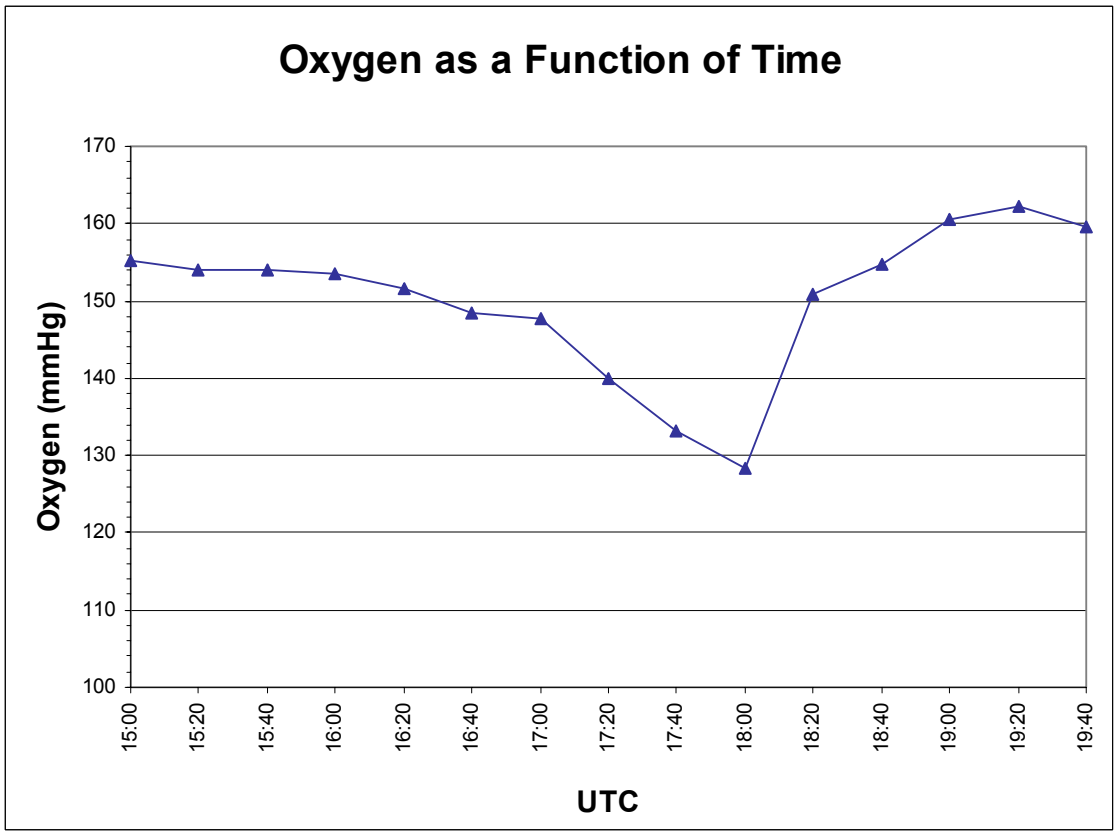
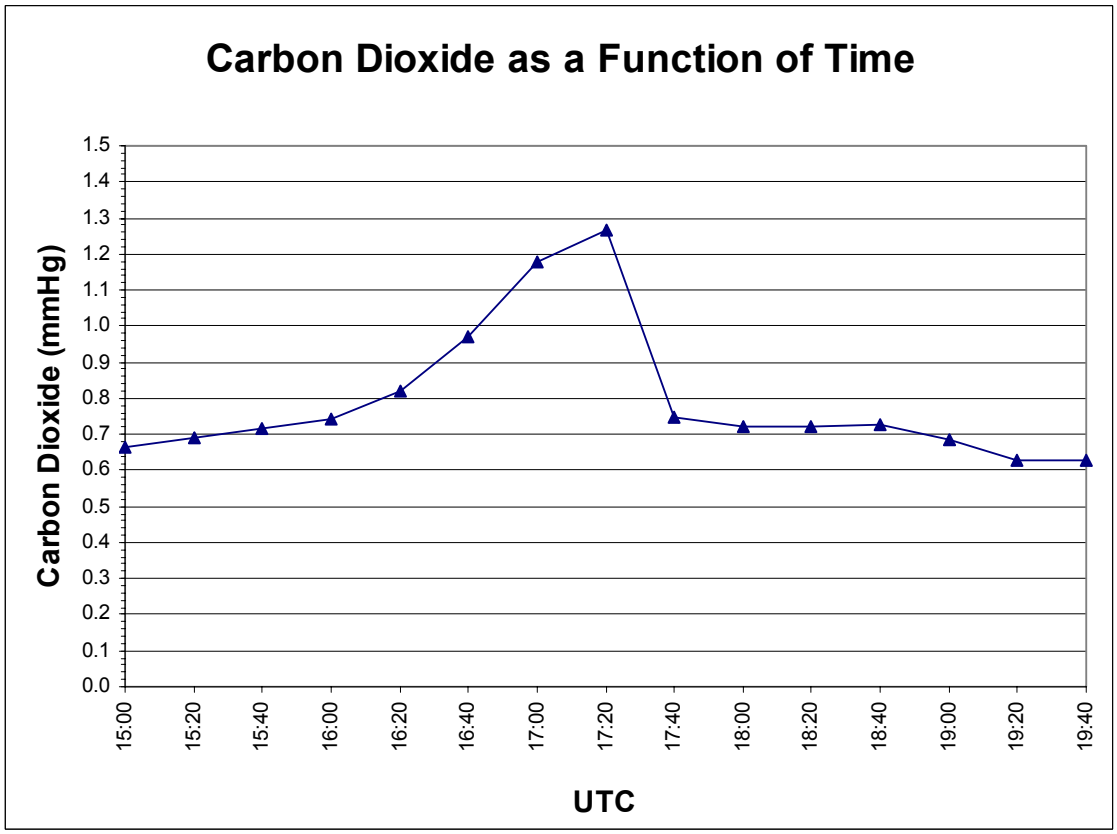
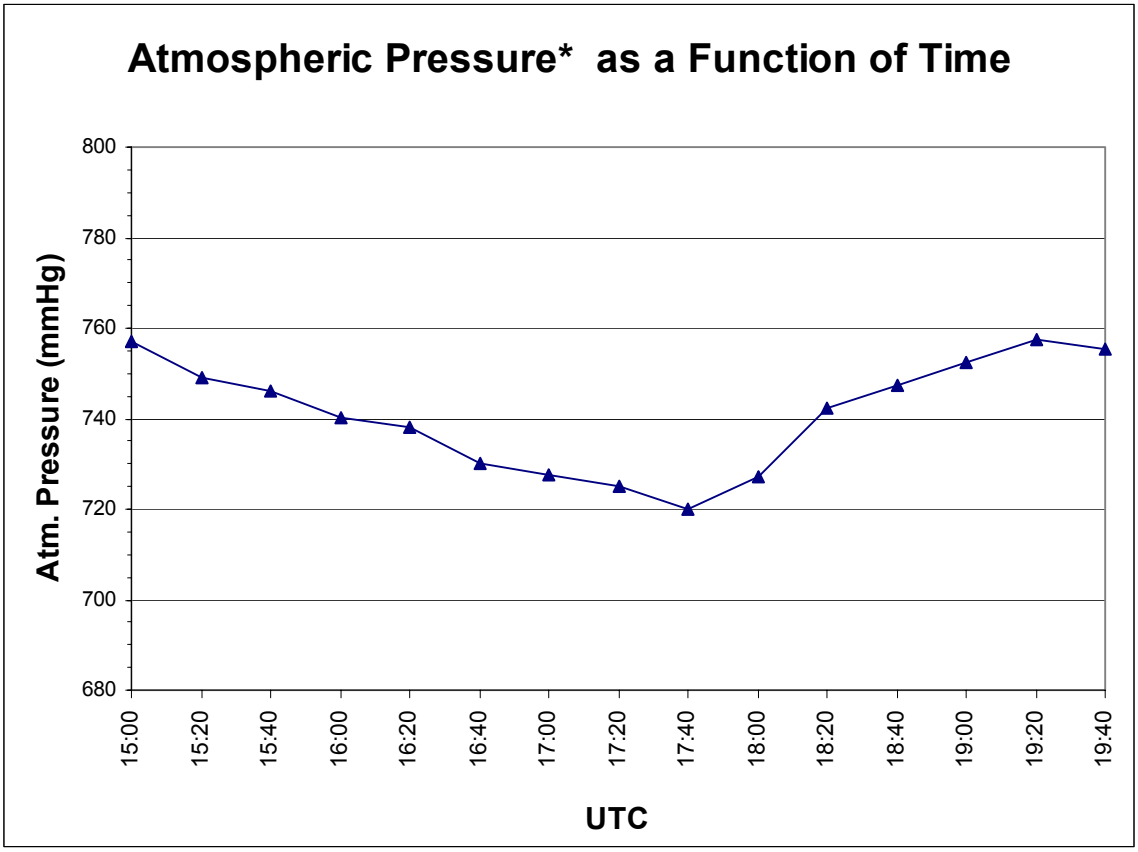
O2	(Critical value= 115 mmHg [millimeters of Mercury])							
Table Headings	Coordinated Universal Time	Total Atmospheric Pressure	Content	Partial Pressure	Change	Rate of Change	Time to Criticality*	
Units	24 Hour Clock	mmHg	%	mmHg	mmHg	mmHg per minute	minutes	
Column	A	B	C	D	E	F	G	
Calculations	From Data	From Data	From Data	D= B x C/100	E = Current D - Previous D	F = E/20	G= Abs Value of Critical Value - D / F	
Mission Data	15:00	757	20.50	155.19	n/a	n/a	n/a	
rev	15:20	749	20.56	153.99	-1.20	-0.06	649.83	
2/24/2003	15:40	746	20.64	153.97	-0.02	0.00	Division by zero	Could also be Zero or N/A
	16:00	740.1	20.75	153.57	-0.40	-0.02	1,928.50	
	16:20	738	20.53	151.51	-2.06	-0.10	365.10	
	16:40	730	20.33	148.41	-3.10	-0.16	208.81	
	17:00	727.5	20.29	147.61	-0.80	-0.04	815.25	
	17:20	725	19.31	140.00	-7.61	-0.38	65.79	
	17:40	720	18.50	133.20	-6.80	-0.34	53.53	
	18:00	727	17.65	128.32	-4.88	-0.24	55.50	
	18:20	742.5	20.33	150.95	22.63	1.13	31.77 (N/A)	PP is rising. Time to crit is not applicable
	18:40	747.5	20.70	154.73	3.78	0.19	210.10 (N/A)	PP is rising. Time to crit is not applicable
	19:00	752.5	21.33	160.51	5.78	0.29	157.58 (N/A)	PP is rising. Time to crit is not applicable
	19:20	757.5	21.42	162.26	1.75	0.09	540.61 (N/A)	PP is rising. Time to crit is not applicable
	19:40	755.5	21.13	159.64	-2.62	-0.13	343.38	

