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AGS OPERATIONS -SUMMARY FOR 1966

R. R. Adams

February 1967

Collider Accelerator Department

Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

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Accelerator Department
BROOKHAVEN NATIONAL LABORATORY
Associated Universities, Inc.
Upton, L.I., N.Y.

AGS DIVISION TECHNICAL NOTE

No. 31

R.R. Adams

February 15, 1967

AGS OPERATIONS SUMMARY FOR 1966

The AGS performance continues to improve. During 1966, the AGS was on 4,991.27 hours for experimenters and 680.62 hours for accelerator research. This total on time of 5,671.89 hours is 75.8% of the scheduled time (7,484.00 hours) for the year.

The total machine downtime of 24.2% is an improvement over the 1965 performance (28.5%). The AGS machine failures reduced from 12.1% for 1965 to 11.1% for 1966 and scheduled maintenance was reduced from 9.9% in 1965 to 7.2% in 1966.

The total integrated machine use time for 1966 amounts to 19,000 hours, as compared to 12,000 hours for 1965 and 6000 hours for 1964. More experiments were run in parallel than in the previous year. During this year the 30-in. bubble chamber took 3,170,163 pictures and the 80-in. bubble chamber took 1,517,772 pictures.

One 30 day shutdown was used to change experimental setups and to improve and maintain the machine. A short shutdown (5 days) was used to change one experiment and a third shutdown (6 days) was used to repair a faulted machine magnet.

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AGS OPERATIONS SUMMARY

Calendar Year 1966

	Hours	%
AGS ON	5,671.89	75.8
1. For Experimenters	4,991.27	66.7
2. For Accelerator Research	680.62	9.1
Machine Downtime	1,812.11	24.2
1. Start-up, Set-up, Shutdown	273.04	3.7
2. Requested by Experimenters	58.17	0.8
3. Experimental Set-up	31.75	0.4
4. Machine Failures	833.22	11.1
5. EAO Equipment Failures	76.02	1.0
6. Scheduled Maintenance	539.91	7.2
Scheduled Operations	7,484.00	100.0
Holidays	212.00	
Shutdowns	1,064.00	

AGS Performance

a. Magnet pulses	8,916,874
b. Accelerated pulses	7,481,254
c. Missed pulses	538,542
d. Accelerated protons (p)	8.7×10^{18}
e. Average protons per Accelerated pulse (d/b)	11.6×10^{11}
f. Overall average protons per pulse (d/b+c)	10.9×10^{11}

EXPERIMENTAL OPERATIONS SUMMARY

Calendar Year 1966

Total AGS On Time		5,671.89 hours
1. For Experimenters	4,991.27 hours	
2. For Accelerator Research	680.62 hours	
Integrated Machine Use Time		19,008.88 hours
1. Integrated Experimental time	18,082.38 hours	
2. Beam tests, etc.	229.95 hours	
3. Accelerator Research	680.62 hours	
4. Radiation Measurements	15.93 hours	
Total 80 inch Bubble Chamber Pictures Taken		1,517,772 pix
1. Pictures in Hydrogen (H_2)	1,340,362 pix	
2. Pictures in Deuterium (D_2)	177,410 pix	
Total 30 inch Bubble Chamber Pictures Taken		3,170,163 pix
1. Pictures in Hydrogen (H_2)	1,918,113 pix	
2. Pictures in Deuterium (D_2)	1,139,051 pix	
3. Pictures in H_2 + Ne	48,433 pix	
4. Pictures in D_2 + Ne	64,566 pix	

AGS OPERATIONS SUMMARY

January through June 1966

	Jan 1 – Jan 25		Jan 26 – Feb 25		Feb 26 – Mar 25		Mar 26 – Apr 25		Apr 26 – May 25		May 26 – Jun 30	
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
AGS ON	401.61	72.8	577.57	77.6	501.20	74.6	630.58	84.8	535.88	76.4	272.14	85.0
1. For Experimenters	341.45	61.9	514.50	69.1	446.68	66.5	556.81	74.9	472.39	65.6	240.35	75.1
2. For Accelerator Research	60.16	10.9	63.07	8.5	54.52	8.1	73.77	9.9	63.49	8.8	31.79	9.9
MACHINE DOWNTIME	150.39	27.2	166.43	22.4	170.80	25.4	112.42	15.2	184.12	25.6	47.86	15.0
1. Machine Set-up, Shutdown	17.44	3.2	19.18	2.5	11.23	1.7	11.78	1.6	19.82	2.7	5.04	1.6
2. Requested Down	4.90	0.9	3.00	0.4	4.12	0.6	5.80	0.8	5.74	0.8	1.33	0.4
3. Experimental Set-up	3.40	0.6	6.23	0.8	0.00	0.0	0.00	0.0	0.48	0.1	2.85	0.9
4. Machine Failures	69.22	12.5	64.69	8.7	115.77	17.2	65.53	8.8	108.57	15.0	30.29	9.5
5. EAO Equipment Failures	12.97	2.3	3.69	0.5	11.68	1.7	1.20	0.2	2.11	0.3	0.00	0.0
6. Scheduled Maintenance	42.46	7.7	69.64	9.4	28.00	4.2	28.11	3.8	47.40	6.7	8.35	2.6
SCHEDULED OPERATIONS	552.00	100.0	744.00	100.0	672.00	100.0	743.00	100.0	720.00	100.0	320.00	100.0
HOLIDAYS	48.00											
SHUTDOWN											544.00	
AGS PERFORMANCE												
a. Magnet pulses	644,691		925,672		765,156		929,320		895,981		417,670	
b. Accelerated pulses	518,696		790,231		661,034		813,882		687,740		350,458	
c. Missed pulses	41,303		57,481		44,338		55,929		63,911		18,760	
d. Accelerated protons (p)	4.2×10^{17}		6.8×10^{17}		7.2×10^{17}		9.8×10^{17}		7.2×10^{17}		3.7×10^{17}	
e. Aver. p/pulse (d/b)	8.1×10^{11}		8.7×10^{11}		10.9×10^{11}		12.0×10^{11}		10.5×10^{11}		10.6×10^{11}	
f. Aver. p/pulse (d/b+c)	7.5×10^{11}		8.1×10^{11}		10.2×10^{11}		11.2×10^{11}		9.6×10^{11}		10.0×10^{11}	

AGS OPERATIONS SUMMARY

July through December 1966

	Jul 1 – Jul 25		Jul 26 – Aug 25		Aug 26 – Sep 25		Sep 26 – Oct 25		Oct 26 – Nov 25		Nov 26 – Dec 31	
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
AGS ON	180.73	50.2	568.20	76.4	565.92	76.1	566.52	78.7	571.48	76.7	300.06	71.5
1. For Experimenters	146.65	40.7	495.43	66.6	502.21	67.5	503.94	70.0	497.98	66.8	272.88	65.0
2. For Accelerator Research	34.08	9.5	72.77	9.8	63.71	8.6	62.58	8.7	73.50	9.9	27.18	6.5
MACHINE DOWNTIME	179.27	49.8	175.80	23.6	178.08	23.9	153.48	21.3	173.52	23.3	119.94	28.5
1. Machine Set-up, Shutdown	58.26	16.2	18.59	2.5	31.18	4.1	19.90	2.8	20.63	2.8	39.99	9.5
2. Requested Down	3.92	1.1	6.53	0.9	9.80	1.3	4.28	0.6	3.41	0.4	5.34	1.3
3. Experimental Set-up	4.70	1.3	5.17	0.7	2.75	0.4	1.90	0.3	4.27	0.6	0.00	0.0
4. Machine Failures	21.97	6.1	109.55	14.7	97.23	13.1	43.39	6.0	59.44	8.0	47.57	11.3
5. EAO Equipment Failures	21.95	6.1	2.30	0.3	2.37	0.3	3.81	0.5	3.20	0.4	10.74	2.5
6. Scheduled Maintenance	68.47	19.0	33.66	4.5	34.75	4.7	80.20	11.1	82.57	11.1	16.30	3.9
SCHEDULED OPERATIONS	360.00	100.0	744.00	100.0	744.00	100.0	720.00	100.0	745.00	100.0	420.00	100.0
HOLIDAYS	48.00										116.00	
SHUTDOWN	192.00										328.00	
AGS PERFORMANCE												
a. Magnet pulses	356,254		892,918		880,079		865,497		872,756		470,880	
b. Accelerated pulses	235,397		752,539		745,560		743,973		750,820		430,924	
c. Missed pulses	33,541		66,143		50,830		44,319		42,393		19,594	
d. Accelerated protons (p)	2.7×10^{17}		10.5×10^{17}		10.4×10^{17}		10.0×10^{17}		9.0×10^{17}		5.4×10^{17}	
e. Aver. p/pulse (d/b)	11.3×10^{11}		14.0×10^{11}		13.9×10^{11}		13.7×10^{11}		11.9×10^{11}		12.5×10^{11}	
f. Aver. p/pulse (d/b+c)	9.9×10^{11}		12.9×10^{11}		13.0×10^{11}		12.9×10^{11}		11.3×10^{11}		12.0×10^{11}	

