



ALICE

Minutes of the 13th RESOURCES REVIEW BOARD Meeting

(Held at CERN on 23rd October 2002)

Present:

Europe:

A. Grigoryan (Yerevan Physics Institute, Yerevan);
G. Paic (Ministry of Science and Technology, Zagreb);
F. Suransky (Ministry of Industry and Trade, Praha), M. Sumbera;
J. Dines Hansen (Danish Natural Science Research Council, Copenhagen), H. Boggild;
D. O. Riska (University of Helsinki, Helsinki), J. Aysto;
P. Brossier (CEA-Saclay, Gif sur Yvette), A. Baldisseri;
J.Y. Gossior (IN2P3, Paris);
J. Richter (BMBF, Bonn) D. Muller; R. Santo (Universität Muenster);
P. Braun-Munzinger (GSI, Darmstadt);
G. Vesztergombi (KFKI-RMKI, Budapest);
G. Ricco (INFN, Roma);
J. Engelen (NIKHEF, Amsterdam), A.J. Van Rijn;
S. Irgens-Jensen (Research Council, Oslo);
J. Bartke (State Committee for Scientific Research, Warsaw);
D. Popescu (Institute of Atomic Physics, Bucharest), F. Buzatu;
F. Grishaev, V.I. Savrin (Ministry of Science and Technologies, Moscow);
A.N. Sissakian (Dubna), A.S. Vodopianov;
A. Sitarova (Ministry of Education of the Slovak Republic, Bratislava), L. Sandor;
L. Gidefeldt (Natural Science Research Council, Stockholm);
G. M. Zinoviev (Ministry for Science and Technology, Kiev);
J. Seed (PPARC, Swindon), O. Villalobos-Baillie.

Asia:

S. Bhave (Department of Atomic Energy, Mumbai).

CERN:

R.J. Cashmore (chairman), E.M. Rimmer (secretary),
K.H. Kissler, A.J. Naudi, C. Saitta, J. Salicio Diez, D. Schinzel, E. Tsismelis.

ALICE:

J. Schukraft, C. Fabjan, P. Giubellino, J. de Groot, H.H. Gutbrod, L. Leistam, L. Riccati.

13th Meeting of the ALICE Resource Review Board RRB, 23rd October 2002

Documents **CERN-RRB-2002-nnn** can be found at <http://web.cern.ch/Committees/LHCRRB/ALICE/>

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1. & 2. Introduction & Approval of the minutes of the last meeting

R.J. Cashmore
Director for Collider Programmes

The Chairman, R.J. Cashmore, welcomed delegates to the meeting and singled out the 2003 budgets and the Completion Scenario as important business items. He hoped that many delegates had been able to visit ALICE earlier in the day. Another visit would be organised, probably in October 2003.

The Minutes of the last meeting were **approved** without changes. There were no matters arising.

At the last RRB the Chairman and J. Schukraft had been asked to communicate with the Greek FA concerning the withdrawal of Greek groups from ALICE. They wrote to E. Floratos and had some discussions with him. Verbally Floratos recognises that Common Fund contributions and M&O 'A' expenses while the groups were still in ALICE will be paid as well as further contributions to the Common Fund. Nothing concrete has happened to date as there is an ongoing discussion with one Greek group wishing to remain in ALICE; the issue will continue to be followed up.

3. Status of the experiment
Paper CERN-RRB-2002-126

Spokesperson J. Schukraft
Presentation CERN-RRB-2002-145

• *Collaboration*

5 new groups have joined ALICE:

Puebla University, Michoacana University and Cinvestav, Mexico

Creighton University, US

FH, Köln, Germany as an Associate Member

Discussions are ongoing with:

Jagellonian University, Poland

Athens, Greece

FH, Worms, Germany

The EPFL group, Lausanne, Switzerland, which worked on data compression, has left.

