



Computing Resources Review Board

18th October 2005

Minutes of the 8th Resources Review Board Meeting Held at CERN on 18th October 2005

Present:

Europe:

D. Kuhn (BBWK, Wien), C. Wulz (Observers);
J. Lemonne (FNO, Brussels); D. Bertrand (FNRS, Brussels);
M. Lokajicek (Academy of Science, Czech Rep.);
J. Dines Hansen (Niels Bohr Institute, Copenhagen);
D.O. Riska (University of Helsinki, Helsinki);
J. Ernwein (CEA-Saclay, Gif-sur-Yvette), C. Cavatta, P. Rebourgeard;
F. Le Diberder (IN2P3, Paris), F. Etienne;
J. Richter (BMBF, Bonn), D. Müller ; S. Bethke (MPI, Stuttgart); K.P Mickel (FZK, Karlsruhe); V. Gülzow (DESY); P. Malzacher (GSI);
E. N. Gazis (National Technical University of Athens) (Observer);
G. Vesztegombi (KFKI-RMKI, Budapest);
U. Dosselli (INFN, Roma), F. Ferroni, M. Mazzucato;
F. Linde (NIKHEF, Amsterdam), A. J. Van Rijn;
B. Jacobsen (Norwegian Research Council, Oslo);
G. Polok (State Committee for Scientific Research, Warsaw);
G. Barreira (LIP, Lisboa), F. Bello (ICCTI, Lisboa);
N.V. Zamfir (Institute of Atomic Physics, Bucharest);
V.I. Savrin (Ministry of Science, Moscow);
A.N. Sissakian (JINR, Dubna);
D. Espriu (MEC, Madrid);
A.C. Lagerkvist (Swedish Research Council, Stockholm);
A. Clark (CHIPP, Genève);
G. Zinovjev (National Academy of Sciences of Ukraine, Ukraine) (Observer);
R. Wade (PPARC, Swindon);
E. Rabinovici (Racah Institute of Physics, Jerusalem), S. Tarem;

N. America:

N. Marcotte (NSERC, Ottawa), R. Orr;
M. Pripstein (NSF, Washington), M. Goldberg, H. Gordon;
J. O'Fallon (DOE, Washington), T. Ferbel, S. Gonzalez;
L. Bauerdick, D. Green; J. Huth, J. Shank, M. Tuts;

Asia:

C.V. Anandabose (DAE, Mumbai);
A. Mori (University of Tokyo), S. Terakado, T. Kawamoto;
Do-Win Kim (Ministry of Science and Technology, Korea), G. Kim (Observers);
S.C. Lin (Academia Sinica, Taipei), S.C. Lee;

Australia:

S. Tovey (AUSHEP, Melbourne);

CERN:

R. Aymar (Director General), J. Engelen (Chairman), C. Jones (Secretary),
P. Geeraert, D. Jacobs, A. J. Naudi, D. Schlatter, E. Tsesmelis, W. Von Rueden;

LCG:

L. Robertson, K. Bos, C. Eck;

ALICE:

J. Schukraft, Y. Schutz;

ATLAS:

P. Jenni, D. Barberis, F. Gianotti;

CMS:

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

LHCb:

T. Nakada, N. Brook;

8th Meeting of the Computing Resources Review Board RRB, 18th October 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, Chief Scientific Officer

J. Engelen welcomed RRB delegates to this 8th session, noting that they were very numerous, pointing to the importance of computing as one of the pillars of the LHC Programme. He trusted that the numerous people would contribute to raising some of the money needed to complete the computing project.

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

The minutes of the 8th meeting, CERN-C-RRB-2004-011, were **approved** with no corrections. J. Engelen thanked C. Jones for having taken these minutes. There were no matters arising.

3. Status of the LCG Project

L. Robertson, Project Leader

Paper CERN-C-RRB-2005-102

Presentation CERN-C-RRB-2005-108

L. Robertson reported on the status of the LCG Project. The details are reported both in his paper and his presentation, which are both referenced above, and are not further abbreviated in these minutes.

