MISSION DATA / WEI

#	STS	STS aka	OV	OV flt #	ET	ET wt.	Date	Pad	MLP	Day or Night	Landing Location	ET Age @ Launch (days)	ET Exposure (days)	Tanking Time (hrs)	Mission Time (hrs)	LS >1	LS Tot	OV>1	OV Tot	Camera	-Y bipod visible?	+Y bipod visible	FOAM LOSS NOTED?	Bipod	NEAR Bipod?	Flange	Intertank	Thrust Panel	Other	Cause	Corrective Action	SRB Mate/Demate from ET	Orbiter Mate/Demate from ET	Rollout/Rollback	Dry OV (incl. SSMEs) (lbs.)	Cargo & Crew (lbs.)	OV Consumables (lbs.)
	STS		OV		ET		LAUNCH& LAND					TIMES				TILE Damage				IMAGERY			FOAM LOSS													WEIGHTS (lb		
1	1		102	1	1	H	04/12/81	A	1	D	E	653	105	3.50	54				247	16	Y	Y	Y	N		N	N	N	Y			11/03/80	11/24/80	12/29/80			
2	2		102	2	2	H	11/12/81	A	1	D	E	258	74	2.50	54				109	Y	Y	Y	N	N		N	N	N	N			06/30/81	08/10/81	08/31/81			
3	3		102	3	3	H	03/22/82	A	1	D	W	175	35	3.00	192				113	Y	Y	Y	Y	N		Y	Y	N	Y			01/04/82	02/03/82	02/16/82			
4	4		102	4	4	H	06/27/82	A	1	D	E	161	33	3.00	169				122	Y	Y	Y	Y	N		Y	Y	N	Y			04/17/82	05/19/82	05/26/82			
5	5		102	5	5	H	11/11/82	A	1	D	E	169	52	3.00	122				161	Y	Y	Y	Y	N	Y	Y	Y	N	Y			08/19/82	09/10/82	09/21/82	172566	35902	37957
6	6		99	1	8	L	04/04/83	A	2	D	E	208	126	4.00	120	21	89	36	120	35	Y	Y	Y	N		Y	N	N	Y			10/21/82	11/23/82	11/30/82	168736	51032	37219
7	7		99	2	6	H	06/18/83	A	1	D	E	327	24	3.00	146	41	153	48	253	35	Y	Y	Y	-Y		Y	Y	N	Y			03/02/83	05/24/83	05/26/83	169044	41134	39448
8	8		99	3	9	L	08/30/83	A	2	N	E	230	29	3.00	145	3	29	7	56		N	N	?	?		?	?	?	?			06/23/83	07/26/83	08/02/83	168832	34008	39953
9	9		102	6	11	L	11/28/83	A	1	D	E	206	43	7.00	248	9	49	14	58		N	N	?	?		?	?	?	?			???	???	11/08/83	176231	36402	35180
10	11	41B	99	4	10	L	02/03/84	A	2	D	K	339	23	5.00	191	11	19	34	63	35	Y	Y	Y	N	Y	Y	Y	N	Y			01/03/84	01/08/84	01/12/84	169166	37743	43496
11	13	41C	99	5	12	L	04/06/84	A	1	D	E	259	19	5.00	168	5	27	8	36		N	N	?	?		?	?	?	?			02/28/84	03/15/84	03/19/84	169433	42040	42931
12	14	41D	103	1	13	L	08/30/84	A	2	D	E	352	79	3.00	145	10	44	31	111		N	N	?	?		?	?	?	?			04/09/84	08/04/84	08/09/84	169944	51483	42194
13	17	41G	99	6	15	L	10/05/84	A	1	D	K	295	23	3.00	197	25	69	36	154	35	Y	Y	Y	N		N	Y	N	Y			06/19/84	09/10/84	09/13/84	170667	27994	43882
14	19	51A	103	2	16	L	11/08/84	A	2	D	K	286	17	3.00	192	14	66	20	87		N	N	?	?		?	?	?	?			10/02/84	10/19/84	10/23/84	169711	49661	43980
15	20	51C	103	3	14	L	01/24/85	A	1	D	K	448	20	3.00	74	24	67	28	81		N	N	?	?		?	?	?	?			10/30/84	12/23/84	01/05/85			
