ENTRY NO. 73

NAME OF MACHINE NEN Cyclotron 3 DATE 30 Jan 1979
INSTITUTION New England Nuclear Corporation
ADDRESS 601 Treble Cove Rd., N. Billerica, MA

IN CHARGE J. L. Need REPORTED by J. L. Need

HISTORY AND STATUS Designed & built by The Cyclotron Corp.
DESIGN, date ____ MODEL tests ____
ENG. DESIGN, date ____
CONSTRUCTION, date May 78
FIRST BEAM date (or goal) Aug 78
MAJOR ALTERATIONS None

OPERATION, 90 hr/wk; On Target 85 hr/wk
TIME DIST., in house 100 %, outside ____ %
USERS' SCHEDULING CYCLE 1 weeks
COST, ACCELERATOR ____
COST, FACILITY, total ____
FUNDED BY New England Nuclear Corp.

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 1 ENGINEERS 1
TECHNICIANS 2 CRAFTS 2
GRAD STUDENTS involved during year None
OPERATED BY ____ Res staff or X Operators
BUDGET, op & dev ____
FUNDED BY ____

RESEARCH STAFF, not included above None

USERS, in house ____ outside ____
GRAD STUDENTS involved during year ____
RES. BUDGET, in house ____
FUNDED BY ____

FACILITIES FOR RESEARCH None

SHIELDED AREA, fixed ____ m^2
movable ____ m^2
TARGET STATIONS ____ in ____ rooms
STATIONS served at same time, max ____
MAG SPECTROGRAPH, type ____
COMPUTER, model ____
OTHER FACILITIES ____

REFERENCES/NOTES

MAGNET

POLE FACE diameter 96.52 cm; R extraction 41.9 cm
GAP, min 5.08 cm; Field 22.5 kG
max 10.16 cm; Field 14.4 kG
} at .26 x 10^6 ampere turns
AVERAGE FIELD at R ext 17.5 kG
CURRENT STABILITY 10 parts/10^6; $B_{max}/\langle B \rangle$ 1.28
NUMBER OF SECTORS 3 ; SPIRAL, max ____ deg
POLE FACE COIL PAIRS: AVF None /sec;
Harmonic correction 2/sector - inner & outer
Rad grad None /sec or Circ coils None
WEIGHT: Fe 22.5 tons; Coils 2 tons
CONDUCTOR, Material and type Hollow copper
STORED ENERGY ____ MJ
COOLING SYSTEM Deionized water
POWER: Main coils 51 max, kW
Trimming coils 1.2 max, kW
YOKE/POLE AREA 111 %
SECTOR ANGLE (Sep Sec) -- deg
ION ENERGY (Bending limit) E/A = ____ q^2/A^2 MeV
(Focusing limit) E/A = 26 q/A MeV

ACCELERATION SYSTEM

DEES, number 2 angle 81 deg
BEAM APERTURE 1.9 cm; DC BIAS 2.5 kV
TUNED by, coarse shorting bar fine capacitor
RF 26.943 to -- mHz, stable ± -- /10^6
Orb F " to -- mHz; GAIN, max 25 kV/turn
HARMONICS, RF/Orb F, used 1st
DEE-Gnd, max 34 kV, min gap 1 cm
STABILITY, (pk-pk noise)/(pk RF volt) --
RF PHASE stable to ± -- deg
RF POWER input, max 55 kW
RF PROTECT circuit, speed 5 μsec
Type Clamps pass tube grid
FREQUENCY MODULATION, rate None /sec
MODULATOR, type ____
BEAM PULSE, width ____

VACUUM SYSTEM

PUMPS, No., Type, Size 1-10" oil diffusion
OPERATING PRESSURE 10-20 μTorr,
PUMPDOWN TIME 1 hrs

ION SOURCES/INJECTION SYSTEM
Pig, cold cathode, radial

EXTRACTION SYSTEM
None

CONTROL SYSTEM
Manual

ENTRY NO. 73 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	p	26.1	26.1
CURRENT		(μA)	(μA)
Internal	p	100	450
External			
		(part/s)	(part/s)
Secondary			

BEAM PROPERTIES

	Measured	Conditions
Pulse Width	____ RF deg	____ μA of ____ MeV ____
Phase Exc, max	____ RF deg	____ μA of ____ MeV ____
Extract Eff	____ %	____ μA of ____ MeV ____
Res, ΔE/E	____ %	____ μA of ____ MeV ____
Emittance		
(mm-mrad) { ____ axial / ____ radial }		____ μA of ____ MeV ____

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	%
Solid State Physics	%
Bio-Medical Applications	%
Isotope Production	90 %
Development	10 %
	%
	%

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, OPERATION SUMMARY, ADDITIONAL REFERENCES