CO2	(Critical value= 0.7600 mmHg [millimeters of Mercury])							
Table Headings	Coordinated Universal Time	Total Atmospheric Pressure	Content	Partial Pressure	Change	Rate of Change	Time to Criticality*	
Units	HH:MM	mmHg	%	mmHg	mmHg	mmHg per minute	minutes	
Column	A	B	C	D	E	F	G	
Calculations	From Data	From Data	From Data	D= B x C/100	E = Current D - Previous D	F = E/20	G= Abs Value of Critical Value - D / F	
Mission Data	15:00	757	0.088	0.6662	n/a	n/a	n/a	
rev	15:20	749	0.092	0.6891	0.0229	0.0011	64.4545	
2/24/2003	15:40	746	0.096	0.7162	0.0271	0.0014	31.2857	
	16:00	740.1	0.100	0.7401	0.0239	0.0012	16.5833	
	16:20	738	0.111	**0.8192**	0.0791	0.0040	14.9671 (N/A)	Above Critical Levels and Still Rising
	16:40	730	0.133	**0.9709**	0.1517	0.0076	27.8012 (N/A)	Above Critical Levels and Still Rising
	17:00	727.5	0.162	**1.1786**	0.2077	0.0104	40.3130 (N/A)	Above Critical Levels and Still Rising
	17:20	725	0.175	**1.2688**	0.0902	0.0045	112.8048 (N/A)	Above Critical Levels and Still Rising
	17:40	720	0.104	0.7488	-0.5200	0.0260	0.4308 (N/A)	Below Critical and Dropping- Good.
	18:00	727	0.099	0.7197	-0.0291	-0.0015	27.7055 (N/A)	Below Critical and Dropping- Good.
	18:20	742.5	0.097	0.7202	0.0005	0.0000	Division by zero	
	18:40	747.5	0.097	0.7251	0.0049	0.0002	174.5000	
	19:00	752.5	0.091	0.6848	-0.0403	-0.0020	37.3325 (N/A)	Below Critical and Dropping- Good.
	19:20	757.5	0.083	0.6287	-0.0561	-0.0028	46.8421 (N/A)	Below Critical and Dropping- Good.
	19:40	755.5	0.083	0.6271	-0.0061	-0.0003	1601.6265 (N/A)	Below Critical and Dropping- Good.
	If CO2 is below 0.76 and the Rate of Change is negative then Time to Criticality does not apply. If CO2 is above 0.76 and the Rate of Change is positive then Time to Criticality does not apply.							


Oxygen as a Function of Time
Oxygen (mmHg)
170
160
150
140
130
120
110
100
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC


Carbon Dioxide as a Function of Time
Carbon Dioxide (mmHg)
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC


Atmospheric Pressure* as a Function of Time
Atm. Pressure (mmHg)
800
780
760
740
720
700
680
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC

Battery Reserve							
Column	A	B*	C	D	E	F	
Table Headings	UTC	Reserve Battery Capacity	Battery Reserve	Change	Rate of Change	Time to Criticality	
Units	24 Hour Clock	%	Kilowatts	Kilowatts	Kilowatts/ Min	Minutes	
Calculations	From Data	From Data	C= B/100 X 24.49**	D= C -previous C	E= D/20 (min)	F= |(12.245-C)/E***|	
Mission Data	15:00	99	24.25	n/a	n/a	n/a	
rev	15:20	90	22.04	-2.21	-0.11	89.00	Time to criticality above 60 minutes is considered ideal. Anything below 30 minutes is considered perilous.
2/24/03	15:40	83	20.33	-1.71	-0.09	89.78	
eclipse	16:00	70	17.14	-3.19	-0.16	30.56	When time to citicality is between 30 and 60 minutes, the Power Team may want to consider managing power consumption closely. The Power Systems Calculator is a tool to help you do this
eclipse	16:20	63	15.43	-1.71	-0.09	35.33	"
	16:40	52	12.73	-2.70	-0.14	3.43	Power Team MUST begin to use PSC to reduce power load
	17:00	43	**10.53**	-2.20	-0.11	15.60 (N/A)	Critical value is 12.25. Power capacity is below 12.25, so we are at and below critical levels. Time to criticality does not apply until we are back above 12.25
	17:20	28	**6.86**	-3.67	-0.18	29.36 (N/A)	"
eclipse	17:40	18	**4.41**	-2.45	-0.12	64.04 (N/A)	"
eclipse	18:00	32	**7.84**	3.43	0.17	25.94	When you are below critical levels and the trend is upward towards having more power, the time to criticality is how much time until levels are back above critical (in this case, 19 minutes)
	18:20	65	15.92	8.08	0.40	9.08 (N/A)	Students recommendations are starting to work. We are back above critical levels. Trend is upward, so time to criticality is non-applicable
	18:40	99	24.25	8.33	0.42	28.81 (N/A)	Trend is upward, so time to criticality is non-applicable
	19:00	100	24.49	0.24	0.01	999.59 (N/A)	"
eclipse	19:20	91	22.29	-2.20	-0.11	91.27	Time to criticality above 60 minutes is considered ideal. Anything below 30 minutes is considered perilous.
eclipse	19:40	83	20.33	-1.96	-0.10	80.80	"

* Graph this column.

** Total Battery Capacity – On any given day, the battery capacity is dependent on the number of solar arrays connected to the main frame. The value on February 14, 2001 is 24.49 kilowatts.

*** Critical Battery Capacity – The station will be in a critical stage if power levels drop below 50% of the total battery capacity. The number is 50% of the Battery Capacity Start Value, or 12.25 kilowatts. Remember, if the Battery Reserve is above 12.25 and the Rate of Change is positive, then Time to Crit does not apply. Also if the Battery Reserve is below 12.25 and the Rate of Change is negative then Time to Crit does not apply.

Note: Column C is Used in the Power Systems Calculator

Solar Array									
Column	A	B*	C	D		E	F	G	
Table Headings	UTC	Solar Array Efficiency	Power Generation	Current Power Load		Rate of Charging or Draining	Charging or Draining	New Time to Criticality***	
Units	24 Hour Clock	%	Kilowatts/Hour	Kilowatts/Hour		Kilowatts/ Hour		Hours	
Calculations	From Data	From Data	C=B/100 X 24.49**	See Power Systems Calculator	Use PSC?	E = C-D	Pos # = Charging Neg # =Draining	G= Col C from Batt Resv – 12.25**** |Column E|	
Mission Data	15:00	95	23.27	24.49	not necessary	n/a	n/a	n/a (cannot calculate)	
rev				24.49		n/a	n/a	n/a (cannot calculate)	
2/24/03	15:20	94	23.02	21.00	not necessary	2.02	Charging	4.85	not applicable since it is charging
				24.49		-1.47	Draining	6.66	Time to criticality above 1 hour is considered ideal. Anything below 0.5 hours is considered perilous.
	15:40	75	18.37	21.00	not necessary	-2.63	Draining	3.07	
				24.49		-6.12	Draining	1.32	When time to criticality is between 0.5 and 1 hour, the Power Team may want to consider managing power consumption closely. The Power Systems Calculator is a tool to help you do this. In this case, 0.5 hour of power is good enough going into the eclipse portion of the orbit.
eclipse	16:00	0	0.00	19.00	optional	-19.00	Draining	0.26	Data indicates significant power losses, but these are explainable due to being in eclipse. It is recommended to not adjust anything until the station is back in full sun.
				24.49		-24.49	Draining	0.20	"
eclipse	16:20	0	0.00	15.00	optional	-15.00	Draining	0.21	Data indicates significant power losses, but these are explainable due to being in eclipse. It is recommended to not adjust anything until the station is back in full sun.
				18.00		-18.00	Draining	0.18	"
	16:40	45	11.02	12.00	YES	-0.98	Draining	0.49	We are essentially AT critical levels, so time to criticality is not applicable.
				15.00		-3.98	Draining	0.12	
	17:00	36	8.82	12.00	YES	-3.18	Draining	0.54	When below critical levels (like now), and rate is negative, time to criticality is not applicable. If the rate is positive, then TTC applies.
				15.00		-6.18	Draining	0.28	
	17:20	46	11.27	10.00	YES	1.27	Charging	4.25	When below critical levels (like now), and rate is negative, time to criticality is not applicable. If the rate is positive, then TTC applies.
				15.00		-3.73	Draining	1.45	
eclipse	17:40	0	0.00	8.00	YES	-8.00	Draining	0.98	When below critical levels (like now), and rate is negative, time to criticality is not applicable. If the rate is positive, then TTC applies.
				22.00		-22.00	Draining	0.36	
eclipse	18:00	0	0.00	8.00	YES	-8.00	Draining	0.55	When below critical levels (like now), and rate is negative, time to criticality is not applicable. If the rate is positive, then TTC applies.
				19.00		-19.00	Draining	0.23	
	18:20	87	21.31	13.00	optional	8.31	Charging	0.44	not applicable since it is charging
				17.00		4.31	Charging	0.85	
	18:40	95	23.27	11.00	optional	12.27	Charging	0.98	not applicable since it is charging
				13.00		10.27	Charging	1.17	
	19:00	91	22.29	15.00	not necessary	7.29	Charging	1.68	not applicable since it is charging
				21.50		0.79	Charging	15.49	
eclipse	19:20	0	0.00	15.00	not necessary	-15.00	Draining	0.67	
				24.49		-24.49	Draining	0.41	
eclipse	19:40	0	0.00	15.00	not necessary	-15.00	Draining	0.54	
				24.49		-24.49	Draining	0.33	

* Graph this column.

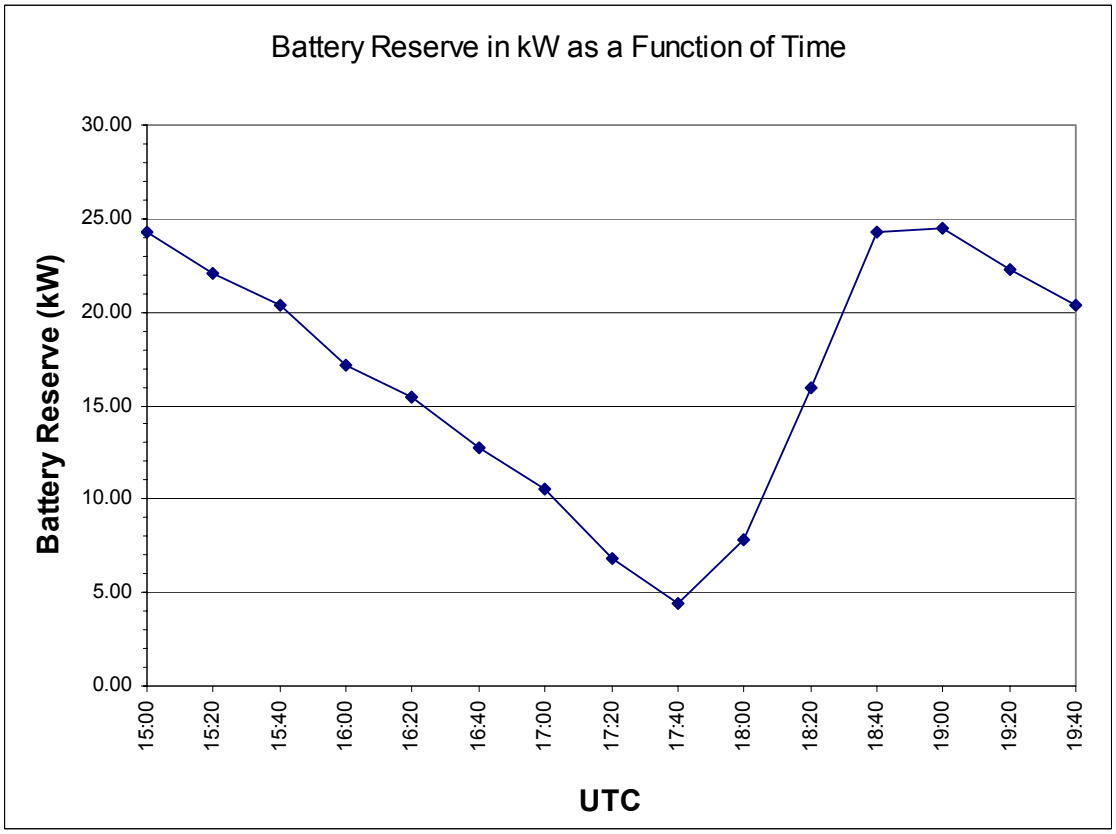
**Total Battery Capacity – On any given day, the battery capacity is dependent on the number of solar arrays connected to the main frame. The value on February 14, 2001 is 24.49 kilowatts.