AGS OPERATIONS SUMMARY

Weekly

January through March 1966

Hours / Period	AGS ON				AGS OFF							Holi-days	Shut-down	Average Intensity
	Sched. Oprs.	HEP	AGS Stud.	Total AGS On	AGS Set-up	Req'd Down	Expt. Set-up	Sched. Maint.	EAO Fail.	AGS Fail.	Total Down			10^{11} p/puls
1/ 1- 1/ 5	72.00	31.92	9.90	41.82	7.00	0.00	0.00	16.00	0.00	7.18	30.18	48.00		10.4/ 9.1
1/ 6- 1/12	168.00	106.82	28.99	135.81	3.13	1.20	1.10	3.66	9.20	13.90	32.19			9.0/ 8.2
1/13- 1/19	168.00	99.14	13.01	112.15	6.21	0.40	2.30	7.06	0.00	39.88	55.85			8.0/ 7.5
1/20- 1/26	168.00	110.82	11.78	122.60	1.10	3.30	0.00	28.22	4.42	8.36	45.40			6.5/ 5.9
1/27- 2/ 2	168.00	98.51	7.42	105.93	7.45	0.41	3.30	30.90	1.34	18.67	62.07			8.2/ 7.7
2/ 3- 2/ 9	168.00	126.00	12.58	138.58	3.96	0.49	0.00	14.26	1.70	9.01	29.42			9.3/ 8.9
2/10- 2/16	168.00	133.40	15.55	148.95	3.56	1.23	2.93	0.00	0.00	11.33	19.05			8.3/ 7.6
2/17- 2/23	168.00	107.39	24.00	131.39	1.60	0.00	0.00	12.00	0.00	23.01	36.61			8.7/ 8.0
2/24- 3/ 2	168.00	142.07	14.84	156.91	2.81	0.87	0.00	0.00	0.94	6.47	11.09			9.5/ 9.0
3/ 3- 3/ 9	168.00	112.65	21.95	134.60	5.10	0.25	0.00	16.00	3.20	8.85	33.40			9.4/ 8.8
3/10- 3/16	168.00	128.55	0.98	129.53	0.64	2.45	0.00	12.00	2.03	21.35	38.47			11.9/11.5
3/17- 3/23	168.00	67.15	16.10	83.25	4.24	1.16	0.00	0.00	5.51	73.84	84.75			13.0/11.8
3/24- 3/30	168.00	139.24	12.98	152.22	1.55	1.01	0.00	0.00	0.00	13.22	15.78			11.4/10.5
Totals,	2088.00	1403.66	190.08	1593.74	48.35	12.77	9.63	140.10	28.34	255.07	494.26	48.00	0.00	9.4/ 8.7
%	100.0	67.2	9.1	76.3	2.3	0.6	0.5	6.7	1.4	12.2	23.7			

AGS OPERATIONS SUMMARY

Weekly

April through June 1966

Hours / Period	AGS ON				AGS OFF							Holi-days	Shut-down	Average Intensity
	Sched. Oprs.	HEP	AGS Stud.	Total AGS On	AGS Set-up	Req'd Down	Expt. Set-up	Sched. Maint.	EAO Fail.	AGS Fail.	Total Down			10^{11} p/puls
3/31- 4/ 6	168.00	101.60	20.39	121.99	0.51	0.65	0.00	12.11	1.00	31.74	46.01			12.2/11.7
4/ 7- 4/13	168.00	139.50	16.30	155.80	2.50	2.75	0.00	0.00	0.20	6.75	12.20			11.8/10.8
4/14- 4/20	168.00	107.70	24.00	131.70	5.62	0.71	0.00	16.00	0.00	13.97	36.30			12.3/11.4
4/21- 4/27	167.00	136.46	10.50	146.96	2.65	0.94	0.00	6.25	0.00	10.20	20.04			13.1/12.4
4/28- 5/ 4	168.00	111.86	14.07	125.93	5.80	2.19	0.48	13.00	0.00	20.60	42.07			12.0/10.9
5/ 5- 5/11	168.00	113.48	17.04	130.52	4.89	1.14	0.00	0.00	0.00	31.45	37.48			8.9/ 8.0
5/12- 5/18	168.00	121.50	19.63	141.13	3.12	1.72	0.00	13.00	1.13	7.90	26.87			9.5/ 8.8
5/19- 5/25	168.00	96.07	3.00	99.07	6.01	0.69	0.00	15.15	0.98	46.10	68.93			10.7/ 9.8
5/26- 6/ 1	168.00	137.20	1.75	138.95	2.92	0.30	2.85	0.00	0.00	22.98	29.05			9.8/ 9.3
6/ 2- 6/ 8	152.00	103.15	30.04	133.19	2.12	1.03	0.00	8.35	0.00	7.31	18.81		16.00	11.5/11.0
6/ 9- 6/15													168.00	
6/16- 6/23													168.00	
6/24- 6/30													192.00	
Totals April-June	1663.00	1168.52	156.72	1325.24	36.14	12.12	3.33	83.86	3.31	199.00	337.76	0.00	544.00	
%	100.0	70.3	9.4	79.7	2.2	0.7	0.2	5.0	0.2	12.0	20.3			
Totals Jan.-June	3751.00	2572.18	346.80	2918.98	84.49	24.89	12.96	223.96	31.65	454.07	832.02	48.00	544.00	10.2/ 9.5
%	100.0	68.6	9.2	77.8	2.3	0.7	0.3	6.0	0.8	12.1	22.2			

AGS OPERATIONS SUMMARY

Weekly

July through September 1966

Hours / Period	AGS ON				AGS OFF							Holi-days	Shut-down	Average Intensity
	Sched. Oprs.	HEP	AGS Stud.	Total AGS On	AGS Set-up	Req'd Down	Expt. Set-up	Sched. Maint.	EAO Fail.	AGS Fail.	Total Down			10^{11} p/puls
7/ 1- 7/ 6												48.00	96.00	
7/ 7- 7/13	72.00	0.00	0.00	0.00	42.80	0.00	0.00	29.20	0.00	0.00	72.00		96.00	1.9/
7/14- 7/20	168.00	70.38	34.08	104.46	5.41	3.92	2.35	15.27	21.95	14.64	63.54			10.6/ 9.1
7/21- 7/27	168.00	106.84	10.63	117.47	10.35	0.00	2.35	24.00	0.00	13.83	50.53			12.6/11.4
7/28- 8/ 3	168.00	121.48	12.55	134.03	2.75	2.85	2.15	0.00	1.75	24.47	33.97			14.6/13.5
8/ 4- 8/10	168.00	110.55	15.22	125.77	7.29	2.10	0.75	19.66	0.00	12.43	42.23			13.8/12.7
8/11- 8/17	168.00	98.69	13.40	112.09	3.83	0.93	2.27	0.00	0.00	48.88	55.91			13.8/12.6
8/18- 8/24	168.00	126.14	7.64	133.78	3.92	0.65	0.00	14.00	0.55	15.10	34.22			13.9/13.0
8/25- 8/31	168.00	127.99	13.83	141.82	2.95	1.57	0.00	16.00	0.00	5.66	26.18			16.5/15.6
9/ 1- 9/ 7	168.00	96.59	16.62	113.21	16.81	0.00	0.00	1.15	0.00	36.83	54.79			11.2/10.4
9/ 8- 9/14	168.00	124.91	31.78	156.69	1.07	0.92	0.00	0.00	1.62	7.70	11.31			14.7/13.9
9/15- 9/21	168.00	90.30	12.26	102.56	7.47	0.00	2.00	17.60	0.75	37.62	65.44			14.3/13.3
9/22- 9/28	168.00	70.42	8.85	79.27	5.08	7.31	0.75	64.00	0.00	11.59	88.73			11.1/10.1
Totals	1920.00	1144.29	176.86	1321.15	109.73	20.25	12.62	200.88	26.62	228.75	598.85	48.00	192.00	
%	100.0	59.6	9.2	68.8	5.7	1.1	0.6	10.5	1.4	11.9	31.2			