16	23	51D	103	4	18	L	04/12/85	A	1	D	K	353	16	3.00	168	43	111	46	152		N	N	?	?		?	?	?	?			02/14/85	03/23/85	03/28/85	169481	40610	40318
17	24	51B	99	7	17	L	04/29/85	A	2	D	E	409	33	3.00	168	45	110	62	140	35	Y	N	Y	?		N	Y	N	Y			01/09/85	04/11/85	04/15/85	170953	35422	40879
18	25	51G	103	5	20	L	06/17/85	A	1	D	E	347	14	3.00	170	109	231	144	315		N	N	?	?		?	?	?	?			05/02/85	05/29/85	06/04/85	169802	49042	37532
19	26	51F	99	8	19	L	07/29/85	A	2	D	E	431	31	3.00	191	179	482	226	553	35	Y	Y	Y	N		Y	Y	N	Y			05/31/85	06/26/85	06/29/85	170948	38742	43043
20	27	51I	103	6	21	L	08/27/85	A	1	D	E	398	22	3.00	170	21	96	33	141		N	N	?	?		?	?	?	?			07/02/85	07/30/85	08/06/85	169919	48781	43354
21	28	51J	104	1	25	L	10/03/85	A	2	D	E	287	35	3.00	98	7	66	17	111		N	N	?	?		?	?	?	?			08/09/85	08/13/85	08/30/85			
22	30	61A	99	9	24	L	10/30/85	A	1	D	E	348	15	3.00	169	24	129	34	183	35	Y	Y	Y	N	Y	Y	N	N	Y			09/30/85	10/12/85	10/16/85	171084	36388	36279
23	31	61B	104	2	22	L	11/26/85	A	2	N	E	459	15	3.00	165	37	177	55	257		N	N	?	?		?	?	?	?			10/22/85	11/08/85	11/12/85	170127	53027	38290
24	32	61C	102	7	30	L	01/12/86	A	1	D	E	208	42	3.00	146	20	134	39	193	16	Y	Y	Y	N		N	Y	N	Y			11/14/85	11/22/85	12/02/85	176549	37894	40480
25	33	51L	99	10	26	L	01/28/86	B	2	D		319	38	3.00	0						N	N	?	?		?	?	?	?			12/10/85	12/17/85	12/22/85	172162	57545	38929
26	26R		103	7	28	L	09/28/88	B	2	D	E	1261	87	3.00	97	47	342	55	411	H	Y	Y	N	N		N	N	N	N			06/10/88	06/24/88	07/04/88	171978	51180	31459
27	27R		104	3	23	L	12/02/88	B	1	D	E	1530	31	3.00	105	272	644	298	707		N	N	?	?		?	?	?	?			09/21/88	10/24/88	11/02/88			
28	29R		103	8	36	L	03/13/89	B	2	D	E	1189	39	3.00	120	18	100	23	132	H	Y	Y	Y	N	Y	Y	N	Y	Y			12/15/88	01/25/89	02/03/89	172149	52640	31446
29	30R		104	4	29	L	05/04/89	B	1	D	E	1450	44	3.00	97	53	134	56	151		N	N	?	?		?	?	?	?			03/02/89	03/11/89	03/22/89	172098	52878	36380
30	28R		102	8	31	L	08/08/89	B	2	D	E	1484	25	3.00	121	13	60	20	74	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		Y	05/22/89	07/04/89	07/15/89			
31	34		104	5	27	L	10/18/89	B	1	D	E	1723	51	3.00	120	17	51	18	53		Y	N	?	?		?	?	?	?			07/29/89	08/21/89	08/29/89	172329	53721	31565
32	33R		103	9	38	L	11/22/89	B	2	N	E	1317	27	3.00	120	21	107	21	118		N	N	?	?		?	?	?	?			09/02/89	10/05/89	10/27/89			
33	32R		102	9	32	L	01/09/90	A	3	D	E	1609	43	3.00	261	13	111	15	120	16,35	Y	Y	Y	-Y	Y	Y	Y	N	Y	Y	Y	11/01/89	11/21/89	11/28/89	179735	31735	44593
34	36		104	6	33	L	02/28/90	A	1	N	E	1597	35	3.00	106	17	62	19	81		N	N	?	?		?	?	?	?			12/22/89	01/19/90	01/25/90			