A proposal for substantial US participation (~ 5.5 M\$ CORE contribution plus > 60FTE of staff+students, to work on PHOS, a new EM calorimeter and computing) was submitted to the DoE in March 2002. It was judged to be 'premature' and was not approved; a more focussed proposal was invited for April 2003. A workshop will be held in November to finalize a proposal for Japanese participation in ALICE, to be submitted end 2002. If successful, it is hoped that these new collaborators will build the second half of the TRD.

- *Heavy Ion Running*

In June 2002 there was an LHCC Workshop on HI running. In practice (as at the SPS), 1 HI 'year' = 10^6 effective seconds, which is ~ 10 days. The LHCC noted that there is good case for an early Pb-Pb pilot run to give the HI community (~ 20% of LHC users) an alternative to RHIC as soon as possible. Assuming pp commissioning starts in April 2007, the following scenario for HI physics was positively received and endorsed by the Workshop:

'short' Pb-Pb run end 2007	literally 'a few days', for first physics à la RHIC
~ 2 years Pb-Pb	$L \sim 10^{27} \text{ cm}^{-2}\text{s}^{-1}$
1 year p - Pb 'like' (p, d or α)	$L \sim 10^{29} \text{ cm}^{-2}\text{s}^{-1}$
1 year light ions (e.g. Ar-Ar)	$L \sim \text{few } 10^{27} \text{ to } 10^{29} \text{ cm}^{-2}\text{s}^{-1}$
pp run at $\sqrt{s} = 14 \text{ TeV}$	$L \sim 10^{29}$ and $< 3 \times 10^{30} \text{ cm}^{-2}\text{s}^{-1}$

- *Detector sub-systems, and infrastructure*

Schukraft gave detailed information on all ALICE sub-detectors. Some outstanding points are given here; full details can be found in *CERN-RRB-2002-145.ppt* on the website.

- *L3 Magnet*: to improve the field quality, large iron plugs (from ITEP) have been installed to reduce the magnet opening by ~1 metre. Microscopic inspection of the cooling tubes is finished and has shown that corrosion is actually limited to outer sections that can more readily be repaired.
- *Space Frame and Support Beams*: this elaborate structure (mass ~10 tons) must be highly optimised to support all barrel detectors (mass ~80 tons). Orders have been placed for delivery in spring 2003, at a price within 0.4% of the estimate (980 kCHF).
- *Local Area Infrastructure*: lots of developments are underway; counting room construction, crane modifications to extend the hook height, new access points into the underground cavern, etc.
- *Si Drift Detectors SDD*: beam tests have shown that the spatial resolution exceeds design specifications and detector pre-series production will start in spring 2003. However, a major concern is the low yield of front-end electronics (in IBM 0.25 μm technology), also seen in the Si strip detector and elsewhere e.g. in ATLAS. It is possibly related to the production method and specific features of some large chips and a new submission was made in September 2002. If this is successful, a few months will have been lost, otherwise this item is on the critical path.
- *ITS cooling - ladders*: support ladder production (St. Petersburg-Torino) is finished.
- *Si Strip Detectors SSD*: 60 pre-series detectors from 3 companies have been successfully tested and the first modules successfully bonded. Nonetheless, the SSD is on the critical path because of the FEE (HAL25) yield problems mentioned above.
- *TPC*: production is well on track with the outer field cage already assembled at CERN. FEE have been ordered (industry and some of the RHIC experiments are interested in this electronics) and a sector test is foreseen for spring 2003.
- *Time of Flight*: the TOF is now fully funded by Italy and the LHCC has recommended the TOF addendum for approval. Detector layout is final, there is good progress on the electronics board and the ASIC v commercial pre-amp decision will be taken end 2003. The MRPC TOF technology has also attracted other users: HARP@CERN, STAR@RHIC and FOPI@GSI.
- *HMPID*: the prototype-2 RICH is back from BNL after running in STAR for 2 years. Production of the actual ALICE RICH is underway at CERN.

– *Photon Spectrometer PHOS*: the first 500 production crystals are at CERN and mass production has started in Apatity/Russia; the rate is governed by Russian funding which is as good (better) than expected thanks to special cash flow support from MinAtom and the Kurchatov Institute. After an April 2002 DoE review the US will no longer participate in PHOS; after the change from PIN diodes to APD readout China is reviewing its responsibilities and a new proposal will be submitted to NSFC in November; Japan has expressed interest with a proposal due end 2002.

