

7 GeV PROTON SYNCHROTRONMagnet Coils

1. In PSPC/P.19 June 1958 the general approach to the design of the Magnet Coils was outlined. This was followed by a complete specification, PS 120 013, August 1958.

2. Initially the specification called for fixed prices for:-

Part 1 - Manufacture of Conductor Bars.

Part 2 - Manufacture of Insulated Coils

Part 3 - Installation (Preliminary Notice)

3. After a technical survey of the Heavy Electrical Engineering field the following firms were considered competent and willing to tender:

Messrs. Yorkshire Imperial Metals Ltd.	Part 1
Messrs. James Booth Ltd.	Part 1
Messrs. Metropolitan Vickers Electrical Co. Ltd.	Part 2 & 3
Messrs. General Electric Co.	Part 2 & 3
Messrs. Brush Electrical Co.	Part 2 & 3

Messrs. English Electrical Company, were regarded as competent but had not sufficient production space available and after considering the specification declined to tender.

4. Tenders have now been returned for both Parts 1 and 2 and these are discussed in turn.

Part 1. Manufacture of Conductor Bar.

<u>Tenderer</u>	<u>Price</u>	<u>Start of Delivery</u>
Messrs. Yorkshire Imperial Metals	£59,954	4 months from order (excluding copper cost of £75,000)
Messrs. James Booth, Ltd.	£142,286	4 months from order (inclusive of copper)

5. Discussion. The Yorkshire Imperial offer includes the following conditions and omissions:-

- 5.1 The supply of 300 tons of copper by A.E.R.E. at a cost of £75,000 (omitted)
- 5.2 An additional 220 tons of copper is required above that delivered in the form of finished bar.
- 5.3 Accurately bored billets have to be supplied by A.E.R.E. before they start manufacture.
- 5.4 Yorkshire Imperial will buy scrap at prices ruling at the time of delivery.

The financial implications of the above are that the Yorkshire Imperial price should be adjusted as follows:

Basic Price	£59,954
Add 5.1	£75,000
Add 5.2)	
5.3)	£19,200
5.4)	
	<u>£154,154</u>

From the above it is concluded that the offer of £142,286 made by Messrs. James Booth is financially more attractive. We are satisfied that Messrs. James Booth are competent to produce the required material to our satisfaction.

Part 2.

6. Manufacture of Coils.

As previously mentioned the specification called for fixed prices, and under this call the following offers were received.

<u>Tenderer</u>	<u>Offer</u>	<u>Delivery.</u>
Messrs. Metropolitan Vickers	£4,39,000	3 months later than requested
Messrs. General Electric Co.	No return	
Messrs. Brush Electric Co.	(Incomplete offer)	No return.

7.

Arising from the discussion at the last Project Committee the contract documents were amended so that manufacturers would be given the opportunity of tendering fixed prices for selected parts of the contract and estimated prices for the remainder. The terms of the modifications were as follows:

1. Manufacture of the coil, testing and inspection before insulation (Clauses 4.3, 4.4 and 4.5.4 of the Specification) - a fixed price.
2. Insulation of Conductors (Clauses 4.5.1, 4.5.2 and 4.5.3 of the Specification) - estimate of cost plus a fixed profit fee to be quoted separately.
3. Loose Insulation (Clause 4.5.6 of the Specification) - either (a) a fixed price or (b) an estimate of cost with a fixed profit fee to be quoted separately.

8.

The above revision to the contract brought the following offer:

	<u>Offer</u>	<u>Delivery</u>
Messrs. Metropolitan Vickers	No modification to fixed price offer	
Messrs. G. E. C.	Estimated all in cost of £1,714,467	12 months later than requested.
Messrs. Brush Electric Co.		
Mechanical Manufacture of Bar	£216,982	
Insulation of Bar	£205,325	As requested
Loose insulation	£ 1,731	
	£424,038	(Complete offer is an estimated cost)

9.

In view of the high G.E.C. figure and late delivery this offer was not seriously considered. The small margin between Messrs. Brush Electric Co. and Metropolitan Vickers called for detailed examination of the offers. The following factors have influenced the recommendation.

- 9.1 The Metropolitan Vickers offer is a fixed price. The Brush Electric offer is an estimate.
- 9.2 Messrs. Metropolitan Vickers have not a satisfactory reputation for delivery on time.
- 9.3 The Metropolitan Vickers samples of insulation are superior to those submitted by Brush Electric.
- 9.4 The Metropolitan Vickers fixed figure for loose insulation is regarded as high, whereas that of Messrs. Brush Electric is only estimated but is considered low.
- 9.5 Metropolitan Vickers has better technical ability, manufacturing capacity and constructional labour.
- 9.6 Metropolitan Vickers have a tendency to impose their standards and methods rather than attempt to achieve those specified.
- 9.7 No substantial experience of the Brush Group is available to the Project Group.

10.

In view of the uncertain nature of the loose insulation,

it is considered that this item could best be associated later with the installation part of the contract, by which time requirements can be closely specified. If the prices of the loose insulation quoted separately in the offer, are extended the adjusted prices are as follows:

Metropolitan Vickers	£420,000	(fixed price)
Brush Electric Co.	£422,307	(estimate)

In view of the above the Metropolitan Vickers offer is both technically and financially the more attractive, but the delivery offered is 3 months later than requested.

11. Before return of the tender the design of the end connections had had to be modified in consequence of the re-designed vacuum vessel. Metropolitan Vickers have been asked for the additional cost to cover the revised scheme. A ceiling figure of £36,000 has been given verbally for this variation.

It is considered that this variation to the contract price is not too unreasonable but it is considered that it should be examined in more detail by both parties.

12. Messrs. Metropolitan Vickers have been interviewed and it has been confirmed that their tender includes the cost of the copper. They have agreed that they can deliver the coils by March 1961. Metropolitan Vickers state that this can only be improved if the Authority assist them to achieve better delivery times for the tools, plant and equipment.

If the following recommendations are approved, an approximate expenditure of £445,000 will have been committed leaving £85,000 under this subhead to cover the cost of terminal connections, loose insulation, installation and minor variations.

13. Recommendations.

It is submitted that the Project Committee recommend to the General Purposes Committee that:

13. A contract be placed with Messrs James Booth for the manufacture of Copper Bar to specification PS 120 - 013 at a fixed price of £142,286.
- 13.2 A Variation order be negotiated with Messrs. James Booth to cover the additional copper bar required for the modified end connections. (A.E.R.E. estimate addition cost to be £6,000).
- [2] 13.3 A contract be placed with Messrs. Metropolitan Vickers for the manufacture of the Magnet Coils generally to our specification at a fixed price of £420,000 plus a sum not exceeding £36,000 to cover the cost of the modified end connections.

13th November, 1958.

P. BOWLES.

Handley

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