PS. Int. LIN. 59-17
July 9th, 1959.
PL/ac.

Notes on the Linac Running-In Committee Meeting No 10

July 7th, 1959

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

1. Instruction Notices

There remains to be done :

- Translation into French of Vacuum Notice (PHS)
- " " of Pre-Injector Vacuum Notice (BM)
- " English of Beam Focusing and Measuring equipment (BV)

Block diagrams have to be added.

Beam measuring and tank I focusing log sheet has been issued. Tank II focusing will provisionally be added on the spare lines.

An index will be prepared of the various log and check sheets and of the instruction notices (PHS).

2. Operation

Protection on HT plugs of pulsed quadrupole supplies has been installed. But SB has not yet put doors to close the back of the equipment.

Radiation interlock system has been put partly into operation.

Instruction notice will be prepared for it (PHS).

Some more breakdowns have occurred in the Faraday Cage. Relative humidity was 80 o/o. Situation has been improved with heating.

One of the four jaw apertures was out of service.

3. Progress

a) Solenoids and new transformers have been installed.

Second solenoid had been modified and much improved.

First transformer (in the vacuum box) is equipped with a secondary electron suppressor. Applied voltage on it must be between 1000 and 2000 volts.

b) On Thursday 2nd of July, acceleration up to 30 MeV was tested with new solenoids. 2 mA of protons were accelerated up to 30 MeV.

In fact, by mistake, current measurements were first made at the end of Tank II after the 10 MeV foil (and not after the 30 MeV one).

Focusing and phase was adjusted to optimum and after about 2 hours operation output current was between 1,9 and 2,2 mA. Tank I accepted the power on each pulse but there were clearly two types of pulses : one was the normal one; in the other one the RF in the tank only built up after a few tens of microseconds : forward wave was normal, reflected wave started higher and then yielded to normal. RF level at the time of acceleration was apparently normal.

When looking at the current after the 30 MeV carbon plate one discovered that the phase was not perfectly adjusted between Tank I and Tank II and after adjustment the two types of pulses gave either 2 mA or 0.5 mA current. That looks to indicate a change in phase between the two modes.

One should mention that the vacuum in the tank had been bad the day before that experiment and even the morning and had just recovered.

Multipactoring situation has been as follows : At the beginning of the run about 50 o/o pulses were lost; even with solenoids in operation. Then apertures were partially closed in order to reduce multipactoring. No change was noticed at that time. Position of apertures was adjusted in order to give only a very slight reduction of beam current (between 5 and 10 o/o) : an aperture of 20 x 20 mm displaced 2 mm upwards on the first jaw and an aperture of 10 x 10 mm displaced 1 mm left on the second one.

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After two hours operation where no changes were made except slight adjustments of the focusing in order to increase output current multipactoring had almost completely disappeared; but there was at that time the two modes situation described above.

Radiation level has been carefully measured. It was rather high and recorders went off scale at the end of the run when output current was rather steady around 2 mA.

c) Emittance

One four jaw aperture transmitter was out of order and the aperture had to be hand operated. Only a few measurements have then been made.

On the first four jaw aperture, at the end of the column, the distribution in phase space looks somewhat like an ellipse of 17,5 mm and 4,6 mrad semi-axis.

Transferred to the source, at around 20 KV potential and through a canal of 3,5 mm diameter that would correspond to an angular distribution of $\pm$ 250 to 300 mrad which is not far from the maximum possible through this canal.

More measurements have to be done.

A four jaw aperture has to be repaired. One will see whether its reliability can be improved.

d) Multipactoring

Capacitors have been included between primary and secondary of the modulators pulse transformers.

That gave a steeper slope at the beginning of the RF pulses on reflectometers.

Statistics of multipactoring percentage with and without condensers were taken for various timings of the modulators. But no evidence was obtained of any effect or improvement.

The exact shape of the pulse looks to be correlated with the vacuum when it varies between 9 and 17 nenons.

It could be useful to carry out some more measurements with larger condensers.

4. Programme

I. - Week 6/10.7.1959.

a) Repair four jaw aperture (BM)
b) Emittance measurements (BM + UT)
c) Acceptance measurements (BM + UT)
d) Adjustments of beam measuring equipment (BV)
e) Multipactoring and associated problems (BWM).

II. - Week 13/17.7.1959.

a) Acceptance and emittance measurements (BM + UT)
b) Focusing experiments on Tank I (BV)
c) Multipactoring (BWM - CT - BM).

III. - Week 20/24.7.1959.

a) Acceptance measurements (BM + UT)
b) Focusing experiments (BV - BWM)
c) Multipactoring (CT - BM)
d) Low power measurements on tank III (FJ).

IV. - Week 27/31.7.1959.

a) Focusing experiments (BV - BWM)
b) Repeat tilting experiments (FJ)
c) Repeat RF (amplitude and phase) experiments (CT)
d) Multipactoring (CT)
e) Final cleaning and pumping of tank III.

5. Next meeting

On Tuesday July 14th, 1959 at 10.00 am.

P. Lapostolle

Distribution : (closed)
Parameter Committee - Machine Operation Committee
Linac Group - (Linac Centre File).
PL/ac.

PS/737.