



ALICE

4 June 2008

## Minutes of the 24th LHC Resource Review Board Meeting (CERN, Geneva, 14th April 2008)

### Present:

M. Sumbera (Nuclear Physics Institute ASCR, Czech Republic)  
 J. D. Hansen (Niels Bohr Institute, Denmark)  
 D-O. Riska (Helsinki Institute of Physics, Finland)  
 B. Erazmus (CNRS/IN2P3, France)  
 J. Zinn-Justin (CEA Saclay, IRFU/DIR, France)  
 P. Braun-Munzinger (GSI, Germany)  
 D. Müller (GSI-PT, Germany)  
 R. Santo (Institut für Kernphysik, University Münster, Germany)  
 E. Gazis (NTU-Athens, Greece)  
 G. Vesztegombi (KFKI-RMKI, Hungary)  
 R. Veeraraghavan Pakshi (DEPARTMENT OF ATOMIC ENERGY, India)  
 E. Nappi (INFN, Italy)  
 G. Fortuna (INFN, Italy)  
 P. Giubellino (INFN, Italy)  
 A. Van Rijn (Nikhef, Netherlands)  
 B. Jacobsen (The Research Council of Norway, Norway)  
 D. Roehrich (University of Bergen, Norway)  
 J. Krolkowski (University of Warsaw, Poland)  
 J. Bartke (Institute of Nuclear Physics PAN, Poland)  
 T. Siemiarczuk (Soltan Institute for Nuclear Physics, Poland)  
 J. Choi (Ministry of Education, Science and Technology, Republic of Korea)  
 D. Lee (KICOS, Republic of Korea)  
 Y. Baek (Kangnung Univ., Republic of Korea)  
 F. Buzatu (Institute of Atomic Physics, Romania)  
 R. Lednicky (JINR, Russia)  
 V. Savrin (SINP MSU, Russia)  
 A. Vodopyanov (JINR, Russia)  
 L. Sandor (Slovak Academy of Science, Inst. of Experimental Physics, Slovakia)  
 P. Ladrón De Guevara (CIEMAT, Spain)  
 P. Karlsson (Swedish Research Council, Sweden)  
 J. Seed (STFC, United Kingdom)  
 D. Evans (University of Birmingham, United Kingdom)  
 G. Lafferty (University of Manchester, Scrutiny Group Chair)

### CERN

J. Engelen, S. Lettow, E. Tsesmelis, D. Jacobs, R. McLaren (Secretary), J-J. Blaising, J. Salicio-Diez, S. Schmelling, S. Moos, P. Geeraert, E. Van Hove, R. Heuer (DESY and CERN Director-General Designate)

### ALICE

J. Schukraft, J. de Groot, C. Decosse, L. Leistam, F. Antinori, Y. Schutz

### Apologies

M. Supin (Academy of Science, Slovakia), A. Sissakian, (JINR, Dubna, Russia)

Documents can be found in the RRB indico pages; accessible via the LHC-RRB home page

<http://committees.web.cern.ch/Committees/WelcomeLHCRRB.html>

**1. Welcome.** J. Engelen, Chief Scientific Officer

J. Engelen welcomed delegates to the 24<sup>th</sup> meeting of the RRB. He introduced the new scientific secretary, R. McLaren.

**2. Approval of the minutes of the last meeting.** J. Engelen, Chief Scientific Officer  
CERN-RRB-2007-121 (report)

The minutes of the last ALICE RRB were approved without comment.

**3. Status of the experiment.** J. Schukraft, Spokesperson  
CERN-RRB-2008-019 (report) CERN-RRB-2008-020 (presentation)

In the last collaboration board, four institutes became full members of ALICE; Purdue (USA), Tennessee (USA); Yonsei (Korea) and Pusan (Korea) which replaces Pohang. In addition Istanbul (Yildiz Technical University, Turkey) has been admitted as associate member.

IPE Karlsruhe (Germany), an associate member, has left ALICE having completed its technical contribution to the TRD electronics. There are ongoing discussions with Houston (USA), and two institutes from Pakistan.

Several elections and nominations have taken place since the last RRB. Four members of the management board were re-elected for 3 years; E. Nappi (Bari), R. Kamermans (NIKHEF/Utrecht), Y. Schutz (Nantes), and J.P. Revol (CERN). In addition, the chair of the Editorial Board, H. A. Gustafsson (Lund) was re-elected for a second term of 3 years. Since the 5<sup>th</sup> of April, L. Leistam is Technical Coordinator (TC), the deputy TC is W. Riegler. J. Schukraft paid tribute to C. Fabjan, who lead ALICE as TC from 2001 to 2008.

