

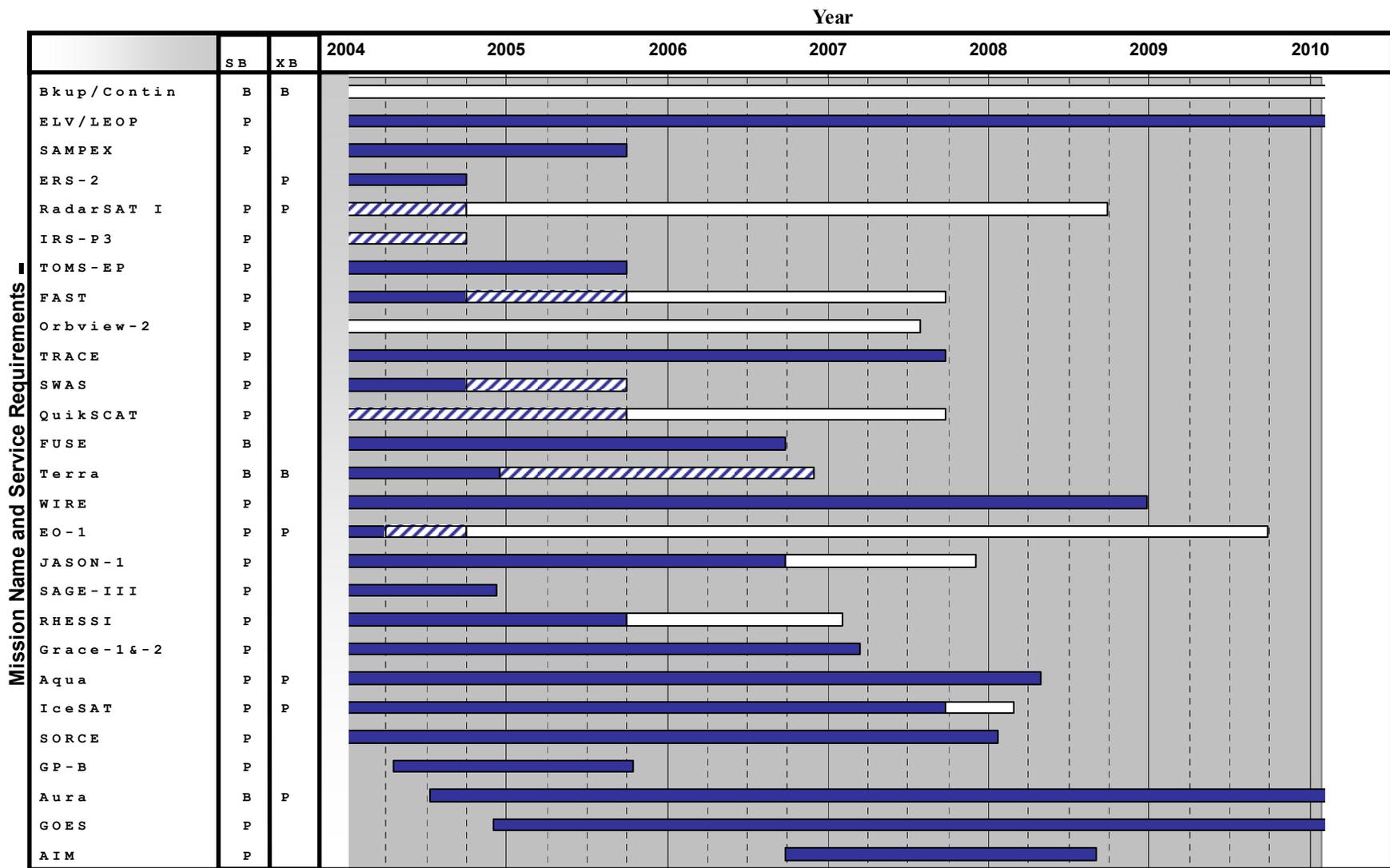
GSFC Ground Network Loading

June 24, 2004

