

CRITERIA AND PARAMETERS FOR EPB TRANSPORT

D. Meyer

August 4, 1967

- 1) In order to provide for future expansion, the EPB will be bent by a septum magnet at point A in the figure. This will save large amounts of machine down time since additional switch points can be built while the machine is operating. Cost of this over using EPB without bend is ~\$1 M.
- 2) The bend at point A must be adequate and the distance to target positions T_1 and T_2 long enough that there is about 350 ft. of transverse clearance between T_1 and the undeflected EPB to allow adequate room for experiments and future EPB expansion. Also, the transverse distance between T_1 and T_2 should be about 200 ft. to allow adequate room for experimental setups at both T_1 and T_2 .
- 3) A rough cost minimization to meet the criteria set out in (2) results in a 150 mrad bend at A and an A-B distance of 1500 ft. At the point B the beam to T_1 would be bent 50 mrad and that to T_2 100 mrad. Distances B- T_1 and B- T_2 would be about 1300 ft.
- 4) The bending magnets at A and B would run at 9000 gauss to allow for future operation at 400 Gev. It is suggested that machine magnets be used in these locations and machine quadrupoles in transporting the beam. This will allow the future possibility of these magnets being pulsed and tracking the machine magnet so that EPB may be delivered to the target stations at several energies in one beam pulse. For the present, these would be operated dc. (The power dissipation is okay at 200 Gev/c and probably at 400 Gev/c.)

- 5) The tunnels for the proton beams should be small with enlargements and access where needed for quadrupoles so the μ 's from π 's produced on the septums will be absorbed in the surrounding fill.
- 6) Low intensity target stations at L1 and L2 would be extremely useful. They would provide small and/or thin targets at minimum shielding expense. A few quadrupoles and bending magnets could provide adequate secondary beams for many experiments in the 20-40 Gev/c momentum range and for testing equipment.
- 7) At the present stage of design there is no good criteria on which to decide whether B-T₁ and B-T₂ should be different distances or the same. The two things which might influence this decision are:
 - a) A desire to minimize the interference between experiments at the two stations.
 - b) The possibility of supplying beams to some relatively immovable piece of apparatus from both T₁ and T₂ (for example an rf separated 50 Gev beam from T₁ and a neutrino beam from T₂).A more detailed design is needed on specific beams before a decision can be made.
- 8) To make the secondary beams more independent, a magnet about 500 ft. upstream from the target can be used to either split the beam or direct it to one of two targets about 2 ft. apart. This greatly simplifies the magnets at the target station. The loss in actual useful beam for an experiment will not be large based on experience at present accelerators.