



**Minutes of the 25th Resources Review Board Meeting
Held at CERN on 22nd October 2007**

Present:*Europe*

V. Simak (Czech Technical University)
 J.D. Hansen (Niels Bohr Institute, Copenhagen, Denmark)
 J. Zinn-Justin (CEA, France)
 F. Le Diberder (IN2P3, Paris, France)
 K. Ehret (BMBF, Germany)
 S. Bethke (MPI Munich, Germany), H. Oberlack
 M. Fleischer (DESY, Germany)
 K. Zioutas (G.S.R.T., Greece)
 E. Rabinovici (Racah Institute of Physics, Jerusalem, Israel), G. Mikenberg
 F. Ferroni (INFN, Italy), M. Curatolo
 A. van Rijn (NIKHEF, Amsterdam, Netherlands),
 B. Jacobsen (Norwegian Research Council, Oslo, Norway), F. Ould-Saada
 J. Królikowski (University of Warsaw, Warsaw, Poland), M. Turala
 F.D. Buzatu (National Institute for Physics, Bucharest, Romania), L. Puscaragiu
 Y. Kozlov (Russian Federal Agency of Science and Innovation), V. Savrin, A. Petrov (Permanent Mission of Russia, Geneva)
 A. Sissakian (JINR, Dubna, Russia)
 A. Sitarova (Ministry of Education of the Slovak Republic, Bratislava)
 M. Mikuz (Jozef Stefan Institute, University of Ljubljana, Slovenia)
 F. Barreiro (Universidad Autonoma de Madrid, Spain)
 J. Fuster (MEC, Spain)
 P. Karlsson (Swedish Research Council, Stockholm, Sweden), T. Ekelöf (Univ. of Uppsala)
 A. Rubbia (ETH Zurich, Switzerland), A. Clark
 I. Turk Cakir (Turkish Atomic Energy Authority, Turkey)
 R. Wade (STFC, United Kingdom), J. Seed

America

W. Davidson (NSERC, Ottawa, Canada), R. Mcperson (Univ. of Victoria)
 E. Henry (DOE, Washington, USA) S. Gonzalez, T. Ferbel, H. Gordon (BNL)
 M. Pripstein (NSF, Washington, USA), M. Tuts, J. Whitmore

Asia

W. Shen (National Science Foundation, China), Y. Zhang, P. Ji
 H. Iwasaki (KEK, Tsukuba, Japan), K. Saito (Permanent Mission of Japan, Geneva)
 S.C. Lin (ASGC, Taipei), C. Chien-Hong (National Science Council)

Australia

S. Tovey (Australian Research Council, Melbourne)

CERN

J-J. Blaising, J. Engelen (chairman), D. Jacobs, C. Jones (secretary), S. Lettow, B. Salami (repl. P. Geeraert),
 S. Schmeling, E. Tsismelis, F. Sonneman, E. Van Hove

ATLAS

P. Fassnacht, F. Gianotti, P. Jenni, M. Nessi, M. Nordberg, S. Stapnes, C. Oram

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

Apologies

E. Gazis (National Technical University, Greece)

25th Meeting of the ATLAS Resources Review Board RRB, 22nd October 2007**1. Introduction****J. Engelen, Chief Scientific Officer**

J. Engelen welcomed the delegates and noted that the Director General would be represented at this meeting by the Directorate. He pointed out that this was the Jubilee Meeting, and he hoped that it would be at least as profitable as any of the previous meetings.

2. Approval of the Minutes of the 24th Meeting (CERN-RRB-2007-002)

The minutes of the 24th meeting were approved with no corrections. J. Engelen thanked C. Jones for having taken these minutes. There were no matters arising.

3. Status of the Experiment

The ATLAS status report would be given in two parts. Firstly the Technical Coordinator, M. Nessi, would report on the status of the hardware and in particular on the installation of the experiment at point 1. The Spokesperson, P. Jenni, would continue the report notably with managerial matters and funding.

3.1 Detector construction and installation (including Common Projects)**M. Nessi**Paper CERN-RRB-2007-070
CERN-RRB-2007-075

Presentation CERN-RRB-2007-080

The ATLAS Technical Coordinator, M. Nessi, showed an impressive set of slides and photographs illustrating the major changes and most substantial progress with the installation since the previous RRB. He presented the achievements and successes, as well as the list of problems that they had faced and overcome. In particular, on slide 5, M. Nessi showed the remarkable achievements of the past six months. He presented the latest version of the completion schedule. He noted that in order to close the detector they would need about two months' notice. The current assumption was that they would close the beam pipe at the end of March or early April 2008.