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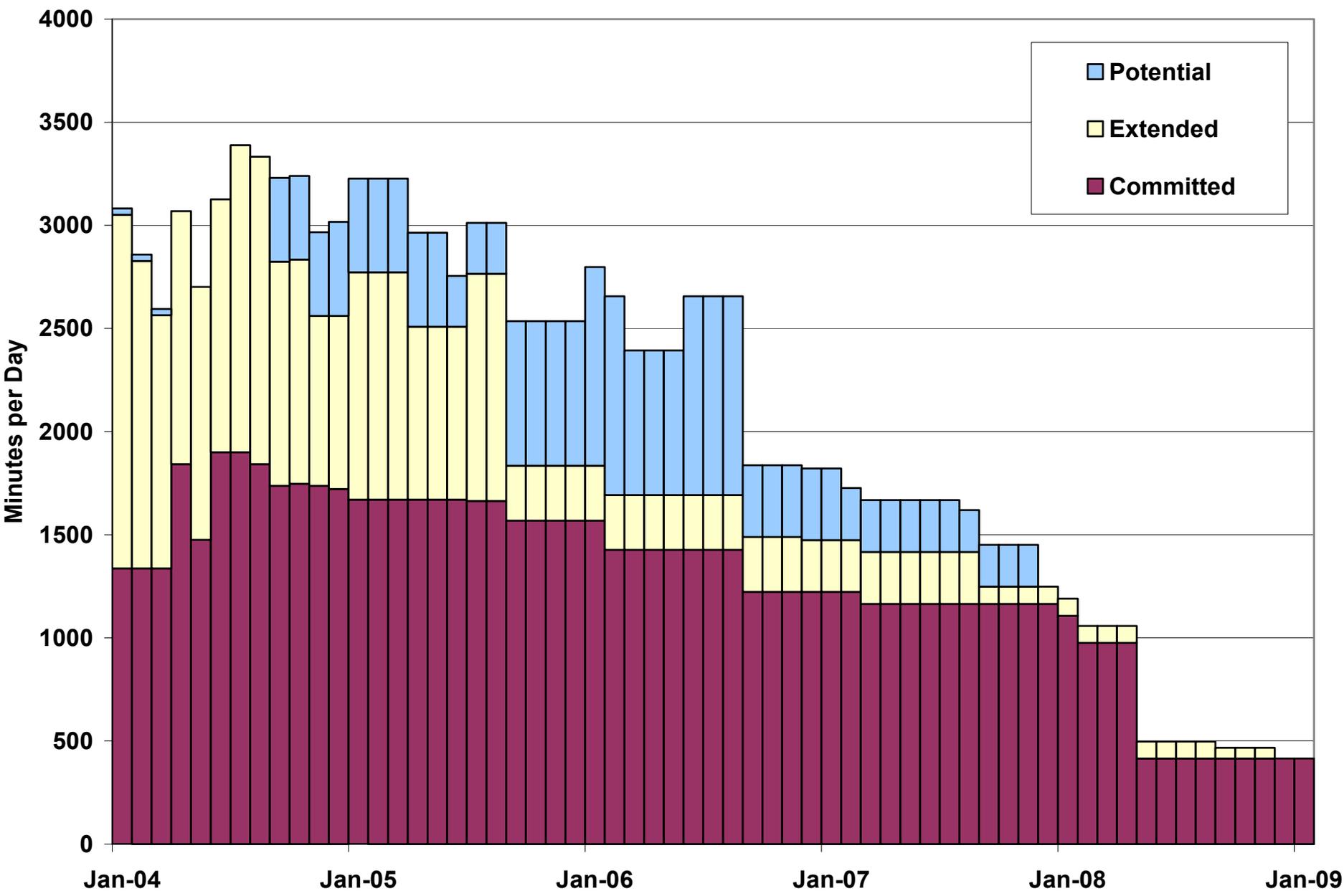
P - Prime support, B - backup

