CERN/EF/EHS-CC/77-20
14 January 1977

EUROPEAN HYBRID SPECTROMETER (EHS)

Minutes of the Fourth Meeting of the Construction Committee (CC)

on 21st December 1976

Present: H. Desportes, P. Falk-Vairant, D. Güsewell, A. Minten (Chairman), L. Montanet, R. Newport, W. Turner, F. Schmeissner

I. APPROVAL OF THE MINUTES OF THE THIRD MEETING

The minutes of the third meeting of CC are approved.

II. PRESENT STATUS OF THE EHS SPECTROMETER LAY-OUT

The paper of L. Montanet on "The Lay-out of EHS" (CERN/EF/EHS-CC/76-3, version of 9 December 1976) is discussed. The following comments are made:

- L. Montanet concerning section 2.2: The SPS Division proposes now to finalize the definition of the EHS beam and to adopt a horizontal beam at 2.46 m from the floor.
- L. Montanet concerning section 2.4: The vertical dimensions of D_1, D_2, D_3 have to be checked in view of a beam height of 2.46 m and the final chamber height must then be accepted by NIKHEF.
- R. Newport concerning section 2.6: The given emittance of the beam exit window ($\pm 13.5^{o}$) is not only limited by the window design, but by the present chamber body. Any increase would require a different chamber body.

III. REVIEW OF PROCEDURE AND TIME-TABLE

3.1 Preparation of contracts with CEA/Saclay and Rutherford Laboratory (RL) for M1 and RCBC following the normal contract procedure of CERN:

- The CERN Supply Services will send to CEA and RL invitations to tender, on the basis of CERN Technical Specifications for M1 and RCBC, respectively.
- CEA and RL will submit offers with price breakdown and time schedule.
- CERN will express the definitive project authorization.

- CERN will propose draft contracts to CEA and RL and will prepare the necessary Finance Committee papers.
- In principle, signature of the contracts is possible immediately after FC authorization.

3.2 Simplified procedure for agreements with the Dutch National Laboratory NIKHEF and the Institut für Hochenergiephysik (HEPHY) Vienna, which have offered to contribute drift chambers D_1-D_3 and D_4-D_6, respectively:

- On the basis of technical specifications for the two groups of drift chambers, prepared by NIKHEF and Vienna in agreement with the latest EHS spectrometer lay-out, P. Falk-Vairant will write letters to the directors of the two laboratories asking to confirm their offer.
- The directors of the two laboratories will confirm their offer and thus make the agreements effective.

3.3 Time-table.
As it turns out to be impossible to prepare the required documents for the Finance Committee meeting of 24 February 1977, the following time-table is envisaged:

- Discussion of EHS budget with CERN Directorate; invitations to tender sent to CEA and RL	January 1977
- Offers from CEA and RL	February 1977
- Documents for Finance Committee prepared	20 March 1977
- Finance Committee meeting	28 April 1977
- Signature of contracts	1 May 1977

IV DISCUSSION OF PROJECT PAPERS

The following draft papers for the technical and financial definition of EHS, Part A, are submitted to the Construction Committee by the different contributing laboratories:

	Reference/Title	Laboratory
4.1	CC/76-18: Technical Specification of the Drift Chambers D_1, D_2, D_3	NIKHEF
4.2	CC/76-19: Technical Specification of the Drift Chambers D_4, D_5, D_6	HEPHY/Vienna
4.3	CC/76-14: Spécification technique de l'aimant supraconducteur M1 de EHS	CERN
4.4	CC/76-15: Technical Specification for the Rapid Cycling Bubble Chamber of EHS	CERN

	Reference/Title	Laboratory
4.5	STIPE/76-99 EHS: Partage des travaux et des fournitures entre le CEA et le CERN	CEA/Saclay
4.6	STIPE/76-101 EHS: Offre de prix et delais pour la fourniture de l'aimant M1 de EHS	CEA/Saclay
4.7	The RL Responsibilities for the Design, Construction and Testing of the Rapid Cycling Bubble Chamber	RL
4.8	Cost Estimate for the RCBC for EHS	RL
4.9	CC/76-16: EHS-Cost Estimate of CERN Contribution to Part A	CERN
4.10	CC/76-17: EHS-Definition of CERN Contribution to Part A	CERN

The papers 4.5 - 4.8 are considered as inofficial information only.

