



ALICE

Minutes of the 10th RESOURCES REVIEW BOARD Meeting

(Held at CERN on 23rd October 2001)

Present:

Europe:

- G. Paic (Ministry of Science and Technology, Zagreb);
- F. Suransky (Ministry of Industry and Trade, Praha);
- O. Hansen (NSRC, København), H. Bøggild;
- J. Keinonen (University of Helsinki, Helsinki);
- J. Feltesse (CEA-Saclay, Gif sur Yvette), P. Brossier, F. Staley;
- D. Guerreau (IN2P3, Paris), J.Y. Gossiorc;
- J. Richter (BMBF, Bonn) D. Muller, P. Braun-Munzinger (GSI, Darmstadt), R. Santo (Universität Muenster);
- G. Vesztergombi (KFKI-RMKI, Budapest);
- M. Calvetti (INFN, Roma);
- J. Engelen (NIKHEF, Amsterdam), A.J. Van Rijn;
- S. Irgens-Jensen (Research Council, Oslo);
- J. Królikowski (State Committee for Scientific Research, Warsaw), M. Kowalski;
- P. Dumitriu (Institute of Atomic Physics, Bucharest);
- 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), B. Grynyov;
- R. Wade (PPARC, Swindon), J. Seed, O. Villalobos Baillie.

Asia:

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

CERN:

- R.J. Cashmore (chairman), E.M. Rimmer (secretary),
- D. Jacobs, C. Jarlskog, A.J. Naudi, D. Schinzel, D. Schlatter, E. Tsesmelis, E. van Hove,
- W. Von Rueden.

ALICE:

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

11th Meeting of the ALICE Resource Review Board RRB, 23rd October 2001

Most documents can be found at <http://web.cern.ch/Committees/LHCRRB/ALICE/>

To benefit from rapid paper-less communications for LHC RRB business, delegates who have not done so should send their e-mail address to F. Baud-Lavigne. She should be informed of any changes in responsibilities for RRBs so that mailing lists can be kept up-to-date.

1. Introduction *R.J. Cashmore Director for Collider Programmes*

The Chairman, R.J. Cashmore, welcomed delegates. He announced that with RRB business expanding, future meetings will be spread through 3 days:

Monday		Tuesday		Wednesday	
April 22 - 24					
11.00 - 12.30	Plenary	09.00 - 12.30	LHC Computing	09.00 - 12.00	ALICE
13.30 - 17.30	CMS	13.30 - 17.30	ATLAS	13.00 - 16.00	LHCb
October 21 - 23					
11.00 - 12.30	Plenary	09.00 - 12.30	LHC Computing	09.00 - 12.00	LHCb
13.30 - 17.30	ATLAS	13.30 - 17.30	CMS	13.00 - 16.00	ALICE

2. Approval of the minutes of the last meeting

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

3. Status of the experiment *Spokesperson J. Schukraft*
(ALICE RRB D-2001-62 *ALICE RRB P-2001-62*)

Schukraft reported that ALICE presently has 937 members from 77 institutes in 28 countries: Zagreb (HR) has joined, discussions are underway with Cape Town (SA), Ohio SC (US), Creighton University (US), ISS (RO), Kaiserslautern (DE) and Mexico, while Marburg (DE), Shanghai (CN) and Lisbon (PT) have left. US participation is under discussion (~ 50 people, ~ 10M\$ investment money), with special interest in the PHOS, a new e-m calorimeter and computing. However, it is not known whether the September 11th events will affect DOE/NSF funding options. Promising negotiations have restarted with 5 Institutes in Japan. The executive role of the Management Board has been strengthened by the participation of Project Leaders. The 4 members currently elected (down from 8) are R. Stock (FF), H.A. Gustafsson (Lund), H. Boggild (NBI) and J.P. Revol (CERN).

