

ENTRY NO. 37

NAME OF MACHINE **Medical Cyclotron Facility**
 INSTITUTION **Bhabha Atomic Research Centre**
 ADDRESS **Nuclear Physics Division, BARC., Trombay, Bombay 400 085, INDIA.**
 TEL **5510321** TELEX **011-71017 BARC IN.**
 IN CHARGE **Dr. R.C. Sethi**

HISTORY AND STATUS

DESIGN, date **1985/86** Model tests
 ENG DESIGN, date
 CONSTRUCTION, date
 FIRST BEAM, date (or goal) **By 1990.**
 MAJOR ALTERATIONS

COST, ACCELERATOR **2 Ms.**
 COST, FACILITY, total
 FUNDED BY

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS **5** ENGINEERS **7**
 TECHNICIANS **7** CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or Operators
 OPERATION hr/wk. On target hr/wk
 TIME DISTR. in house %, outside
 BUDGET, op & dev
 FUNDED BY

RESEARCH STAFF, not included above

USERS, in house outside
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY

MAGNET

POLE FACE, diameter (compact) **150** cm, R-extraction **60** cm
 R injection cm
 GAP, min **1.6** cm, Field **18.5** kG
 max **3.2** cm, Field kG at
 AVERAGE FIELD at R ext **14** kG Ampere turns
 B max / < B >

NUMBER OF SECTORS { compact **3** } Spiral, max. **38** deg
 { separated }
 SECTOR ANGLE (SSC) **59** deg
 TRIMMING COILS **6**

CONDUCTOR, material and type **ETP copper**
 STORED ENERGY (cryogenic) MJ
 POWER: main coils **100** max kW: current stability
 trimming coils max kW: current stability
 WEIGHT: Fe **90** tons: coils **3** tons
 COOLING system
 ION ENERGY (Bending limit) E/A = **30** q²/A² MeV/amu
 (Focusing limit) E/A = **30** q/A MeV/amu

ACCELERATION SYSTEM

DEES, number **One** angle **180** deg
 BEAM APERTURE **2.5** cm, DC Bias kV
 TUNED by, coarse fine **trimmer**
 RF **21** to MHz, stable ± **10⁻⁶**
 Orb F **21** to MHz
 HARMONICS, RF/Orb F, used **1 and 3**
 DEE-Gnd, max **45** kV, min gap **3.2** cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max **90** kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max **70** kW
 FREQUENCY MODULATION, rate /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE **5 x 10⁻⁶** Torr
 PUMPS, No, Type, Size **Two Diffusion Pumps of 120001/sec.**
each backed by Rotary Pump of 30001/min.

ION SOURCES

PIG, hot cathode.

INJECTION SYSTEM

Internal, radial insertion.

EXTRACTION SYSTEM

Electrostatic channel followed by magnetic channel.

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m²; movable m²
 TARGET STATIONS in rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

| PARTICLE | ENERGY (MeV) | | CURRENT (µA) | |
|-------------------------|--------------|----------|--------------|----------|
| | Goal | Achieved | Internal | External |
| p | 30 | | 100 | |
| α | 15 | | | |
| d | 7.5 | | | |
| He³⁺⁺ | 20 | | | |
| SECONDARY | | | | (part/s) |

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH RF deg µA of MeV ions
 PHASE EXC. max RF deg µA of MeV ions
 EXTRACT eff % µA of MeV ions
 RESOL ΔE/E % µA of MeV ions
 EMITTANCE
 axial µA of MeV
 (π mm-mrad) rad

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS **100%**

REFERENCES/NOTES

- The control room, counting room, users facility etc., are situated on a floor above the layout, shown below.

PLAN VIEW OF FACILITY, COMMENTS, ETC.