AGS OPERATIONS SUMMARY

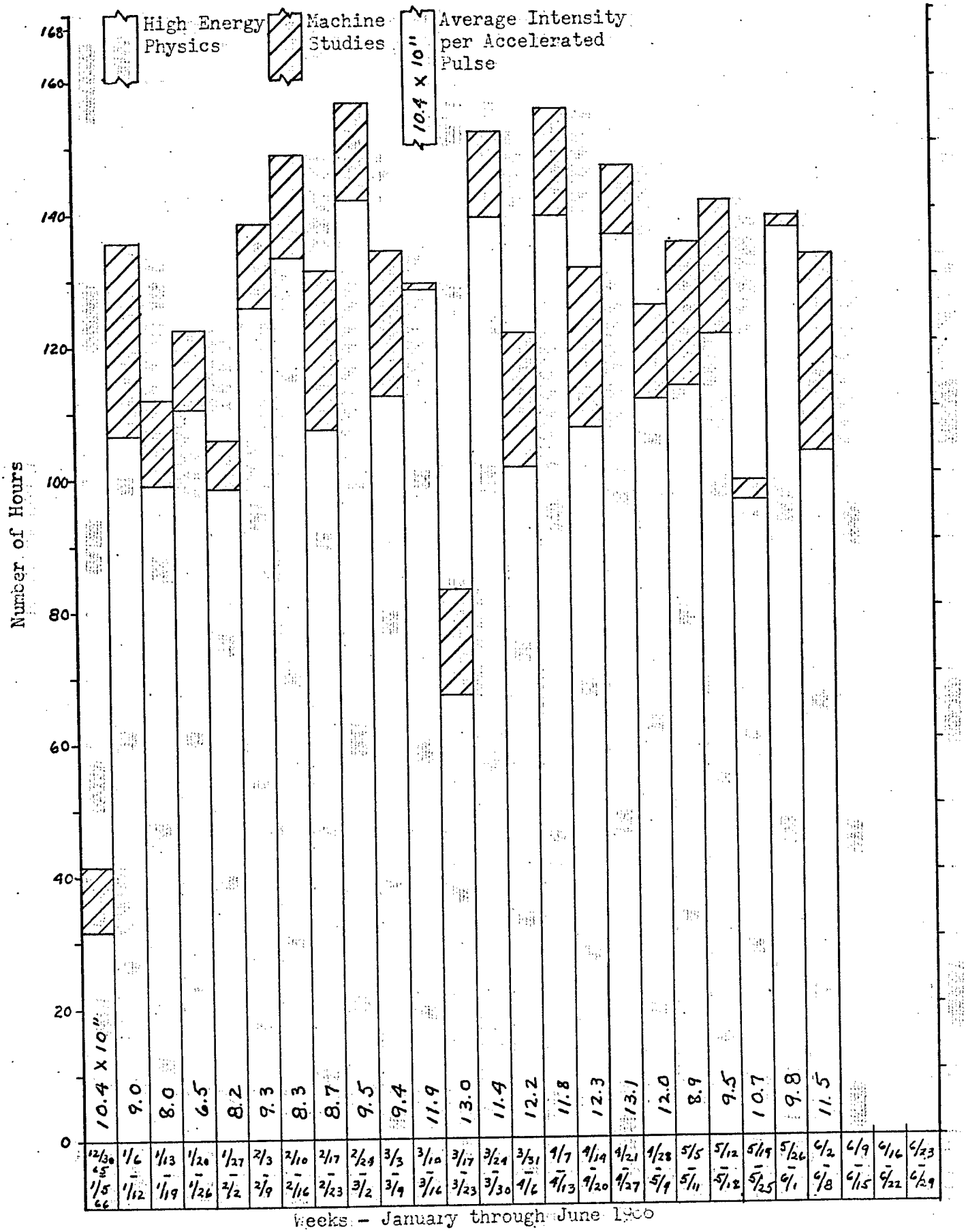
Weekly

October through December 1966

Hours / Period	AGS ON				AGS OFF							Holi-days	Shut-down	Average Intensity
	Sched. Oprs.	HEP	AGS Stud.	Total AGS On	AGS Set-up	Req'd Down	Expt. Set-up	Sched. Maint.	EAO Fail.	AGS Fail.	Total Down			10^{11} p/puls
9/29-10/ 5	168.00	132.01	15.69	147.70	9.17	1.98	1.20	0.42	2.06	5.47	20.30			13.4/12.4
10/ 6-10/12	168.00	139.89	13.10	152.99	2.75	1.50	0.00	2.20	0.00	8.56	15.01			14.7/14.0
10/13-10/19	168.00	114.47	14.96	129.43	4.90	0.00	0.00	13.58	1.05	19.04	38.57			14.1/13.4
10/20-10/26	168.00	120.31	18.61	138.92	1.76	0.80	1.50	14.00	0.70	10.32	29.08			12.8/12.1
10/27-11/ 2	169.00	107.31	15.89	123.20	9.03	0.00	0.00	20.07	0.00	16.70	45.80			14.5/14.0
11/ 3-11/ 9	168.00	141.18	2.60	143.78	2.40	0.89	0.00	16.00	0.00	4.93	24.22			10.6/10.2
11/10-11/16	168.00	101.75	37.43	138.18	3.47	0.00	3.32	9.00	3.20	9.83	28.82			9.9/ 9.1
11/17-11/23	168.00	100.40	11.20	111.60	4.50	2.52	0.15	23.50	0.00	25.73	56.40			11.7/10.5
11/24-11/30	104.00	92.55	0.80	93.35	1.85	0.00	0.00	0.00	0.75	8.05	10.65		64.00	16.1/15.6
12/ 1-12/ 7	136.00	83.36	9.30	92.66	7.96	1.54	0.00	8.30	2.96	22.58	43.34		32.00	14.5/13.7
12/ 8-12/14	40.00	33.54	0.16	33.70	1.20	2.00	0.00	0.00	1.85	1.25	6.30		128.00	13.3/13.0
12/15-12/21	160.00	100.03	8.30	108.33	19.68	1.80	0.00	8.00	5.18	17.01	51.67		8.00	9.6/ 9.1
12/22-12/31	28.00	8.00	8.92	16.92	10.15	0.00	0.00	0.00	0.00	0.93	11.08	116.00	96.00	9.8/ 8.2
Totals 4th quarter	1813.00	1274.80	156.96	1431.76	78.82	13.03	6.17	115.07	17.75	150.40	381.24	116.00	328.00	
%	100.0	70.3	8.7	79.0	4.3	0.7	0.3	6.4	1.0	8.3	21.0			
Totals July-Dec.	3733.00	2419.09	333.82	2752.91	188.55	33.28	18.79	315.95	44.37	379.15	980.09	164.00	520.00	13.2/12.3
%	100.0	64.8	8.9	73.7	5.0	0.9	0.5	8.5	1.2	10.2	26.3			

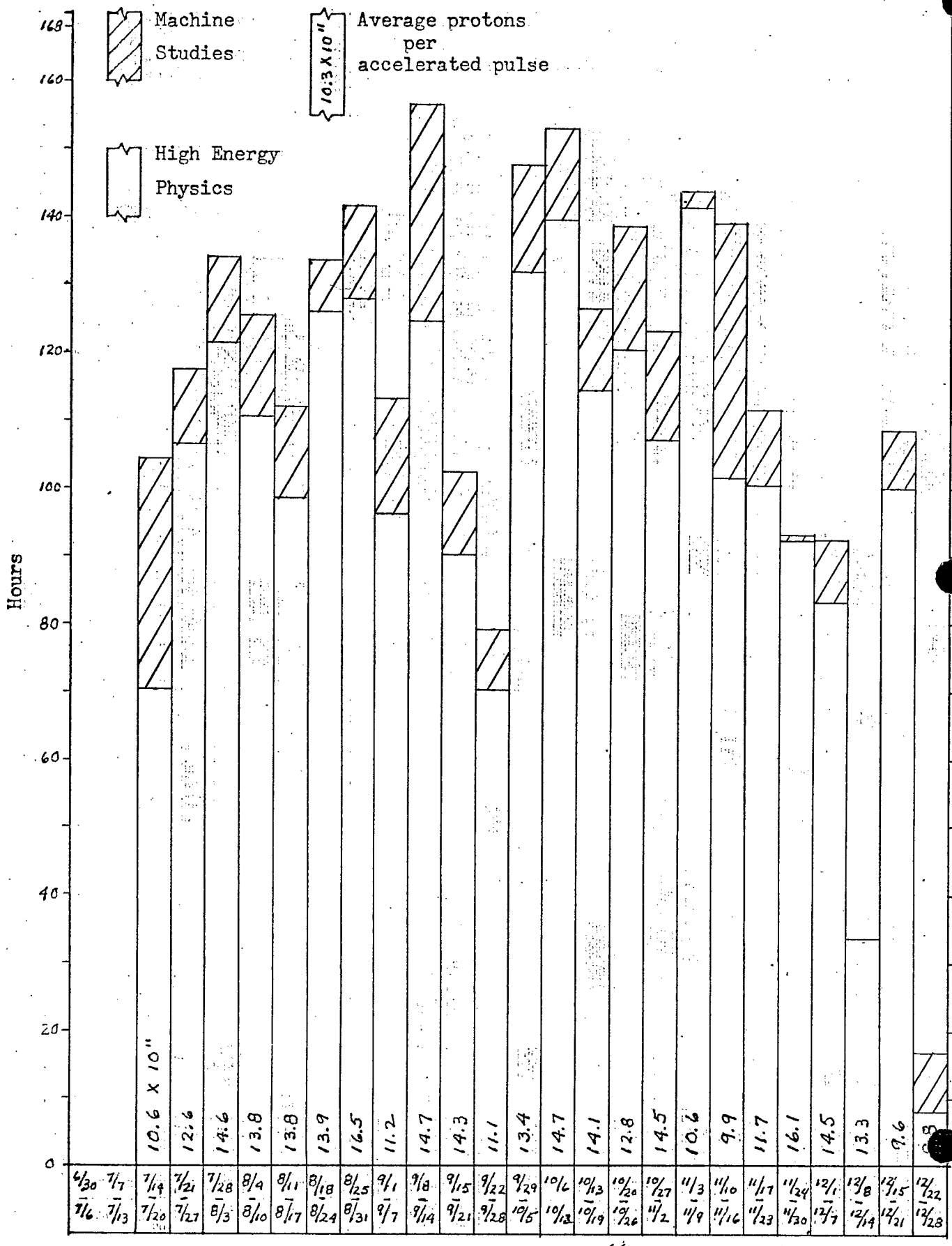
AGS ON for High Energy Physics and Machine Studies

