

7 GeV PROTON SYNCHROTRONMAGNET COIL DEVELOPMENTS.

1. In the paper PS.PC/P.30 presented last November, it was recommended that the order for the magnet coil manufacture be placed with Messrs. Metropolitan-Vickers at a fixed price of £420,000, plus a sum not exceeding £36,000 to cover the cost of modified end connections.
2. These two amounts were financially sanctioned and the order placed subject to receipt of a firm tender for the modified end connectors.
3. During the last six months, the time has been mainly taken up by the manufacture of tools, much of which has been sub-let to Messrs. Vickers-Armstrongs at Swindon. Substantial progress has been achieved and, to date, the programme is about two weeks late, based on an overall time three months less than that tendered by Metropolitan-Vickers originally.
4. Messrs. Metropolitan-Vickers have now quoted for the extra cost of the modified end connections and also for a number of additions we have made to the specification. These extras are mainly for improved fittings to the coil, more expensive than the original specification indicated, and are detailed below. The quotations are :-

a)	Extra for modified end connections	£17,455 ✓
b)	Extra for checking fixture	9,175 ✓
c)	Improved hose to pipe connection and stouter terylene reinforced neoprene hose	3,610 ✓
d)	Improved water cone fitting with clamps and flexible bellows tubing connectors instead of solid copper tube and standard vacuum unions	16,300 ✓
e)	Improved end plugs	1,540 ✓
f)	Transport Cradles (These were quoted originally but not ordered)	6,400. ✓

	Authorised extra expenditure	54,480 36,000
		£..18,480

5. DISCUSSION(a) Checking fixture

Messrs. Metropolitan-Vickers included for two checking fixtures, one to ensure the correctness of longitudinal conductors and one for correctness of end conductors. We

think that a further fixture is necessary to make sure end connectors fit the longitudinal connections accurately and that the assembly will be stress free. We have not yet seen their detailed proposals but there is bound to be a large amount of accurate engineering in this device to account for the quoted cost. The feature will, however, ensure more rapid assembly on site and contribute to a stress-free assembly.

(b) Improved Water connections

The original specification allowed Messrs. Metropolitan-Vickers to put forward their own designs for water connectors and hose. We have not regarded these as entirely satisfactory and have designed, ourselves, a more positively leak-proof type and called for a stouter hose. We have further designed a flexible water connection between longitudinal and end connections which we consider more reliable than the rigid type allowed for by Metropolitan-Vickers.

The prices quoted need to be investigated before acceptance as they appear rather high.

(c) Transport Cradles

Two steel frameworks are necessary for the transport of the finished coil parts to Harwell. They were quoted for originally but we decided at the time not to include them in the order as we were not sure what was involved. It is certain, now, that some such cradles are necessary but, before accepting them, some investigation of their design and cost is to be done.

6. RECOMMENDATIONS

- (1) It is recommended that orders be placed with Messrs. Metropolitan Vickers for items covered by 4(a) and 4(f) at a fixed cost of £23,855 (Twenty-three thousand eight hundred and fifty-five pounds) x
- (2) That instructions be given to Messrs. Metropolitan-Vickers to proceed with 4(b), 4(c), 4(d) and 4(e) at a cost to be negotiated but not exceeding £30,625 (Thirty thousand six hundred and twenty-five pounds) x

There is provision in the present Plant Budget of £36,000 for additions to this Contract. The above items exceed this sum by £18,480 and will contribute to the increase in the Plant Estimate which is forecast in the Financial Statement No. 7

P. BOWLES

M. J. MARCHBANKS

Engineering Division,
29th May, 1959