In April 2008, an ALICE Industrial award was presented to Xilinx Inc, San Jose, CA for collaboration and support of FPGAs which are used in several detectors.

Turning to financial matters, the DOE final review of EMCAL was positive and the project is now approved and funded in the US. J. Schukraft expressed his gratitude for help from groups in France, Italy and CERN. The total cost of the EMCAL project is 13.5 MUS\$ which does not including R&D, EMCAL support, common fund contribution (~ 500 k CHF) or computing.

The construction of the super-module in the US started in April. The first 2 units, one from US, one from France/Italy, could be ready for installation during the winter shutdown of 2008/9. The rate of progress of the project is limited by cash flow and attempts are being made to accelerate production in order to allow the EMCAL to participate in the first high luminosity run foreseen at the end of 2011.

Computing resources are being discussed with the US. Since resources are proportional to PhDs and assuming 40 PhDs, this would mean a US contribution at the level of 7% of the computing needs. A computing plan has been submitted to the DOE and is under discussion.

In March 2008, there was a biennial STFC Programmatic Review in the UK. J. Schukraft asked if the UK delegate would like to make a statement about the process and the status. J. Seed explained that the UK undertook a programmatic review of funding for experiments every two years. The aim is to ensure that funding is aimed at high-priority areas. The scheduled programmatic review also coincided with the outcome of the UK spending review, which sets the budget for three years. The outcome showed a funding shortfall of 80M £ over 3 years. The Programmatic Review classified and re-prioritised all scientific activities and grants. The ALICE experiment was deemed by the review to be a lower priority project and consequently the funding is now at risk. The review is still on-going with a consultation period. The final outcome will be made public before July 1st.

J. Schukraft then described the likely impact on ALICE. The UK Birmingham group is the 10th biggest group in ALICE. Birmingham are involved in physics, playing a significant role in analysis (particle production, strangeness, cross sections..). More important in the current context is their hardware involvement, where they have sole responsibility for the production/commissioning/expert operation of the trigger. The trigger is made up of hardware (electronics), firmware (specialized low level code) and software (UI). The hardware production and installation of components is complete. However, commissioning of the firmware has only just begun; this will not be complete until sometime after the first Pb run (end 2009). In addition, in the longer term, expert operation and intervention will be required throughout the lifetime of ALICE.

J. Schukraft emphasized that a well commissioned and working trigger is vital for any operation of ALICE. In his view, disengagement or disintegration of the trigger group would be a disaster.

J. Schukraft showed several pictures of the installation of parts of the detectors and continued with the detailed status of the sub-detectors.

The TRD Chambers are 80% complete, the pre-trigger is partially installed and the global trigger unit is being debugged. Two super modules have been installed and two more are ready for installation. Assembly should be complete before the end of 2009. Measurements of noise in a super module at the PS, both with and without magnetic field, were very satisfactory. However, during the test at the PS, a leak of Xenon gas was discovered. The leaks have been localized and all chambers will be repaired.

All 18 TOF modules have been produced and 15 have been installed. The installation should be complete by April/May.

Module 1 of the PHOS detector has been tested and calibrated with cosmic rays and in the test beam. A number of improvements are being implemented. Module 2 is assembled. All elements of Module 3 have been produced. The Cooling plant was produced and commissioned and will be installed in April.

Condensation was observed during warm-up after 2 month cold operation of Module 1 at the end of 2007. It was therefore decided to design new airtight enclosure and feed-through. The first re-designed casing will be ready only at the end of April which is too late for operation in 2008. One module will be installed in April without the new casing; it will run at ambient temperature which should permit system commissioning and pp physics. The

two modules which are currently being upgraded will be installed during the winter shutdown at the end of this year.

Production and testing of the PMD is complete. However, long term tests showed that the MANAS Front-End Electronics was damaged by sparks. It was decided to improve the protection but this will result in delays, the PMD will be completed during 2008.