In addition, M. Nessi presented a paper for information on the Proposals for In-Kind Contributions and Status of the ATLAS Common Projects and Construction Completion. He reported two major adjustments concerning the busbars and the MDT wheels support. These adjustments were **accepted** by the RRB.

Discussion

J. Engelen thanked M. Nessi for this presentation and asked for any questions at this stage of the status report.

M. Nessi clarified the interpretation of the graphic of the distribution of energy in the calorimeter in response to a question from T. Ferbel.

R. Wade acknowledged the remarkable progress in the installation. There were also a number of areas where there was retrofit or repair work. Would these be reflected in the cost to completion? M. Nessi replied that, in the main, this work would not result in new bills to the funding agencies.

3.2 General status of the experiment (including status of completion financing)**P. Jenni**

Paper CERN-RRB-2007-075

Presentation CERN-RRB-2007-076

The ATLAS Spokesperson, P. Jenni, continued the ATLAS Progress Report covering the data acquisition and trigger, computing and physics preparation, LHCC milestones and activities as ATLAS moved towards operation of the experiment. He pointed out the ATLAS Operational model and the Operation Task Sharing, as well as the ATLAS organization to steer R&D for future

upgrades. These are clearly described both in his paper and in the presentation and are not repeated in these minutes. P. Jenni turned to other managerial considerations.

3.2.1 Collaboration News and Management

P. Jenni announced that, since the last RRB in April 2007, three new Institutions had been admitted unanimously to the Collaboration, following the standard procedures defined in the initial Construction MoU:

- Department of Physics, Georg-August-University Göttingen, Germany (HLT, data preparation, grid computing, Pixel upgrade)
- Universidad Antonio Nariño (UAN), Bogotá, Colombia (HLT, computing tools)
- A joint Chilean team formed by members of Pontificia Universidad Católica de Chile (PUC), Santiago and of the Universidad Técnica Federico Santa María (UTFSM), Valparaíso (HLT, computing, electronics engineering)

At the request from the Chairman the RRB **endorsed** the admission of these three new Institutions in the ATLAS Collaboration.

As of October 2007 there were 37 Countries, 167 Institutions and 2000 Scientific Authors (1600 with a PhD, for the calculation of the M&O share) in total in the ATLAS Collaboration.

There were no changes to be reported in the ATLAS management team. The Deputy Collaboration Board Chair, Kerstin Jon-And, Stockholm University, Sweden, would take over as Chairman for two years starting in 2008, whereas the present CB Chairman, Christopher Oram, from TRIUMF would still act for one year as Deputy Chairman in 2008.

3.2.2 Cost to Completion, and initial staged detector configuration

P. Jenni reminded the RRB that the Cost to Completion (CtC) was defined as the sum of Commissioning and Integration (C&I) pre-operation costs plus the Construction Completion (CC) cost in addition to the deliverables.

He noted that ATLAS was proceeding within the framework agreed at the October 2002 RRB, namely:

The following framework was accepted at the October 2002 RRB

(ATLAS Completion Plan, CERN-RRB-2002-114rev.):

CtC 68.2 MCHF (sum of CC = 47.3 MCHF and C&I = 20.9 MCHF)

Commitments from Funding Agencies for fresh resources (category 1) 46.5 MCHF

Further prospects, but without commitments at this stage (category 2) 13.6 MCHF

The missing resources, 21.7 MCHF, have to be covered by redirecting resources from staging and deferrals.

The Funding situation will be reviewed regularly at each RRB, and is expected to evolve as soon as further resources commitments will become available.

He noted that the physics impact of the staging and deferrals was discussed in detail with the LHCC previously. It had to be clearly understood that the full potential of the ATLAS detector would need to be restored for the high luminosity running, which was expected to start only very few years after turn-on of the LHC, and to last for at least a decade.

3.2.3 Main Funding Issues today

P. Jenni showed on slide 29, an updated Financial Overview.

Financial Overview	MCHF
Financial framework:	
Initial Construction MoU 1995	475.0
Updated construction baseline	468.5
Additional Cost to Completion (accepted in RRB October 2002) based on the Completion Plan (CERN-RRB-2002-114)	68.2
Additional CtC identified (mentioned at the last RRB, and now announced in CERN-RRB-2006-069)	4.4
Total costs for the initial detector	541.1
Missing funding at this stage:	
Baseline Construction MoU, mainly Common Fund, (of which 2.8 MCHF are in progress of being paid, and 4,6 MCHF remain at risk)	7.4
2002 Cost to Completion (CC and C&I) calculated shares (of which 2.8 MCHF are in progress of being paid, and assuming that the U.S. will provide their remaining 4.5 MCHF on a best effort basis, 2 MCHF remain at risk)	9.3
It must be stressed that all these resources, already specified in the 2002 Completion Plan, are needed to complete the initial detector	
Note that not included are:	
- This assumes beam pipe closure end August 2007, later dates would imply additional manpower costs of 200-400 kCHF per month	
- No provision for future 'force majeure' cost over-runs	
- Restoration of the design-luminosity detector, estimated material costs of parts not included in present initial detector (CERN-RRB-2002-114)	20.0
- Forward detectors parts (luminosity) not funded yet	1.5

