

Notes on the Linac Running-In Committee Meeting No 9

June 30th, 1959

Present : F. Block - H.G. Hereward - P. Lapostolle - B. Marsicanin  
B.W. Montague - U. Tallgren - B. Vosicki.

1. Instruction Notices.

Pre-injector notice is ready in english and french except for vacuum (including block diagram) (B.M.).

R.F. one is ready but not typed and a block diagram should be added (F.B.).

Vacuum one is to be typed and translated.

For beam focusing french is ready but it has to be translated (B.V.).

Temporary beam measuring notice and block diagram has still to be made (B.V.).

2. Operation.

Operation has started on the 22nd of June with a rota of operators. It has been very satisfactory since that time.

Incidents must always be recorded on log sheets. For the time being the best log to record such things seems to be either the one referring to the equipment concerned or the log sheet more extensively used at that time (generally the R.F. one). One can contemplate for the future a smaller number of sheets and possibly the introduction of an incident sheet or book.

3. Progress.

a) Incidents.

The column broke down several times. This looks to be due to dust :

The Faraday cage has been cleaned during the week-end. On this occasion, the corona protection was displaced giving a higher corona on the 29th (0,7 mA instead of 0,6 mA).

The motor generator switched off. This can come from bad contacts on the switch. This question should be looked at. If it was more serious it could be necessary to have a spare generator.

Trigger voltage on quadrupole igniters had to be increased. This is a sign of ageing but does not yet indicate a close death.

b) Tilting experiments.

Threshold method has been used. For tank I the level was measured on reflectometer, on loop 2 (input end) and on loop 17 (output end).

There is still some scattering on the measured points.

The optimum tilt is probably for tilt tuners between central and high input field positions.

Threshold power is around 400 KW. For tank II power was the only measurement.

The optimum is obtained for the tank being tilted downwards (maximum field at input end).

Threshold power is around 1,05 Mw (that looks rather low).

More measurements should be done.

c) Transparency.

Output current from Tank I has been measured with ( $I_2$ ) and without ( $I_1$ ) aluminium foil stopping non-accelerated protons.

For a pre-injector voltage of 510 KV and quadrupole focusing in operation  $I_1$  is always slightly higher than  $I_2$  by a small amount almost independant of R.F. level between 0 and 800 Kw.

With no focusing  $I_2$  is always 0 but  $I_1$  decreases progressively from say 200  $\mu$ A to 100  $\mu$ A when R.F. increases.

For a fixed R.F. level of low value much below threshold  $I_1$  increases slowly with pre-injector voltage if quadrupole focusing is on; but if there is no focusing  $I_1$  exhibits curious oscillations with voltage (two oscillations between 350 kV and 500 kV).

During these experiments with low R.F. power the multipactoring situation has been very bad.

d) Multipactoring.

Multipactoring is slightly sensitive to pressure but not very much.

Repetition rate is more important but one must go down to  $1/4$  or  $1/5$  pps to have only a few percent pulses lost.

It could then be good not to inject continuously but only when necessary (for doing a measurement, or for injecting into the synchrotron). A small shutter would be useful for this purpose.

It is clear that multipactoring pulses are coming by batches and that nothing is more likely to cause multipactoring than a recent multipactoring.

Multipactoring looks also to decrease if H.T. is below 480 Kv. One wonders whether it is really sensitive to acceleration itself. More experiments should be carried out.

4. Programme.

I. - Week 29.6./3.7.1959

- a) Put in place solenoids and transformers (B.M.)
- b) Test solenoid lenses and new current transformers (B.M. + U.T.)
- c) Emittance measurements (B.M. + U.T.)
- d) Multipactoring. Sensitivity to modulator pulse shape (B.W.M.).

II. - Week 6/10.7.1959

- a) Emittance measurements (B.M. + U.T.)
- b) Acceptance measurements (B.M. + U.T.)

- c) Focusing experiments on tank I (B.V.)
- d) Multipactoring
- e) Low power measurements on tank III (Agoritsas).

III. - Week 13/17.7.1959

- a) Acceptance measurements (B.M. + U.T.)
- b) Focusing experiments on tank I (B.V.)
- c) " " " II (B.W.M.)
- d) Multipactoring (continued)
- e) Final cleaning - Finishing tank III.

IV. - Week 20/24.7.1959

- a) Focusing experiments on tank I (B.V.)
- b) " " " II (B.M.)
- c) Repeat tilting experiments on tanks I and II
- d) Repeat intensity / R.F. measurements on tanks I and II
- e) Pumping tank III.

5. Next meeting.

On Tuesday July 7th, 1959 at 10.30 a.m.

P. Lapostolle.

Distribution : (closed)

Parameter Committee - Machine Operation Committee.

Linac Group - (Linac Centre File).

PL/ac.