Planning of ALICE for 2008

PHASE	Detector	Start	Finish
PHASE 4	V0-A/T0-A/TOF/L3 magnet test	7.1.2008	17.2.2008
	Cosmic Run II	18.2.2008	9.3.2008
Ongoing	TOF/TRD/PHOS/PMD	11.3.2008	4.5.2008
	Cosmic Run III,	5.5. 2008	start of beam
	Mobile shielding, close vacuum	T0 - 6 weeks	T0 - 3 weeks
	Start of beam	T0	

The expected start-up configuration May 2008 will be:

Complete	ITS, TPC, TOF, HMPID, muon arm, FMD, trigger dets (V0, T0,ZDC, Acorde),..
Partially complete	PHOS(1/5), TRD (3/18), PMD (few/48), DAQ/HLT (20-30%)
Beyond 2008	- Complete DAQ/HLT capacity (shifted from 2008 to 2009) in line with expected LHC running - Complete modular detectors: PMD (2008), TRD (2009), PHOS (2010), EMCAL (2011)

J. Schukraft then turned to commissioning runs. There was a run for 2 weeks in December 2007. This was mainly devoted to readout of individual detectors (local) and the readout of several detectors in parallel (global).

The second run took place in Feb/Mar 2008 and lasted 3 weeks. Counting rooms were manned 24/7. The run was used to test global alignment procedures and collect a small sample of cosmic rays tracks. Unfortunately the TPC had to be turned off after ~ 1 week due to a drift HV instability which was due to a residue of water in the resistor rods. This is now understood and corrected.

The next cosmic run is planned for early May and will last at least 6 weeks. It will be used to perform global commissioning, calibration, and to collect a bigger sample of tracks to check alignment for all detectors.

Magnet status: both Muon Dipole (run I) and L3 (run II) have been retested and commissioned to full field. However, the old 'L3 short' still shows up intermittently; this is not a concern for operation (Earth current < 100 mA).

14 detectors were installed but some were only partially operated. The global runs used cosmic rays or pulsers as a trigger and exercised the complete DAQ chain Data was sent to

Castor then out to Tier 1 and 2. Over 50 TBs of data were collected in February. Comparing the figures in 2007 and those for March this year, there has been a significant improvement when running with many detectors. Good progress, as demonstrated by the "feuille de route", has also been made in the integration with DAQ, with the Experimental control system and with the Trigger system.

J. Schukraft demonstrated progress by showing a number of transparencies of events in the detectors.

One of the typical problems of commissioning is noise. The detectors are initially tested in the lab in a low-noise environment. However, during commissioning, they are subjected to interference from other detectors. Noise studies which were performed on the TPC, showed that the noise drastically increased when using the final power supply. Discussions are ongoing with the manufacturers of the power supply to remove common-mode current which also affects the TRD and some of the muon chambers.

Commissioning of the offline has started using cosmic runs and the computer challenges. The data was sent to Tier 1 and partially to the Tier 2. The first phase of the computing readiness challenge will start in May. As already presented in the computing RRB, the situation of computing for ALICE remains unsatisfactory; the deficit is in the order of 30 to 40%.

ALICE has 18 different detector systems, plus 5 online control systems. In addition there are quality assurance and offline tasks. The number of people required on each shift is around 30; in addition there are on-call experts. The load on each institute in the collaboration is proportional to the number of their members; for a typical 7 month run, each author will have to be at CERN for 24 days. Resources will have to be made available by the institutes and the funding agencies to provide and support the manpower required to run the experiment. Hopefully manpower requirements will diminish in the medium and long term.

To summarize, ALICE has reached the end of many years of installation and has started the global commissioning. The major concerns are the trigger system and the computing resources.

### Questions and discussion

E. Gazis (National Technical University, Greece) asked what the collaboration would do in the event that Birmingham could not continue work on the trigger. J. Schukraft replied that the problem was not just a lack of manpower, it is primarily that the knowledge of the firmware in the trigger system is very difficult to pass on to a new team. Experience had shown that it could be necessary to totally rewrite the firmware which could take as long as two years. This is unacceptable as the experiment cannot run without the trigger.

### **4. LHCC deliberations (paper only).** E. Tsesmelis, LHCC Scientific Secretary CERN-RRB-2008-013 (report)

Delegates had no further comment to make and the RRB took note of the report of E. Tsesmelis.

**5. Financial matters** P. Geeraert, Head, CERN Finance Dept.  
CERN-RRB-2008-04 (paper) CERN-RRB-2008-009 (presentation)

The common fund is in deficit by 425 kCHF and there are open commitments for 304 kCHF. No funds have been received since 29th February. The outstanding contributions total 657 kCHF which includes 5 kCHF from Poland and the remainder from non-member states.