Following many collaboration discussions on M&O, Schukraft reported that ALICE does not consider activities/costs listed in the MoU Ss 4.6.1, 4.6.2 and 4.6.3 to be M&O. These include detector R&D, institute infrastructure, personnel, travel etc. for participation in ALICE and all costs for supplying deliverables, from engineering design to installation and commissioning. M&O resources are those needed to 'run' the detector after commissioning, and the collaboration, which has already been running for 10 years. The definition of experiment-specific versus host laboratory running costs must be homogeneous across all experiments and is subject to 'higher' jurisdiction. Of specific concern is the wide variety of views on what is or is not M&O, and how M&O costs should be shared. ALICE has a large proportion of countries with a low R&D budget/scientist and these budgets will come under stress during construction. Whatever the scheme, it has to be agreed by all concerned, workable, and allowing the possibility of in kind payments.

Schukraft then gave a brief overview of the ALICE sub-systems.

- *Transition Radiation Detector (TRD)*: the TDR was submitted in early October 2001. The TRD is designed for high p_T (> 1 GeV) electron identification to address the physics of hard probes and heavy quarks. The cost of the full TRD is ~ 15 MCHF of which only 8.3 MCHF are covered by the MoU. Additional funds are being sought. Staging implies reduced acceptance and a reduced physics reach.
- *Pixel detector*: bonding problems reported earlier seem to be solved and the project is back on track with some delay that can be absorbed.
- *Silicon drift detector*: after successful tests of the full detector and electronics chain, tendering is complete and production will start early 2002.
- *Photon Spectrometer PHOS*: after having had to switch from Bogoroditsk which is fully busy producing CMS crystals, 18 furnaces are in operation in Apatity and ~ 1000 crystal ingots have been grown satisfactorily.
- **TOF: two full-scale prototype modules are under test, most design decisions have been taken and a TDR addendum will be submitted early 2002.**
- *TPC*: production has started on both chambers and the field cage. A full-size 120 degrees, 5 m long prototype inner FC has been built and an assembly site is being prepared at CERN.
- *Muon Magnet Yoke*: machining of the huge yoke has started in local industry using existing iron slabs from JINR.
- *ALICE pit*: the L3 magnet central tube has been removed as a Russian 'in kind' CF contribution and the pit is now the 'property' of ALICE.

Schukraft then updated the RRB on costs and funding. He explained that cost figures were produced for the recent LHC review and should be considered as preliminary because spending by ALICE (~ 40 MCHF by end 2002 $\approx 1/3$ of total) is less advanced than by ATLAS/CMS.

The funding shortfall of ~ 10 MCHF is essentially linked to the Russian MoU commitment for 13 MCHF. Under the 'Skrinsky scheme' the expected Russian cash contribution was 6.5 MCHF for an effective contribution of twice that amount. Although the scheme may work well for the LHC machine, it does not work well for experiments, being partially successful only for items with large institute involvement. Also Russian prices are tied to the \$ and have amassed a 20-25% increase due to the CHF/\$ exchange rate variation. Finally there have been significant price rises for two large items, the muon absorber and the crystals. Precautions had already been taken, including conservative costing, some over-funding (1.6 MCHF) and back-up plans to redistribute responsibilities, but these were largely insufficient to offset the combination of problems.

Concerning costs, given the 5-10% accuracy of CORE estimates, variations in real costs after tendering should ideally cancel. Cost increases caused by design changes following improved technical understanding have been deliberately cancelled by cost-reducing simplifications. However, additional items not originally accounted for drive costs irreversibly upwards and in part can be seen as equivalent to 'Commissioning & Integration' reported by the other experiments. These are special detector-to-general installations and detector-to-machine interfaces, the need to upgrade inherited L3 equipment such as racks, magnet control and cooling units, and some unexpected costs for services, installation and integration.

Solutions have been found for some major cost problems. The price of the muon magnet coil+yoke, as made in Russia, increased from 2.8 MCHF to 4.2 MCHF. Splitting yoke/coil production between Russia/France respectively brought the price back to almost the CORE value. Tenders for a 'turn-key' TPC field cage ranged between 2 – 5 MCHF; the CORE estimate was 0.7 MCHF. By having parts delivered and assembled in-house the price was brought down to 1 MCHF; the additional 300 kCHF was offset by a design change in the electronics. Price increases from the CORE value of 10 MCHF for the DAQ/Trigger/HLT that were caused by design changes could be contained by some simplifications based on Data Challenge tests.