– *Dimuon Spectrometer*: magnet production is on track (the world's largest warm dipole magnet); 'mini-trigger' tests using small chambers have given very good results for efficiency and background rejection; the PRR of the tracking chambers (1&2) will take place end 2002; FEE was delayed, but is ready now; the absorber call for tender is out with a new assembly scheme at CERN designed to contain costs.

– *Transition Radiation Detector TRD*: the EDR for the digital chip was passed in January 2002, and for the chamber design in September 2002. The chip is in 0.18 μm technology and contains ADCs, tracklet pre-processor, buffer memory, tracklet processor and a configuration chain. Tests at the PS in October 2002 with 5 small chambers in a row to verify the combined pion rejection (ALICE will have 6) went very well and showed an online resolution < 400 microns.

– *Photon Multiplicity Detector PMD*: because of excessive background at the foreseen location, the PMD has been relocated to smaller angles and the necessary re-optimisation is under way. A PMD of the same design as that originally intended for ALICE has been built in India and will start data-taking in STAR in January 2003, providing very valuable experience for ALICE.

– *Zero Degree Calorimeter*: the ZDC, used in the trigger, consists of 4 dense, rad-hard, calorimeters ~ 100 m down the LHC tunnel. The first neutron calorimeter is finished and will be tested with HIs in 2003.

- *ALICE Data challenges ADCs*

ALICE's data taking target is 3 Gbyte/second transiting through the DAQ system and 1 Gbyte/second to tape. To reach this goal, a series of ADCs with increasing data volume are planned between 1999 and 2006. In 2001, ADC III reached about 10% of the final rates through the system and to tape. In 2002, using commercial hardware with ~ 200 CPUs, 36 disk servers and 10 tape servers, ADC IV exceeded its target rates, reaching 1.8 Gbytes/s (target=1) through the system and 350 Mbytes/s (target=300) to disk with stable operation.

A basic version of ALICE's Grid, Alien, is already in use with 28 sites configured, ~14 contributing CPU cycles in production runs and 4 providing mass storage. The fully distributed production can be controlled from one point and 5 very successful runs have taken place in the past 12 months, with up to 450 jobs running concurrently.

- *Milestones*

ALICE's milestones have been re-base-lined according to new LHC schedule and planning has been adjusted to take account of delays already incurred, hopefully for the last time. A float of 4 months exists for most sub-systems.

Summarising, Schukraft noted the importance of the awaited decisions concerning the possible collaboration of the US and Japan in ALICE. For the detector, approval and full funding for the TOF is good news, while major uncertainties remain over the involvement of China and Japan in the PHOS and the yield problems of the ITS FEE are a source of continuing concern. Nonetheless, and despite the constant struggle to stay on time and in budget, ALICE production proceeds on a significant scale.

4. **Report from the LHCC** *LHCC Scientific Secretary E. Tsismelis* *Paper CERN-RRB-2002-118*

Since the last RRB the LHCC has held ALICE sessions in May, July and October 2002. The third Comprehensive Review and the first Installation Review are scheduled for March 2003.

The LHCC considers that ALICE is progressing well and is currently reviewing the new list of milestones compatible with LHC start-up in April 2007. The Committee regards the schedule for remaining TDRs etc., as reasonable:

	<i>Submission date</i>
Addendum to TOF TDR	June 2002; RB November 2002
Computing TP	To be defined
Trigger / DAQ TP	Summer 2003
Physics Performance Report	be defined
Forward Detectors TDR	Early 2003

COST-TO-COMPLETION

The LHCC considers that progress to secure the 6.9 MCHF cost-to-completion is positive and supports the plan being implemented by ALICE. It noted that, if needed as a contingency measure, parts of the PHOS and DAQ systems can be staged, albeit with some impact on the physics capability of ALICE.