Hours per Week



AGS ON for High Energy Physics and Machine Studies

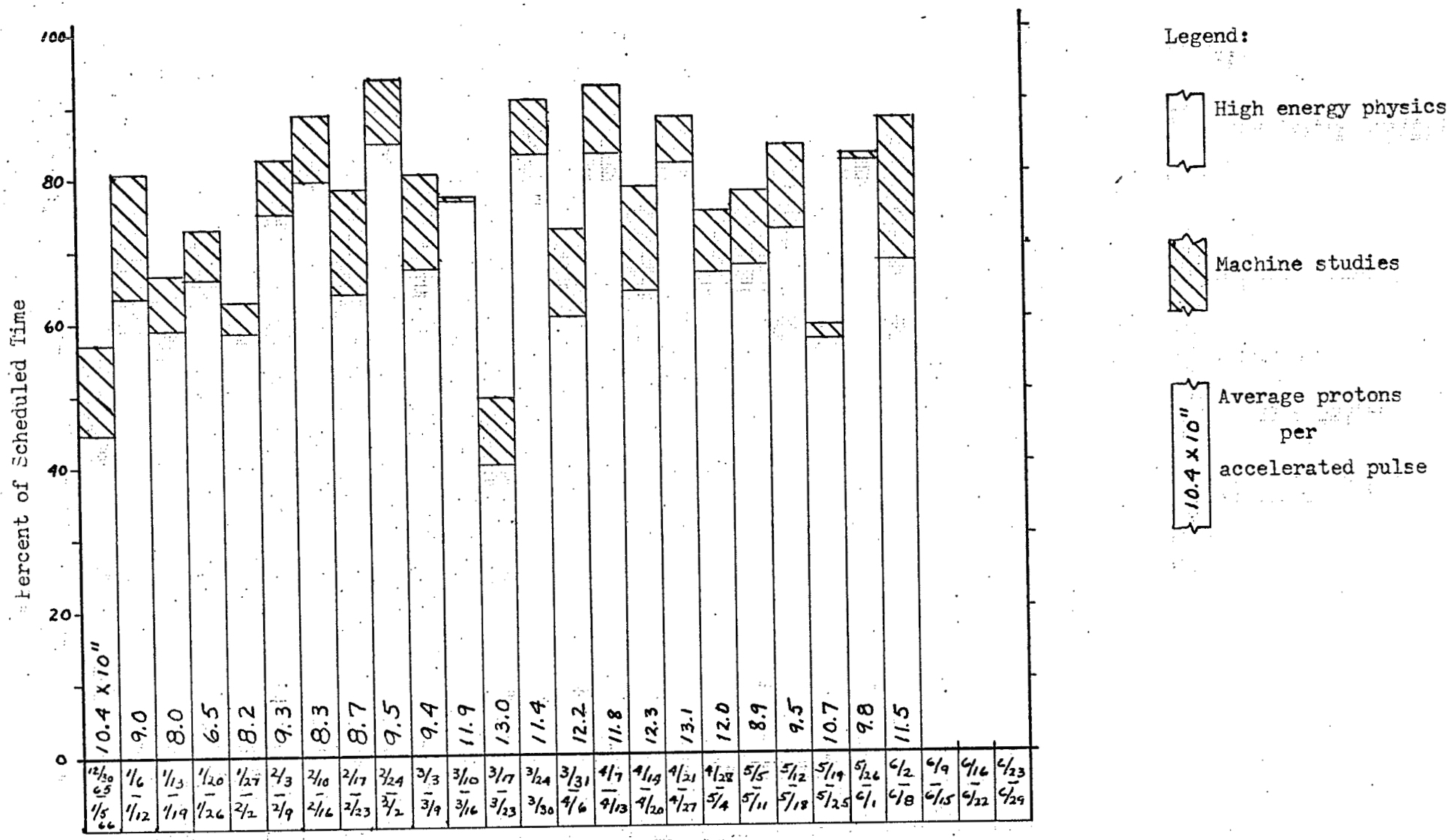
Hours per Week



Weeks – July through December 1966

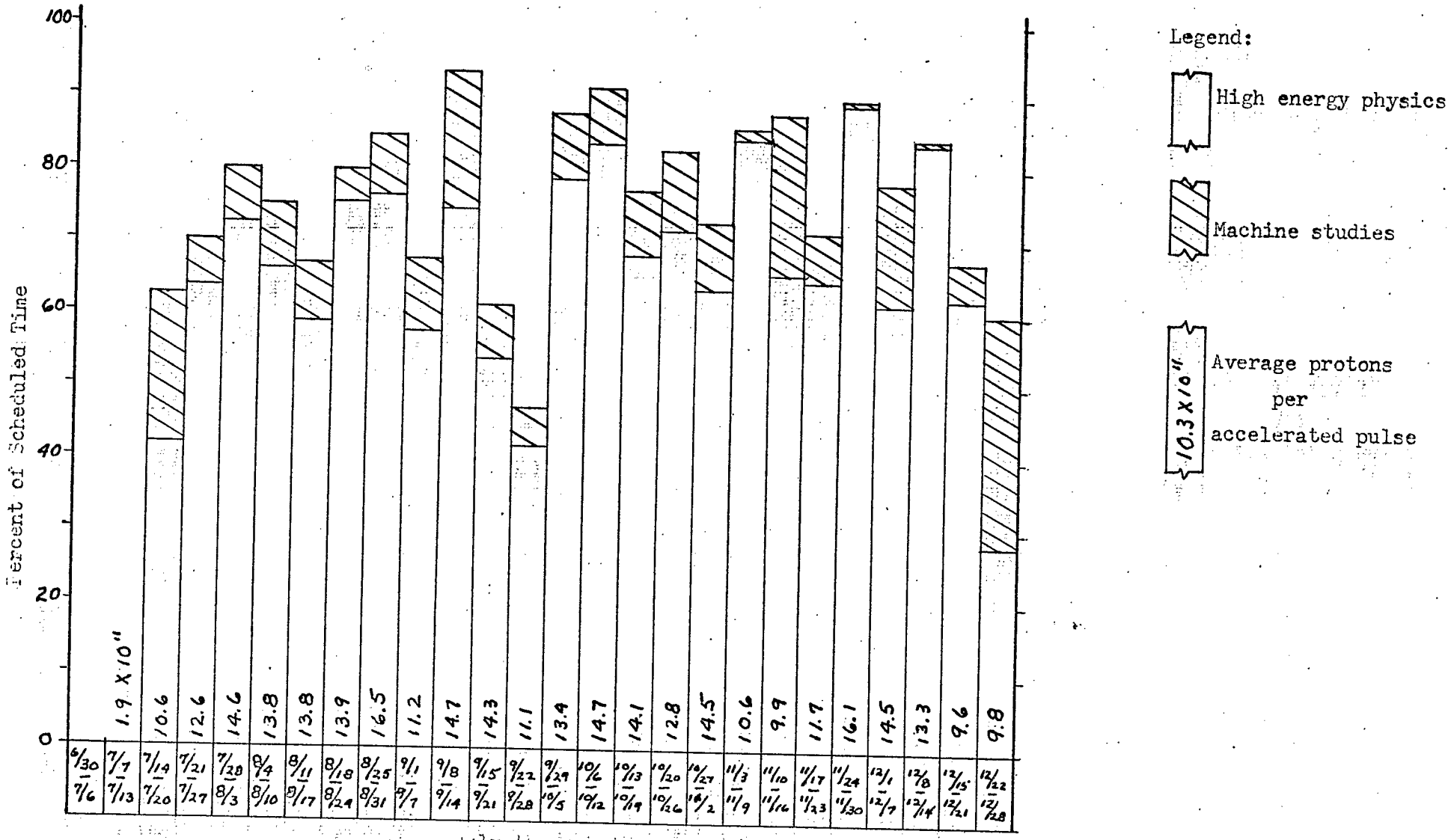
AGS ON for High Energy Physics and Machine Studies