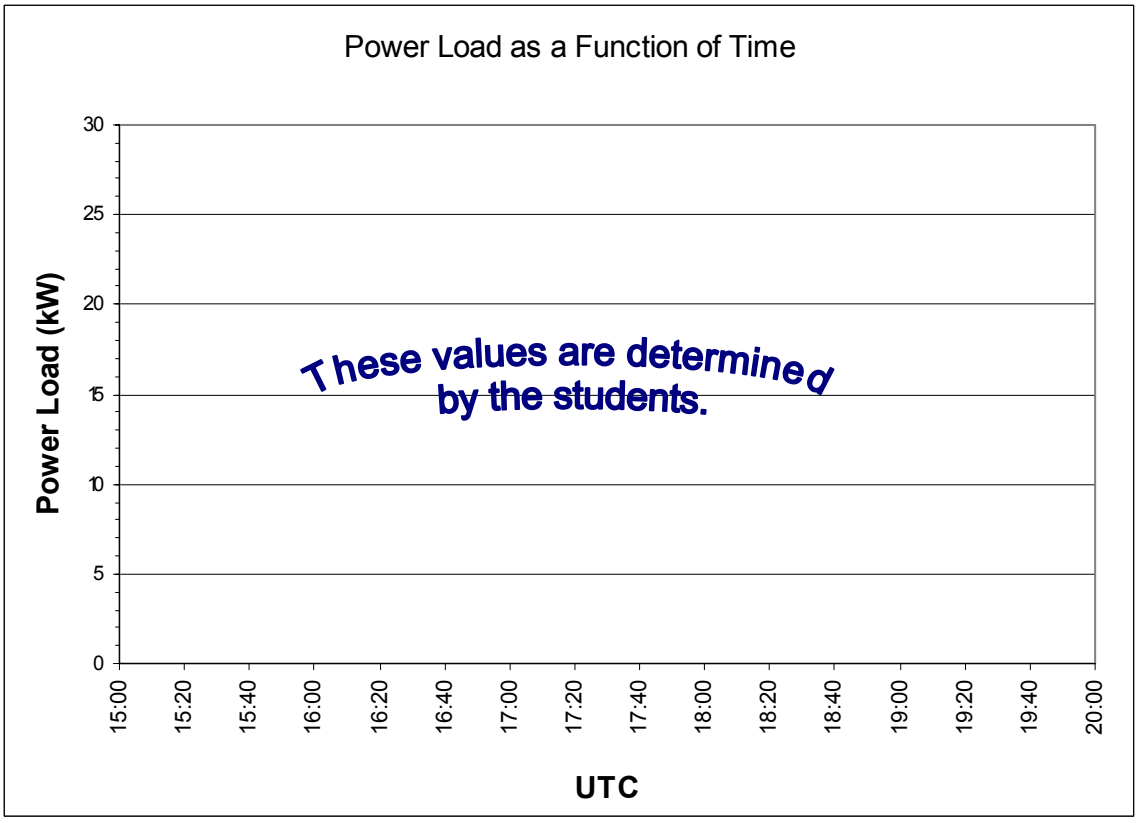
***Remember, if the Battery Reserve is above 12.25 and the Rate of Change is positive, then Time to Crit does not apply. Also if the Battery Reserve is below 12.25 and the Rate of Change is negative then Time to Crit does not apply.

**** Critical Battery Capacity – The station will be in a critical stage if power levels drop below 50% of the total battery capacity. The number is 50% of the Battery Capacity Start Value, or 12.25 kilowatts.

Note: The Power Systems Calculator should be used to balance the Power Load (Column D) against the Time to Criticality (Column G). As the load goes down, the time to criticality will go up and vice versa. In general, the Power Load should stay above 15 kilowatts/hour of consumption and the new Time to Criticality should stay above 0.5 hours