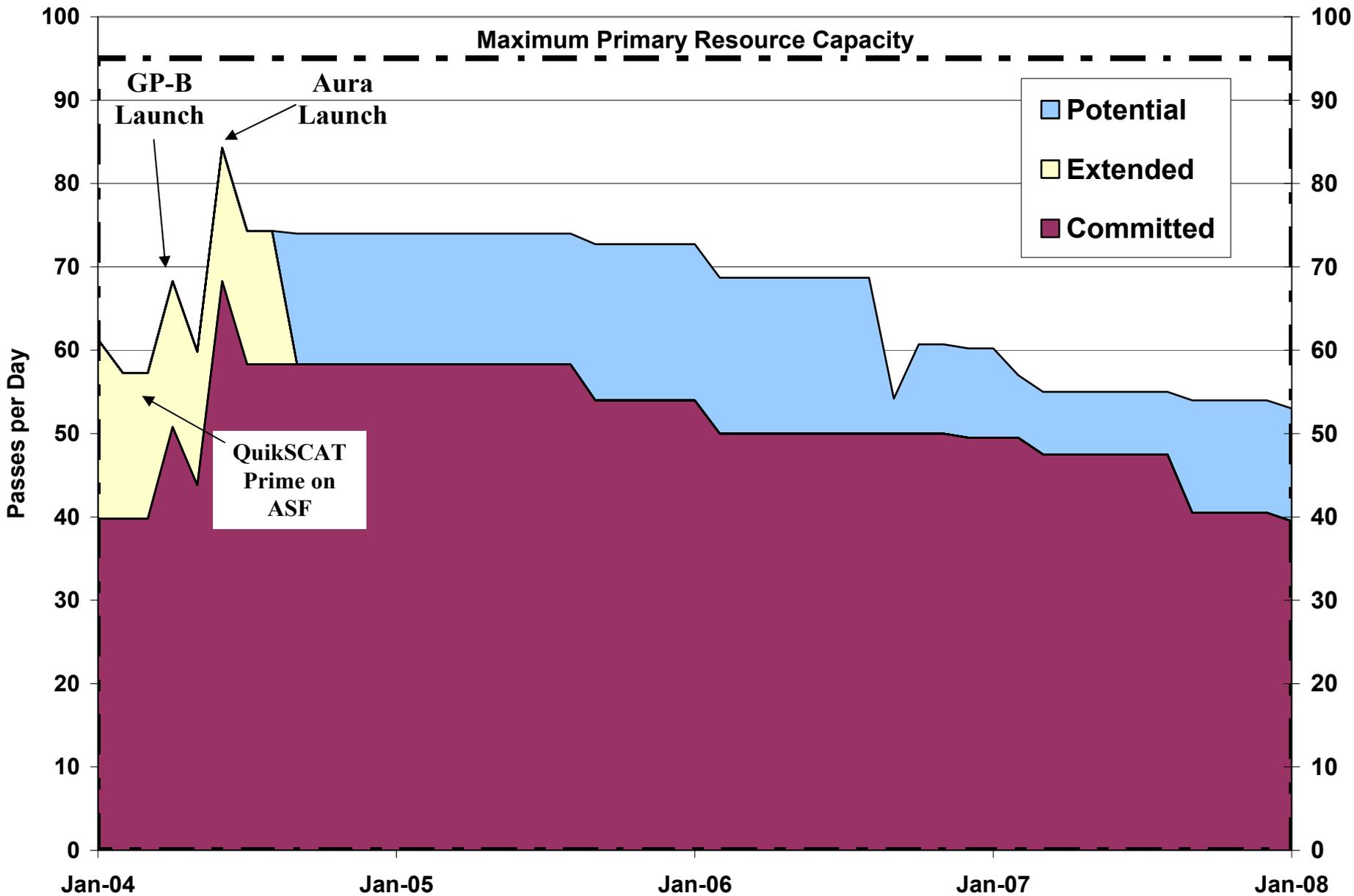
■ Committed ▨ Extended □ Potential

* "Extended" indicates change to support commitment since original approved agreement