The papers 4.1 - 4.4 are discussed in detail as they constitute the technical definition of EHS, Part A. On all basic options, agreement is reached in the Construction Committee. Minor changes of wording will still be necessary, in particular for 4.3 and 4.4 in order to take into account comments of Construction Committee members, CERN Safety Group and CERN Supply Services. The final versions will be distributed to the Construction Committee members before CC5. In the following the major points of discussion on the different papers are listed:

Papers 4.1/4.2:

- Drift chamber dimensions have to be revised
- Pattern recognition has to be studied in more detail (request of E. Lohrmann); may have impact on plane number of modules
- NIKHEF and Vienna must use identical electronics
- Spare channels of electronics have to be supplied
- Decision necessary, who will take care of the study of a fast trigger electronics
- Time schedule of NIKHEF supply needs precision in order to permit early data acquisition tests: From January 1979 on, 1 chamber per month should be delivered to CERN.

Paper 4.3:

- Vibrational spectrum of iron frame has to be known soon; study by A. Hervé is under way.

Paper 4.4:

- Section 3.2.3: Radiation length in beam exit window (< 11.5% over ±12°) is, according to latest RL computations, the minimum possible with a stainless steel chamber body, which is chosen for reliability reasons.
- Section 3.2.8: R. Newport underlines that the required correlation between down-stream and fiducial volume is only possible if the expansion side of the iron frame is in a fixed position with respect to ground.
- Section 3.3.3: L. Montanet recalls that the choice of 50 mm unperforated film (instead of 70 mm perforated) for RCBC is dictated by technical reasons (space in cameras, fast film transport), but it implies also a substantial saving in film cost. 31 potential user laboratories were consulted; 25 replied; only 1 reply strongly urged for 70 mm with use of film perforations for positioning; 5 replies expressed a preference for 70 mm, but will probably be able to work with 50 mm as well.
- Section 7: It is agreed that the "joint definition of instrumentation" has to take into account the limits imposed by the contract price.
- Section 8.1: It is finally agreed that, in view of cost and time required, the cold test at RL of the assembled chamber, as wanted by CERN, will be replaced by a general pneumatic test at 125% of specified service pressures, as asked for by RL.
- Time schedule: R. Newport confirms that it is planned to transport the main chamber items to CERN in March 1979 and that separate items of instrumentation (e.g. optics) will be delivered before end of June 1979; he expresses his concern that a belated decision on EHS authorization by CERN will also delay the constitution of the construction team at RL (25 persons). The transport of the iron frame to CERN is requested for October 1978 in view of the delivery of the first magnet M1 coil in December 1978.

Paper 4.8:

- The latest price estimate of RL takes into account the CERN request for quartz windows on the RCBC safety tank and vacuum tank and for cold dynamic tests on piston and bellows. Apart from salaries and overheads, the contribution of RL to EHS will consist of the construction of ISIS at RL, development work not included in the cost estimate (piston, bellows, data box, etc.), staff allowances for work at CERN and covering of contingencies.

Paper 4.10:

- P. Falk-Vairant states that the sum of the cost estimates to be covered by the CERN budget for EHS, Part A, is now up to 9.2 MSF. He asks for more precision on the cost of installations and services supplied by SPS Division and evokes the possibility that

the CERN Directorate may impose a budget ceiling to EHS below the present budget estimate.

V. NEXT MEETINGS

For the next meetings of the EHS Construction Committee, the following dates are accepted:

CC5: Tuesday, February 1, 1977 at 9.30 a.m.

CC6: Tuesday, March 15, 1977 at 9.30 a.m.

D. Güsewell