However, problems remain for which no solution has yet been found. The muon absorber is a complicated engineering object. One hundred tons of material encircling the beampipe in front of the muon chambers, it is a critical item that must be ready within 2 years. The expected price, after much cost cutting, was ~ 3.5 MCHF; the cost estimated in Russia is 3.3 M\$, 1.8 MCHF higher. Price evaluations in industry and attempts at simplifications are ongoing. Also in Russia, the price of the lead-tungstenate crystals has risen from 3 CHF/cc to 3.5 \$/cc. This is partly due to set-up costs in Apatitiy (the Bogoroditsk facility being fully booked by CMS), partly to TVA levy of 20%, and partly to the \$ exchange rate rise from 1.3CHF to 1.6CHF. This has raised the PHOS price of 10.5 MCHF by 5.6 MCHF.

Cashmore strongly objected to the 20% TVA. Such projects are covered by a zero-tax agreement and he asked the Russian RRB delegate to look into this.

Several actions have been taken to contain the PHOS price, including removal of the 'Skrinsky factor'. This creates the need for an additional 6.5 MCHF in cash of which Minatom and the Kurchatov Institute have already contributed 1 MCHF. The change of TPC field cage strategy has allowed JINR to make an 'in kind' contribution of crystals worth ~ 1 MCHF and it is hoped that US participation will bring additional funds. Non-Russian PHOS contributions will be capped to MoU money rather than crystal volumes. Reducing the number of crystals from 20k to ~ 16k is being studied, by skipping test modules and reducing spares. While emphasising the very high priority of the muon absorber, ALICE is making every effort to avoid cuts in PHOS performance, especially the capacity to detect direct and thermal photons.

Price increases are also reported in the Silicon Pixel Detector (0.35 – 0.61 MCHF on 2.8 M), the Silicon Drift Detectors (0.32 MCHF on 5.2 M) and the Silicon Strip Detectors (0.25 MCHF on 10.3 M), and the SSDs have a funding shortfall 0.7 MCHF.

The CORE estimate of ~ 12 MCHF for common, non-detector items for commissioning, integration, services and installation was redone recently with all TDR's submitted. Preliminary results show an increase of 3 – 5 MCHF. Some of this is equivalent to C&I costs reported by ATLAS and CMS. This dramatic rise is mostly linked to the increase in complexity and size of services, infrastructure and integration when moving from 'conceptual designs' in the TP to final design in the TDRs, and to the cost of manpower needed for installation. Unforeseen upgrades/repairs of inherited L3 equipment and less help and/or increased costs of CERN services also contribute to the cost increase. Potential cost saving measures include using more Project Associate manpower from the Institutes, looking for design simplifications, and discussing possible economies with the machine and general service sectors. ALICE, like the other experiments, is worried by shifts in responsibility brought about by the CERN budget situation. Of course, new collaborators (Japan, US) would also help.

In total, the preliminary cost-to-completion of the ALICE MoU detector is 6.3 MCHF – 6.9 MCHF, (5.5% of the CORE cost), assuming that price increases for infrastructure and services can be limited to 3 MCHF. The estimate will be refined for the April 2002 RRB. With the exception of the muon absorber, the actual cost increase of the detector proper is at the 1% level. The collaboration will

continue to pursue every possible cost saving and will discuss with the FAs how to safeguard ALICE's physics capabilities within financial possibilities.