P. Jenni acknowledged the efforts made by the Funding Agencies in order to reach the present situation. The full details on the cost to completion funding could be found in CERN-RRB-2007-075.

Discussion

J. Engelen asked at this point whether there were any questions concerning the financial issues, referring back to slide 29. He noted that all the money that was at risk was really necessary and that it was fortunate that a large majority of the Funding Agencies did indeed contribute in accordance with that which was requested and agreed. However, for the last millions, ATLAS and the CERN Management were working with those Funding Agencies from whom a contribution was still due or expected. If this money were not to be found ATLAS would have to de-scope items such as the high level trigger. The missing money was decreasing, but at a rate which he would like to see improve.

The costs of re-scoping the detector to its full capacity were not for tomorrow, but would come soon. CERN was planning to contribute its share to this re-scoping and he trusted that the Funding Agencies were planning the same.

S. Lettow, the CERN CFO, emphasized that CERN was no longer in a position to help, since the CERN financial situation was so tight in 2008 that the margin was really down to zero.

R. Wade commented that the numbers missing were quite small, as was the remaining time before initial operation. What was the level of risk to the physics, were the money not to turn up?

P. Jenni replied that they would have to be much more restrictive on the level 1 trigger. Therefore parts of the physics could not be done. All emphasis would remain on the major discovery channels but certain other physics, such as B physics, might have to go.

J. Engelen said that, from his side, he would find it unacceptable that the physics be put at risk.

3.2.4 Conclusion

P. Jenni continued his presentation, reporting on the work underway in order to prepare for the first physics analyses and the physics that they expected to see (slides 32 to 41). He concluded by noting that:

The ATLAS project was proceeding within the framework of the accepted 2002 Completion Plan, and all the resources requested in that framework were needed to complete the initial detector, which were then also just sufficient to cover the additional CtC costs reported in 2006.

Construction and installation would end soon, and the emphasis had already shifted strongly on to the commissioning and the start-up of operation.

The most critical detector issue was the delay of the Inner Detector in-situ commissioning, which had an impact on the overall installation completion as M. Nessi has shown (other critical issues remained the calorimeter electronics and muon power supplies).

Very major software, computing, trigger, data preparation and physics activities were underway.

The worldwide LHC Computing Grid (WLCG) was the essential backbone for all distributed computing resources.

Commissioning and planning for the early physics phases were in full swing.

ATLAS was on track for the eagerly awaited LHC physics.

Since ATLAS expected to remain at the energy frontier of HEP for the next 10 – 15 years, the Collaboration had already set in place a coherent organization to evaluate and plan for upgrades in order to exploit future LHC machine high luminosity upgrades.

Discussion

J. Engelen thanked M. Nessi and P. Jenni for their very clear, impressive and complete overview of the ATLAS progress and plans for the near future. He asked whether there were any further questions.

K. Ehret noted that ATLAS required some 600 FTEs for initial operation. He wondered whether this would decrease with time. P. Jenni replied that people expected that this might indeed be so, but that at this stage they could not plan for this.

A. Rubbia asked whether the upgrades were considered to be part of an approved CERN programme or were they still to be approved. P. Jenni considered that the LHCC was the natural place to have an overview of these upgrades and they would ask them at some stage to be involved. J. Engelen considered that there were three stages. The 20 MCHF was already part of the approved programme. Then there was a possible upgrade related to operational experience. There was also the project that would relate to the 10^{35} luminosity upgrade. The formal decision for the latter would not happen before 2011 or so. However the R&D for such an upgrade needed to be done in the meantime and they had in place the LHCC committee which would scrutinize such proposals. Alan Clark considered it extremely important that CERN make a statement concerning the approval of R&D related to upgrades, since in many cases even the R&D funding was being

blocked by the lack of an explicit statement. J. Engelen was happy to discuss this at the next LHCC and hence to provide such a document.