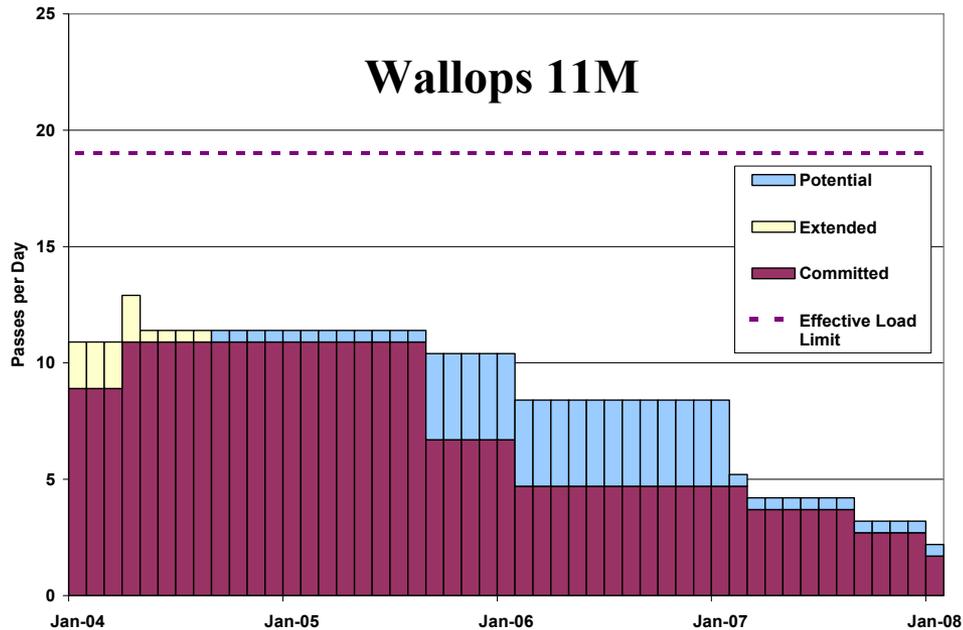
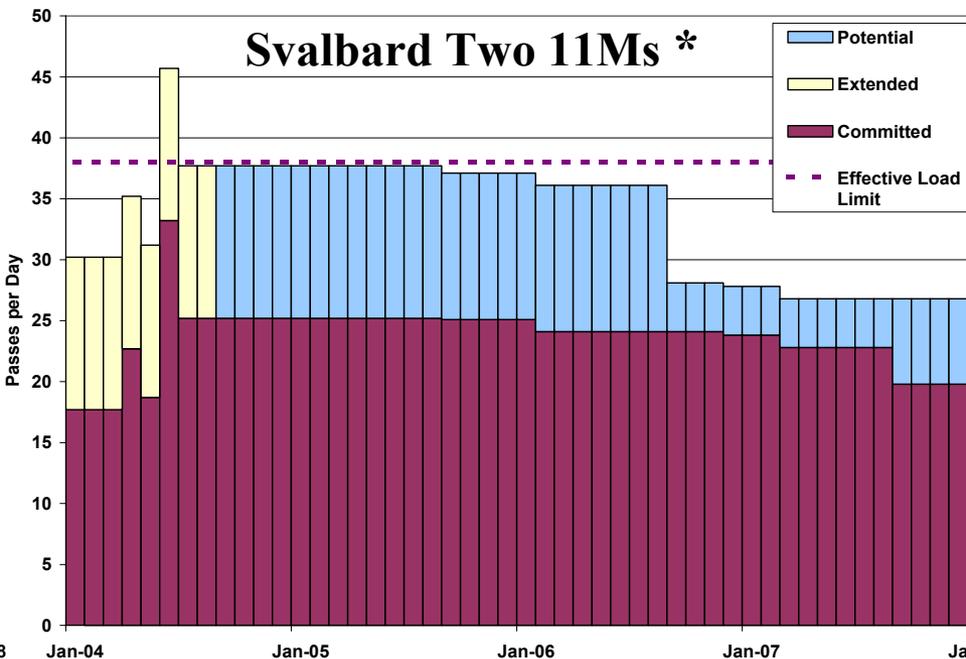
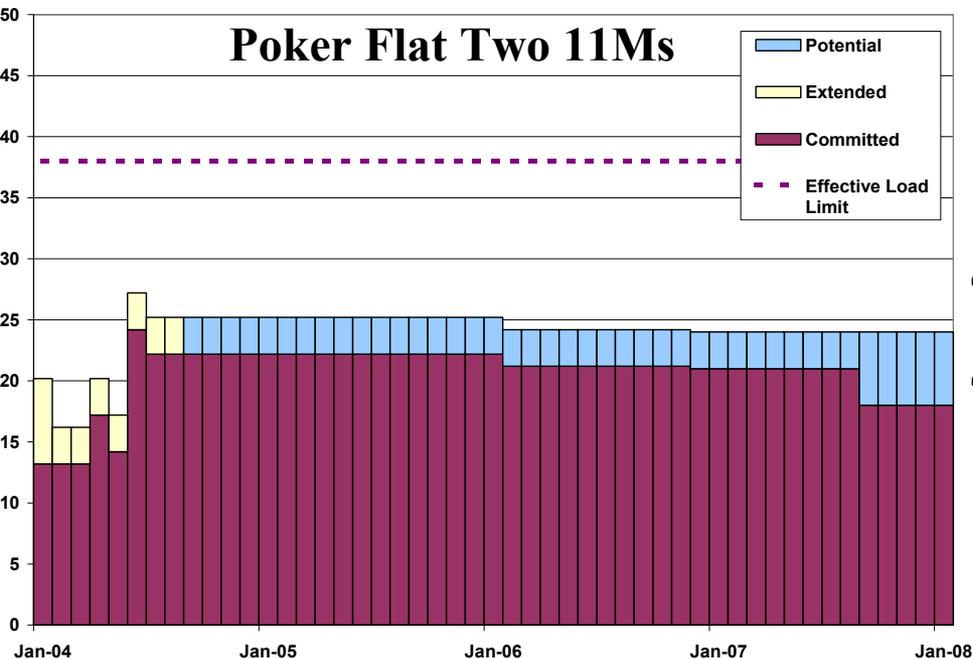
Station	Aperture Diameter (Meters)	Frequency Band	Turnaround Time (Minutes)	Prepass Component (Minutes)	Postpass Component (Minutes)
AGS	11	X/S	18	8	10
	8	S	15	10	5
	5	S	10	5	5
PF1 *	11	X/S	15	13	2
SGS	11	X/S	18	8	10
SKS	11	X/S	15	15	0
SG3	13	X/S	15	15	0
MGS	10	X/S	20	15	5
WGS	11	X/S	18	8	10
	9	S	25	20	5
	8	S	15	10	5
	7.3	S/L	25	20	5
	5	S	10	5	5
MILA	9	S	25	20	5
AGO	9/12	S	15	10	5
	7.5	S	15	10	5

