Operation of PET Cyclotrons for Medical Imaging, T. JONES, Cyclotron Unit, Medical Research Council, Clinical Sciences Centre, Hammersmith Hospital, London, UK - Positron Emission Tomography and Positron Emitting Tracers e.g. Carbon-11 and Fluorine-18 (PET) provide the most sensitive and specific means for studying, through imaging, molecular pathways and molecular interactions in humans. As the fields of molecular biology and molecular medicine develop so also is molecular imaging which provides the means to study, within the diseased tissue, perturbations in molecular exchange and the efficacy of therapies designed to correct this[1]. With respect to the operation of PET Cyclotrons the following points are relevant:

- The targets need to be optimised to provide high yields and *specific activities.*
- The low energy, self-shielding, deep valley design of cyclotrons represent suitable, economic to run, machines for the medical environment.
- The essential feature in the operation of a medical cyclotron, upon which considerable expense in clinical research and diagnosis depends due to the rapidly decaying isotopes, is not only on production of radioactivity but more importantly on *reliability* followed by *flexibility*.

1 T. Jones, Eur. J. Nucl. Med. 1996, 23, 2, 207-211.