Percent of Scheduled Time



Weeks - January through June 1966

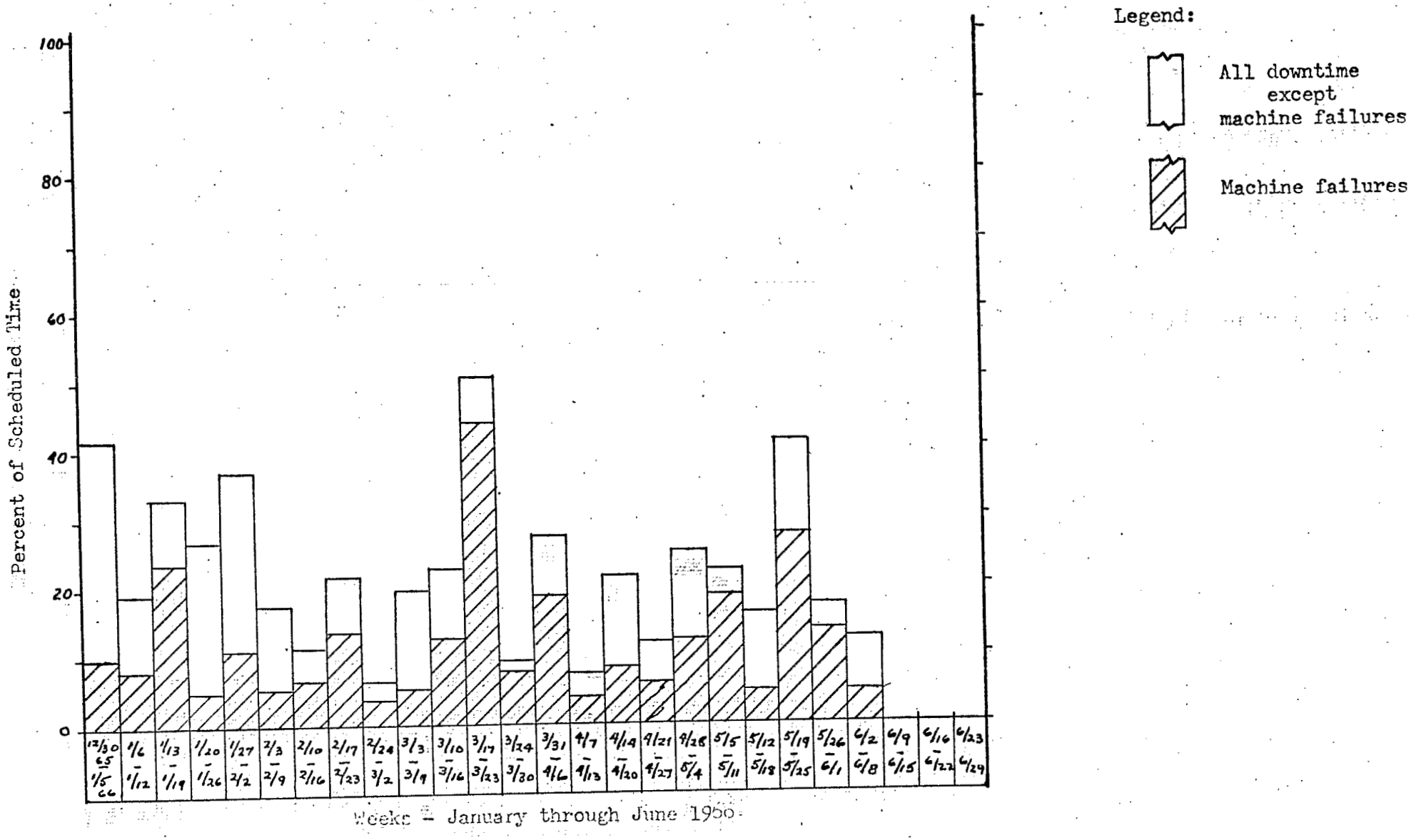
AGS OR for High Energy Physics and Machine Studies
Percent of Scheduled Time