* Commercial Service Provider (PF1) antenna at Poker Flat, AK, currently out-of-service and is being temporarily replaced by leased 7.3 meter X/S-band antenna





Covers 5 primary 11 meter apertures with 2 at each of Poker Flat, AK, and Svalbard, Norway, and 1 at Wallops Island, VA (Includes some occasional SG3 support)



* Svalbard site loading includes some SG3 (13 meter aperture) support due to occasional conflicts

Mission	Instrument/Data Flow	Data Rate (kbps)	Destination	Required Latency (minutes)	Avg D/L Volume (MB)
ACRIMSAT	Proficiency	115.2	SOCC	RT	RT
AIM	RT HK	1660	MOC (LASP)	RT	RT
	PB SCI		MSOC	120	75
AQUA	PB SCI	150000	Multiple	180 (from last D/L)	6124
	RT HK	524	ERPS	RT	RT
AURA	PB SCI	150000	Multiple	180 (from last D/L)	4343
	RT HK	524	ERPS	RT	RT
CHAMP	Proficiency	32	GSOC	RT	RT
CHIPSAT	PB SCI	115.2	UCB	Internet/FTP	--
COBE	Best Effort Support				
EO-1	RT HK	32	MOC	RT	RT
	PB HK (VC-1)	1000	CSAFS	60	31.7
	PB HK (VC-2)			60	1.3
	PB HK BU (VC-3)	2000		60	30.9
	PB HK BU (VC-6)			60	5.4
	PB HK BU (VC-7)			60	5.4
	PB HK BU (VC-8)			60	5.4
	PB HK BU (VC-9)			60	5.4
	60			5.4	
ERS-2	PB X-Band TLM	105000	ASF	TAPE	TAPE
FAST	RT HK	4.96	UCB	RT	RT
	PB HK	2250		30	1
	PB SCI			240	337
FUSE	Backup PB HK/SCI	1024	FUSE SCC	As Available	76.8
GP-B	PB TLM	2560	CSAFS	ASAP	81.5
GRACE-1	RT HK/SCI	32	GSOC	RT	RT
	PB HK/SCI	1000	CSAFS	60	75
GRACE-2	RT HK/SCI	32	GSOC	RT	RT
	PB HK/SCI	1000	CSAFS	240	75
ICESAT	RT HK	16.384	MOC	RT	RT
	PB HK	262	CSAFS	60	12
	PB SCI	40000	Multiple	N/A	1.25
IRS-P3	PB TLM	5200	Wallops Workstation	FTP Post-Pass	NA

Aug-2004 Nominal Ops w/ Aura & GP-B			
Avg Latency (minutes)	Min Latency (minutes)	Max Latency (minutes)	Rqmts Met
N/A			
Not in time period			
123.8	97.3	813.2	96.2*
N/A			
111.6	91.1	739.3	98.2*
N/A			
N/A			
N/A			
Best Effort Support			
N/A			
27.3	16.3	50.7	100.0
2.8	2.6	3.5	100.0
27.1	16.1	49.9	100.0
10.8	6.4	20.0	100.0
11.0	6.6	20.1	100.0
11.1	6.7	20.2	100.0
11.1	6.7	20.2	100.0
N/A			
N/A			
0.8	0.2	1.6	100.0
69.1	60.8	117.3	100.0
N/A			
36.7	43.9	59.1	N/A
N/A			
18.6	14.8	44.0	100.0
N/A			
22.0	14.2	44.8	100.0
N/A			
7.2	4.4	16.4	100.0
12.8	2.9	803.2	N/A
N/A			

* AQUA and AURA requirements satisfaction is less than 100% due to the largely variable delays in the ground system and need for data retransmission. Results based on simulations using actual ground system availability, delay and retransmission statistics. The AQUA and AURA project goals of 90% data satisfaction is met for all retransmission rate simulations.

