MPS/ML Note 71-19
PR/slb - 24.9.71

CHEMISTRY TANK, PROPOSALS

For the next long shut-down, it is proposed to move the chemistry sector from the ss 82 to ss 10 (U. Jacob, MPS/SR Memo 71-39). Unfortunately, the present design does not allow the use of metallic joints and the ss 10 has been a hot spot from the point of view of radio-activity for the last few years; in addition its realisation is such that even without targets inside, only a poor vacuum can be achieved. Because of these poor vacuum characteristics, the use of ion pumps is not recommended. The ss 10 has already been converted to ion pumps and the re-installation of old diffusion pumps there would require the installation of a few cables between the ring and the central building and some arrangement of the connection points in the ring, the central building and the MCR. This represents an estimated investment of approximately Sw.Frs. 10,000.-.

An improvement would be the redesign of some parts of the tank, in order to use metallic joints and new sector valves and to install a TMP and an IP. A multiwire cable and a coaxial cable would be installed for the pumps between the ring and the CBE. In this case one could expect a better vacuum and good radiation resistance.

With the existing sector valves and target mechanisms and the rebuilding of a new tank, it is possible to have an arrangement with the airlock principle for the chemistry target, which overcomes some of the inconveniences and shortens the PS stops.

The existing material allows a half aperture of only 55-58 mm, thus limiting the location of the chemistry tank to the even ss, but there is no longer a need to be close to an existing sector valve.

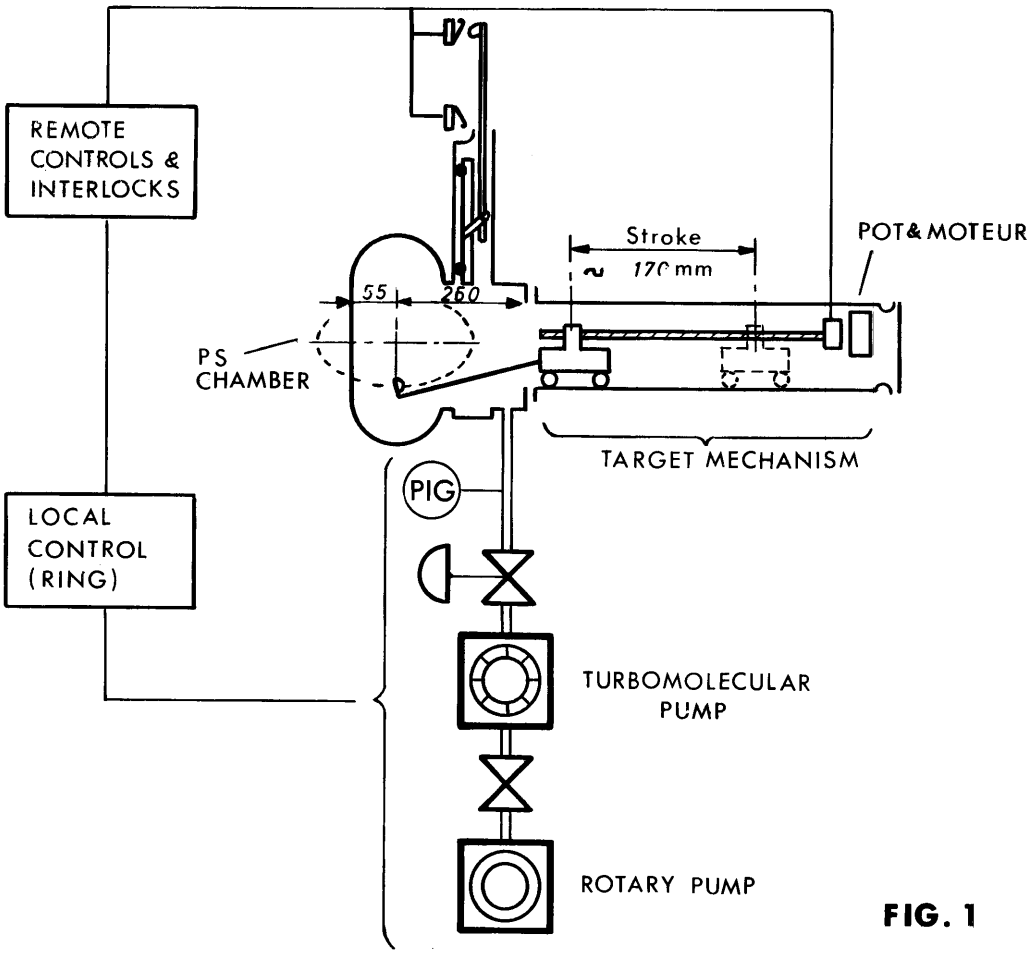

FIG. 1

Figure 1 indicates the main components and controls only. The air lock valve is a Riber sector valve mounted in vertical position. A standard TMP would assure the vacuum on the target side. The guiding system that was used on the magnet unit 60 some years ago (drawing VAC 1163) would assure an easy change of the target units; two of them would be installed on the tank. A possible layout of the equipment is sketched in Figure 2.

To sum up the two solutions, we have :

a) Tank modified with metallic joints, TMP and IP and new sector valve.

Mechanical (manifolds, support, flanges)	6 ÷ 8,000.- SF.
Electrical (cables, control units)	10,000.- SF.
2 Riber valves	16,000.- SF.
1 TMP Pfeiffer TPV 900	16,000.- SF.
1 IP Varian 400 l/sec	10,000.- SF.

1 month's work for a designer.