4. LHCC Deliberations (paper only)

E. Tsesmelis, LHCC Scientific Secretary
CERN-RRB-2007-079 rev.

J. Engelen noted that the RRB should take into consideration the paper on the LHCC Deliberations provided by the scientific secretary of the LHCC, E. Tsesmelis. The contents were consistent with the previous presentations and confirmed that the LHCC was in agreement with the reports. Delegates had no further comments to make and the RRB **took note** of the report of E. Tsesmelis.

5. Financial Matters

Paper CERN-RRB-2007-077

B. Salami, Finance Department

Presentation CERN-RRB-2007-078

B. Salami presented a financial update on the situation reported at the end of August 2007 in his paper referenced above. For the Common Fund, CC and C&I they had received new contributions from Canada, China, France IN2P3, JINR and USA for a total of 1.75 MCHF.

There were outstanding contributions to the Common Fund, CC and C&I, shown in detail in slide 3, amounting in total to 11.32 MCHF, including 9.62 MCHF in cash contributions and 1.07 MCHF for C&I contributions.

Additional payments for the M&O-A for a total of 2.03 MCHF had been received from China, Czech Republic, Greece and USA.

Outstanding contributions to M&O-A now amounted to 2.60 MCHF, including 1.53 MCHF for 2007 and 1.07 MCHF for all previous years (slide 5).

Discussion

There were no questions on this presentation.

6. Construction Budgets

Paper CERN-RRB-2007-071

M. Nordberg, Resources Co-ordinator

Presentation CERN-RRB-2007-074

M. Nordberg noted that the full tables and detailed explanations were to be found in the paper, whilst the presentation would contain only summaries. His first slide re-stated a number of definitions that he used in the documents.

6.1 2007 Budget update for information

M. Nordberg presented the evolution of the baseline commitments which showed that essentially all the funding had been committed, except for the trigger DAQ, which was at 90% of the foreseen number. By the end of 2007 the construction funding would be complete in terms of payments. M. Nordberg presented the current budgets in detail for information only.

6.2 2008 Budget for approval

M. Nordberg presented the 2008 baseline budget for approval. He presented Annex 2 from his paper which summarized the status of all the contributions. From the baseline they needed to use about 6 MCHF as deferrals in order to fund the cost to completion.

M. Nordberg presented the projected budget balance (Table 7) for ATLAS. This had changed little since April and they expected a total cumulative budget deficit of 3 MCHF by the end of 2010. This assumed that they would not get all the due contributions, and hence showed the risk to which they were exposed. Should they get all of these outstanding contributions, they would not be in

deficit. Technically this could be balanced by using 3 MCHF for the trigger DAQ but they hoped they would not have to cripple the physics in this way.

M. Nordberg presented his understanding of these budget balance problems in slide 11. He thanked Russia and JINR for having made very good progress. The Canadian problem had not yet been resolved. The situation for the USA was related to the timing of their fiscal year and the money was coming in. He thanked China for resolving some outstanding payments.

The technical problems encountered in the Inner Detector had been solved and the Funding Agencies concerned had agreed to step in and help to pay for this. The cost of keeping the commissioning crews beyond the foreseen date of August 2007 had not been included and they would come back to this point at RRB in April 2008. He thanked a number of Funding Agencies who had made advanced contributions which were very helpful.

Discussion

The RRB **approved** the 2008 ATLAS construction budget.

7. M&O Budgets

Paper CERN-RRB-2007-073

M. Nordberg, Resources Co-ordinator

Presentation CERN-RRB-2007-074

7.1 2008 M&O Budget Estimates

M. Nordberg then presented the 2008 M&O-A Budget Estimates which amounted to 14.1 MCHF, including 2.2 MCHF for energy. The major components were technical services (4.0 MCHF), magnet operation (2.9 MCHF), core computing support (1.8 MCHF) and on-line computing (2.3 MCHF).

The 2008 M&O-B Budget estimates amounted to 6.9 MCHF including technical services (3.0 MCHF), electronics replacements and rental (1.7 MCHF), operation of SR1 (0.7 MCHF) and 98 FTEs for core computing effort in-kind. He noted that gases and coolants had been moved into category A which led to a small shift with respect to the numbers shown in April.

The graph of the evolution of M&O from 2002 to 2010 showed a small dip in 2010, as identified by the Scrutiny Group, but they would rise up again in 2011 (replacements of the trigger DAQ).

7.2 2008 M&O in-kind contributions

M. Nordberg presented two new in-kind contributions for the approval of the RRB. An excellent collaboration with JINR for surveyors was being extended to 2010 for 165 kCHF. For core computing (I&S) multiple Funding Agencies were contributing a total of 870 kCHF. The RRB **approved** these contributions.

