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CONFIDENTIAL - COMMERCIAL

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NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Ferrite for the 7 GeV Proton Synchrotron

Note by the Chairman

The Project Committee discussed the contract for ferrite for the 7 GeV proton synchrotron on 28th November and their recommendations are set out in the attached paper. Members will see that the Project Committee recommend that the contract be placed with Philips, Eindhoven, at a price of £39,000.

It is hoped to place the contract in early January i.e. some time before the meeting of the General Purposes Committee arranged for 24th February. I would be grateful, therefore, if members of the General Purposes Committee would let me know by 1st January whether or not they wish a meeting to be arranged to discuss this matter or if they have any comments on the proposals. If there are no objections to the proposals I will approve them on behalf of the Committee.

For the attention of members of the General Purposes Committee.
For the information of members of the Governing Board.

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CONTRACT FOR THE FERRITE FOR THE 7 GeV MACHINE

1. PURPOSE OF FERRITE

The ferrite is used to load the accelerating cavity of the 7 GeV synchrotron, to enable this cavity to be frequency modulated in synchronism with a harmonic of the rotational frequency of the proton beam.

2. SCOPE OF CONTRACT

The total weight of the ferrite is approximately 6½ to 7 tons. Tenderers have quoted for slightly differing amounts of material for the following reason. The ferrite is in the form of frames which when placed together must form a stack 120 cm. long, but the individual frame length and hence the total number of frames may be varied to suit the manufacturer between the limits 2.5 cm. to 4 cm. or 48 to 30 frames. Tenderers have been requested to quote for the appropriate number of frames plus six spare frames which accounts for the difference in total quantity.

3. INITIAL ENQUIRIES

Initial enquiries were made early in 1956 to:

- i) Mullards, London.
- ii) S.T.C., London.
- iii) Philips, Eindhoven.
- iv) L.T.T., Paris.
- v) Steatit-Magnesia, Porz-Rhein (Western Germany).

Our requirements are unusual and it has been necessary for the firms to develop new materials to meet them. A large number of samples were submitted to us and tested and eventually a detailed specification was drawn up based on these measurements. During this period it appeared that neither Mullards nor S.T.C. were able to produce a suitable material of the desired shape and size and these firms withdrew in favour of their continental associates. The specification was discussed in detail and approved by the three remaining firms, though at the time the tenders were sent out we had only received satisfactory samples from one firm (L.T.T.)

In an early verbal enquiry an official of the Plessey Company stated that the company was not interested, but later the company requested, and received, tender documents. The Plessey Company were requested to submit samples, but these were unsatisfactory.

4. TENDER ACTION

A minimum specification was circulated to the following firms with the remark that a tighter specification could be submitted if desired.

- i) Plessey Co., Towcester.
- ii) Philips, Eindhoven.
- iii) L.T.T., Paris.
- iv) Steatit-Magnesia, Porz-Rhein.

Plessey's withdrew and firm price tenders together with samples were received from the other three firms.

5. ANALYSIS OF TENDERS.

The prices for the total order are given in the first column, the total number of frames and percentage of spares in the second and third; to enable a fair comparison the cost without spares is given in the fourth column.

<u>Firm</u>	<u>Total Cost</u>	<u>Number of Frames</u>	<u>% Spare</u>	<u>Cost less spares</u>
Philips	£39,000	36	20	£32,500
L.T.T.	a) £55,860	54	12	£49,700
	b) £51,080	38	19	£43,000
	c) £49,570	34	21	£41,000
	Based on rate of exchange of 1176f. to £.			
Steatit-	£35,950	46	15	£31,340
Magnesia	Based on rate of exchange of 11.76 dm. to £.			

Measurements on the samples supplied with the tenders showed the Philips and L.T.T. material to be considerably better than the minimum required. Philips proposed to accept the minimum properties whilst L.T.T. were prepared to raise the minimum properties slightly. The Steatit-Magnesia material did not meet the minimum specification though their tender was for this specification.

It should be pointed out that this minimum specification was arrived at partly for technical reasons and partly on a basis of total cost of the ferrite plus its associated components. It is recommended that the choice of ferrite is made on a basis of total cost. In this case the improved properties of the L.T.T. material result in a saving of approximately £1500 over a material satisfying the minimum specification. Technically it would be possible, though difficult, to accept the Steatit-Magnesia material but the increased cost in the other components would be of the order £5,000.

6. CONCLUSIONS

The slightly improved specification proposed by L.T.T. does not justify the high cost. The Steatit-Magnesia material does not satisfy the specification, which could be lowered though this would be technically undesirable, but the increased cost of the associated components would then result in a total cost greater than that if the Philips material were used.

7. RECOMMENDATION

That a contract for ferrite be placed with Philips, at the fixed price of £39,000 subject to normal variations for labour and material costs.

8. This recommendation was discussed at a meeting of the Project committee on November 28th, when it was agreed that the contract should be placed with Philips at the price stated.

P. D. Dunn.

10th December, 1957.