SUB-SYSTEMS

Progress on the Muon Dipole Magnet, Time Projection Chamber, Dimuon Forward Spectrometer and Trigger/DAQ is satisfactory.

- *Silicon Strip Detector*: while there is good progress in most areas, the yield of HAL25 chips needs improvement, as it does also for the SDD.
- *Transition Radiation Detector*: delays are noted in the chamber, radiator and digital chip reviews as well as in the start of chamber production.
The Committee asked for a follow-up on the above problems, as well as results from beam tests, at its November 2002 session.
- *Time-of-Flight Detector*: the LHCC recommended approval of the Addendum to the TOF TDR. Deliberation in the Research Board is scheduled for November 2002.

COMPUTING

The LHCC is now reviewing the LHC Computing Grid Project LCG in the same way as it reviews the experiments. The Committee strongly supports the Project as a very important strategic step towards the success of the LHC Computing and regards the LCG Project team as well-organised and competent to undertake the task. The Committee considers that execution of the Project requires the immediate deployment of the organization structure and basic infrastructure. It finds that construction of an appropriately-sized and technologically-advanced computing centre is mandatory and also encourages construction of the CERN Tier-0 prototype.

Cashmore noted that the status of the TOF is now excellent and that the LHCC has found ALICE's Completion Scenario to be sensible. However, the Committee has warned that if the total cost-to-completion is not found, the detector will have to be reduced with a consequent undesirable reduction in physics performance. ALICE is therefore strongly encouraged to look for new collaborators. The LHCC has also endorsed a preferred HI running scenario, clarifying the sequence of activities needed at CERN to produce the injector chains for such a programme. ALICE is now moving into construction with a lot of progress being made and the usual kind of problems showing up. The first Installation Review next Spring will be very important, not only for ALICE, but also to ensure that ALICE's needs are properly accounted for along with those of the other LHC experiments in CERN's planning.

5. Financial matters *CERN Finance Director A.J. Naudi*

- ***Construction Common Fund accounts***

Paper CERN-RRB-2002-087

Updating the distributed document, Naudi announced additional membership fees of 5 kCHF have been received from Kiev and from Prague, plus a cash contribution of 300 kCHF from BMBF, Germany. Additional expenditures have been negligible. Naudi strongly urged those few FAs with outstanding membership fee contributions to pay before the end of 2002.

- **M&O Category A accounts**
Paper CERN-RRB-2002-088

Updating the distributed document, Naudi reported that contributions have been received from INFN/Roma-Bologna-Catania-Alessandria, Ukraine and Budapest. However, contributions are outstanding from several FAs and payments would be appreciated before the end of the year.

- **Summary of market surveys & tenders**
Paper CERN-RRB-2002-089

Updates to the distributed document can be found on the website as *CERN-RRB-2002-153*

- **External Audit**

The Spanish External Auditors of the Tribunal de Cuentas, Madrid, audited the Annual Accounts of the Organization for 2001 and concluded their report by stating: "As a result of the audit, we are of the opinion that the Annual Accounts 2001 properly reflect the recorded financial transactions of the year, which were in accordance with the budget provisions, the Financial Rules, the Internal Financial Regulations and other established financial procedures of CERN. The Annual Accounts with Financial Statements present fairly, in all material respects, the financial position of CERN as at 31 December 2001, subject to the observations in our report".

Cashmore noted that income to date for M&O Category 'A' is at 70-80% of the total for the other 3 experiments but only ~ 50% for ALICE. He added that the ALICE Resource Co-ordinator will be following up on outstanding contributions for both M&O and Common Fund accounts.

6. Completion Scenario
Paper CERN-RRB-2002-129

J. Schukraft
Presentation CERN-RRB-2002-146

Schukraft began by reporting on the Greek situation. Three Greek Institutes, with MoU engagements totalling 1.5 MCHF, left ALICE early in 2002 with an outstanding debt of 62 kCHF. After various cuts, savings and funding reorganization (in T0/FMD where the Greek participation was substantial) a shortfall of 200 kCHF was added to the Cost-to-Completion C-to-C. The April RRB instructed Schukraft and Cashmore to contact the Greek FA with respect to Article 3.3 of the MoU, which defines the 'rules' for withdrawal from the Collaboration. After an exchange of letters and discussions, the Greeks gave a verbal commitment to pay the 62 kCHF debt (not yet honoured). Part of the Athens group is interested to remain in ALICE and they are currently preparing a funding request for the 'lost' 200 kCHF.

