

SUMMARY OF OPERATIONS - MAY 1978

Program Planning Office

The approximately two weeks of operation during May brought with it the completion of seven experimental activities. Many of these had begun months earlier and were scheduled to be finished just prior to an interruption for major maintenance and development in the accelerator and experimental areas. The quadrupole triplet focusing train in the Neutrino Area ended its long period of continuous service which began in September 1977. During operation since then the train load was exposed to a total flux in excess of 1×10^{19} protons used for hadron, muon, and neutrino experiments. The successful completion of this running period must be one of the most successful since experimental activities first began at the Laboratory in 1972. The triplet train will now be replaced by a new dichromatic train which will be in use during most of the summer.

Actually, experimental activities at Fermilab have been underway almost continuously from September 1977 until the shutdown which began on May 22. During this period there was a brief standby period at Christmas and an unexpected interruption of about two weeks in February and March during the coal strike. Activities in all experimental areas are expected to resume on June 13.

FERMI NATIONAL ACCELERATOR LABORATORY
MONTHLY OPERATIONS HISTORY
MAY 1978

Date	Accelerator	Internal Target Area	Proton Area	Neutrino Area	Meson Area
Mon. 5/1	Accelerator Studies				
Tue. 5/2					
Wed. 5/3					
Thu. 5/4	Reprs:MR Gnd.Fault & MR LCW System	OFF	87A (PE)	203A/391 & 448 (N1)	Part.Sch.469 (M6E)
Fri. 5/5			288 (PC)	Yield.Meas.(N3)	Had.Dissoc. 272 (M1E)
Sat. 5/6			OFF (PW)	203A/391 & 448 (N1)	Incl. K ⁰ 383 (M4)
Sun. 5/7	Reprs:Gas Bar.&MR LCW		Photoprod. 401 Tests (PE)	203A/391 & 448 (N1)	Multi-Muon 439(M2)
Mon. 5/8			Di-Lepton 288 (PC)	V356 Calib.(N5)	
Tue. 5/9	~1.5x10 ¹³ ppp @400 GeV		Nuc.Scal.592(PW)	203A/391(N1)	
Wed. 5/10	Accelerator Maintenance & Development				
Thu. 5/11					
Fri. 5/12	~1x10 ¹³ ppp @400 GeV	OFF	Photoprod.152B (PE)	Target Tests	
Sat. 5/13				Nucl.Scal. 592 (PW)	Part.Sch.596 & 272 (M1E)
Sun. 5/14	1.25 sec flattop		OFF reprs.(PC)	203A/391 Calib. (N1)	469 (M6E)
Mon. 5/15				V356 Calib.(N5)	439 (M2)
Tue. 5/16					585 (M4)
Wed. 5/17					same but 451 (M6E)
Thu. 5/18			Photoprod. 152B (PE)	596,356 Calib.	Incl.Scatt.451(M6E)
Fri. 5/19	~1.6x10 ¹³ ppp @400 GeV		Nucl.Scal. 592 (PW)	596, Yield Meas.	Part.Sch.490 (M1W)
Sat. 5/20			Di-Lepton 288 (PC)	596, 15 Tests	Incl.Scatt.451(M6E)
Sun. 5/21	1.25 sec flattop			596, Yield Meas.	Part.Sch.596 (N1)
Mon. 5/22	Accelerator Studies; Switchyard Development; Experimental Areas Open				
Tue. 5/23					
Wed. 5/24					
Thu. 5/25	Facility Maintenance & Development				
Fri. 5/26	(through June 12)				
Sat. 5/27					
Sun. 5/28					
Mon. 5/29					
Tue. 5/30					
Wed. 5/31					