He summarized the current status as follows:

- The scale of the underlying grids was already at/beyond the target level
- Basic operational environment had been established
- There was good and growing collaboration between operations centres
- Baseline services had been agreed
- Implementation by the start of the next year was realistic
- Service challenges had progressed
 - from 4 sites last November
 - through 7 sites in April
 - to ~20 sites in SC3 - including all major centres
 - lots of problems were being identified – and solved
 - reliability metrics were being defined – for SC4
 - end-to-end performance was below targets – some problems were understood, but more experience was needed
- Applications medium term plan had been agreed
- Database services were still to be decided and deployed, and for this there a workshop was currently taking place.

He concluded by emphasizing that first data would arrive in less than two years. CERN and the Tier 1 centres had to provide an integrated and reliable service for the bulk data right from the first beams. It was NOT an option to get things going later. The priority had to be to concentrate on getting the basic service going, setting modest goals, choosing pragmatic solutions and developing collaboration.

Discussion

J. Engelen thanked L. Robertson for his presentation and asked for questions at this time. He noted that there would be shortly a presentation from the scientific secretary of the LHCC on their review of the Computing Technical Design Reports. He pointed out that the Chairman of the Grid Deployment Board, K. Bos, was also present at the meeting.

M. Pripstein asked whether the outstanding issues in SC3 would compromise SC4. L. Robertson hoped that they would not. The main issues concerned the functioning of the mass storage system

and the way in which data transfer interacted with the mass storage systems. SC3 was the first time that the mass storage systems had been used as part of a challenge at many sites and there had been a number of difficulties. A workshop in August had focussed on how to configure one of the mass storage systems which was being widely used, namely dCache from DESY. This gave some immediate improvements. A new version of dCache to address some of the issues was just being made available. The system at CERN had some difficulties as well and on which they were working. They hoped to overcome these problems by the end of the year, in plenty of time for getting the service phase going in May 2006. However they were not yet at the end of finding all of the problems.

There were no further questions. J. Engelen noted that the last transparency underlined the importance of point 7 on this agenda under which the RRB would discuss the MoU which would guarantee this integrated and reliable service that was so vital to the success of the LHC Programme.

J. Engelen explained that the LHCC had conducted a review of the experiments' computing TDRs and the LCG TDR only very recently. Their final report would only be available after the November LHCC Meeting. However it had been felt important to give a first feedback to the C-RRB, basically to confirm the health and soundness of the project such that there was a basis to continue and later to sign the MoU. After a discussion with the Chair of this Review Panel, P. McBride, the LHCC scientific secretary, E. Tsesmelis, had agreed to summarize briefly the initial conclusions of the Review.

4. LHCC Deliberations

E. Tsesmelis, LHCC Scientific Secretary

Presentation CERN-C-RRB-2005-103

E. Tsesmelis presented findings of the LHCC Review of the Computing TDRs which had taken place on the 7th and 8th October 2005. The TDRs had been submitted to the LHCC in June 2005 and the mandate had been to review the five TDRs (ALICE, ATLAS, CMS, LHCb, LCG) with emphasis on the computing models, resource requirements, manpower, milestones and management.

The Review Committee Membership was:

- Chair: P. McBride
- Representatives from the LHCC: S. Bertolucci, K. Borras, F. Forti, S. de Jong, M. Martinez-Perez, V. Kekelidze, B. Peyaud
- External members: D. Boutigny (Annecy), T. Haas (DESY), C. Bozzi (INFN Ferrara), A. Campbell (DESY)

The review process was still ongoing and the final report would be available for the November 2005 session of the LHCC.

He made some general comments:

- the Service Challenges formed the backbone of conditioning plans for the WLCG. SC-3 was underway but was one month behind schedule and much work remained to be done.
- All experiments had included the need for a CERN Analysis Facility (CAF) in their computing models. This facility would be important for calibration and alignment and for early user analysis.
- Strong management of the systems would be required.