Discussion

- M. Calvetti (IT): is the 7 MCHF missing for the TRD in addition to the cost-to-completion?
 JS: the TDR in the MoU was already staged by about 50% and so the 7 MCHF are not part of the cost-to-complete the MoU detector.
- R.J. Cashmore: the LHCC accepted a 50% TDR as a good physics device; clearly 100% would be better.
 JS: some cost explosions have been contained successfully and ALICE is still optimistic that Japan and the US will join.
- RJC: new collaborators will help most if they do not bring new devices. (The US is interested in the PHOS). The RRB should appreciate ALICE's efforts to control costs. CERN has also recently reviewed costs of the LHC experimental areas and an additional 20 MCHF have been requested as well as 10 MCHF to meet the experiments' expectations of Technical Services. ALICE will benefit from this.
- JS: it may solve a 1 MCHF problem for ALICE, 20 MCHF for the others.
- J. Engelen (NL): ALICE already has 1,000 authors bringing 120 MCHF to ALICE. This is not an impressive amount of money per author. What are they all doing?
 JS: heavy ion experiments create an enormous wealth of data covering lots of physics so they will all be busy. Also ALICE has many collaborators 'poor' in cash but 'rich' in people, often from low energy physics departments in small institutes. M&O cost/scientist is lowest in ALICE, so we are getting a good deal. Including the value of inherited L3 equipment would increase the effective cost of ALICE by almost 40 MCHF.
- RJC: CERN has already foreseen a cost overrun for ALICE, but the extra funds will be the last that are forthcoming.
- M. Calvetti: the 7 MCHF for the full TRD should be included.
 JS: if that is an encouragement to look for extra funds, we will. Cutting more now (at 40% of total spending) has a disproportionate effect on the physics.
- RJC: to proceed towards a more complete picture for April 2002, by the end of 2001 FAs should indicate whether any more resources will become available.
- JS: the main problem is for services which ALICE has chosen as common items that in other experiments would be considered as part of the sub-systems, e.g. 300 new racks. The split between detector/experimental area is arbitrary and ALICE might reconsider it.
- RJC: need to know the total amount. In the other experiments, the sharing of cost increases has been roughly by costbook.
- JS: will discuss with each FA based on a simple guideline of 5% of the investment, and we have a detailed list of the items involved.

4. Report from the LHCC *LHCC Scientific Secretary E. Tsesmelis*
(ALICE RRB-D 2001-63)

Tsesmelis summarised the outcome of the May, July and October 2001 LHCC sessions, noting that the Committee considers that ALICE is following the schedule and milestones presented in the Technical Design Reports. The updated schedule for the remaining TDRs is deemed to be reasonable, with the exception of the Addendum to the Time-of-Flight TDR, which the LHCC has requested be advanced.

	<i>Submission to LHCC</i>	<i>Research Board deliberation</i>
RICH HMPID	August 1998	November 1998
Photon Spectrometer	March 1999	June 1999
Zero Degree Calorimeter	March 1999	June 1999
Inner Tracking System	June 1999	September 1999
Muon Arm	August 1999	November 1999
Addendum	December 2000	<u>Approved June 2001</u>
Photon Multiplicity Detector	September 1999	February 2000
Time Projection Chamber	January 2000	April 2000

Time-of-Flight	February 2000	June 2000
Addendum	March 2002	
Transition Radiation Detector	October 2001	Expected February 2002
Computing TP	End 2001	
Physics Performance Report	2002	
Trigger / DAQ TP	End 2002	

Sub-systems

- The LHCC MAG noted that the dipole magnet is on schedule and within budget.
- The LHCC is currently studying the Transition Radiation Detector TDR, submitted in October 2001. It notes that current funding only covers about 50% of the full detector.
- The LHCC noted the impressive R&D results on detector strip performance and prototyping of front-end amplifier card for the TOF. However, several tasks remain to complete the R&D phase and ALICE requested that the Addendum to the TOF TDR be submitted in March 2002. The Committee considers that to be late and encourages ALICE to advance it as much as possible.
- The LHCC noted a delay of at least 8 months on all milestones of Central Trigger Processor but does not consider that this is critical for sub-detector commissioning

Concerning the Resistive Plate Chambers RPCs of all four experiments, the LHCC evaluated their performance and ageing properties. The Committee recommends that the experiments should produce detailed documents showing the individual tasks involved in manufacturing to be used as a basis for preparing industrial contracts and for reviewing and monitoring production. Experiments should not move hastily into RPC production before ensuring the soundness of both their functionality and the manufacturing process. The LHCC will continue to monitor progress.

