CMS ECAL Cost Review - 2nd Meeting
RAL - 1/9/98

Present: G J Barber, D I Britton, R M Brown, D J A Cockerill, J F Connolly, G P Heath, P R Hobson, D C Imrie, P W Jeffreys, A L Lintern

Agenda

1.	Approval of Minutes of last meeting	RMB	5'
2.	Matters arising	RMB	5'
3.	Engineering prototypes and mechanical mockups - Revised proposal for programme of activities and a first estimate of associated costs	JFC	20'
4.	VPT prototype activities: - Status of Hamamatsu order - Status of ET order	 PRH DCI	 5' 5'
5.	Regional Centre activities: - Update on current and planned future expenditure at IC - Update on current and planned future expenditure at Brunel - Update on current and planned future expenditure at Bristol - Update on current and planned future expenditure in PPD	 DIB PRH GPH ALL	 10' 10' 10' 10'
6.	Updated estimate of Global Calorimeter Trigger costs, including prototyping and Development	GPH	10'
7.	CERN Test Beam costs	DJAC	5'
8.	Summary, conclusions, actions	RMB	10'
9.	Date of Next meeting.		

1 Approval of minutes

The minutes of the last meeting were approved as presented.

2 Matters arising

There had been an action on DJAC to discuss with the Russians which of the major construction items they could undertake to provide. DJAC reported that he sent an e-mail to the Russians on 16 July (Appendix 1). There would be a discussion with Matveev in Lyon, and further discussions with other Russian representatives during the forthcoming ECAL week.

3 VPT Prototype activities

PRH reported on the procurement of further prototypes from Hamamatsu. A quotation had been received for the supply of 15 fine-mesh VPTs: 12 with face plates of borosilicate glass, 3 with UV glass. The tubes would have a 25.8 mm diameter glass envelope and an effective photocathode diameter of 20 mm.The price was £2100 including VAT (very close to the estimate given at the last meeting), and the delivery date was the end of November.

It was agreed that PRH should proceed with placing the order. (It was learned after the meeting that the order had already been placed by MS on 20 August.)

DCI gave suggested details for a second generation of prototypes from ET. He proposed ordering 20 tubes of which 6 would have radiation hard face plates (the type of glass to be specified in consultation with ET and PRH). He had established that finer mesh (1000 lpi) was available at a reasonable price from the US firm that had supplied the previous mesh, and proposed using this for the new tubes. Initial discussions with ET had indicated that the price would be £20k. His aim was to place the order within the next three weeks for delivery by the end of November.

It was agreed that he could go ahead with the proposed procurement on condition that the cost did not exceed £20k, though he was urged to try and negotiate a lower price.

4 Regional Centre activities

DIB reported that the purchase of items for IC, agreed at the last meeting, was proceeding as planned. The amount committed so far was £8k, and a further £5k would be committed soon. There had been some savings (IC had paid for a DVM, and an existing oscilloscope had been located), however, it had been found necessary to add the purchase of Labview and a picoammeter to the list.

PRH said that the stabilised LED had already been bought and a calibrated PIN diode had been ordered through RAL. The other costings had not changed. However, he pointed out that the proposed automated control system was based on the use of a Lecroy GPI CAMAC controller with an existing Power Mac, and would be incompatible with the systems at RAL and IC (PC + Hytec Controller). He suggested revising his proposal to follow the IC/RAL approach, using an existing PC. This would increase the cost by about £2.5k.

This proposal was agreed.

GPH said that he had nothing to report concerning mechanical items at Bristol. He mentioned that D Newbold had started to study the housings required for the front end electronics, but noted that no one had yet committed themselves to procuring these items.

ALL described the status of the design of a VPT acceptance rig at RAL and quoted two preliminary cost estimates. The 'cheap' option (£5.3k) assumed that everything could be controlled using Labview, a more expensive (and probably more realistic) option would cost £14.8k. The details are given in Appendix 2. (It was noted after the meeting that the estimates should be increased to include the cost of the preamps. The additional cost could be as much as £8k, including £5k for labour for assembly.)

5. Engineering prototypes and mechanical mockups.

JFC presented his latest views concerning the engineering development programme. He emphasised the need to validate the designs by building engineering models. He stressed that, although the test beam array had provided a lot of information, it had not proved useful as an engineering prototype. He therefore proposed that the engineering design team should not be involved in producing an array for beam tests in 1999, but should concentrate on engineering prototypes.

His objective was to have design details agreed by the end of this year, enabling work to start on an engineering prototype in January 1999. This would be completed in 6-7 months and a working prototype would then be built, which could be tested in a beam from April 2000.

JFC then listed other areas of work which would need significant resources for prototyping:

- A digital readout system would be needed for testing supercrystals.

- A scheme for mounting supercrystals had to be developed. Three iterations would be needed to measure deflections and establish clearances.

- It would be necessary to model the packaging of the front end electronics.

- A back plate model would be needed to investigate cooling, space for services etc.