As preliminary observations:

- The TDRs contained reasonable conceptual designs of the computing systems. However:
 - These models remained essentially untested.
 - This was particularly a problem for the distributed analysis models.
 - Tier 0 planning was the most advanced.
 - Much would become known by September 2006 as many system tests, including tests of large-scale distributed analysis, were planned.

- The Review Committee urged the computing management to proceed with caution and to re-evaluate the resource planning regularly so that most computing resources were purchased only when needed. However there was a need to proceed with planned purchases in 2006 so that infrastructure could be put in place and large-scale system tests could advance.
- The Review Committee supported the first steps of the transition of the LCG towards a global LHC “computing centre”.
- A balance amongst the experiments for resources outside of CERN would be difficult to achieve. An estimate of the missing resources for each experiment had been made.
- ALICE was currently missing ~50% of its required resources (CPU, disks, tapes)
- For ATLAS and CMS:
 - The LHCC did not see any significant difference in the fundamental computing needs between ATLAS and CMS.
 - The differences in their requests depended mainly on the details of the computing model in the use of disk versus tape.
 - This was a concern and had to be resolved.
- A plan was needed to support the computing and software infrastructure after the funding for EGEE and other GRIDs would come to an end. This should be included in the MoU process.
- Planning for computing needed to be linked more strongly to the physics needs of the experiments. A suggestion here was for a Computing Physics Coordinator.

J. Engelen thanked E. Tsesmelis for his presentation and asked for questions. There being no questions J. Engelen noted that things were therefore very clear. Missing resources had to be found and seeing how numerous were the delegates around the table he had no doubt that they would find those resources in the near future.

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-2005-104

P. Geeraert noted that he would be brief as no new information had arrived since his paper had been written.

Delegates should note that in Phase 1 expected contributions up to 2005 amounted to 21.9 MCHF and they had received so far 19.3 MCHF. Commitments were slightly above contributions received by 300 kCHF. On the CERN Budget they had spent so far 88 MCHF on this project, of which 37.7 on materials and 50.4 on personnel.

For the first time they had added a page on Phase 2 which was just starting. Delegates could see that they had end of year estimates for expenditure of about 3 MCHF altogether.

Discussion

U. Dosselli commented that there was a negative number in the report for Italy for 2005. This invoice was being settled. J. Engelen thanked him for this clarification.

D. Espriu also commented that according to his information the missing 150 KCHF from Spain should now have been received by CERN. J. Engelen thanked him for this information.

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-2005-105

Presentation CERN-C-RRB-2005-109

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 for both Phases 1 and 2. He would also give a summary of the computing capacities in WLCG Tier 1 and Tier 2 centres. Further details could be found in his written paper CERN-C-RRB-2005-105 and in Annex 5 of the WLCG MoU CERN-C-RRB-2005-001/Rev. This presentation would give some of the key numbers and the proposed materials budget for 2006.

He showed the tables of the Phase 1 contributions, and given that this was the last C-RRB before the end of Phase 1, he wished to point out certain numbers. Voluntary externally funded personnel would amount to 223.1 FTE years, valued at 26.5 MCHF. This corresponded to 33% of the total manpower for LCG-1 at CERN. External funding of materials at CERN for Phase 1 amounted to the impressive number of 10.3 MCHF. This corresponded to nearly half the materials expenditure for LCG-1 at CERN. Given these two impressive results, one could only conclude that the call for voluntary contributions for LCG Phase 1 was a major success. In addition, since these contributions came on top of the large effort required to prepare the WLCG regional centres, the people concerned had made a very special effort and were thanked very gratefully.

Thus LCG Phase 1 at CERN ended with a balanced budget, as already predicted in the April C-RRB. Details could be found in the written report.