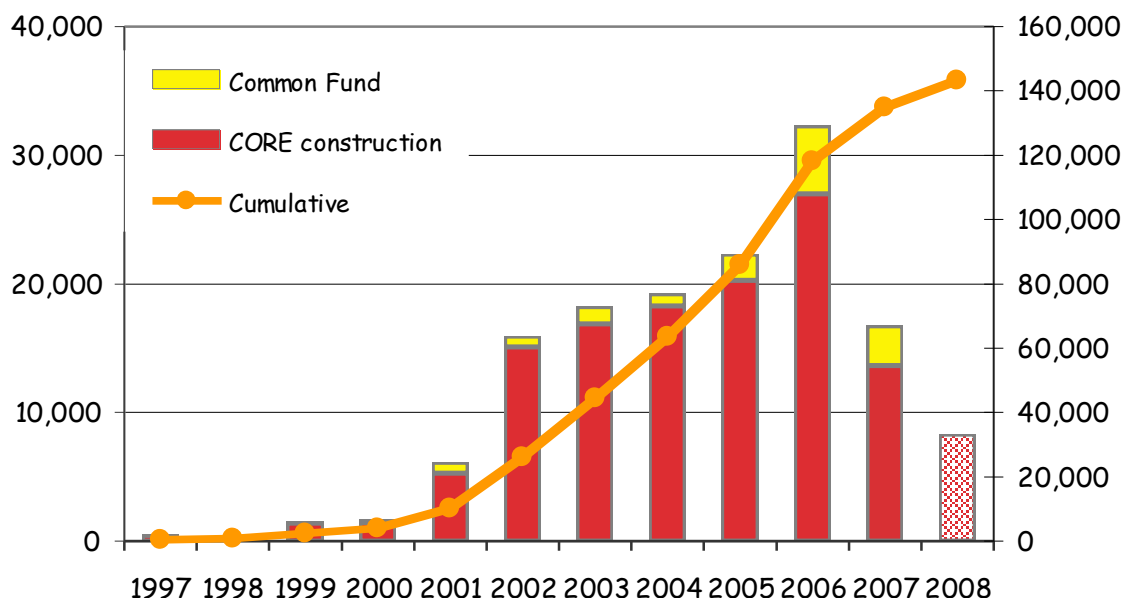
Since the 29th of February, there have been several payments on the M&O budget; the Netherlands has paid 89 kCHF, USA 50 kCHF, Japan 13 kCHF, GSI (Germany) 146 kCHF and Sweden 49 kCHF. The outstanding amount for non-member states for years up to and including 2007 is now 461 kCHF. The outstanding amount for 2008 is around 4 MCHF.

**6. Construction Budgets** J. de Groot, Resources Co-ordinator  
CERN-RRB-2008-21 (report) CERN-RRB-2008-22 (presentation)

**Report on 2007 CORE expenses.**

The budget agreed by the RRB for 2007 was 10 MCHF. Major elements were the TRD, the TOF, the PHOS and infrastructure services.

The CORE expenditure from 1997 to 2007 was summarized by the following graph.



J. de Groot announced a small correction for the Slovak Republic which should be 20 kCHF less than the published figure.

**Update on 2008 CORE expenses**

The budget agreed at the last RRB was 8'340 kCHF, major components being the TRD and the PHOS.

## Preliminary 2009 CORE budget

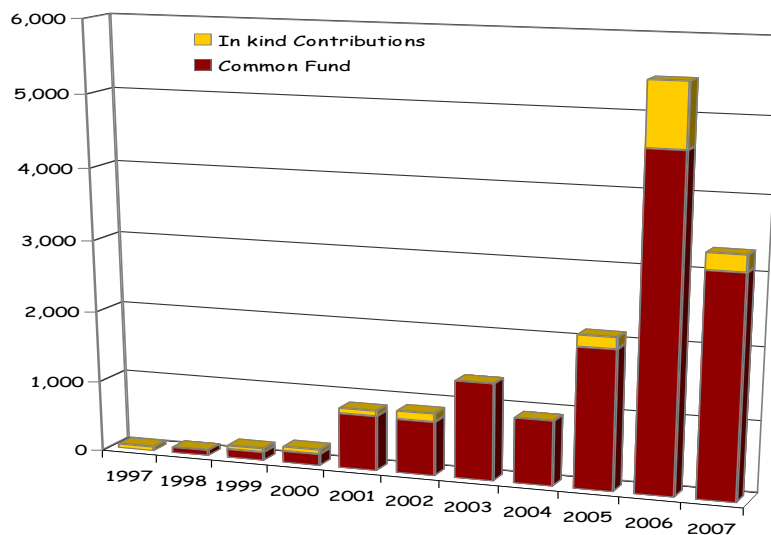
Construction is reaching the end, however CORE spending will continue in 2009. This will include expenditure for the TRD, PHOS, forward detectors and Data Acquisition which will only reach full capacity in 2009.