Concerning costs, JFC said that no estimates had been made yet, but he felt that the current budget figure of £100k was light for such an extensive programme.

It was accepted that the proposed programme was reasonable and necessary. (The plan was agreed in the UK ECAL meeting in the afternoon, following a further discussion.) The concern of JFC that the cost would be greater than £100k was noted, although finding additional money would not be easy. One possibility would be to reduce the funds allocated to VPT prototyping, but it was too early to be certain that further VPT iterations would not be needed.

6. Global Calorimeter Trigger

GPH reported that the sum of money required this year for development would be slightly more than originally forecast, but the total cost of GCT prototyping was still expected to be covered by the £40k allocated. The first ASIC tests are now being carried out and this work has incurred some one-off costs. The current phase of the programme will cost £12k, of which £9k is for electronics that will be reused in subsequent tests.

7. Test Beam Costs

DJAC reported that the amount of money spent so far on requisitions for test beam work at CERN was 380 SF (1997) and 2270 SF + 570 SF (1998). He expected future costs to be at a similar level. It was noted that there was no explicit allocation of funds for test beam work, and that they had to be considered under the general heading of prototyping.

8. Construction Costs

JFC stated that no further information would be available before the end of this year. However, consideration should be given to adding electronic packaging to the list of items to be purchased by the UK, since we would have design responsibility for this item. The cost would be of the order of £60k -£100k, of the same order as the uncertainty on the estimated cost of the other items.

It was felt that the existing cost estimates were sufficiently precise to form the basis of initial negotiations with J F Faure aimed at setting up 'bilateral agreements' for the procurement of items that could not be paid for by the UK. It was therefore agreed that DJAC/RMB should start this exercise.

9. Summary and Conclusions.

- DCI to proceed with procuring the next iteration of ET prototypes at a cost not exceeding, and preferably less than £20k.

- The allocation of funds for Regional Centre activities at Brunel to be increased to allow a PC/Hytec system to be set up.

- DJAC and RMB should start discussions on bilateral agreements with J L Faure.

- Confirmation should be sought from the Russians concerning which items they would procure - DJAC.

10. Date of Next Meeting.

No date was set for the next meeting.

RMB 2/9/98

Appendix 1

From: RALHEP::DAVEC "Dave Cockerill"
To: MATVEEV,KATCHANOV,GNINENKO
CC: RMB,CONNOLLY
Subj: Items needed for the CMS ECAL Endcaps

To : V Matveev
V Katchanov
S Gninenko

CC : R Brown
J Connolly

16 July, 1998

Hi Victor, Vassily and Sergei,

in the UK we have recently started a cost review of all the items on the crystal ECAL Endcap. We would like to get an overview of which items might be made and/or purchased in Russia at a more cost effective level than elsewhere.

There are some MECHANICAL items which Russia has already shown an interest in producing
ie :
the ALVEOALR units
the TEST BEAM calibration table for Dees
the Supercrystal loader to offer SCs onto the Dees
Dee Installation equipment in CMS

There are other items which you may be interested in.
For example :

1) the 4 back support plates
2) the supercrystal positioning plates
3) the 4 support ring flanges for the Dees
4) the mounting ring flange to HE
5) the 4 environmental shields
6) the moderator enclosures
7) the 4 transfer frames for the Dees
8) the chassis mechanics for the 10 card readout crates

If you see items listed here which your institute or industries may be interested in then please let me know.

Also please let me know if there are other items of interest outside this list.

Many thanks for your help,

Dave Cockerill

Appendix 2

C O S T   E S T I M A T E S   F O R   V P T / M A G N E T   T E S T S

1 **LOW COST OPTION** (ASSUMES ALL CAN BE CONTROLLED BY LABVIEW - WORK PROCEEDING)

		£
STEPPER MOTOR DRIVE	FARNELL	200
MAGNET CONTROL	ADAM?	300
VPT SUPPLY HT	RS232 (PROVED)	-
DAQ - CAMAC	HYTEC?	-
PICO AMMETER	RS232	1500
GAUSSMETER	RS232 (PROVED)	-
LED DRIVE/MONITOR		300
MECHANICAL WORK		3000
	TOTAL	£5300

2 **HIGHER COST OPTION**

		£
STEPPER MOTOR DRIVE	MCLENNAN RS232	3000
MAGNET NATIONAL INSTRUMENTS		3500
VPT HT	RS232 (PROVED)	-
DAQ - CAMAC NAT. INSTRUMENTS		3500
PICO AMMETER	RS232	1500
GAUSSMETER	RS232 (PROVED)	-
LED DRIVE/MONITOR		300
MECHANICAL WORK		3000
	TOTAL	£14800

3 **AMPLIFIER COST TO BE ADDED TO BOTH ESTIMATES**

VPT PREAMPS _ 50 OFF		2000
LABOUR (ASSEMBLY &HOUSING)		5000
BASE CARD & WIRING		1000
	TOTAL	£8000