He then turned to resources for Phase 2. Since the last C-RRB a new Annex 6.6 had been added to the WLCG MoU entitled “Pledges by Funding Agencies for Common WLCG Resources at CERN”. Funding Agencies from Germany, India, Italy, Portugal and Taipei were at the moment listed in Annex 6.6 with resource pledges. He thanked these five Funding Agencies and encouraged those who were not yet included in this list to join. The latest news were that Russia (FASI & JINR) were ready to pledge 3 FTE-years per year.

Looking at the capacities of the Regional Centres he showed a summary of the current capacity planning of external Tier 1 and Tier 2 centres. Details for each contributing centre or federation and for the Tier 0 and CERN Analysis Facility were listed in Annex 6 of the MoU. The comparison between offered and required capacity was made for the year 2008, the first full year of LHC running. Requirements were taken from the Computing TDRs of the experiments. The tables were dynamic and changing daily, mainly upwards. Delegates were invited to look at the report for details, but in summary the Tier 1 planning showed for 2008 a shortfall of 17% in CPU, 25% in disk space and 36% in tape capacity. In the Tier 2 planning for 2008 there was a shortfall of 22% in CPU and 24% in disk space. There were 30 Tier 2 centres included in this table, and 9 more centres planned to join as soon as possible. These were listed in Table 6 of the report. However the planning for capacity for the ALICE experiment gave rise to some concern as had been discussed by the LHCC Review.

Turning to the Phase 2 Materials Budget at CERN, C. Eck noted that it had been decided at the last C-RRB to allocate available funds with priority for personnel. This balanced the LCG Phase 2 personnel budget at CERN. Major changes to the Phase 2 materials budget at CERN since April were:

- Italy had increased its voluntary contribution to common WLCG resources at CERN (43.5 FTE-years during 2006–2008), reducing the required personnel costs at CERN by 1 MCHF, which would be available for the materials budget.
- A shift of 3.7 MCHF materials budget from 2007 to 2006 was made to help the creation of a balanced budget for 2006.

He then showed the proposed budget for 2006, together with an outlook until 2008, not including the 1 MCHF discussed above (see the paper for details). The 2006 budget was nearly balanced, with nearly all of the money coming from the CERN budget. Infrastructure and Tier 0 spending

corresponded fully to the original profile. CAF spending had been re-profiled by postponing purchases to 2007 and 2008, still leading to full CAF functionality in 2008. Cuts elsewhere in IT Dep. would cover the small negative balance in 2006. He asked the C-RRB to agree to the proposed 2006 budget.

Discussion

J. Engelen thanked C. Eck for his presentation, and asked for questions.

R. Wade noted that the RRB was being asked to agree a 2006 budget which was balanced, but only at the expense of pushing expenditure downstream. He wanted to know what plans were in place if the RRB did not plug this downstream gap. J. Engelen noted that this was not a new problem, and they had forced a solution for 2006 in order not to stop the project. Formally there was no solution available at the moment, and they would welcome additional voluntary contributions. In this they were not looking at those Funding Agencies that already made a very large effort, as had been made clear in the presentation. All they could do from next year onwards was to improvise gymnastics in order to preserve the functionality for the CERN Tier 0 plus the CAF. The CAF had been emphasized by the LHCC Review Committee as something essential to the experiments. There might be some improvement in prices but he was advised not to hope too much in this direction. Another method would be voluntary contributions, and a third method could be for the CSO and CFO to prepare a plan for the Director General. The problem that R. Wade raised was not a new problem, but equally it had not gone away.

The Director General noted that the decision had been made clearly to give priority to the manpower. CERN had paid for this and there could be some additional help from external FTEs. There was a materials bill of 80 MCHF to be purchased up to 2008. In calling for tenders the results could be high or low by 20% with respect to the estimates. They would of course delay any purchases as long as possible. They would see the real situation in 2007/2008.

