

A.1: Endurance testing and installation of 10 MeV linacs

RRCAT has completed development of two 10 MeV, 5 kW S-band electron linacs for radiation processing applications. These linacs will be used at the agricultural radiation processing facility (ARPF) being developed at Devi Ahilya Bai Holkar Vegetable and Fruit Market, Indore. The first linac (Linac-B1), after completion of its endurance testing at RRCAT, has been shifted to ARPF. Subsequently, all its subsystems have been assembled and tested in standalone mode. The linac is ready for preliminary beam trials at ARPF as shown in Figures A.1.1 and A.1.2.

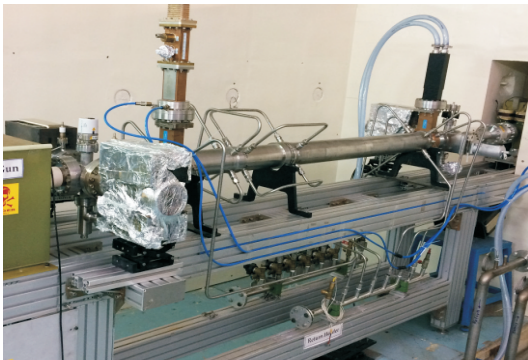


Fig. A.1.1: Linac-B1 assembled at ARPF.



Fig. A.1.2: Linac-B1 process chamber at ARPF.

The endurance testing of the second linac (Linac-B2), Figure A.1.3, has been completed at RRCAT with nominal beam energy of 9.5 MeV and beam power of 6 kW. Magnetic field mapping of solenoids was carried out and fiducialisation was completed. Precision alignment system for the solenoids was developed. A significant improvement in the beam transmission efficiency was obtained with the use of beam focusing solenoids. Beam current increased from 260 mA (without solenoids) to ~500 mA (with solenoids) thereby increasing transmission efficiency considerably. Typical

parameters of the beam and the linac systems during the test are shown in Figure A.1.4. The endurance testing of the linac included full power non-stop operation for ten shifts (each shift of 8 hour duration) as shown in Figure A.1.5. Linac operation at high beam current of ~500 mA is shown in Figure A.1.6.

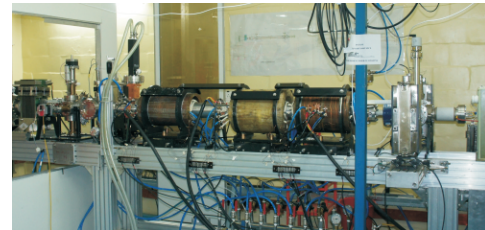


Fig. A.1.3: Linac-B2 under high power test.

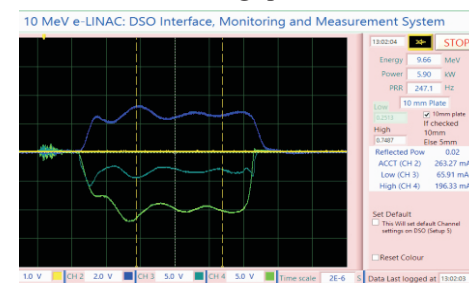


Fig. A.1.4: Linac-B2 parameters during high power testing.

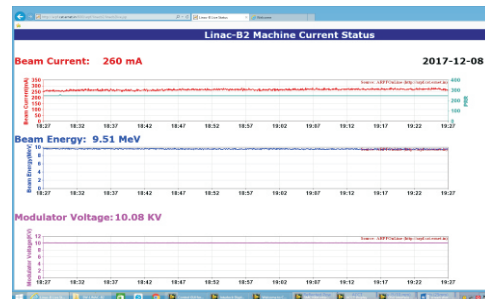


Fig. A.1.5: Linac-B2 parameters during endurance testing at 6 kW with non-stop operation for 8 hour shifts.

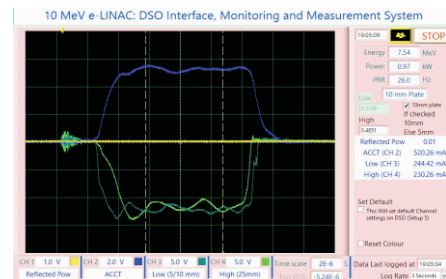


Fig. A.1.6: Linac-B2 testing at high beam current.

Reported by:
Rajeshwar Singh Sandha and Jishnu Dwivedi
(jishnu@rrcat.gov.in)