Power Team – Mission Data

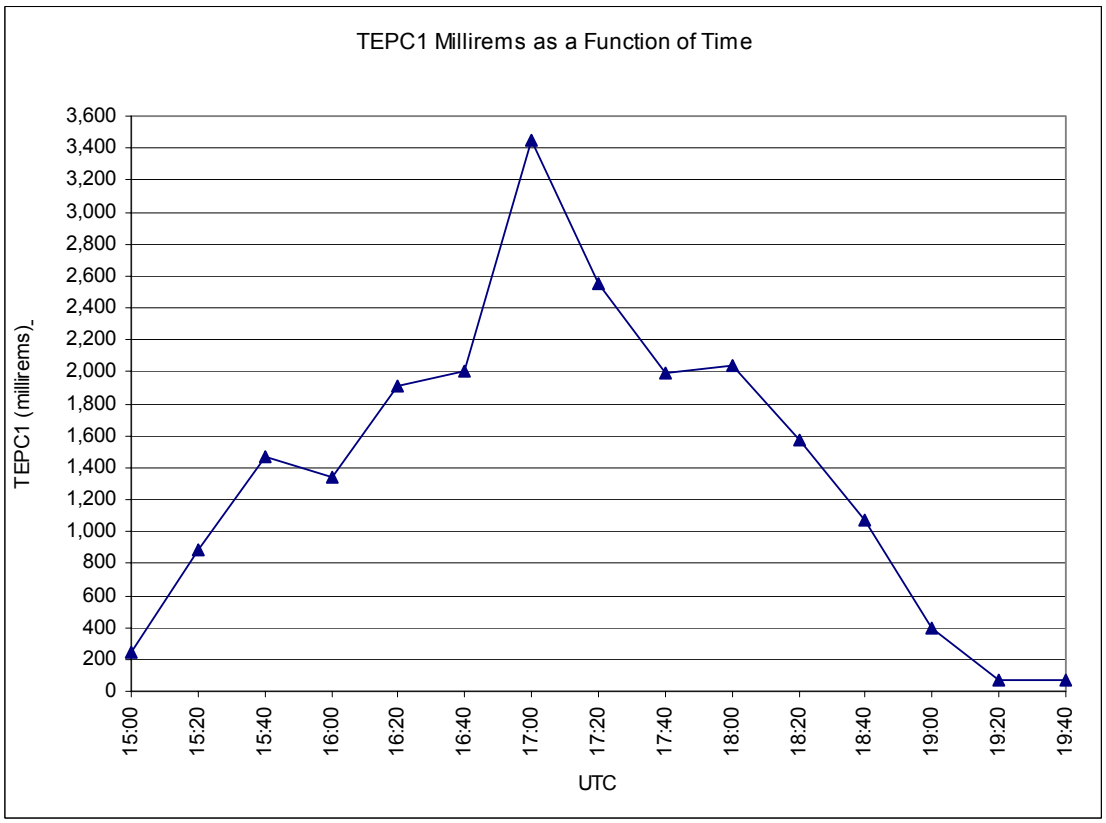


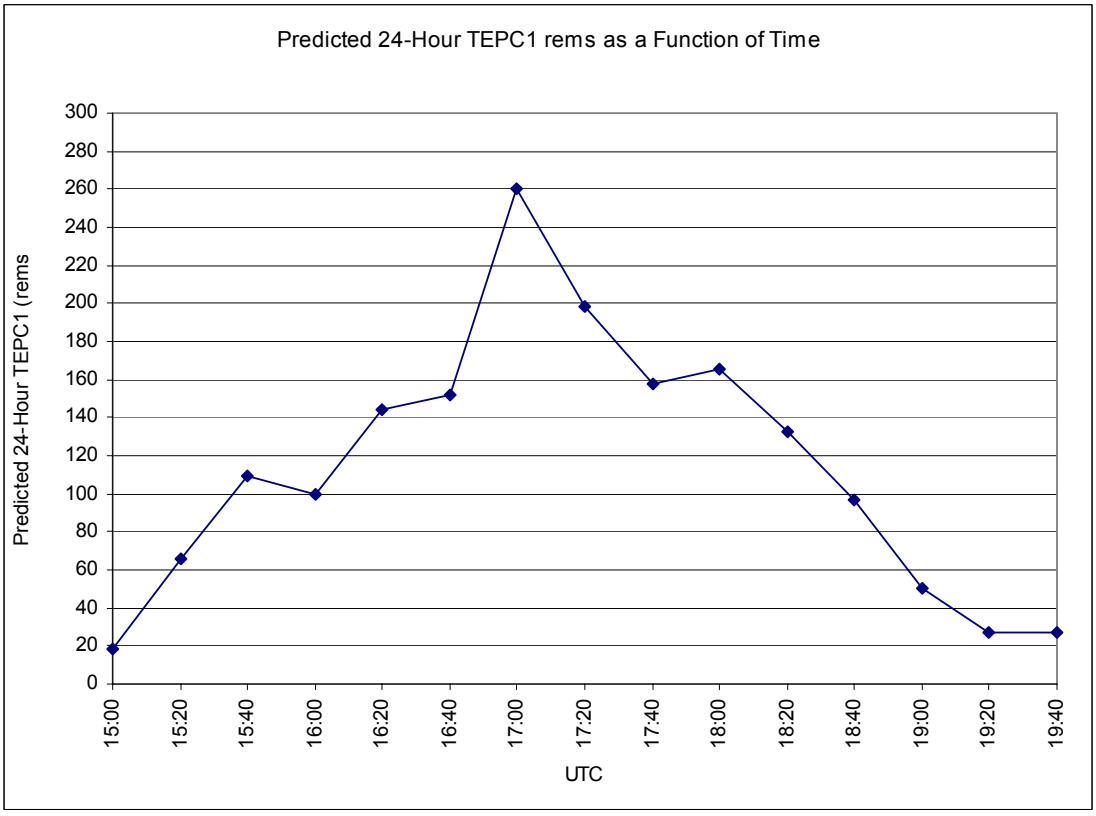


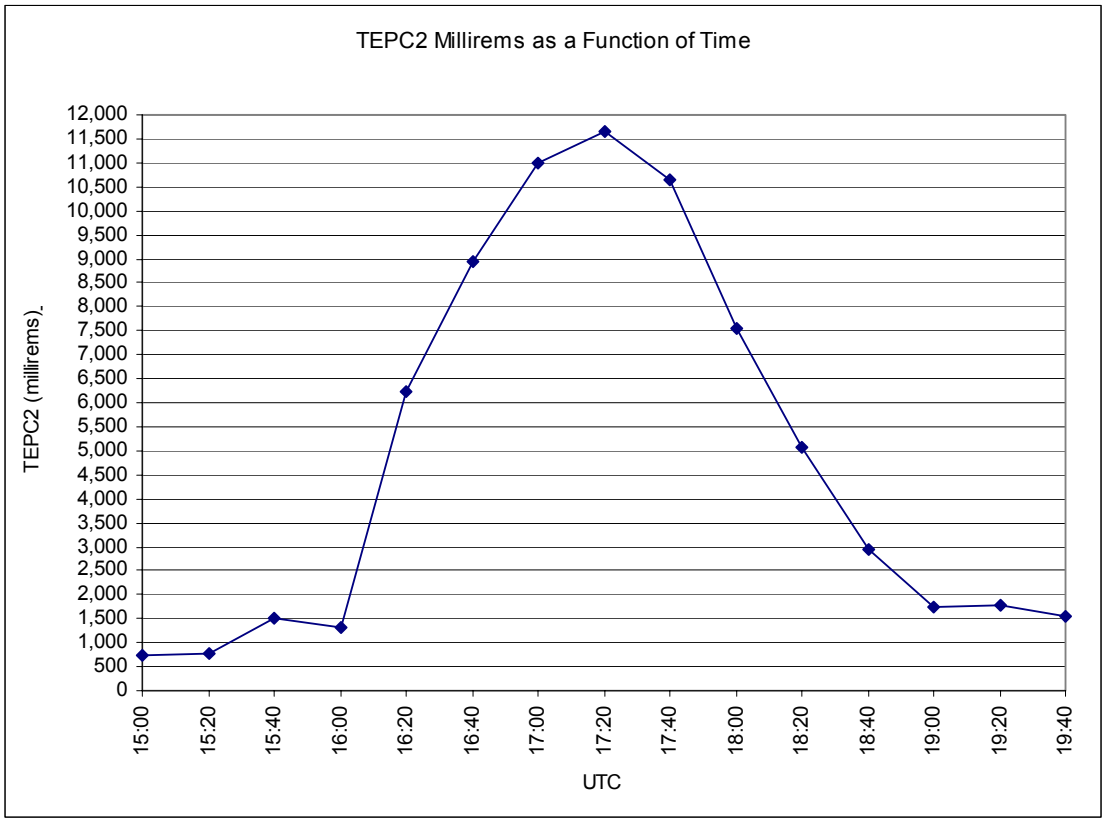
TEPC1								
Column	A	B	C	D	E	F	G	H
Table Headings	UTC	15 min DoseTotal	Cumulative Dose	Dose Rate	Time to Criticality	Time to Criticality	24 hour ProjectedTotal	24 Hour ProjectedTotal
Units	24 Hour Clock	mrems	mrems	Mrem/min	Minutes	Hours	mrems	Rems
Calculations	From Data	From Data	C= B+ Previous C	D= B / 20 min	E = 100,000 - C / D	F= E / 60 min	G =C + (D X 1440)	H = G/ 1000
Mission-TEPC1								
	15:00	240	240	12	8,313	139	17,520	18
	15:20	890	1,130	45	2,197	37	65,930	66
	15:40	1,473	2,603	74	1,316	22	109,163	109
	16:00	1,345	3,948	67	1,434	24	100,428	100
	16:20	1,914	5,862	96	981	16	144,102	144
	16:40	2,003	7,865	100	921	15	151,865	152
	17:00	3,452	11,317	173	513	9	260,437	260
	17:20	2,554	13,871	128	673	11	198,191	198
	17:40	1,988	15,859	99	850	14	158,419	158
	18:00	2,043	17,902	102	805	13	164,782	165
	18:20	1,575	19,477	79	1,019	17	133,237	133
	18:40	1,068	20,545	53	1,499	25	96,865	97
	19:00	395	20,940	20	3,953	66	49,740	50
	19:20	74	21,014	4	19,747	329	26,774	27
	19:40	70	21,084	4	19,729	329	26,844	27