R. Wade appreciated these comments and agreed that CERN had been doing all it could to help. He thought the issue was as follows. It had been pointed out that Phase 1 had been a great success in external funding. A very significant contribution in this had been made by the UK, and this had been a deliberate investment by the UK government. In Phase 2 this situation had changed and they were obliged to focus their resources back in the UK, in order to make sure that they had sufficient resources to fund the UK Tier 1. He considered that the very large contribution from the UK in Phase 1 had been masking a problem that was now apparent in Phase 2. There were many people who would profit from this project, and there were many people sitting in this C-RRB. One needed now to consider who would profit from this project, and who was contributing to the project, in order to see where one should be looking in order to obtain more resources. He feared that by continuing to push this problem downstream they would end up with real problems in years that were very crucial for the project. J. Engelen thanked him for these comments, and invited other delegates to make their views known.

G. Barreira understood that a limited number of countries had made an enormous effort in funding Phase 1 of the project. In Portugal there had been no funds available for this in the past three years, but there were now new initiatives and there were some opportunities to recover from the past years with a contribution. It had been decided to sign the MoU, and the effort in providing people had been increased with 7 or 8 new engineers coming to CERN. These were young people who needed training but he expected that after some months they would contribute fully to the project. He hoped that they could sustain this level of manpower throughout Phase 2, and to add some level of material contribution. J. Engelen thanked him for this.

J. Engelen agreed that, whilst some countries had made strong efforts to be involved very early in the GRID, there were a number of other national GRID initiatives that were late for Phase 1 but might be able to contribute to Phase 2, benefiting from new momentum. He asked delegates to bear this in mind when considering whether they could contribute to Phase 2.

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

J. Engelen introduced this topic, pointing out that the process of building a foundation for LCG in the form of this MoU had been started quite a while ago. The contents of the MoU had already been discussed in the RRB. The Project Overview Board had probed the possibilities of the Tier 1 centres to contribute and all signs were good so far. He requested D. Jacobs, as Chairman of the Task Force responsible for creating the text of the MoU, to present the latest version and current situation.

D. Jacobs began by noting that the text of the MoU had changed little from that in front of the C-RRB at the April 2005 meeting. He reminded delegates that in April the C-RRB was in agreement with the draft MoU, subject to the addition of the detailed material in the Annexes and two points of formulation:

- The need to distinguish clearly between the Collaboration that was the subject of this MoU and the LCG Project (a CERN activity).
- The need for a mechanism to regulate publication etc.

In the present draft the two points of formulation had been addressed. In order to do this the subject of the MoU was now everywhere referred to as the Worldwide LHC Computing Grid (WLCG) Collaboration. The name LCG Project was only used in connection with the CERN activity. Within the text of the MoU the newly founded Collaboration Board was charged with oversight (via appropriate subcommittees) of publications, presentations and press releases made in the name of the WLCG Collaboration.

There were three other minor changes since April, namely:

- Article 4.7 referred to a new Annex 6.6, which acknowledged the help that some funding agencies were giving towards solving the under-funding of LCG at CERN.
- Article 12.2 (prior agreements). It was now clarified that this only referred to obligations under this MoU.
- Article 13.1 (liability exclusions). This now put licensing to Members of the LHC Experiments on the same footing as licensing to the Analysis Facilities (this had been forgotten).

The big changes since April concerned the annexes and especially the quantitative annexes which listed the centres, the agencies and the capacity pledges. These changes were particularly in Annexes 2, 4 and 6. It was important to keep in mind that these annexes were subject to rolling update. It was fully expected that new centres would evolve, the names of people responsible could change, new funding agencies could emerge and become members of the C-RRB, and refined capacity plans for the years after 2006, hopefully increases, would be made.

D. Jacobs described in detail the material added to annexes since April. In Annex 1 the Tier 1 list had been completed. In Annex 2 the Tier 2 list had been expanded in a major way and the compositions of the Tier 2 Federations were now acknowledged. In Annex 4 the Funding Agency list had been corrected and completed. Annex 6 included now the Tier 2 capacity plans which was a major change. Some agencies were unable to put down numbers for later years simply because their resource planning did not extend that far. In such cases the implicit assumption was that the numbers to be pledged for the later years would not be less than that for the last year for which figures were given. As stated above the new Annex 6.6 listed the voluntary contributions to the common WLCG resources at CERN.