The evolution of the C-to-C in MCHF (unchanged since April) has been:

	<i>Sub-systems</i>	<i>Common Items (C&I)</i>	<i>Total</i>	<i>Remarks</i>
<i>Oct. 2001</i>	3.3 – 3.9	~ 3	6.3 – 6.9	assumed 2 MCHF of savings could be found
<i>April 2002</i>	3.7	3.2	6.9	included 200 kCHF from Greek withdrawal

The C&I figures were examined and agreed by the Scrutiny Group in September. ALICE proposed extending the membership fee period by one year to obtain 295 kCHF for common items. Guidelines for sharing the C-to-C were accepted in April as the basis for discussions, and ALICE thanks the FAs most sincerely for their very generous help since then. Of the 6.9 MCHF needed, firm commitments currently amount to 5.7 MCHF with an additional 680 kCHF 'possible', in which case only ~ 500 kCHF would be missing. (Schukraft announced that Croatia had just confirmed its 17 kCHF contribution, until now only 'possible').

<i>Funding Agency</i>	<i>Requested</i>	<i>Agreed</i>	<i>Possible</i>
CERN (Si Pixel, Strip)	825	825	
CERN	525	525	
Czech Republic	52	10	42
Denmark	103	103	
Finland	77	77	
France CEA	172	150	22
France IN2P3	846	650	196
Germany BMBF	679	679	
Germany GSI	389	389	
Hungary	32	32	
Italy	1,378	1,378	
Netherlands	147	147	
Norway	117	117	
Poland	53	0	53
Slovak Republic	51	30	21
Sweden	199	199	
Switzerland	14	0	
United Kingdom	69	0	69
Armenia	11	11	
China NSFC	125	0	125
Croatia	17	0	17
India	276	165	111
JINR	206	95	
Mexico	6	6	
Romania	23	0	23
Russia	394	24	
Ukraine	82	82	
United States	19	15	
Total	6,887	5,709	679

If discussions with Greece to re-join T0/FMD are successful, the shortfall in these two detectors could reduce by up to 200 kCHF and only 300 – 500 kCHF would be missing. However, planning must be based on agreed funding and so it is assumed that ~ 1.2 MCHF is missing. ALICE is a single stage detector with no 'high luminosity' configuration and therefore no 'natural' candidates for deferral. Several scenarios have been evaluated, aimed at minimising the physics damage and at not wasting funds already spent. The following 'solution', focusing on 2 items, has been supported by LHCC.

Firstly, up to 440 kCHF of the PHOS can be redirected by deferring up to one of the five modules thereby reducing the area by ~ 20%. The PHOS is in an early stage of procurement, is easily accessed for later restoration and the physics damage – reduced acceptance at low p_T , lower statistical accuracy at high p_T – would be significant but not catastrophic.

Secondly, deferring up to 40% of DAQ capacity (~ 20% of cost) would release ~ 1.1 MCHF. The DAQ performance is scalable by design and system capacity is already planned to be installed incrementally, 20% end 2006, 30% end 2007, and 100% end 2008 for the first Pb-Pb run at design luminosity. The impact on physics would be significant, namely 40 % loss in signals dominated by statistics, with significant deterioration in the most interesting 'hard' signals (jets, charm, physics with TRD, ...). If currently 'possible' contributions become firm, even after 2006, this drastic deferral could be mitigated.

The time profile of C-to-C spending has been partially discussed with FAs. Some money can come early, some only after 2006. No problem is foreseen for 2003 but C&I spending peaks in 2004 when ALICE may have cash-flow problems. Wherever possible, funds can be shifted between CORE and C-to-C within projects or FAs. Other possibilities are borrowing from the Common Fund as long as it has a positive balance, or borrowing between projects or FAs.

