

ENTRY No. 51 Cancer Research Institute
 NAME OF MACHINE Medical Cyclotron DATE August 4, 1981
 INSTITUTION King Faisal Specialist Hospital and Research Centre
 ADDRESS P.O. Box 3354, Riyadh, Saudi Arabia
 TEL 464-7272 TELEX 201050 (ROSPEC SJ)
 IN CHARGE Raymond C. Barrall REPORTED BY Dale K. Wells

HISTORY AND STATUS

DESIGN, date Model tests
 ENG DESIGN, date TCC Model CS-30
 CONSTRUCTION, date Factory Tests: March 1977
 FIRST BEAM, date (or goal) October 1981
 MAJOR ALTERATIONS None

COST, ACCELERATOR
 COST, FACILITY, total
 FUNDED BY Kingdom of Saudi Arabia

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
 SCIENTISTS 1 ENGINEERS 1
 TECHNICIANS 5 CRAFTS 1
 GRAD STUDENTS involved during year 0

OPERATED BY Research staff or Operators
 OPERATION hr/wk, On target hr/wk
 TIME DISTR. in house % , Outside %
 BUDGET, op & dev
 FUNDED BY Kingdom of Saudi Arabia

RESEARCH STAFF, not included above
 USERS, in house outside
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY Kingdom of Saudi Arabia

MAGNET
 POLE FACE, diameter (compact) 96.5 cm, R extraction 42 cm
 R injection cm
 GAP, min 5 cm, Field 19.5 kG
 max 10 cm, Field 12 kG } at
 AVERAGE FIELD at R ext 16 kG } Ampere turns
 B max/

NUMBER OF SECTORS { compact } Spiral, max 60 deg
 separated 3 }
 SECTOR ANGLE (SSC) deg
 TRIMMING COILS

CONDUCTOR, material and type Copper, hollow
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 60 max, kW ; current stability
 trimming coils max, kW ; current stability
 WEIGHT: Fe 20 tons ; coils tons
 COOLING system D.I. Water
 ION ENERGY (bending limit) E/A = q²/a² MeV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2 ; angle 90 deg
 BEAM APERTURE 2.5 cm ; DC Bias 1.5 kV
 TUNED by, coarse Shorting Bar, fine Capacitor
 RF 14 to 26 MHz, stable ±
 Orb F to MHz
 HARMONICS, RF/Orb F, used First
 DEE - Gnd, max 30 kV, min gap 1 cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max 100 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 10 Torr or mbar
 PUMPS, No, Type, Size 1 Diffusion Pump
 10"

ION SOURCES

"Cold Cathode" (1)

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic and Magnetic Channel (2)

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 190 m² ; movable None m²
 TARGET STATIONS 9 in 4 rooms
 STATIONS served at same time, max 1
 MAG SPECTROGRAPH, type 101.5° Analyzing Magnet
 COMPUTER model
 OTHER FACILITIES Isotope Production
 Isocentric Neutron Production

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
P	26	26.5	200	60
³ d	15	14.8	300	100
He	38	38.1	135	60
α	30	29.6	90	

SECONDARY (part/s)
 n 27 Rad/min @ 125 cm

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
 (π mm. mrad) { axial } μA of MeV ions
 { rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- (1.) IEEE Trans. Nucl. Sci. NS-14 70-71 (1967)
- (2.) IEEE Trans. Nucl. Sci. NS-16 500-503 (1969)

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