There had been some other changes to the more textural part of the annexes. In Annex 3 the Minimum Service Levels of various entities were discussed and the way in which such service levels would get reviewed by the operational boards of the WLCG Collaboration was defined. In

Annex 5 some new language had been introduced in 5.1.7 to regulate publication etc. as already described. In Annex 7 the schedule had been updated and in Annex 8 the Programme of Work had been refined and updated, particularly with respect to Service Challenge aims.

D. Jacobs then clarified that the C-RRB was being asked now to approve that the WLCG MoU be sent out for signature. This would amount to an agreement that the document, in its present state, was in a state fit to be signed. If the C-RRB gave its approval, then the MoU text would be considered as final. Each Funding Agency, after confirmation of the pledge and planning numbers for which it was prepared to sign, would be sent a copy for signature.

While it was recognised that, exceptionally, some delay might be inevitable, all Funding Agencies were naturally encouraged to sign as soon as possible such that the deployment of the Worldwide LHC Computing Grid might proceed on a firm basis with the necessary momentum.

Discussion

J. Engelen thanked D. Jacobs for his clear presentation. Before starting the discussion he noted that it had been pointed out that, in Annex 4, the Funding Agencies and their representatives were listed. CERN was however not explicitly listed. This did not mean that CERN was not part of the Computing Resources Review Board; this was not the intention of that annex. He asked for reactions to the invitation to approve and then send out the MoU for signature.

J. O'Fallon had noted several concerns over the many months that the MoU had been under development. He would like to thank D. Jacobs and his Task Force for carefully listening and seriously considering their concerns, and for very often implementing their suggestions for improvements. They were now satisfied with the MoU and considered it ready for signature. They were prepared to move ahead on that front.

K.P Mickel spoke on behalf of the German Tier 1 centre. They had a big problem with the term "responsibility" in 4.2, concerning responsibility for Tier 2 centres. They considered it really impossible that they as a Tier 1 centre could be responsible for resources and service levels in the attached Tier 2 centres all over Germany, in Poland, the Czech Republic and in Austria. D. Jacobs replied that K.P Mickel was perhaps reading too much into the wording at that point. This wording had been introduced to avoid the likelihood that a Tier 1 centre would include in with its numbers, in a way that could not be distinguished, the capacity that it was providing in its role as a Tier 1 and that as a Tier 2. There was in fact no obligation on a Tier 1 centre to take responsibility for Tier 2 centres in the sense of pledging numbers.

S.C. Lin, noting that in Taipei there was a second Funding Agency to be considered which was not yet listed in the MoU, asked how to deal with this situation. It seemed that the MoU was to be signed by just one Funding Agency per country. J. Engelen replied that they could consider organizing themselves nationally such that there was just one signatory, or if necessary they could consider having two separate documents and signatures.

D.O. Riska noted that there was no country named Scandinavia, and although they had listed in the MoU something that had been called a distributed Nordic Tier 1 Centre, he believed that the Nordic Countries, namely the three Scandinavian Kingdoms and the Republic of Finland, would have to sign separately for their contributions to this Tier 1 centre.

F. Linde declared that in the Netherlands they were happy with the text. He admitted that the work in the Netherlands as a Tier 1 centre would proceed independently of whether they signed the MoU today or tomorrow. However in order to sign the MoU they needed some money guarantee in the Netherlands and he thought this might happen as early as December 2005. If not they would work hard on that situation.