All in all, thanks to the generous support from the FAs, the collaboration can have a viable detector ready for LHC turn-on. If 'possible' additional resources become available, the remaining shortfall would have only a limited impact on the physics capabilities of ALICE.

- **Report from the C&I Scrutiny Group** *Scrutiny Group Chair D. Schinzel*
Paper CERN-RRB-2002-107

Cashmore invited D. Schinzel to comment on whether ALICE's C&I costs were *bona fide* and whether any double counting had been noted between these costs and any others. Schinzel reported that, in the case of ALICE, C&I was originally part of construction completion. As in ATLAS and CMS (where C&I was originally embedded in M&O), the SG recommended separate listings for C&I, defined as non-recurrent work in assembly and test areas. C&I costs and the reasons for them were scrutinised and the spending profile was carefully reviewed. All cases of double counting, with CORE and M&O, were removed (C&I SG is a 50:50 mixture of CORE and M&O members). The SG found the costs to be rather low, but after lengthy discussions with ALICE, agreed to the levels and can recommend them to the the RRB for approval.

Discussion

- S. Bhawe (IN): concerning additional contributions of FAs, what distinguishes 'agreed' from 'possible'?
- J. Schukraft: for India, 'agreed' refers to identified in-kind items that can be contributed, 'possible' means further in-kind contributions still under discussion. Note that the extended membership fee in 2006 (not yet agreed) must be in cash (3 x 5 kCHF for India).
- R.J. Cashmore: ALICE will have to work to 'agreed' contributions at all times; they can hope but not assume that 'possible' funds will eventually materialise.
- L. Gidefeldt (SE): how have the guideline ('requested') numbers for the FAs been calculated? Are the costs of deliverables increased?
- JS: the sharing algorithm was presented in April in *CERN-RRB-2002-042*; common costs are shared by MoU investment (amounting to ~ 3% per FA) and detector-related over-costs are shared amongst those FAs involved. The cost of Swedish deliverables has not increased; the detector-related increase is for the purchase of electronics racks (inherited L3 racks having proved inadequate).

Cashmore echoed Schukraft's thanks to the FAs for the very positive response since April; promises of 5.7 MCHF have allowed ALICE to make a sensible plan, accepted as such by the LHCC, that can be added to later should further funding materialise. However, if additional funds are not found, ALICE's performance at LHC start-up will be unfortunately reduced.

The RRB **approved** ALICE's Completion Plan and cost-sharing as presented (including the 1-year membership fee extension), on condition that the collaboration works at all times within the ceiling of agreed contributions, as orders, especially on the Common Fund, can only be placed against assured money. The status of the Completion plan will be reviewed at each future RRB.

Budgets

- **2003 Construction and C&I Budgets** *Resource Co-ordinator, J. De Groot*
Paper CERN-RRB-2002-127 *Presentation CERN-RRB-2002-147*

In April, the preliminary 2003 CORE construction budget was estimated at ~ 18.8 MCHF. In the present draft budget it has been revised to ~ 21 MCHF, the increase being mainly due to INFN's contribution of 1.8 MCHF to the TOF which had not yet been approved in April. Cost sharing between FAs and detector systems is given in *CERN-RRB-2002-127*. In addition, for the Common Fund, each institute is expected to pay the 5 kCHF annual fee (for a total of 250 kCHF) and cash contributions of 1,000 kCHF from CERN and 49 kCHF from Germany BMBF are planned.

Concerning annual fees, institutes joining ALICE after early 1998 will be billed in 2003. The MoU Art. 6.3 stipulates a total fee of 40 kCHF per institute to be invoiced at the rate of 5kCHF/year. If necessary, this payment schedule can be adjusted. Institutes involved are:

Bergen College	Zagreb University
Darmstadt TU	Mexico (Puebla and Morelio)
Heidelberg Kirchof Institute	Creighton University
Warsaw TU	Ohio Supercomputer Centre
Yerevan Physics Institute	University of Cape Town

The ALICE construction/installation schedule was revised during 2002 to fit the new LHC machine schedule and all projects were asked to revise their spending profiles for essentially all of CORE Fund construction costs. Some uncertainties and inconsistencies remain over CORE cost versus C-to-C and because some countries work with commitments, others with cash flow. However, it is clear that 2003 and 2004 will be peak spending years.