Inconveniences : the chemistry tank is still a sector and has to placed adjacent to an existing sector valve. An air inlet on the PS is required to change a target and the target unit pollutes the PS vacuum continuously.

b) New tank with air lock.

Tank, support, manifolds	10 ÷ 12,000.- SF.
Electrical (cables, control units, etc.)	10,000.- SF.
2 Riber valves	16,000.- SF.
1 TMP Pfeiffer TPV 900	16,000.- SF.

1.5 months' work for a designer.

Inconveniences : only even ss are allowed for the tank; the electrical control is somewhat different from the standard PS control.

NB The cost of valves, TMP and IP is indicated even if this material is already in stock.

If the solution b) is chosen, it could serve as a good test for a long term improvement, i.e. the installation of the operational targets with an air lock valve as shown in figure 3.

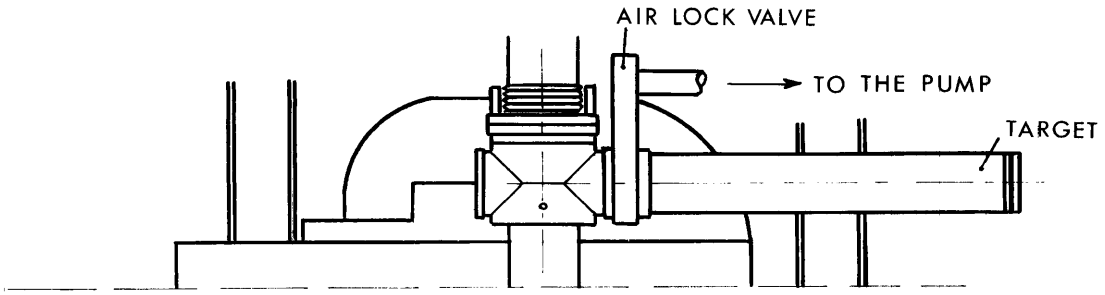

FIG. 3

A new valve and a new target mechanism have to be developed (C. Steinbach, private communication), but the advantages for the PS run are quite evident.

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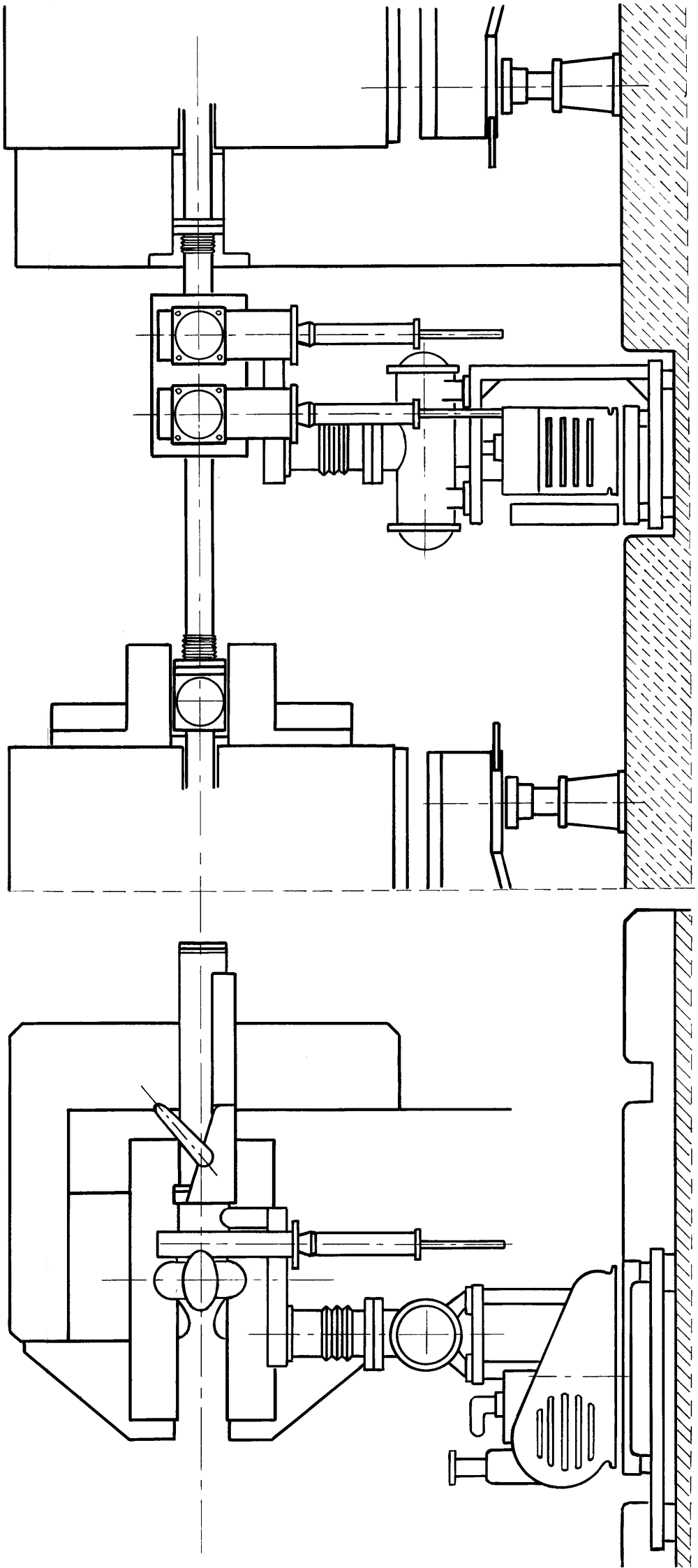

FIG. 2