B. Jacobsen, on behalf of Norway, thanked the Task Force and its Chairman for the work they had put into finalizing the MoU. He noted that the Nordic Nations had contributed substantially to the

Service Challenges and there was a strong ambition to contribute to the capacity needed for the WLCG as well. The Nordic Data GRID Facility was not yet formally established and he agreed that separate signatures would be needed as discussed above. On the Norwegian side he stressed that the numbers provided were current best estimates and he hoped by the end of the year that they would be confirmed. Nonetheless the MoU currently contained for Norway numbers that were best guesses rather than pledges.

U. Dosselli agreed that the level of the MoU was such that it could be sent around for signature. He agreed also on the procedure. In Italy they still needed to do some homework. He thought that the numbers that could be considered as the integrals for Tier 1 and Tier 2s were correct. They still had to decide how many Tier 2 s would exist in Italy and how they would divide up the resources. This had consequences for manpower and other resources that had to be allocated in different centres. This work was being done and as soon as they would have a final table they would sign the MoU. He also wanted to underline that it was very important, as the LHCC secretary had noted, that the hardware was purchased just in time.

D. Espriu wished to report that, in the case of Spain, the figures for the resources up to 2008 had just been approved. Their pledge had been received just the day before.

T. Kawamoto for Japan appreciated highly the efforts that had gone into the MoU and stated they were happy and ready to sign. Nonetheless the timing of the signature was not yet sure. They were confident that they would get the money but this would take some time. Hopefully this would be not later than spring 2006.

J. Engelen commented that he understood that Funding Agencies wished to be cautious. On the other hand he wished to draw their attention to the total capacity that had been identified, even on the basis of these “soft pledges” added up in the document. One thing that was becoming clear was that the order of magnitude was the right one, but the resources would not be generous. Since everyone was in this together, he expected that people would make every effort to make these pledges materialize. If the comments around the table were based on the feeling that one had to be careful then this was appreciated, but he hoped that these feelings were not a sign of cold feet. F. Linde confirmed that this was not the case for the Netherlands.

J. Engelen noted that some delegates had remained silent and he hoped that this was a sign of agreement. He was pleased that they had taken another step leading to the foundation upon which to build further the WLCG. They would contact Funding Agencies for signature and they would report the new situation to the C-RRB in April 2006.

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

In summary the Chairman noted that the project was making very large steps forward but that it was not quite there yet. The collaboration was becoming living, dynamic and very constructive. The project of a Tier 0 and Analysis Facility at CERN was based on a funding problem which had to be solved, and he asked those that were obtaining new national funding for GRIDS that they should bear in mind the need for more voluntary contributions towards Phase 2.

The next RRB meetings in 2006 will take place at CERN on
Monday 24th, Tuesday 25th and Wednesday 26th April 2006
and on the
Monday 23rd, Tuesday 24th and Wednesday 25th October 2006

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

Appendix 1

For this 8th Meeting the following papers are available at the Web Site:

C-RRB Meeting of October 18, 2005

[CERN-C-RRB-2005-001/Rev.](#)

Final Draft

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

[Memorandum of Understanding](#) - D. Jacobs (transparencies)

[CERN-C-RRB-2005-107](#)

Draft Agenda - J. Engelen

CERN-C-RRB-2005-111

Minutes of the meeting of [October 18, 2005](#) - Chris Jones

[CERN-C-RRB-2005-011](#)

Minutes of the meeting of [April 19, 2005](#) - Chris Jones

[CERN-C-RRB-2005-102](#)

Status of the LCG Project - Les Robertson

[CERN-C-RRB-2005-103](#)

LHCC Deliberations - E. Tsesmelis

[LHCC Review of the Computing Technical Design Reports](#) - E. Tsesmelis

[CERN-C-RRB-2005-104](#)

Status of Common Project Accounts - P. Geeraert

[CERN-C-RRB-2005-105](#)

Status of Resources - C. Eck

[CERN-C-RRB-2005-108](#)

Status of the LCG Project - Les Robertson (transparencies)

[CERN-C-RRB-2005-109](#)

Status of Resources - C. Eck (transparencies)