35	31R		103	10	34	L	04/24/90	B	2	D	E	1674	40	3.00	121	11	33	12	48		N	N	?	?		?	?	?	?			02/23/90	03/06/90	03/16/90	172036	34236	42892
36	41		103	11	39	L	10/06/90	B	2	D	E	1635	32	3.00	98	13	64	16	76	H	N	N	?	?		N	N	N	N			08/01/90	08/27/90	09/05/90	172562	55036	31903
37	38		104	7	40	L	11/15/90	A	1	N	K	1609	88	3.00	118	7	70	8	81		N	N	?	?		?	?	?	?			09/12/90	10/03/90	10/12/90			
38	35		102	10	35	L	12/02/90	B	3	N	E	1850	164	3.00	215	15	132	17	147	H	Y	Y	Y	N		Y	N	N	Y	Y	Y	03/22/90	08/02/90	10/14/90	178847	38800	38864
39	37		104	8	37	L	04/05/91	B	1	D	E	1906	22	3.00	144	7	91	11	115	H	N	N	Y	?		Y	N	N	N			02/04/91	03/08/91	03/15/91	172272	46082	37404
40	39		103	12	46	L	04/28/91	A	2	D	K	1327	49	3.00	199	14	217	16	237	H	N	N	?	?		N	N	N	N			12/18/90	03/25/91	04/01/91	172883	33052	41401
41	40		102	11	41	L	06/05/91	B	3	D	E	1776	35	3.00	218	23	153	25	197	H,16?	Y	Y	Y	N		Y	N	N	N			04/17/91	04/25/91	05/02/91	180375	39117	32429
42	43		104	9	47	L	08/02/91	A	1	D	K	1323	39	3.00	213	24	122	25	131	H	Y	N	?	?		?	?	?	?	Y		06/03/91	06/19/91	06/25/91	172179	54799	32369
43	48		103	13	42	L	09/12/91	A	3	D	E	1829	32	3.00	128	14	100	25	182		N	N	?	?		?	?	?	?			07/24/91	08/01/91	08/12/91	172770	26978	40306
44	44		104	10	53	L	11/24/91	A	1	N	E	846	33	3.00	167	6	74	9	101		N	N	?	?		?	?	?	?			09/26/91	10/18/91	10/23/91	172322	52859	34670
45	42		103	14	52	L	01/22/92	A	3	D	E	994	35	3.00	193	38	159	44	209	H	Y	N	Y	?	Y	N	Y	N	N	N	N	11/04/91	12/13/91	12/19/91	172707	37890	32859
46	45		104	11	44	L	03/24/92	A	1	D	K	1840	34	3.50	214	18	122	22	172	H	Y	N	Y	?	Y	Y	N	N	N			01/22/92	02/13/92	02/20/92	172140	25963	35547
47	49		105	1	43	L	05/07/92	B	2	D	E	2005	56	3.00	213	6	55	11	114		N	N	?	?		?	?	?	?			02/17/92	03/07/92	03/13/92	172749	44886	38698
48	50		102	12	50	L	06/25/92	A	3	D	K	1333	23	3.00	332	28	141	45	184	16,35,H	Y	Y	Y	-Y		Y	N	N	Y	Y	Y	04/09/92	05/29/92	06/03/92	180784	38315	38596
49	46		104	12	48	L	07/31/92	B	1	D	K	1561	51	3.00	191	11	186	22	236	H	Y	Y	N	N		N	N	N	N			05/15/92	06/05/92	06/11/92	171994	40185	43852
50	47		105	2	45	L	09/12/92	B	2	D	K	1923	19	3.00	191	3	48	11	108	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	07/13/92	08/20/92	08/25/92	172859	38812	32897
51	52		102	13	55	L	10/22/92	B	3	D	K	994	27	2.50	237	6	152	16	290	16,35,H	Y	Y	Y	-Y		Y	Y	N	Y			09/09/92	09/20/92	09/26/92	181201	32341	36828
52	53		103	15	49	L	12/02/92	A	1	D	E	1577	25	3.00	175	11	145	23	240	H	Y	Y	Y	N	Y	Y	N	N	N			10/13/92	11/03/92	11/08/92	173438	33943	36516