Mission	Instrument/Data Flow	Data Rate (kbps)	Destination	Required Latency (minutes)	Avg D/L Volume (MB)
JASON-1	RT HK	699	OCC @ JPL	RT	RT
	PB HK			15	3.1
	PB SCI 1			ASAP	15.6
	PB SCI 2			ASAP	15.6
LANDSAT-7	Proficiency RT HK	4.864	LGS	RT	RT
ORBVIEW-2	PB SCI	2000	OSC/Dulles	FTP Post-Pass	125
QUIKSCAT	RT HK	4.096	MOC & SEAPAC	RT	RT
	PB HK 1	262	MOC	45	3.4
			SEAPAC	45	3.4
	PB HK 2	2000	NOAA	150 from observ	6
			SEAPAC	150 from observ	6
			NOAA	150 from observ	35
PB SCI		SEAPAC	150 from observ	35	
RADARSAT-I	PB SAR	85000	ASF	TAPE	TAPE
RHESSI	RT HK/SCI	16	UCB	RT	RT
	PB HK	1000		480	0.125
	PB SCI			480	205
SAC-C	Proficiency RT HK	1	MOC/Argentina	RT	RT
SAGE-III	PB SCI	665.4	LaRC	60	60
SAMPEX	RT HK	16	SMEX MOC	RT	RT
	PB HK	900		60	1.9
	PB SCI			60	9
SORCE	RT HK	64	LASP	RT	RT
	PB SCI	1500		Post-Pass FTP	35.6
SWAS	RT HK	18.75	MOC	RT	RT
	PB HK	1800		720	3.8
	PB SCI			720	27.5
TERRA	Proficiency RT HK	524	ERPS	RT	RT
TOMS-EP	RT HK	1.125	MOC	120	RT
	PB SCI	202.5		120	16.4
TRACE	RT HK	23.438	MOC	RT	RT
	PB HK	2250		120	1
	PB SCI			120	37.5
WIRE	RT HK	23.4375	MOC	RT	RT
	PB HK	2250		N/A	3.35

Aug-2004 Nominal Ops w/ Aura & GP-B			
Avg Latency (minutes)	Min Latency (minutes)	Max Latency (minutes)	Rqmts Met
N/A			
1.2	0.8	2.5	100.0
4.9	3.5	11.1	100.0
4.9	3.5	11.1	100.0
N/A			
N/A			
105.0	104.4	110.6	100.0
104.6	104.0	109.5	100.0
105.8	104.9	114.5	100.0
105.8	104.8	114.5	100.0
126.3	110.7	143.0	100.0
114.1	110.3	143.0	100.0
N/A			
N/A			
2.1	2.1	2.1	100.0
103.1	82.7	145.0	100.0
N/A			
20.8	16.8	40.3	100.0
N/A			
0.6	0.5	1.0	100.0
35.2	34.2	37.1	100.0
N/A			
9.5	9.1	13.0	N/A
N/A			
0.8	0.6	2.0	100.0
4.1	3.2	11.8	100.0
N/A			
N/A			
6.0	1.7	56.0	100.0
N/A			
0.2	0.1	0.8	100.0
6.8	4.1	20.3	100.0
N/A			
0.6	0.4	2.2	N/A

NOTE: ALL NETWORK MODEL/SIMULATION ASSUMPTIONS, ARCHITECTURE/SYSTEM PARAMETERS, AND REQUIREMENTS ARE AVAILABLE UPON REQUEST AND WILL BE INCLUDED IN THE FULL END-TO-END FOLLOW-ON ASSESSMENT.

- Analysis of simulation modeling results indicate that:
 - Most support commitments can be met through the peak loading period of mid-2004 through late 2005 with QuikSCAT supported at the Alaska Satellite Facility (ASF) and the 7.3 meter substitute for PF1
 - Continued use of SG3 at Svalbard will be required to ‘easily’ resolve occasional support conflicts between Aqua/Aura and IceSAT or QuikSCAT
 - Under limited resource availability scenarios, some Aqua hand-overs cannot be supported
 - Maintaining commercial service provider site minimums (established for budgetary reasons) at both Poker Flat and Svalbard in FY '05 will become an operational issue with support movement between sites required by the DSMC schedulers during both Forecast Schedule generation and Active Schedule monitoring
 - Some customers may be required to periodically reduce support to approved levels