## Status of the common fund

Contributions received until the end of 2007, which included annual fees, cash contributions, commission and integration and in-kind from 1997 until end 2007 totaled 14'747 kCHF. The funds pledged, as defined in the MoU were 12'180 kCHF. In addition there was an extra 2'546 kCHF of C&I and two additional contributions, 242kCHF from CERN and 249 kCHF from France (CEA). The balance was now -932 kCHF.

The outstanding amount on the 15th April is 660 kCHF.

The expenditure of the common fund over the period 1997 - 2007 is shown below



The balance of the common fund, which was positive for many years, is now -764KCHF, in agreement with the numbers provided by Finance Department.

Looking ahead, most of the income for 2008 has already been received. If income and spending is as expected, the end-year balance will be -554 kCHF.

## MoU Addenda

Participation is still under discussion with two Brazilian universities, the Universidade de São Paulo (USP) and the Universidade Estadual de Campinas (UNICAMP).

A joint Addendum to the MoU and the M&O MoU has been signed with five institutes from the United States. This covers participation of: Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), Physics Division, Oak Ridge

National Laboratory (ORNL), Wayne State University and the Relativistic Heavy Ion Group, Yale University.

## **7. Maintenance and Operation budgets** J. de Groot, Resources Co-ordinator

### **Report on 2007 M&O Income and Expenses**

At the end of 2007 there were still outstanding contributions for the period 2000 – 2006. This included China and JINR Dubna. However, an in-kind contribution from JINR Dubna in 2007 covered the outstanding debt and also covered part of 2008.

Looking at the present situation, there have been contributions from Armenia, Korea, and the DOE in the USA. Significant amounts are outstanding from China and Russia, with smaller amounts from Croatia, South Africa and the Ukraine.

The 2007 M&O A budget was 4'172 kCHF. The total expenditure (spent+committed+In-kind) was 3'849 kCHF; i.e. 92% of the agreed budget was spent.

The M&O A summary for 2002-2007 on the 15th April shows a positive balance of 1,500 kCHF but this includes 700 kCHF which was received in 2007 for the 2008 budget and the amount committed. The final cash total is then only slightly positive.

For the M&O A 2008, 44% of the amount invoiced has already been received.

### **Preliminary Estimates for 2009 Budget**

Looking at the evolution of the M&O, preliminary estimates for 2009 and 2010 are around 7.5MCHF with an increase in 2011 and 2012 to 8.3MCHF due to replacement of online computers. The budget will be reviewed and then presented for approval at the 2008 November RRB.

For M&O B, estimates for 2009 until 2012 are constant at around 1.5 MCHF. The budget will also be reviewed and then presented for approval at the 2008 November RRB.

### **M&O MoU Signatures**

There is an addendum to the M&O MoU for funding agencies who were not members at the time of the original MoU. These included signatures for Japan, Korea, US DOE, Spain and Cuba. The signature of Greece and China are still missing.

### **Discussion and questions**

J. Engelen reminded the meeting that the Scrutiny group will review the budgets and the chairman would report at the November RRB.

D-O. Riska (University of Helsinki, Finland) asked whether it would be possible to present the figures, by institute, for M&O cat. B. J. de Groot replied that this information had been included in the past but parts of the table are still under discussion. He would however provide the information.



E. Gazis (National Technical University, Greece) informed the RRB that Greece was in the process of signing the M&O MoU. J. de Groot added that an addendum would be prepared.

#### **8. Summary** J. Engelen, Chief Scientific Officer

J. Engelen summarised that ALICE was very close to completion and it would be available for data taking later this year. The start-up and operation of ALICE will require considerable manpower, J. Schukraft spoke of 24 days at CERN per author, and this will have implications for travel budgets. The financial situation still presents problems, mostly from the past; they are relatively small but solutions should be found.

J-D. Hansen (Niels Bohr Institute, Denmark) asked if the figure of 24 days applied to PhDs and PhD students. J. Schukraft replied positively and J. Engelen confirmed that it was 24 days per author.

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