1.8 ELECTRON BEAM RF LINAC FOR CARGO INSPECTION

APPD/BARC in collaboration with ECIL (Electronics Corporation of India, Ltd.), have initiated a project to develop a prototype cargo scanning system. A Cargo Scanning Source has three major components: (a) electron accelerator for generating the X-rays, (b) radiographic and imaging techniques for constructing and viewing the images and (c) container handling system inclusive of overall electromechanical controls. The role of APPD is to supply the electron accelerator.

The developed prototype machine will have a beam energy of about 10 MeV with an average beam current of about 0.2 mA. The expected X-rays dose rate is 30 Gy/min m.

The required X-ray beam focal spot size is about 2 mm with a field uniformity of ± 5 % at ±7.5 deg, off the central axis. The leakage of radiation will be confined to 0.1 % for X-ray field, spanning to an area of 30 degrees with respect to the axis. Except for the power level, the X-ray source specifications are similar to the 10 MeV, 10 kW electron beam RF linac, already taken up by APPD. Therefore, this RF linac will be duplicated by restricting the power level to 2 kW. A schematic of the proposed X-rays source is shown in fig.

The entire operation of the developed machine is computer controlled.