53	54		105	3	51	L	01/13/93	B	2	D	K	1440	42	3.00	144	14	80	14	131	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			11/05/92	11/23/92	12/03/92	173073	54495	31844
54	56		103	16	54	L	04/08/93	B	1	N	K	1256	25	3.00	222	18	94	36	156	H	Y	Y	Y	N		N	Y	N	N	N	Y	02/10/93	03/02/93	03/15/93	173563	27278	36412
55	55		102	14	56	L	04/26/93	A	3	D	E	1082	79	3.00	240	10	128	13	143	H,16?	Y	Y	Y	N	Y	Y	N	N	Y			01/12/93	02/02/93	02/07/93	180891	39484	35093
56	57		105	4	58	L	06/21/93	B	2	D	K	979	55	3.00	240	10	75	12	106	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y			03/08/93	03/25/93	04/28/93	173363	35196	44144
57	51		103	17	59	L	09/12/93	B	3	D	K	900	80	3.00	236	8	100	18	154	H	Y	Y	Y	N	Y	Y	N	N	Y			06/02/93	06/18/93	06/25/93	173664	52473	35341
58	58		102	15	57	L	10/18/93	B	1	D	E	1180	33	3.00	336	23	78	26	155	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	N		07/21/93	08/12/93	09/16/93	181268	38442	36393
59	61		105	5	60	L	12/02/93	B	2	N	K	889	36	3.00	260	7	59	13	120	H	N	N	?	?		?	?	?	?			10/06/93	10/21/93	10/28/93	173685	32016	44577
60	60		103	18	61	L	02/03/94	A	3	D	K	842	25	3.00	199	4	48	15	106	H	Y	Y	N	N		N	N	N	N			11/29/93	01/05/94	01/10/94	173781	35012	37143
61	62		102	16	62	L	03/04/94	B	1	D	K	773	23	3.00	335	7	36	16	97	16,35,H	Y	Y	Y	-Y	Y	Y	Y	N	Y			01/20/94	02/03/94	02/10/94	181475	36350	38754
62	59		105	6	63	L	04/09/94	A	2	D	E	737	22	3.00	270	10	47	19	77	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			02/23/94	03/14/94	03/19/94	173853	40423	32573
63	65		102	17	64	L	07/08/94	A	3	D	K	718	24	3.00	354	17	123	21	151	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			05/03/94	06/09/94	06/15/94	181576	39732	37991
64	64		103	19	66	L	09/09/94	B	2	D	E	591	23	3.00	236	18	116	19	150		N	N	?	?		?	?	?	?			07/27/94	08/11/94	08/18/94	173579	32194	35661
65	68		105	7	65	L	09/30/94	A	1	D	E	697	47	3.00	270	9	59	15	110	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			06/16/94	07/21/94	09/13/94	173891	40911	32601
66	66		104	13	67	L	11/03/94	B	3	D	E	535	25	3.00	263	22	111	28	148	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			09/14/94	10/04/94	10/10/94	173051	30635	40552
67	63		103	20	68	L	02/03/95	B	2	N	K	546	25	3.00	198	7	84	14	125		N	N	?	?		?	?	?	?			11/08/94	01/05/95	01/10/95	173605	31156	42864
68	67		105	8	69	L	03/02/95	A	1	N	E	484	23	3.00	399	11	47	13	76	H	Y	Y	N	N		N	N	N	N			12/13/94	02/03/95	02/08/95	174223	34923	47349
69	71		104	14	70	L	06/27/95	A	3	D	K	495	63	3.00	235	24	149	25	164	16	Y	Y	Y	N	Y	Y	Y	N	Y			03/15/95	04/20/95	04/26/95	173189	33963	41936