The LHCC has also reviewed the computing requirements for LHC physics. It considers that the LHC Computing Review has set out a sound model, it concurs with the creation of the LHC Software and Computing Steering Committee SC2 and it endorses the plan for the LHC Computing Grid Project. However, the Committee notes the potential lack of resources for hardware, infrastructure and manpower, and the current limited maturity of the software and analysis tools.

5. Financial matters ***CERN Finance Division Leader A.J. Naudi***

- Status of collaboration accounts
(ALICE RRB-D 2001-60 NOT ON THE WEBSITE)

Updating the distributed document, Naudi announced that payments have been received from Athens and Darmstadt and that there has been some expenditure on the L3 magnet. Referring to outstanding membership fees, he strongly urged the FAs concerned to pay as soon as possible. J. De Groot reported 3kCHF received from Armenia thereby reducing their outstanding debt to 10 kCHF.

Naudi asked that the following be attached to the minutes, an extract from the May 10th 2001 report of CERN's external auditors, the Spanish Court of Audit, Madrid, for 2000.

"As a result of the audit we are of the opinion that the Annual Accounts 2000 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 31st December 2000, subject to the observations in our report."

- Summary of market surveys & tenders
(ALICE RRB-D 2001-61 NOT ON THE WEBSITE)

Naudi reported minor changes to the distributed document:

MS 3072 sent 12.10.01 closing date 23.11.01 to 42 firms in 11 MS
MS 3073 sent 12.10.01 closing date 23.11.01 to 31 firms in 10 MS

6. Budget issues

Resource Co-ordinator J. De Groot

- Update on 2001 CORE Budget; Draft 2002 CORE Budget
(ALICE RRB-D 2001-64 RRB T 2001-64)

The 2001 CORE Budget in kCHF, as approved at the October 2000 RRB meeting was:

<i>Funding Agency</i>	<i>Commitments</i>	<i>Expenditure</i>	<i>Subdetector(s)</i>
CERN	4,708	3,738	Pixel, Strip, TPC, HMPID, Muons, CP
Czech Republic	110	110	Drift
Denmark	105	105	Forward
Finland	205	205	Drift
France CEA	150	150	Muons
France IN2P3	1,936	1,346	Strip, Muons
France SUBATECH	1,200	600	Muons
Germany	2,235	2,235	TPC
Greece	165	165	Forward
Hungary	5	5	
Italy	4,422	2,558	Pixel, Drift, Strip, HMPID, Forward, Muons
Netherlands	887	458	Strip
Norway	115	115	PHOS
Poland	165	165	PHOS
Portugal	10	10	
Slovak Republic	110	110	Pixel, TPC
Sweden	655	655	TPC
Switzerland	5	5	
United Kingdom	105	105	Trigger
Armenia	5	5	
China	15	15	
Croatia	5	5	
India	340	340	Forward, Muons
JINR	657	657	Muons
Korea (Rep. of)	5	5	
Mexico	5	5	
Romania	5	5	
Russia	410	410	CMA, PHOS, Muons, CP
Ukraine	160	160	Drift, Strip
United States	20	20	Drift
<i>Total</i>	<i>18,920</i>	<i>14,467</i>	

Actual 2001 expenditure will be reported, as usual, to the RRB meeting in spring 2002.

Full details of the Draft 2002 CORE Budget request can be found in the distributed document.