BEAM UTILIZATION BY

	<u>Beam</u>	<u>Hours</u>
PROTON AREA	PE	20
Photoproduction # 87A	PC	150
Di-Lepton # 288	PW	200
Nuclear Scaling # 592	PE	30
Photoproduction # 401	PE	170
Photoproduction # 152B		
NEUTRINO AREA	N1	200
Muon # 203A/391	N1	40
Muon # 448	N5	180
Neutrino # 356 Calibration	N1	180
Particle Search # 596	N0	-
Nuclear Fragments # 466	N3	40
Yield Measurements	N5	0
15-Ft Plate Tests		
MESON AREA	M6E	110
Particle Search # 469	M1E	120
Hadron Dissociation # 272	M4	60
Inclusive K_S^0 # 383	M2	150
Multi-Muon # 439	M4	80
Kaon Charge Exchange # 585	M1W	70
Particle Search # 490	M6E	120
Inclusive Scattering # 451	M0	-
Nuclear Chemistry # 81A		
TOTAL HOURS FOR HIGH ENERGY PHYSICS		<u>1920</u>

EXPERIMENTAL ACTIVITY -- MAY 1978

Activities

completed: search for charmed states produced in photon interactions
data: for a high-resolution study of the dimuon spectra produced by 400-GeV protons
tuneup & data: to study connection between scaling phenomena and the determination of structure functions in the inclusive reaction $pA \rightarrow (p, d, t, \pi, K) X$
tests: of the ability to deaden the central region of PWC's and allow higher beam fluxes
tuneup: for study of elastic and inelastic Compton scattering

completed: including a search for heavy neutral leptons produced in muon interactions at 225 GeV
completed: study of muon interactions with nuclear targets at 225 GeV
tuneup: calibration of detectors to be used in the study of deep inelastic $\nu, \bar{\nu}$ scattering
completed: use of Cherenkov and time-of-flight techniques to search for heavy long-lived particles
data: 3 targets exposed
data: for measurements of π 's and K's produced at various energies and angles by 400-GeV proton interactions with a BeO target
tests: of 15 ft. bubble chamber operation with internal photon converting plates; tests with beam were not done because problems were discovered

completed: use of Cherenkov and time-of-flight techniques to search for heavy long-lived particles
tuneup: for study of inelastic Coulomb excitation and diffractive production of hadrons
completed: study of the reaction $K^-p \rightarrow K^0_s X$ at 75 GeV
completed: study of the high mass dimuon and multimuon spectra produced by 400-GeV proton interactions
tuneup: for study of exclusive KN charge exchange scattering
tuneup: including tests of a new high pressure streamer chamber and of trigger rates in a 300 GeV π^- beam
data: study of the A-dependence of inclusive processes
data: 10 targets exposed

FACILITY UTILIZATION SUMMARY-- MAY 1978

I. Summary of Accelerator Operations

	<u>Hours</u>
A. Accelerator use for physics research	
Accelerator physics research	53.7
High energy physics research	289.9
Subtotal	343.6
B. Other activities	
Accelerator setup and tuning to exp. areas	1.2
Program interruption	276.6
Unscheduled interruption	122.6
Subtotal	400.4
C. Unmanned time	
Total	<u>744.0</u>

II. Summaries of High Energy Physics Research Use

	<u># of Expts.</u>	<u>Hours</u>	<u>Results</u>
A. Counter experiments	16	1880	7 expts. completed
B. Bubble chamber experiments	-	-	-
C. Emulsion experiments	-	-	-
D. Special target experiments	2	-	13 targets exposed
E. Test experiments	-	-	-
F. Engineering studies and tests	(2)	40	Yield Measurements & 15-ft tests
G. Other beam use	-	-	-
Totals	<u>18</u>	<u>1920</u>	

III. Number of Protons Accelerated and Delivered @ 400 GeV ($\times 10^{18}$)

A. Beam accelerated in Main Ring	0.96
B. Beam delivered to experimental areas	<u>0.89</u>
Meson Area	0.21
Neutrino Area	
Slow Spill	0.53
Fast Spill	0.10
Proton Area	0.05