Requirements Table

MISSION	REQUIREMENT	PER MONTH	PER DAY
ACRIMSAT	1/week	4	0.13
AQUA	1/orbit + 6 H-O/day	616	20.53
AURA *	1/orbit	436	14.53
COBE	{As needed & avail.)	17	0.57
EO-1	6/day	180	6.00
ERS-2	PRN	42	1.40
FAST	1/orbit	345	11.50
FUSE	{As needed & avail.)	2	0.07
GP-B *	5/day	150	5.00
GRACE-1	2/day	60	2.00
GRACE-2	1/3day	10	0.33
HESSI	3/day	90	3.00
ICESAT	5/day	150	5.00
IRS-IP3	2/day	60	2.00
JASON-1	7/day, 1/wk	214	7.13
LANDSAT-7	1/week	4	0.13
METEOSAT **	1/day	30	1.00
ORBVIEW-2	2/day	60	2.00
QUIKSCAT	1/orbit	427	14.23
RADARSAT-1	1/day	30	1.00
SAC-C	{As needed & avail.)	1	0.03
SAGE-3	2/day	60	2.00
SAMPEX	3/day	90	3.00
SNOE	2/day	60	2.00
SORCE	2/day	60	2.00
SWAS	2/day, 2/wknd	68	2.27
TERRA	1/week	4	0.13
TOMS-EP	4/day, 3/wk	132	4.40
TRACE	7/day	210	7.00
WIRE	2/day, 2/wknd	68	2.27
Total		3680	122.67

*Projected Support Level

** Dedicated UHF Antenna

Antenna Site	Destination	Network	Services	Total Circuit Throughput (kbps)
AGS	GSFC	Closed IONet	T1	1536
		Closed EBNet	T1	1536
		EBNet HR	DOMSAT	52000
PF1	GSFC	Open IONet	1/2 T1	768
SGS	GSFC	EBNet HR	DOMSAT	52000
		Closed IONet	E-1/T-1 (Channelized)	460.8
		Closed EBNet		896
SKS	GSFC	Open IONet		460.8
WPS	GSFC	Closed IONet	3 x T1	4608
		Closed EBNet		952
MGS	GSFC	Closed IONet		128
MIL	GSFC	Closed IONet	T1	1536
ASF	JPL	Closed EBNet	2 x T1	1536
AGO	GSFC	Closed IONet		128

Mission	AG11	PF1	ASF	AG08	AG05	SGS	SKS	SG3	WG11	WG09	WG08	WG07	WG05	MILA	MGS	AGO
ACRIMSAT	P					P			P						P	
Aqua	P	P				P	P	S	S							
Aura	P	P				P	P	S	S							
CHIPSat										P	S					
COBE	P					P			C	C				C	C	
ENVISAT-1	C								C					C		C
EO-1	P	P				P			S						C	
ERS-2			P												P	
FAST				P	P						P		P	S	P	S
FUSE										S			S			
GP-B	P	P				P	P		P						C	
GRACE-1/-2	P					P			P						P	
RHESSI									P	S			C			S
ICESat	P	P				P	P	S	S						S	
IRS-P3									S	S	P	S	P			
JASON-1					P								P			
Landsat-5										C				C		C
Landsat-7						C			C						C	
OrbView-2									P	P	P	S	P			
ProSEDS										P						P
QuikSCAT	P	P	P			P	P	S	P	C					S	
RADARSAT			P												P	
SAC-C						C	C									
SAMPEX				P	P				C		P		P			C
SORCE									P	S	C		C			P
STS										C				P		C
SWAS				P	P				S		P		P	P		S
Terra	C	C				C	C		C							
TOMS-EP				P					P	P	P				S	P
TRACE				P	P						P		P		P	C
WIRE				P	P						P		P		P	C

P = Primary site, normally used for science and engineering support.

S = Secondary site, used for science and engineering support when Primary site is not available.

C = Contingency site, available for engineering support, science mission may not be supported.

AM & PM Constellation Predicted Phase Relative to Landsat-7

