VACUUM CHAMBER IBH 1

MPS 1A05-000-2

The chamber makes part of the LINAC-MPS injection line. It is situated in the region where the proton beam is either deflected to the MPS or allowed to drift to the booster.

It is necessary to replace the existing chamber for a new one, because :

a) the new bending magnet is shorter than the present one,

b) the angle of deflexion is greater than the angle of the existing chamber.

EXISTING SITUATION

Bending magnet, drawing N°	23 - 100 - 1	(1.3.1957)
Vacuum chamber, drawing N°	23 - 376 - 0A	(30.5.1961)
Connecting sections, drawing N°	P23 - 139 - 2A	(5.3.1958)
Support of the BM, drawing N°	023 - 0158 - 1 and 023 - 0158 -1	

For an unknown reason the existing chamber was designed and made for a bending angle of 16° instead of 300 mrad (17,19°), for which the injection line was conceived. Because of this, the chamber has been rotated around a point at its upstream end for the difference in angles of 1,2°, causing a displacement of the downstream flange of 24 mm from the LINAC beam line.

The chamber is made in normal 18/8 stainless steel. All vacuum seals on the chamber, as all the seals in the injection line, are rubber O-rings.

On the downstream end, the chamber is electr. insulated from the rest of the line. Insulating sheets have been placed between the chamber and the magnet poles.

SPECIFICATIONS FOR THE NEW CHAMBER

- Bending angle : 300 mrad (T. Sherwood)
- Effective bending length (chord) : 1030 mm (T. Sherwood)
- Material for the chamber : austenitic stainless steel Avesta 328 SKRN (T. Sherwood)

- The distance from the crossing point LINAC beam - MPS beam (middle of chamber) to the booster-line flange : 1417 mm (C. Rufer).

- The tube to the booster-line should be of the largest possible diameter and equipped with a flange SI 3.19.110.3 (C. Rufer).

The chamber will be provided with aluminium seals ; in order to match it with the rest of the injection line, the two existing connecting sections have to be remade with an Al-seal flange on one end and a rubber-seal flange on the other end. These sections will have to be changed one again when, in some future time, the whole injection line will be reconstructed.

CONSTRUCTION OF THE CHAMBER

The chamber is similar to the existing one, the main difference is that, looking at it from the top, the inner side is not curved, but straight, thus making it possible to produce it from two half-shells welded together in the horizontal plane. The three round tubes are of the largest possible diameter to fit between the magnet coils ; they are in stock at CERN. All three flanges are of the same type (SI 3.19.1109.3) so that the same clamps and Al-seals can be used.

The chamber will be fixed to the magnet poles by means of brackets ; on the upstream end with possibilities of adjustment in radial and longitudinal sense, on the downstream end only in radial sense. Adjustment in the vertical sense is not provided, the chamber being wedged between the magnet poles with thin vetronite sheets for insulation.

The production method of the chamber : the two half-shells welded together will be machined on both ends to the required angles ; the two end plates after being welded on the shell will be machined to the required thickness and provided with openings. The last operation is the welding of the three tubes already provided with flanges.

E. Boltezar