Week – July through December 1971

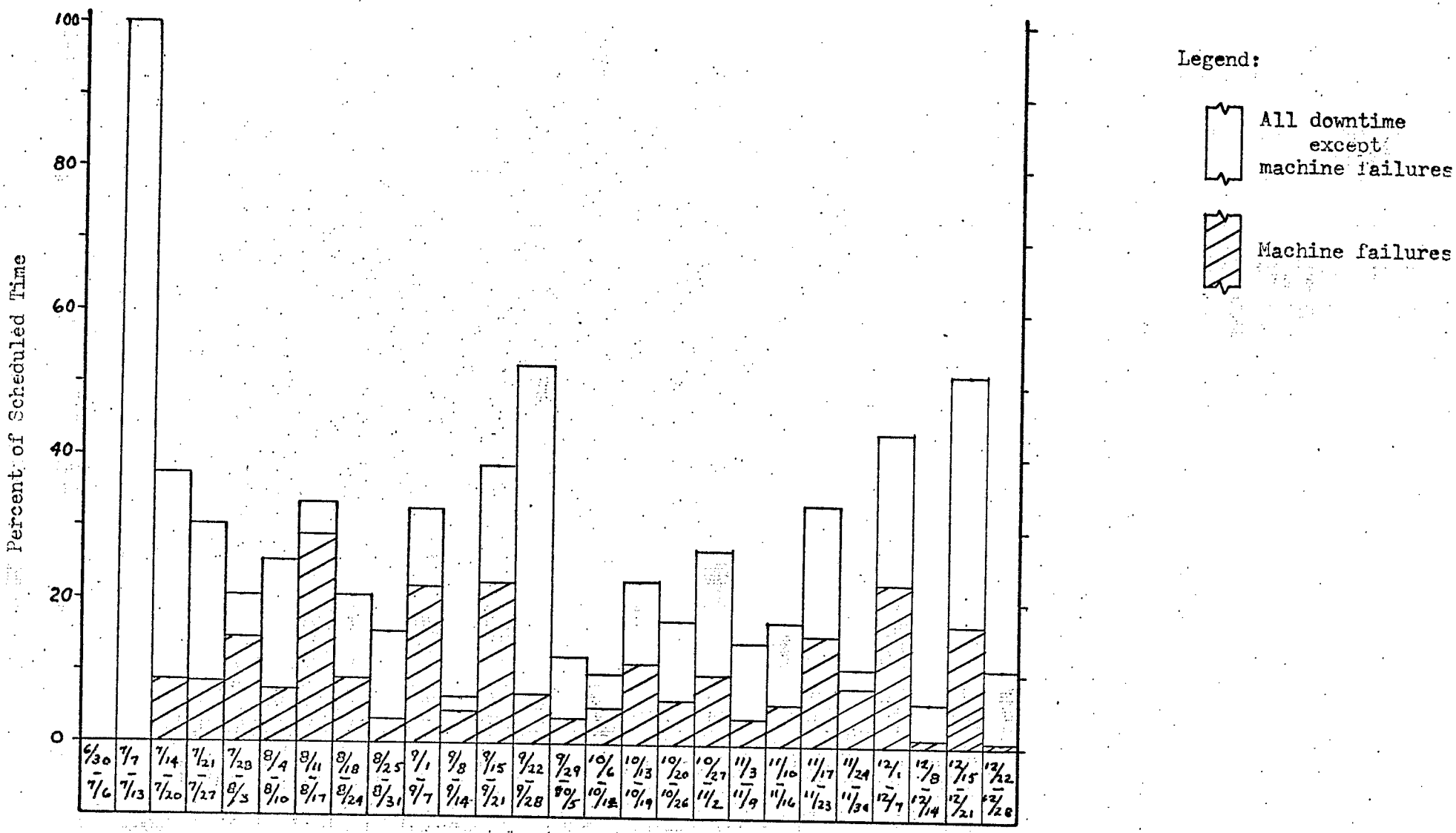
MACHINE DOWNTIME

Percent of Scheduled Time



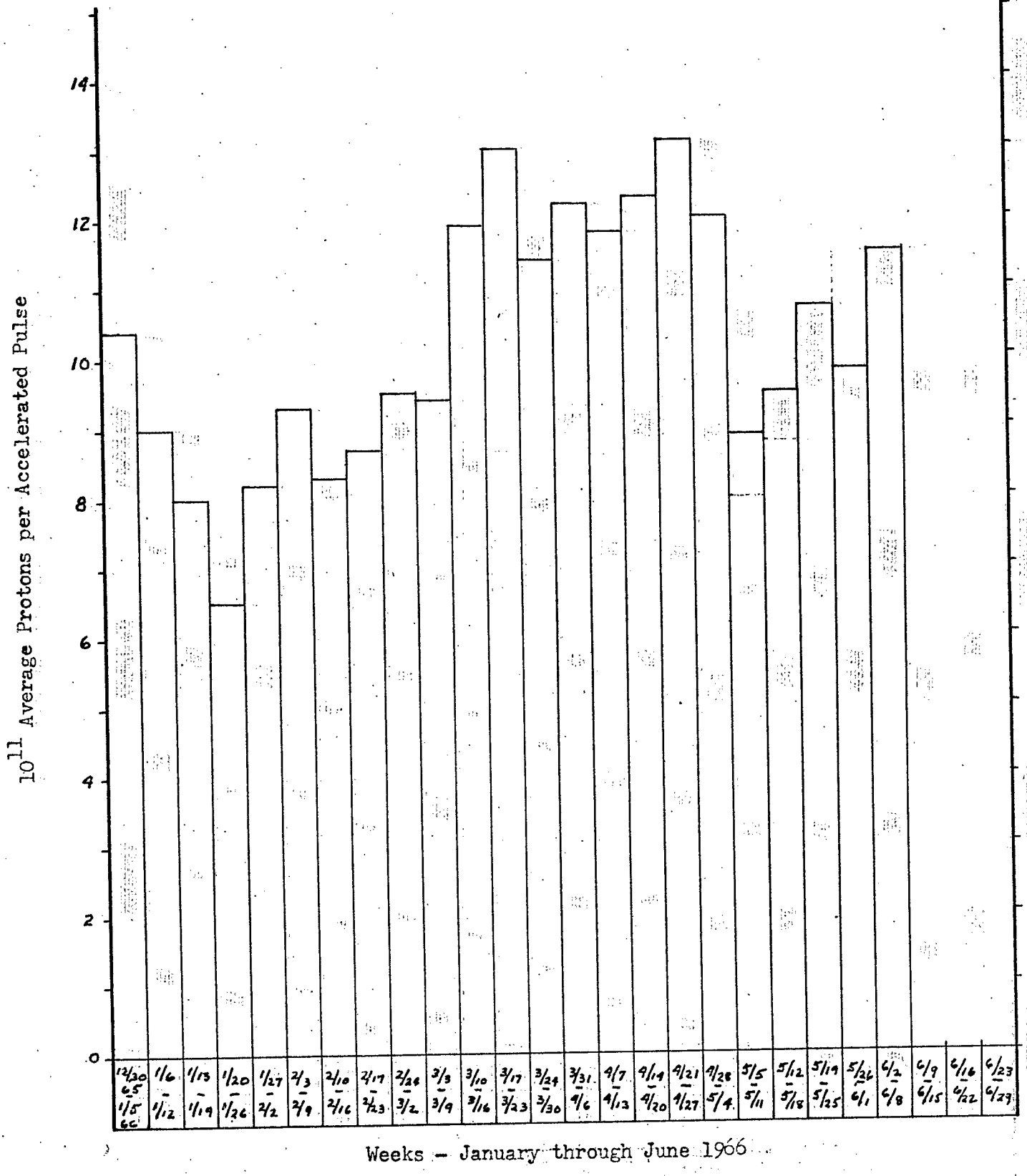
MACHINE DOWNTIME

Percent of Scheduled Time

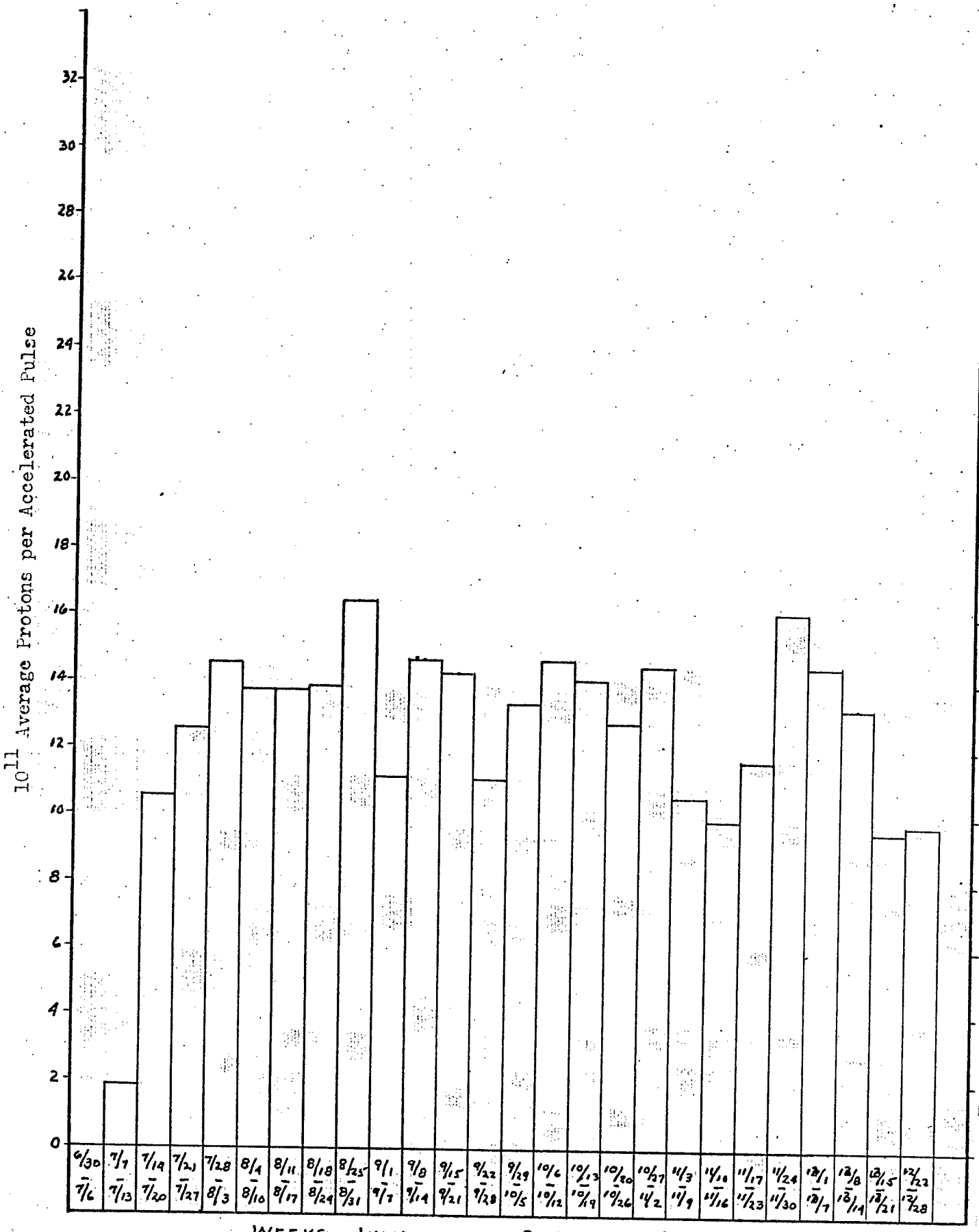


Weeks - July through December 1960

AVERAGE BEAM INTENSITY



AVERAGE BEAM INTENSITY



Experimental Users' Operations Summary

30 inch Bubble Chamber Experiments

January through June 1966

Hours run Pix taken Pix usable Period	Experiment Number											
	214	217	222	255	256	288	293 COMP. 3/2	313 COMP. 3/28	316			
1/ 1- 1/25				153.13R 127,185T 109,700U			102.17R 90,830T 90,602U					
1/25- 2/25							214.95R 235,952T 235,716U					
2/26- 3/25					112.65R 119,895T 119,895U		89.17R 108,044T 104,804U	108.51R 31,558T 31,558U	120.55R 106,340T 102,512U			
3/26- 4/25		8.54R 7,061T - - -		268.55R 226,623T 226,623U		29.94R 9,482T 9,482U		68.33R 39,963T 39,963U				
4/26- 5/25	172.61R 157,999T 157,999U		94.34R 90,722T 90,722U	198.40R 171,534T 171,534U								
5/26- 6/30	99.53R 93,503T 93,503U	61.80R 37,123T 37,123U				47.23R 43,616T 43,616U						
Totals Jan. thru Jun. '66	272.14R 251,502T 251,502U	70.34R 44,184T 37,123U	94.34R 90,722T 90,722U	620.08R 525,342T 507,857U	112.65R 119,895T 119,895U	77.17R 53,098T 53,098U	406.29R 434,826T 431,122U	176.84R 71,521T 71,521U	120.55R 106,340T 102,512U			
Previous Totals	305.04R 243,778T 224,100U			327.45R 256,886T 229,309U								
Totals to date	577.18R 495,280T 375,602U	70.34R 44,184T 37,123U	94.34R 90,722T 90,722U	947.53R 782,228T 737,166U	112.65R 119,895T 119,895U	77.17R 53,098T 53,098U	406.29R 434,826T 431,122U	176.84R 71,521T 71,521U	120.55R 106,340T 102,512U			

