-RRB-2005-011 (not available for the moment)

Minutes of the meeting of April 19, 2005 - Chris Jones

[CERN-C-RRB-2005-001](#)

Memorandum of Understanding for Collaboration in the Deployment and Exploitation of the LHC Computing GRID

[CERN-C-RRB-2005-002](#)

Status of the LCG Project - Les Robertson

[CERN-C-RRB-2005-003](#)

LHCC deliberations - E. Tsesmelis

[CERN-C-RRB-2005-004](#)

Status of Common Project Accounts - P. Geeraert

[CERN-C-RRB-2005-005](#)

Status of Resources - C. Eck

[CERN-C-RRB-2005-006](#)

LHC Review of Computing Resources for the LHC Experiments

[CERN-C-RRB-2005-008](#)

Status of the LCG Project - Les Robertson (transparencies)

[CERN-C-RRB-2005-009](#)

Status of Resources - C. Eck (transparencies)

[Update table 6](#) - C. Eck

[CERN-C-RRB-2005-010](#)

Resources in Regional Centres - K. Bos (transparencies)