In mid-September, the Common Fund contained 2.9 MCHF in cash (including interest of 161 kCHF), of which 1.2 MCHF are tied to 'open' commitments (i.e. contractually committed but not yet paid), leaving 1.7 MCHF available. The spending profile of the CF also peaks in 2003/2004. With the CF at its present level and without further cash contributions, cash flow problems are foreseen in 2004. De Groot invited FAs with outstanding CF cash contributions to consider paying as soon as possible.

C&I expenditure in 2002 was not budgeted and so 208 kCHF was 'borrowed' from the Common Fund (by agreement with CERN Research Director, Roger Cashmore). The C&I budget for 2003 is 716 kCHF, 190 kCHF for surface work and 526 kCHF for general services. Some FAs will be able to contribute on that time scale and will be invoiced accordingly. Any shortfall will continue to be advanced from the Common Fund, at least during 2003.

Cashmore noted that in the case of ATLAS and CMS, 'borrowing' from the CF under carefully controlled conditions had been formally approved by the RRB. This had not been the case for ALICE, but he had agreed to such borrowing, under the same conditions, to keep ALICE moving forward.

Discussion

- G. Paic (HR): I have not understood the minimum cash contribution to the CF. Zagreb University signed an MoU committing them to 50 kCHF for construction; I did not know that that they should also pay 5 kCHF per year.
- J. De Groot: the MoU specifies a minimum of 40 kCHF payable at a rate of 5 kCHF/year.
- RJC: this should be resolved 'offline'.
- J. Seed (GB): why is there a large increase in spending on the CF in 2008?
- JDG, JS: to install staged DAQ components as late as possible to minimise costs.
- J. Dines-Hansen (DK): does the 40 kCHF minimum include extension of the membership period?
- JDG: no; the minimum would become 45 kCHF.

As detailed in *CERN-RRB-2002-127*, the RRB **approved** CORE expenditures of 21 MCHF, Common Fund spending of 2.6 MCHF and a CF income of 1.3 MCHF in 2003, and 208 kCHF retroactively in 2002 and 716 kCHF in 2003 for spending on C&I.

Cashmore reminded delegates that although no CF cash flow problems are foreseen in 2003, FAs should make their CF contributions as early as possible to avoid possible difficulties in 2004.

- **2003 M&O budgets** *J. De Groot*
Paper CERN-RRB-2002-128 *Presentation CERN-RRB-2002-148*

ALICE has revised its M&O Category A estimates in accordance with the delay of 1 year in LHC start-up, which allows the same shift in most detector-related and online items. Also, there will be no test beams in 2005 and power consumption for magnetic field measurements in 2003 will be less than anticipated. The revised figures have been examined and accepted by the M&O Scrutiny Group.

<i>in kCHF</i>						
<i>including power</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>
<i>Original estimate</i>	446	1,019	1,441	2,291	5,291	6,761
<i>Revised estimate</i>	446	753	1,440	1,689	3,128	5,694

For 2002, 430 kCHF of the approved (and unchanged) budget have been invoiced (not all of the power is invoiced) and 224 kCHF have been received to date; 8 FAs have made no contribution as yet. Currently about 159 kCHF have been paid with further payments pending; some test beam expenditures will be delayed to end 2002 - early 2003. The final accounting for 2002 M&O will be presented to the April 2003 RRB.

For 2003, the total M&O 'A' budget is estimated at 753 kCHF, of which 719 kCHF is to be invoiced, shared by number of PhD scientists or equivalent according to the list updated by the FAs as of 1st September 2002.

The RRB **approved** the 2003 M&O Category 'A' budget as it appears in the RRB presentation *CERN-RRB-2002-148* (reproduced here). De Groot took note of a request that this table should appear in the RRB paper in future.

