ENTRY NO. 77

NAME OF MACHINE NEN Cyclotron 1 DATE 20 April 1984

INSTITUTION E.I. DuPont

ADDRESS 331 Treble Cove Road, N. Billerica, MA (USA)

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IN CHARGE R. Garniewicz REPORTED BY F. Buck

HISTORY AND STATUS Built by the Cyclotron Corp.

DESIGN, date ... Model tests ...

ENG DESIGN, date ...

CONSTRUCTION, date March 70

FIRST BEAM, date (or goal) July 70

MAJOR ALTERATIONS None

COST, ACCELERATOR ...

COST, FACILITY, total ...

FUNDED BY E.I. DuPont

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ... ENGINEERS ...

TECHNICIANS ... CRAFTS ...

GRAD STUDENTS involved during year None

OPERATED BY ... Research staff or X ... Operators

OPERATION 100 hr/wk. On target ... hr./wk

TIME DISTR. in house 100 % Outside ... %

BUDGET, op & dev ...

FUNDED BY E.I. DuPont

RESEARCH STAFF, not included above None

USERS, in house ... outside ...

GRAD STUDENTS involved during year ...

RESEARCH BUDGET, in house ...

FUNDED BY ...

MAGNET

POLE FACE, diameter (compact) 96.6 cm, R extraction 43 cm

R injection ... cm

GAP, min 5.1 cm, Field 21.0 kG
min 10.2 cm, Field 13.5 kG at 14×10^6 Ampere turns

AVERAGE FIELD at R ext 16.5 kG

B max/ < B > 1.22

NUMBER OF SECTORS { compact 3 / separated ... } Spiral, max 5 deg

SECTOR ANGLE (SSC) ... deg

TRIMMING COILS Outer harmonic only, one per sector

CONDUCTOR, material and type Strap copper

STORED ENERGY (cryogenic) ... MJ

POWER main coils 45 max, kW; current stability ...
trimming coils 0.5 max, kW; current stability ...

WEIGHT: Fe 19.5 tons; coils 2.5 tons

COOLING system Dejonized water

ION ENERGY (bending limit) E/A = ... q^2/a^2 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 2.5 kV

TUNED by, coarse Tap Bars fine Panels

RF 25.0 to ... mHz, stable ±

Orb F 25.0 to ... mHz

HARMONICS, RF/Orb F, used 1st

DEE—Gnd, max 30 kV, min gap 40 cm

STABILITY, (pk-pk noise)/(pk RF volt) ...

ENERGY GAIN, max ... kV/turn

RF PHASE, stable to ± ... deg

RF POWEP input, max 55 kW

FREQUENCY MODULATION, rate None /s

modulator, type ...

beam pulse, width ...

VACUUM SYSTEM

OPERATING PRESSURE 10-20 Micro Torr or mbar

PUMPS, No, Type, Size 1, 10" oil diffusion

ION SOURCES

Pig, cold cathode radial

INJECTION SYSTEM

EXTRACTION SYSTEM

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ... m^2; movable ... m^2

TARGET STATIONS ... in ...

STATIONS served at same time, max ...

MAG SPECTROGRAPH, type ...

COMPUTER model ...

OTHER FACILITIES ...

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	ENERGY (MeV) Achieved	CURRENT (pμA) Internal	CURRENT (pμA) External
p	22	22	200	
SECONDARY		(part/s)		

BEAM PROPERTIES

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

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS ... SOLID STATES PHYSICS ...

BIOMEDICAL APPLICAT ... ISOTOPE PRODUCTIONS 100

REFERENCES/NOTES

1)

2)

AN VIEW OF FACILITY, COMMENTS, ETC.