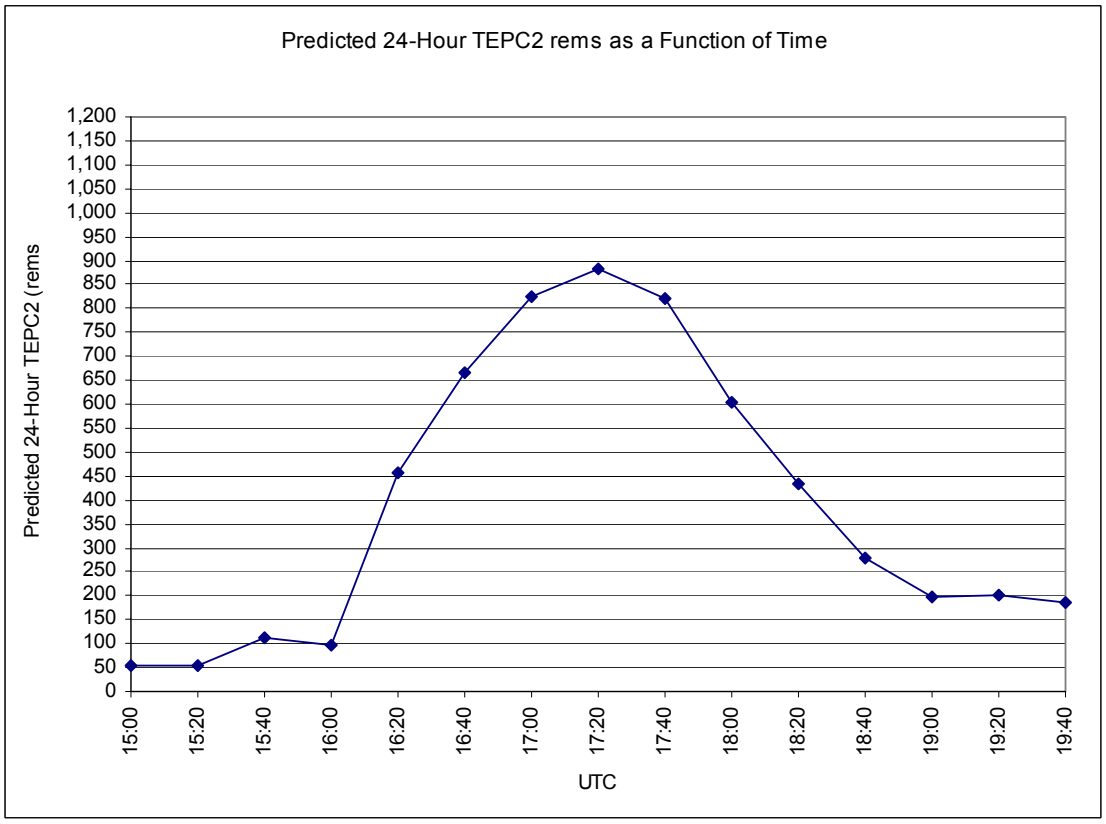
TEPC2								
Column	A	B	C	D	E	F	G	H
Table Headings	UTC	15 min DoseTotal	Cumulative Dose	Rate of Change	Time to Criticality	Time to Criticality	24 hour ProjectedTotal	24 Hour ProjectedTotal
Units	24 Hour Clock	mrems	mrems	Mrem/min	Minutes	Hours	mrems	Rems
Calculations	From Data	From Data	C= B+ Previous C	D= C / 20 min	E = 100,000 - C / D	F= E / 60 min	G =d X 1440 (min)	H = G/ 1000
Mission-TEPC2								
	15:00	735	735	37	2,683	45	54,015	54
	15:20	765	1,500	38	2,592	43	56,220	56
	15:40	1,515	3,015	76	1,276	21	112,455	112
	16:00	1,305	4,320	65	1,472	25	97,920	98
	16:20	6,225	10,545	311	288	5	458,385	458
	16:40	8,955	19,500	448	180	3	664,620	665
	17:00	10,995	30,945	550	126	2	822,945	823
	17:20	11,640	42,585	582	99	2	880,665	881
	17:40	10,635	53,220	532	88	1	819,300	819
	18:00	7,560	60,780	378	104	2	605,100	605
	18:20	5,085	65,865	254	134	2	431,625	432
	18:40	2,940	68,805	147	212	4	280,485	280
	19:00	1,740	70,545	87	339	6	195,825	196
	19:20	1,785	72,330	89	311	5	200,490	200
	19:40	1,543	73,873	77	339	6	184,753	185