In kCHF it is:

<i>Funding Agency</i>	<i>Commitments</i>	<i>Expenditure</i>	<i>Subdetector(s)</i>
CERN	6,379	5,191	Pixel, Strip, TPC, HMPID, Muons, Infrastructure
Czech Republic	50	50	Drift
Denmark	175	175	TPC, Forward
Finland	200	200	Strip
France CEA	285	285	Muons
France IN2P3	2,379	2,379	Strip, PHOS, Muons
Germany BMBF	2,349	2,349	TPC, TRD
Germany GSI	1,253	1,253	TPC, TRD
Greece	60	60	Forward
Italy	3,605	3,605	Pixel, Drift, Strip, ITS-CMA, HMPID, Forward, Muons
Netherlands	625	625	Strip
Norway	400	400	PHOS
Poland	150	150	TPC
Slovak Republic	115	115	Pixel, TPC
Sweden	720	720	TPC
United Kingdom	10	10	Trigger
Croatia	20	20	TPC
India	150	150	Forward
JINR	607	607	PHOS, Muons
Russia	650	650	ITS-CMA, TOF, HMPID, PHOS, Forward, Muons
Ukraine	200	200	Drift, Strip
<i>Total</i>	<i>20,381</i>	<i>19,193</i>	

The expected 2002 Common Fund Income in kCHF is:

<i>Description</i>	<i>Commitment</i>	<i>Funding Agency</i>
Obligatory cash contributions	250	All (5k/Institute/year)
Cash contributions	259	CERN
	500	Germany BMBF
<i>Total</i>	<i>1,009</i>	

The planned 2002 Common Fund Expenditure in kCHF is:

<i>Item</i>	<i>Commitment</i>	<i>Expenditure</i>
Local area	500	250
Space Frame	650	375
Central support beams	330	330
Steel structures	250	150
Repair of L3 cooling system	850	675
Upgrade of control and services L3 magnet	375	225
Vacuum chamber	50	50
<i>Total</i>	<i>3,005</i>	<i>2,055</i>

The current CF balance plus the expected 2002 income should be sufficient to cover these expenditures. L. Gidefeldt asked why commitments and expenditures are so similar. De Groot explained that sometimes actual expenditure follows rather quickly after a commitment is made, although sometimes there can be quite a time lag; it depends on the type and size of the contract.

With this clarification, the RRB **approved the ALICE 2002 CORE budget** as presented.

- Draft 2002 M&O budget
(ALICE RRB-D 2001-65 RRB-T 2001-65)

De Groot explained the procedures for estimating M&O costs and gave details concerning ALICE data (see the distributed documents). He commented that the intervention of the Scrutiny Group had improved the quality of all data, especially in harmonising the approach across the 4 experiments. ALICE M&O cost estimates for all categories for the period 2002 – 2007 in kCHF are:

<i>Item</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>
Detector related costs	5	150	340	624	1,650	1,803
Secretariat	41	119	160	209	217	226
Communications	0	0	0	0	0	0
On-line computing	0	10	20	238	471	1,167
Test beams, calibration facilities	295	217	167	167	167	167
Laboratory operations	0	280	280	280	280	280
General services	792	859	1,289	1,483	3,284	3,916
Consultancy	0	0	0.0	200	200	200
Outreach	20	20	20	20	20	20
<i>Total ('A' + 'C' cost)</i>	<i>1,153</i>	<i>1,655</i>	<i>2,276</i>	<i>3,222</i>	<i>6,289</i>	<i>7,779</i>
<i>A Total (common items)</i>	<i>493</i>	<i>1,005</i>	<i>1,606</i>	<i>2,532</i>	<i>5,524</i>	<i>6,999</i>
<i>C Total (CERN funded)</i>	<i>660</i>	<i>650</i>	<i>670</i>	<i>690</i>	<i>765</i>	<i>780</i>
<i>B Total (sub-systems specific)</i>	<i>0</i>	<i>0</i>	<i>130</i>	<i>767</i>	<i>1,064</i>	<i>1,165</i>

De Groot explained that current M&O costs are linked to running the Collaboration and the experimental area which is partly operational already. Only Category A costs have been scrutinised at this stage. To determine Category A cost sharing by 'scientists holding a PhD or equivalent qualification', a survey has been carried out in the Collaboration. The preliminary total is ~ 750 out of ~ 1,000 collaborators, but more work is needed to make sure that the rules are applied consistently. De Groot noted that with updated scientist numbers, the M&O Category A+B costs per annum in 2007 when ALICE will be in full operation is ~ 11 kCHF per scientist.