Experimental Users' Operations Summary
30 inch Bubble Chamber Experiments
July through December 1966

Hours Pix taken Pix usable Period	Experiment Number											
	214 COMP. 7/30	215	217 COMP. 7/25	255 COMP. 9/5	256 COMP. 10/2	288 COMP. 12/21	289 COMP. 12/21	316	344 COMP. 11/25			
7/1 - 7/25	17.89R 7,772T 7,772U		39.05R 19,317T 19,317U									
7/26- 8/25	80.93R 69,447T 69,447U	279.01R 221,325T 221,325U		105.62R 100,762T 100,762U								
8/26- 9/25				158.39R 168,395T 168,395U	129.14R 114,249T 114,249U			5.70R - - - - - -				
9/26-10/25		4.85R - - - - - -			82.28R 84,632T 84,632U	54.57R 11,468T 11,468U		216.93R 207,588T 207,588U				
10/26-11/25		72,12R 69,411T 69,411U							231.97R 212,599T 212,599U			
11/26-12/31		158.06R 137,335T 137,335U				- - - - 7,891T 7,891U	82.41R 40,542R 40,542U					
Totals Jul. thru Dec. '66	98.82R 77,219T 77,219U	519.04R 428,071T 428,071U	39.05R 19,317T 19,317U	264.01R 269,157T 269,157U	211.42R 198,881T 198,881U	54.57R 19,359T 19,359U	82.41R 40,542T 40,542U	222.63R 207,588T 207,588U	231.97R 212,599T 212,599U			
Previous Totals	577.18R 495,280T 475,602U		70.34R 44,184T 37,123U	947.53R 782,228T 737,166U	112.65R 119,895T 119,895U	77.17R 53,098T 53,098U		120.55R 106,340T 102,512U				
Totals to date	676.00R 572,499T 552,821U	519.04R 428,071T 428,071U	109.39R 63,501T 56,440U	1211.54R 1051385T 1006323U	324.07R 318,776T 318,776U	131.74R 72,457T 72,457U	82.41R 40,542T 40,542U	343.18R 313,928T 310,100U	231.97R 212,599T 212,599U			

Experimental Users' Operations Summary

80 inch Bubble Chamber Experiments

January through June 1966

Hours run Pix taken Pix usable Period	Experiment Number											
	26 COMP 4/13	196 COMP 2/16	203 COMP. 2/12	219	261 COMP 4/18	271 COMP. 4/22	285 COMP. 4/10	287	299	317		
1/ 1- 1/25			42.06R 1,900T - - -	122.65R 61,788T 61,788U								
1/26- 2/25	29.04R 11,749T 11,749U	91.82R 62,445T 62,445U	173.17R 106,887T 106,887U	7.25R 8,511T 8,511U			87.70R 50,670T 50,670U					
2/26- 3/25	38.85R 30,347T 30,347U											
3/26- 4/25	63.20R 59,414T 59,414U				71.23R 58,383T 58,383U	59.56R 49,006T 49,006U	60.57R 31,019T 31,019U	67.63R 36,156T 36,156U				
4/26- 5/25								55.52R 26,925T 26,925U	37.72R 14,387T 14,387U	15.27R 2,700T 2,700U		
Totals Jan. thru Jun. '66	130.09R 101,510T 101,510U	91.82R 62,445T 62,445U	215.23R 108,787T 106,887U	129.90R 70,299T 70,299U	71.23R 58,383T 58,383U	59.56R 49,006T 49,006U	148.27R 81,689T 81,689U	123.15R 63,081T 63,081U	37.72R 14,387T 14,387U	15.27R 2,700T 2,700U		
Previous Totals												
Totals to date	130.09R 101,510T 101,510U	91.82R 62,445T 62,445U	215.23R 108,787T 106,887U	129.90R 70,299T 70,299U	71.23R 58,383T 58,383U	59.56R 49,006T 49,006U	148.27R 81,689T 81,689U	123.15R 63,081T 63,081U	37.72R 14,387T 14,387U	15.27R 2,700T 2,700U		

Experimental Users' Operations Summary
80 inch Bubble Chamber Experiments
July through December 1966

Hours Run Pix Taken Pix usable Period	Experiment Number															
	203	216 COMP. 10/25	219 COMP. 11/9	239	251 COMP. 11/1	267 COMP. 11/7	299 COMP. 8/25	317 COMP. 10/12	319 COMP. 10/2	328 COMP. 11/20	335	341	343 COMP. 8/30			
7/ 1- 7/25	120.41R 32,468T 32,468U															
7/26- 8/25	72.91R 52,033T 52,033U						210.39R 106,474T 82,474U									
8/26- 9/25									68.57R 52,423T 52,423U			30.29R 3,352T 3,352U	85.39R 53,197T 53,197U			
9/26-10/25		115.92R 86,939T 86,939U						185.59R 128,180T 108,180U	70.34R 59,986T 59,986U		92.26R 63,427T 63,427U					
10/26-11/25			31.40R 30,762T 30,762U	63.81R 17,400T 17,400U	91.96R 76,487T 76,487U	95.03R 72,823T 72,823U				114.11R 53,829T 53,829U						
11/26-12/31				37.85R 15,705T 15,705U												
Totals Jul. thru Dec. '66	193.32R 84,501T 84,501U	115.92R 86,939T 86,939U	31.40R 30,762T 30,762U	119.26R 33,105T 33,105U	91.96R 76,487T 76,487U	95.03R 72,823T 72,823U	210.39R 106,474T 82,474U	185.59R 128,180T 108,180U	138.91R 112,409T 112,409U	114.11R 53,829T 53,829U	92.26R 63,427T 63,427U	30.29R 3,352T 3,352U	85.39R 53,197T 53,197U			
Previous Totals	215.23R 108,787T 106,887U		129.90R 70,299T 70,299U				37.72R 14,387T 14,387U	15.27R 2,700T 2,700U								
Totals to date	408.55R 193,288T 191,388U	115.92R 86,939T 86,939U	161.30R 101,061T 101,061U	119.26R 33,105T 33,105U	91.96R 76,487T 76,487U	95.03R 72,823T 72,823U	248.11R 120,861T 96,861U	200.86R 130,880T 110,880U	138.91R 112,409T 112,409U	114.11R 53,829T 53,829U	92.26R 63,427T 63,427U	30.29R 3,352T 3,352U	85.39R 53,197T 53,197U			

Experimental Users' Operations Summary

Counter Experiments

January through June 1966

Hours test Hours run Hours chgd	Experiment Number											
	153 comp. 1/19	189 comp. 3/16	210	245	269	272 comp. 4/20	275 comp. 4/27	280	281	Biology	Radio Chemistry	
1/ 1- 1/25	6.15T 231.70R 189.3 C	31.92T 300.32R 109.0 C	301.31T - - - - - -			90.73T - - - - - -		100.54T - - - - - -			3.01	
1/26- 2/25		- - - 408.41R 262.0 C	223.98T 98.93R 44.5 C			7.25T 405.55R 263.7 C	16.60T - - - - - -	254.05T - - - - - -		1.60	6.54	
2/26- 3/25		223.71T 99.75R 83.0 C	129.61T 230.43R 149.2 C			- - - 98.47R 93.1 C	288.17T 38.41R 37.4 C					
3/26- 4/25			38.87T 204.72R 144.9 C			- - - 98.76R 93.1 C	97.95T 338.21R 321.5 C					
4/26- 5/25			26.62T 298.60R 253.8 C	96.84T 208.47R 179.9 C	94.50T - - - - - -		- - - 29.48R 29.5 C		49.23T - - - - - -		3.78	
5/26- 6/30			10.00T 52.74R 52.6 C		222.44T - - - - - -				214.39T - - - - - -		1.66	
Totals Jan. thru Jun. '66	6.15T 231.70R 189.3 C	255.63T 808.48R 454.0 C	730.39T 885.42R 645.0 C	96.84T 208.47R 179.9 C	316.94T - - - - - -	97.98T 602.78R 445.7 C	402.72T 406.10R 388.4 C	354.59T - - - - - -	263.62T - - - - - -	1.60	13.33	
Previous Totals	221.63T 886.38R 608.7 C	114.38T - - - - - -	778.13T - - - - - -	225.27T 184.11R 183.00								
Totals to date	227.78T 1118.08R 798.0 C	370.01T 808.48R 454.0 C	1508.52T 885.42R 645.0 C	322.11T 392.58R 362.9 C	316.94T - - - - - -	97.98T 602.78R 445.7 C	402.72T 406.10R 388.4 C	354.59T - - - - - -	263.62T - - - - - -	1.60	13.33	