Radiation Team - Mission Data



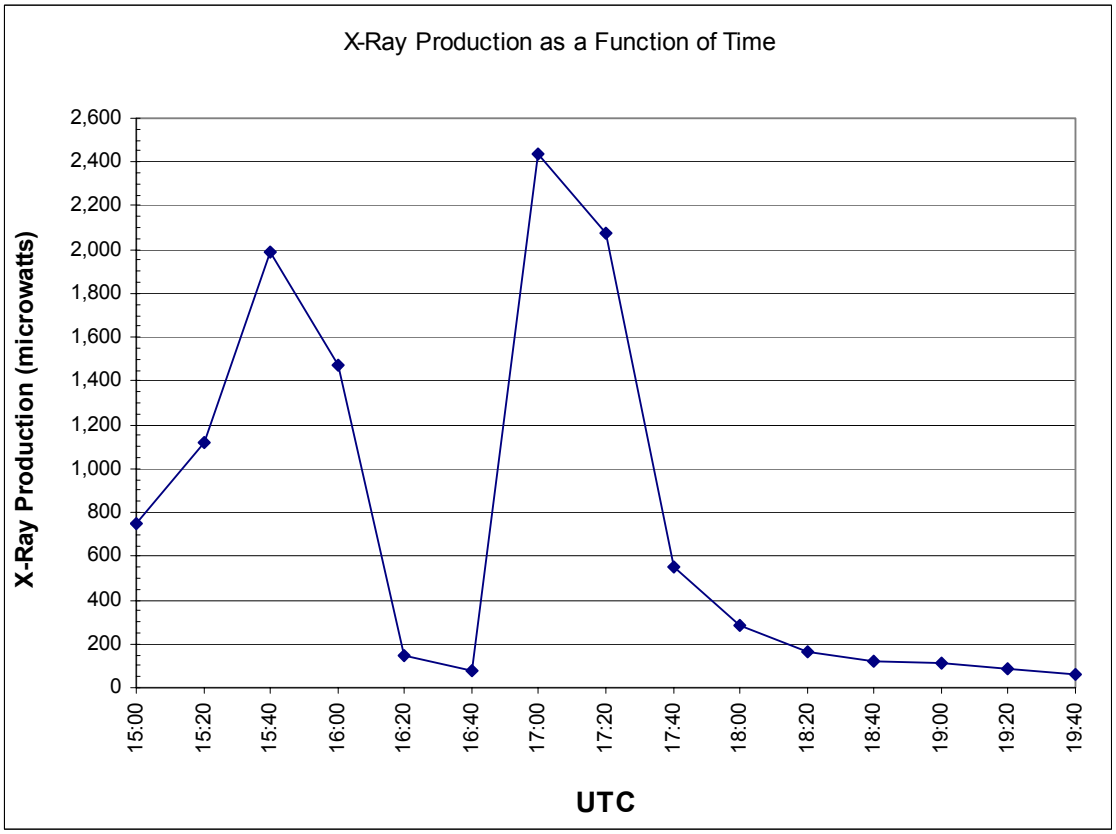


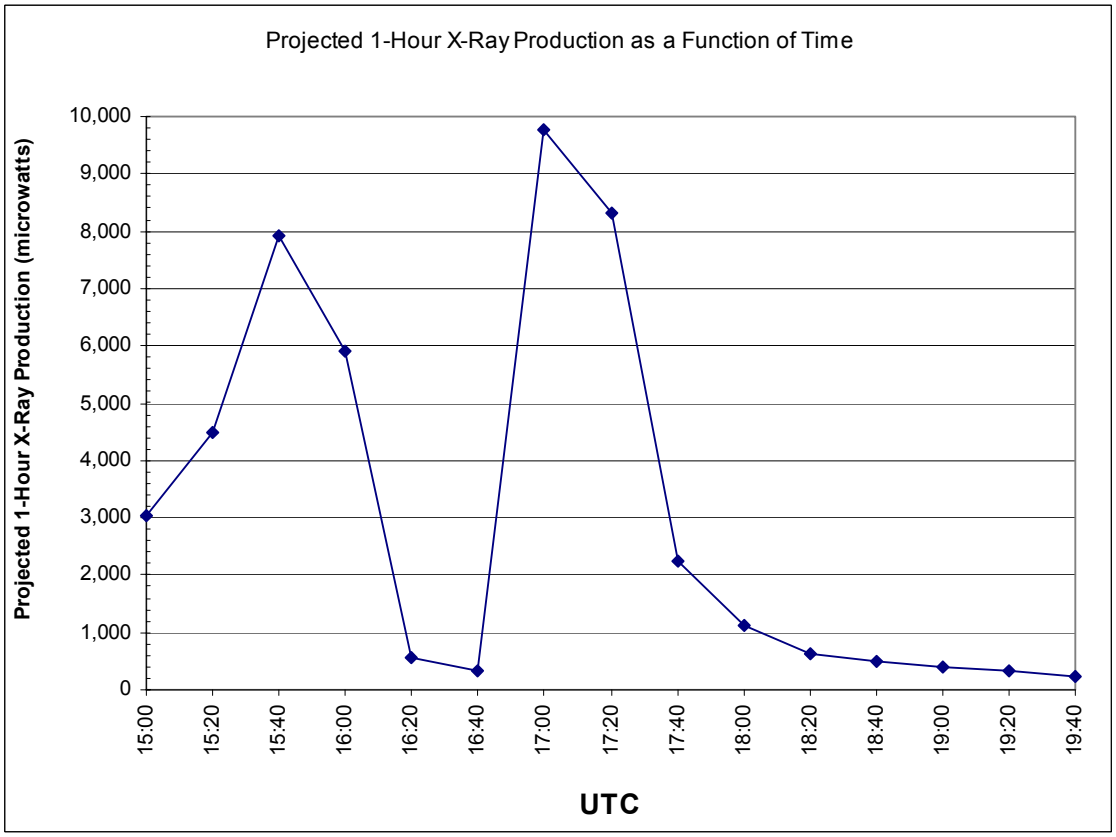

TEPC2 Millirems as a Function of Time
TEPC2 (millirems)
12,000
11,500
11,000
10,500
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC

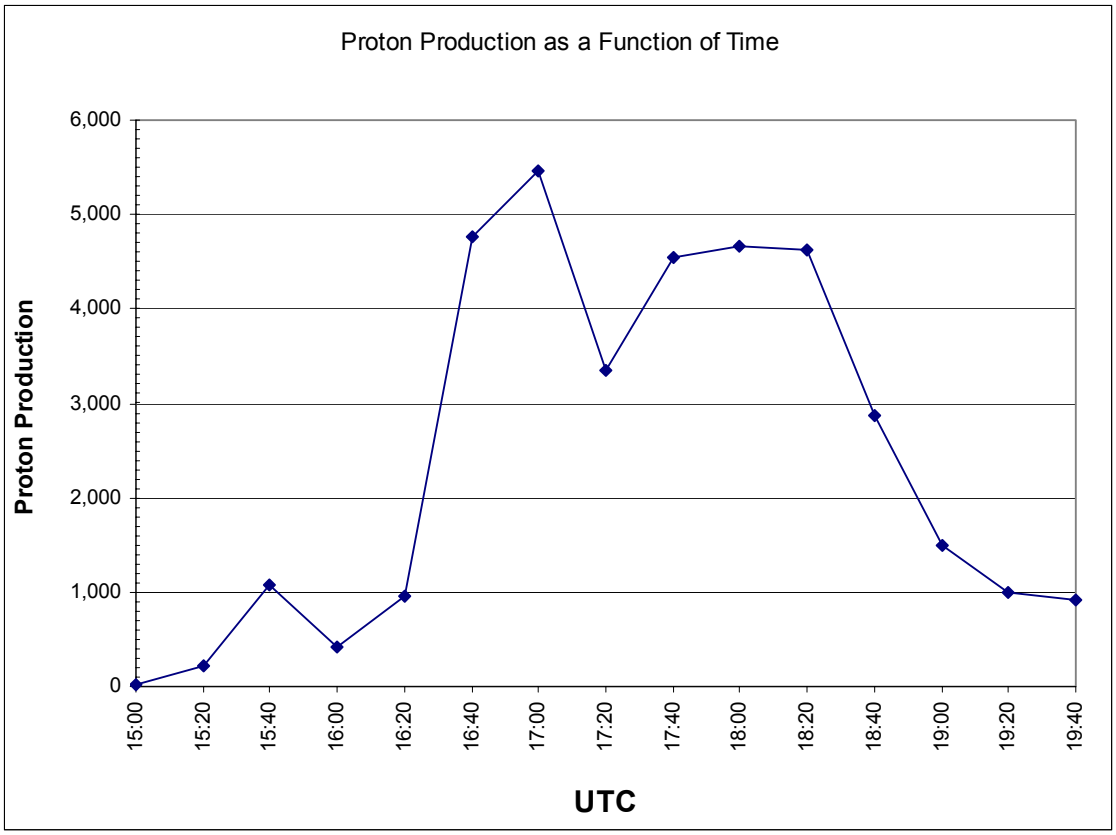

Predicted 24-Hour TEPC2 rems as a Function of Time
Predicted 24-Hour TEPC2 (rems
1,200
1,150
1,100
1,050
1,000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC

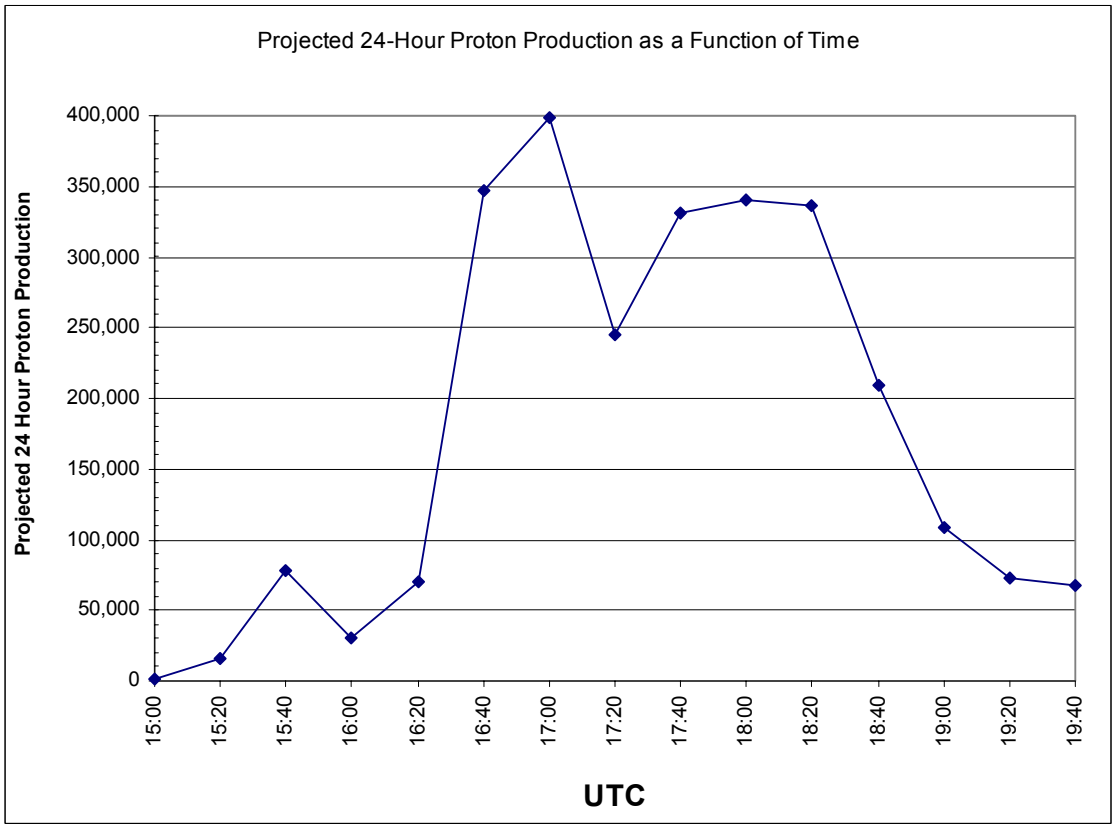
X-ray	A	B	C	D	E	F	G	H	I	J
Table Headings	UTC	X-Rays	Category	Descriptor	Change	Rate	Time to Next Critical Level*	Projected X-Ray Flux in 1 Hour	Category	Descriptor
Units	24 Hour Clock	X-Ray Flux	From R1 to R5	From Minor to Extreme	Amount of Protons	Protons/Min	Minutes	X-Ray Flux	From R1 to R5	From Minor to Extreme
Calculations	From Data	From Data	See Reference Guide	See Reference Guide	B-Previous B	B /20 min	G= Critical Value – B / F	(F x 60 min) + B	See Reference Guide	See Reference Guide
Mission	15:00	750	R3	Strong	n/a	38	7	3,030	R5	Extreme
Data	15:20	1,117	R4	Severe	367	56	16	4,477	R5	Extreme
rev.	15:40	1,989	R4	Severe	872	99	0	7,929	R5	Extreme
2/24/03	16:00	1,476	R4	Severe	-513	74	7	5,916	R5	Extreme
	16:20	145	R3	Strong	-1,331	7	122	565	R3	Strong
	16:40	79	R2	Moderate	-66	4	5	319	R3	Strong
	17:00	2,439	R5	Extreme	2,360	122	Critical	9,759	R5	Extreme
	17:20	2,079	R5	Extreme	-360	104	Critical	8,319	R5	Extreme
	17:40	554	R3	Strong	-1,525	28	16	2,234	R5	Extreme
	18:00	288	R3	Strong	-266	14	51	1,128	R4	Severe
	18:20	163	R3	Strong	-125	8	105	643	R3	Strong
	18:40	121	R3	Strong	-42	6	147	481	R3	Strong
	19:00	109	R3	Strong	-12	5	178	409	R3	Strong
	19:20	83	R2	Moderate	-26	4	4	323	R3	Strong
	19:40	61	R2	Moderate	-22	3	13	241	R3	Strong

Proton	A	B	C	D	E	F	G	H	I	J
Table Headings	UTC	Protons	Category	Descriptor	Change	Rate	Time to Next Critical Level*	Projected 24 hour Proton Production	Category	Descriptor
Units	24 Hour Clock	Amount of Protons	From S1 to S5	From Minor to Extreme	Amount of Protons	Protons/Min	Minutes	Amount of Protons	From S1 to S5	From Minor to Extreme
Calculations	From Data	From Data	See Reference Guide	See Reference Guide	B-Previous B	B /20 min	G= Critical Value – B / F	(F x 1440 min) + B	See Reference Guide	See Reference Guide
Mission	15:00	15	S1	Minor	n/a	1	113	1,095	S3	Strong
Data	15:20	213	S2	Moderate	198	11	74	15,549	S4	Severe
rev.	15:40	1,077	S3	Strong	864	54	166	78,621	S4	Severe
2/24/03	16:00	419	S2	Moderate	-658	21	33 (N/A)	30,283	S4	Severe
	16:20	964	S2	Moderate	545	48	1	70,390	S4	Severe
	16:40	4,755	S3	Strong	3,791	238	22	347,097	S5	Extreme
	17:00	5,453	S3	Strong	698	273	17	398,069	S5	Extreme
	17:20	3,358	S3	Strong	-2,095	168	27 (N/A)	245,152	S5	Extreme
	17:40	4,535	S3	Strong	1,177	227	24	331,077	S5	Extreme
	18:00	4,662	S3	Strong	126	233	23	340,300	S5	Extreme
	18:20	4,615	S3	Strong	-47	231	31 (N/A)	336,902	S5	Extreme
	18:40	2,873	S3	Strong	-1,742	144	34 (N/A)	209,714	S5	Extreme
	19:00	1,496	S3	Strong	-1,377	75	38 (N/A)	109,226	S5	Extreme
	19:20	998	S2	Moderate	-499	50	2 (N/A)	72,818	S4	Severe
	19:40	918	S2	Moderate	-80	46	4 (N/A)	66,992	S4	Severe


X-Ray Production as a Function of Time
X-Ray Production (microwatts)
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC


Projected 1-Hour X-Ray Production as a Function of Time
Projected 1-Hour X-Ray Production (microwatts)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC


Proton Production as a Function of Time
Proton Production
6,000
5,000
4,000
3,000
2,000
1,000
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC


Projected 24-Hour Proton Production as a Function of Time
Projected 24 Hour Proton Production
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
15:00
15:20
15:40
16:00
16:20
16:40
17:00
17:20
17:40
18:00
18:20
18:40
19:00
19:20
19:40
UTC