Cashmore asked the RRB to approve 30% of the 2002 M&O Category A request shared by author, as for the other experiments, to allow ALICE to continue on track. If agreed, FAs will receive 30% rebated invoices around January 2002, the remainder being discussed in the April RRB. It is recognised that 2007 is far in the future and that figures will be continually refined before then. The SG should also scrutinise C costs and prepare common templates for B costs. D. Schinzel (Scrutiny Group Chair) reported that ALICE figures were scrutinised along with those of the other experiments. They are considered sound and justify endorsement. Schinzel also expressed his appreciation for the excellent working spirit between the SG and the four collaborations.

The RRB agreed to the 2002 M&O Category A costs at the 30% level.

7. M&O Memorandum of Understanding *D. Jacobs* (RRB-BINGO-D 2001-5)

Jacobs explained the next steps in reaching a final ALICE version of the MoU. All comments made at the Plenary Session, and any further ones, will be taken into consideration in preparing the next version of the generic BINGO draft. This document will then be transformed into four separate drafts containing annexes specific to each experiment. Hopefully these documents can then be approved for distribution at the April 2002 RRBs.

8. ALICE Computing *Offline Project Leader F. Carminati*
(ALICE RRB P-2001-66)

Carminati reminded the RRB that ALICE computing is of the same magnitude as ATLAS/CMS. Major DAQ and off-line decisions have been taken, the move to C++ is complete and TDRs have all been produced with the new framework ROOT. Physics performance and computing is handled by a single team and DAQ/Computing integration is being done via a series of ALICE Data Challenges ADCs on the LHC prototype in collaboration with CERN-IT Division.

The ALICE Physics Performance Report is just starting to evaluate acceptance, efficiency and signal resolution. The aim is to produce ~ 10,000 Pb-Pb events each needing ~ 20 hours of simulation. Production will be distributed to several ALICE sites using GRID tools. ALICE GRID resources presently consist of 37 people at 21 institutes as far-flung as Capetown, Berkeley and Yerevan.

ALICE runs yearly ADCs of increasing size and complexity to reach 1.25 GB/s in 2006. ADC III in spring 2001 demonstrated excellent system stability during 3 months with a throughput exceeding 100 MB/s and 100 TB of data stored in 10^5 files in CASTOR. As well as doubling the performance, ADC IV in 2002 will focus on the computing fabric architecture and include some L3 trigger functionality; it will involve 1 or 2 regional centres.

The ALICE Offline Computing structure consists of an Offline Board, with Carminati as Chair, that co-ordinates with ALICE DAQ led by P. Vande Vyvre, with the International Computing Board and with several other projects, boards, etc. There are 4 offline groups:

Production Environment & Co-ordination	P. Buncic
Framework & Infrastructure	F. Rademakers
Simulation	A. Morsch
Reconstruction & Physics	K. Safarik

ALICE has opted for a core CERN offline team of 17 FTEs, of which 3 are missing at the moment. Cashmore remarked that this was a good 'score' but Carminati pointed out that as the team is small, the percentage missing is large. It is hoped to add 10-15 people from the collaboration through Software Agreements, if possible avoiding the need for a full MoU. So far Torino has taken on GRID co-ordination, Nantes the ALICE World Computing Model, and Warsaw the detector database. Carminati noted the imbalance between manpower pledged for the GRID (enough) and for the experiments (not enough), although both are needed for success. He stressed that candidate Tier 1 centres must provide people as well as hardware.

Understaffing of the offline team risks to jeopardise the readiness of ALICE for physics at LHC start-up and will soon become a problem. Efforts are underway to alleviate this through Technology Transfer with IT experts, recruitment of temporary staff as Project Associates and a request to IT support for the core software (FLUKA and ROOT).

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

Cashmore closed by noting that ALICE is making a lot of progress, although work is still needed to refine cost overrun estimates. The FAs have some homework to do to give ALICE an indication by the end of 2001 of whether and when new funds may be available. Approving 30% of the 2002 M&O budget is very useful and we will learn how to manage M&O as the year unfolds, hopefully putting the MoU out for signature in April.