Experimental Users' Operations Summary

Counter Experiments

July through December 1966

Hours test Hours run Hours chgd. Period	Experiment Number															
	210 COMP. 11/7	245	249	259	269 COMP. 10/23	281 COMP. 9/14	283	290 COMP. 10/20	321 COMP. 7/23	322 COMP. 10/20	327 COMP. 10/5	330	349 COMP. 11/7	358 COMP. 12/22	Radio Chemistry	
7/ 1- 7/25	104.66T - - - - - -				135.15T - - - - - -	73.27T - - - - - -			- - - 75.31R 75.3 C							
7/26- 8/25	250.91T 179.34R 153.8 C	23.91T - - - - - -			50.00T 423.69R 375.1 C	176.20T 187.33R 169.0 C				- - -	- - - 224.89R 185.8 C					
8/26- 9/25	174.88T 188.24R 128.7 C	9.06T 12.07R 11.9 C			35.80T 322.80R 309.8 C	8.92T 242.11R 236.6 C		- - - 2.00R 2.0 C		- - - 2.00R 2.0 C	- - - 310.87R 302.4 C				3.61	
9/26-10/25	125.78T 209.57R 161.4 C			7.60T - - - - - -	29.05T 360.89R 337.5 C			- - - 7.60R 7.6 C		- - - 7.60R 7.6 C	- - - 75.78R 75.6 C	158.62T - - - - - -		22.12T 134.65R 134.7 C	7.65	
10/26-11/25	1.40T 162.73R 152.7 C			27.39T - - - - - -			120.82T 112.26R 104.5 C					4.65T - - - - - -	- - - 50.06R 50.0 C	- - - 366.57R 269.4 C	4.82	
11/26-12/31			80.03T - - - - - -				- - - 247.71R 235.5 C							- - - 247.98R 232.3	1.04	
Totals Jul. thru Dec. '66	657.63T 739.88R 596.6 C	32.97T 12.07R 11.9 C	80.03T - - - - - -	34.99T - - - - - -	250.00T 1107.38R 1022.4 C	258.39T 429.44R 405.6 C	120.82T 359.97R 340.0 C	- - - 9.60R 9.6 C	- - - 75.31R 75.3 C	- - - 9.60R 9.6 C	- - - 611.54R 563.8 C	163.27T - - - - - -	- - - 50.06R 50.0 C	22.12T 749.20R 636.4 C	17.12	
Previous Totals	1508.52T 885.42R 645.0 C	322.11T 392.58R 362.9 C			316.94T - - - - - -	263.62T - - - - - -										
Totals to date	2166.15T 1625.30R 1241.6 C	355.08T 404.65R 374.8 C	80.03T - - - - - -	34.99T - - - - - -	566.94T 1107.38R 1022.4 C	522.01T 429.44R 405.6 C	120.82T 359.97R 340.0 C	- - - 9.60R 9.6 C	- - - 75.31R 75.3 C	- - - 9.60R 9.6 C	- - - 611.54R 563.8 C	163.27T - - - - - -	- - - 50.06R 50.0 C	22.12T 749.20R 636.4 C	17.12	

AGS OPERATIONS SUMMARY

1964, 1965, 1966, Yearly Comparisons

	1964		1965		1966	
	Hours	%	Hours	%	Hours	%
AGS ON	4,762.02	70.2	4,623.78	71.5	5,671.89	75.8
1. For Experimenters	4,196.26	61.9	3,836.00	59.3	4,991.27	66.7
2. For Accelerator Research	565.76	8.3	787.77	12.2	680.62	9.1
MACHINE DOWNTIME	2,016.98	29.8	1,840.35	28.5	1,812.11	24.2
1. Machine Set-up, Shutdown	332.75	4.9	233.13	3.6	273.04	3.7
2. Requested Down	70.70	1.0	61.81	1.0	58.17	0.8
3. Experimental Set-up	0.00	0.0	27.12	0.4	31.75	0.4
4. Machine Failures	1,119.94	16.6	783.45	12.1	833.22	11.1
5. EAO Equipment Failures	88.25	1.3	120.19	1.9	76.02	1.0
6. Scheduled Maintenance	405.34	6.0	614.65	9.5	539.91	7.2
SCHEDULED OPERATIONS	6,779.00	100.0	6,464.13	100.0	7,484.00	100.0
HOLIDAYS	156.00		240.00		212.00	
SHUTDOWN	1,849.00		2,055.87		1,064.00	
AGS PERFORMANCE						
a. Magnet pulses	N.A.		7,286,034		8,916,874	
b. Accelerated pulses	6,340,509		5,638,403		7,481,254	
c. Missed pulses	N.A.		483,912		538,542	
d. Accelerated protons (p)	2.3×10^{18}		4.0×10^{18}		8.7×10^{18}	
e. Aver. p/pulse (d/b)	3.6×10^{11}		7.1×10^{11}		11.6×10^{11}	
f. Aver. p/pulse (d/b+c)	N.A.		6.5×10^{11}		10.9×10^{11}	

AGS OPERATIONS SUMMARY

1964, 1965, 1966, 1/2 Year Comparison

	1964				1965				1966			
	Dec 26 - Jun 25		Jun 26 - Dec 25		Dec 26 - Jun 25		Jun 26 - Dec 25		Jan 1 - Jun 30		Jul 1 - Dec 31	
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
AGS ON	2,689.52	69.6	2,072.50	71.1	2,120.53	66.9	2,503.25	75.9	2,918.98	77.8	2,752.91	73.7
1. For Experimenters	2,411.75	62.4	1,784.51	61.2	1,716.85	54.2	2,119.15	64.3	2,572.18	68.6	2,419.09	64.8
2. For Accelerator Research	277.77	7.2	287.99	9.9	403.67	12.7	384.10	11.6	346.80	9.2	333.82	8.9
MACHINE DOWNTIME	1,173.48	30.4	843.50	28.9	1,047.47	33.1	792.88	24.1	832.02	22.2	980.09	26.3
1. Machine Set-up, Shutdown	186.08	4.8	146.67	5.0	156.94	5.0	76.19	2.3	84.49	2.3	188.55	5.0
2. Requested Down	49.82	1.3	20.88	0.7	23.07	0.7	38.74	1.2	24.89	0.7	33.28	0.9
3. Experimental Set-up	0.00	0.0	0.00	0.0	11.62	0.4	15.50	0.5	12.96	0.3	18.79	0.5
4. Machine Failures	648.97	16.8	470.97	16.2	509.64	16.1	273.81	8.3	454.07	12.1	379.15	10.2
5. EAO Equipment Failures	58.55	1.5	29.70	1.0	84.16	2.6	36.03	1.1	31.65	0.8	44.37	1.2
6. Scheduled Maintenance	230.06	6.0	175.28	6.0	262.04	8.3	352.61	10.7	223.96	6.0	315.95	8.5
SCHEDULED OPERATIONS	3,863.00	100.0	2,916.00	100.0	3,168.00	100.0	3,296.13	100.0	3,751.00	100.0	3,733.00	100.0
HOLIDAYS	0.00		156.00		0.00		240.00		48.00		164.00	
SHUTDOWN	529.00		1,320.00		1,200.00		855.87		544.00		520.00	
AGS PERFORMANCE												
a. Magnet pulses	N.A.		3,472,080		3,483,849		3,802,185		4,578,490		4,338,384	
b. Accelerated pulses	3,595,535		2,744,974		2,503,631		3,134,772		3,822,041		3,659,213	
c. Missed pulses	N.A.		290,600		279,816		204,096		281,722		256,820	
d. Accelerated protons (p)	12.1×10^{17}		10.6×10^{17}		15.2×10^{17}		24.9×10^{17}		38.9×10^{17}		48.0×10^{17}	
e. Aver. p/pulse (d/b)	3.4×10^{11}		3.9×10^{11}		6.1×10^{11}		7.9×10^{11}		10.2×10^{11}		13.2×10^{11}	
f. Aver. p/pulse (d/b+c)	N.A.		3.5×10^{11}		5.5×10^{11}		7.5×10^{11}		9.5×10^{11}		12.3×10^{11}	