<i>ALICE 2003</i>	<i>Scientists</i>	<i>M&O Cat A</i>	<i>Energy</i>	<i>Bill in kCHF</i>
CERN	68	94.12	7.27	101.39
Czech Republic	11	15.23		15.23
Denmark	4	5.54		5.54
Finland	5	6.92		6.92
France CEA	5	6.92		6.92
France IN2P3	43	59.52		59.52
Germany BMBF	31	42.91		42.91
Germany GSI	26	35.99		35.99
Hungary	3	4.15		4.15
Italy	120	166.10		166.10
Netherlands	9	12.46		12.46
Norway	8	11.07		11.07
Poland	14	19.38		19.38
Slovak Republic	12	16.61		16.61
Sweden	6	8.30		8.30
United Kingdom	8	11.07		11.07
Armenia	3	4.15	0.32	4.47
China	7	9.69	0.75	10.44
Croatia	5	6.92	0.53	7.46
India	28	38.76	2.85	41.61
JINR	16	22.15	1.71	23.86
Mexico	7	9.69	0.75	10.44
Romania	4	5.54	0.43	5.96
Russia	42	58.13	3.24	61.38
Ukraine	7	9.69	0.75	10.44
South Africa	3	4.15	0.32	4.47
USA (Oak Ridge)	4	5.54	0.42	5.95
USA (OSC)	1	1.38	0.10	1.49
USA (OSU)	5	6.92	0.52	7.44
<i>Total</i>	<i>505</i>	<i>699.00</i>	<i>19.97</i>	<i>718.97</i>

De Groot invited FAs to sign the M&O MoU if they have not already done so; to date, 13 out of 29 signatures have been received. Cashmore reminded delegates that the M&O MoU stipulates that half of the **Scrutiny Group** members should be replaced next April. He urged delegates to send names for external candidates to him by **NOVEMBER 30th 2002** (people with experience of large experiments and also, though not obligatory, of CERN, and preferably not involved with the LHC programme). Proposals will be discussed with the aim of forming a well-balanced new SG next April consistent with statements in the MoU concerning SG composition.

8. Extension of the ALICE Construction MoU *R. Cashmore*
CERN-RRB-2002-121

Although the RRB has accepted the ALICE Completion Plan, formal commitment's against these extra monies cannot be made unless backed by documented agreements. So it would be helpful if each FA sends formal letter to Cashmore (a draft proposal is given in *CERN-RRB-2002-121* which can be used as a basic template) defining what monies they can commit to now, what they might hope to find in future and the timing of those monies, including extension of membership fees by one year. The draft letter has been revised to contain a clause indicating that, as for the Construction MoU, it defines 'best efforts' and is not legally binding. Signed letters will be acknowledged and placed on file with the Construction MoUs. At the same time, it is proposed to extend the construction period (and hence the validity of the Construction MoU) from 31st December 2005 to 31st December 2007. This must be done by end 2003 in any event. These suggestions were **agreed** to by the RRB.

9 Summary, future activities & A.O.B. *R. Cashmore*

Cashmore remarked that there has been a big step forward during the past six months, as was seen by those who visited the pit, where the remains of L3 have been largely transformed into ALICE. The step taken by the RRB today towards finding the resources to complete the detector has been a very important one. M&O payments for 2002 are moving along well and 2003 M&O costs have been agreed. He asked FAs who had not paid yet for 2002 to do so, and those who had not yet signed the M&O MoU to do so. ALICE should, with the FAs, prepare for an important discussion for April 2003 on any foreseeable cash flow problems to allow them to be addressed in a timely fashion.

The HI Workshop should help CERN to cater for the needs of the community in the early years of LHC running, particularly in underlining the value of an early, short Pb-Pb run, and the desirability of proton - heavy ion collisions before light ion collisions.

A summary of the decisions taken at the meeting will be e-mailed to delegates as soon as possible.

2003 meetings:	April 14 - 16	ALICE on the morning of Wednesday 16th
	October 20 - 22	ALICE on the afternoon of Wednesday 22nd