7.3 Status of M&O Signatures

The MoU for the M&O had been signed by 38 out of the 40 Funding Agencies and ATLAS was still waiting for Argentina and Brazil.

7.4 Status of due M&O contributions

M. Nordberg presented the list of contributions (Categories A and B) which were due by the end of 2006 or earlier and which had not been paid by the end of August 2007 (slide 18). He noted that ATLAS had a procedure in place, which was somewhat harsh, but which had helped them enter into a dialogue in these cases. Global plans to restore the balance had been made through discussions with the Funding Agencies concerned, although in some cases this was expected to take some time.

7.5 M&O Scrutiny Group Report**G. Lafferty. Scrutiny Group Chair**

Paper CERN-RRB-2007-112

G. Lafferty, chairman of the M&O Scrutiny Group, presented some remarks specific to the ATLAS experiment, having already presented the general part of his report during the RRB Plenary Session. The Scrutiny Group had examined the M&O-A budget essentially line by line.

The increase in FTEs for the core computing from 16 to 20 was discussed in detail and the scrutiny group was convinced that this was good use of resources and that the four people existed and were identified. Moving the cost to Cat A seemed a very sensible way to maintain their expertise within the collaboration.

The transfer for the costs for gas from Cat B to Cat A was also examined and the Scrutiny Group was convinced that sufficient care had been taken in getting the costs correct and in line with the costs of the other experiments. On the associated issue of resolving the technical problems in re-circulating the gas for the RPCs, the Scrutiny Group felt that good progress had been made by ATLAS and CMS working together.

The costs of the Service Agreements, which would increase in the future, were examined and considered to be good value.

The build-up strategy for the trigger DAQ and the on-line created some concerns, with ATLAS building up their systems slightly faster than CMS, and if one simply mapped the projected replacement strategy into the future, there is a dip in the M&O for 2010 but quite a large increase in 2011. It was felt that in all probability something would happen to allow them to smooth this in the future.

The issue of IT Department and video-conferencing, on particular interest notable to the USA and Canada and other far-away countries, centred around the concerns that the facilities available were not really sufficient to meet the needs. He understood that ATLAS were hoping to sign a service level agreement with IT department quite soon which would go some way towards solving this problem and that money was ear-marked for this.

The Scrutiny Group had looked in considerable more detail than usual at the M&O-B and they were perfectly content with what they had seen there. Overall they recommended approval of the ATLAS M&O Budgets.

Discussion

J. Seed asked for an explanation of the rationale of moving the gas costs from M&O-B to M&O-A, and whether this was now being treated consistently across all of the experiments. M. Nessi replied for ATLAS that, after a global review across the experiments, this was now consistent and handled by central CERN contracts. G. Lafferty agreed that ATLAS was now in line with the other experiments. In response to T. Ferbel, G. Lafferty replied that the gas costs amounted to about 7 to 8% of the budget.

J. Engelen thanked G. Lafferty for his report and asked the RRB to approve the ATLAS 2008 M&O Budgets. This was **approved**.

8. M&O Scrutiny Group in 2008**J. Engelen**

J. Engelen returned to the issue raised in the Plenary Session by G. Lafferty, namely that of replacing some members of the Scrutiny Group whose term of appointment was at an end. J. Engelen was looking for a replacement for the scientific secretary. He was also still looking for a delegate to represent the smaller member states. M. Pripstein noted that the USA had already started the process of selecting a candidate to replace the USA member and would provide the name shortly. There was also a member need to represent France or perhaps a large member state.

G. Lafferty emphasized the importance of finding members who would perform this work seriously and willingly. J. Engelen would communicate with members of the RRB via email whilst they were establishing the new composition.

9. Summary

J. Engelen

J. Engelen summarized the meeting by noting that ATLAS was again, in an impressive way, converging towards completion, and also preparing to be in a position to take the first data as soon as they became available. There remained some resource issues to be solved, relatively small but not at all negligible. They would continue to work with those concerned in order to solve these. He was confident that they would find solutions.

M. Pripstein noted that John O'Fallon, who had represented the USA DoE for all of the previous RRBs, and who was perhaps the longest serving member, had now taken retirement. M. Pripstein wished to acknowledge his major contribution to these meetings to express how much his efforts had been appreciated. J. Engelen fully agreed and had written to John O'Fallon in this sense.

<p>The next RRB meetings in 2008 are provisionally scheduled to take place at CERN on Monday 14th, Tuesday 15th and Wednesday 16th April 2008 and on Monday 10th, Tuesday 11th and Wednesday 12th November 2008</p>

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

C. Jones
November 2007