PS INTERNAL REPORT
Not for outside distribution

Minutes of
Parameter Committee Meeting
October 4th, 1954.
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Present : J.B.Adams, H.Bradner, A.Citron, H.G.Hereward, M.G.N.Hine, K.Johnsen, P.Lapostolle, Ch.Schmelzer, A.Schoch.

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1. R.F.Cavities

To find an answer to the question how the straight section length available would affect the cost of the R.F. system, Schmelzer introduced as an indication for the cost a figure proportional to the total power times the total volume of ferrite. This figure is independent of the number of R.F. cavities used. It contains the cavity geometry in the ferrite volume and in the shunt impedance of a cavity. Plotted against ferrite core length, their ratio drops rather steeply up to 100 cm, much less above that value. Schmelzer's conclusion is that the ferrite core ought to be 100 cm long, perhaps a little shorter, but that 75 cm is an absolute minimum. The validity of the figure used as a cost index was discussed. It was also emphasized that as much as 1/5 of all the positions originally assigned to R.F. cavities may be taken up by other equipment (inflection, targets, ejection). On top of that one ought to have a safety factor of 2 in power available.

On the mechanical design of the cavities Schmelzer mentioned that he had decided to build the amplifier into a unit separated from the cavity and magnet. This would make replacement of an amplifier much easier.

2. Information on magnet iron (Adams).

Model 5 will be made out of 1 mm laminations of a cheap iron. The cost of this stands to that of good transformer iron and that of hypersil in the ratio of 50:125:180. Measurements of the magnetic properties of the cheap iron - data on the other sorts will be provided to us by the firms - will be carried out here on samples. A complete model out of high grade iron will only be considered if and when the cheap one proves to be unsatisfactory. The lamination will be glued together with a sheet of araldited paper in between.

3. Influence of parameters on injection and ejection facilities.

Hereward summarized the situation by stating that from an ejection (target accomodation) point of view 16 super-periods are most favourable, and 14 or 13 may be made acceptable by certain modifications. From the injection point of view the order is inverse, 13 being ideal, 14 good and 16 acceptable, but requiring some modifications of the present design for the linac wing. It was felt, however, that these latter modifications could lead to quite a reasonable layout. Lapostolle is going to make a study of the resulting inflection geometry. Citron said it was not surprising that the target building designed round a machine of 16 super-periods with 3 magnet yokes inside, 3 outside, fitted this arrangement best. By lengthening the super-period three things happen : 1) Important targets as those for high energy meson production shift into positions in which larger deflections are necessary to get the outcoming particles into the target areas. This can be offset by shifting the whole magnet structure back by 6 to 7 m with respect to the building. This shift restricts the forward beam facilities to a certain extent. 2) Less targets are in the useful region between the movable shielding walls. 3) The targets provided for backward radiation disappear further into the tunnel so that it is no longer possible to observe overlapping angular ranges up to 180°. He concluded that with the present target building 16 super-periods made the machine most useful from an experimental point of view. Hine said he would like to have other possibilities investigated, which would result from altering the magnet yoke configuration and throwing out more R.F. cavities.

4. <u>Outstanding points.</u>

1) To try and find magnet configuration other than the "16 super-period, three in, three out" one which would be as satisfactory from the in- and ejection point of view. (Hine, Citron).

2) To study the inflection system for the 16 super-period case. (Lapostolle)

3) To find a desirable cross-section for the linac wing. (Hereward).

A. Citron