70	70		103	21	71	L	07/13/95	B	2	D	K	435	58	3.00	214	5	81	9	127	H	Y	Y	N	N		N	N	N	N			04/13/95	05/03/95	06/14/95	173728	52140	32716
71	69		105	9	72	L	09/07/95	A	1	D	K	433	59	3.00	260	22	175	27	198	16	Y	Y	Y	N		N	N	N	Y			05/31/95	06/28/95	08/08/95	173869	37782	44733
72	73		102	18	73	L	10/20/95	B	3	D	K	381	54	3.00	382	17	102	26	147	16,35,H	Y	Y	Y	N		N	N	N	Y			08/05/95	08/21/95	08/28/95	182071	39838	35418
73	74		104	15	74	L	11/12/95	A	2	D	K	360	33	3.00	197	17	78	21	116	16,35	Y	Y	Y	N		Y	N	N	N			09/11/95	10/03/95	10/11/95	173255	30086	44925
74	72		105	10	75	L	01/11/96	B	1	N	K	342	37	2.92	214	3	23	7	55	H,16	N	N	?	?		N	N	N	N			11/09/95	12/01/95	12/06/95	174465	27771	44775
75	75		102	19	76	L	02/22/96	B	3	D	K	330	25	2.92	338	11	55	17	96	H,16,35	Y	Y	Y	N		Y	N	N	Y			01/08/96	01/24/96	01/29/96	181514	38894	41083
76	76		104	16	77	L	03/22/96	B	2	N	E	303	24	3.17	221	5	32	15	69		N	N	?	?		?	?	?	?			02/05/96	02/20/96	02/28/96	173405	31342	41473
77	77		105	11	78	L	05/19/96	B	1	D	K	307	34	3.17	241	15	48	17	81	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			03/21/96	04/08/96	04/16/96	174484	40955	39314
78	78		102	20	79	L	06/20/96	B	3	D	K	281	23	3.17	406	5	35	12	85	16,35,H	Y	Y	Y	N	Y	Y	N	N	N			05/03/96	05/21/96	05/29/96	182433	37873	36189
79	79		104	17	82	L	09/16/96	A	1	N	K	188	38	3.00	243	8	61	11	103	H	Y	Y	N	N		N	N	N	N			08/05/96	08/13/96	09/05/96	173550	34533	41357
80	80		102	21	80	L	11/19/96	B	3	D	K	368	35	3.00	424	4	34	8	93	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			09/26/96	10/10/96	10/16/96	181558	37388	42871
81	81		104	18	83	L	01/12/97	B	2	N	K	262	34	3.00	244	14	48	15	100	H	N	N	?	?		Y	N	N	N			11/14/96	12/04/96	12/10/96	174043	34669	41455
82	82		103	22	81	L	02/11/97	A	1	N	K	390	26	3.17	240	14	53	18	103	H	Y	Y	N	N		N	N	N	N			12/09/96	01/11/97	01/17/97	175820	31998	44168
83	83		102	22	84	L	04/04/97	A	3	D	K	291	25	3.50	95	7	38	13	81	16,H	Y	Y	Y	N	Y	Y	N	N	Y			01/30/97	03/05/97	03/11/97	181532	40462	37973
84	84		104	19	85	L	05/15/97	A	2	N	K	281	22	3.17	221	10	67	13	103	H	Y	Y	Y	N	Y	Y	Y	N	N			03/24/97	04/20/97	04/24/97	173265	34927	41432
85	94		102	23	86	L	07/01/97	A	1	D	K	266	21	3.00	371	11	34	12	90	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			05/12/97	06/04/97	06/11/97	181842	40448	37989
86	85		103	23	87	L	08/07/97	A	3	D	K	246	25	3.50	284	6	37	13	102	H	Y	N	?	?		N	N	N	N			06/20/97	07/07/97	07/14/97	175865	37478	36758
87	86		104	20	88	L	09/25/97	A	2	N	K	251	39	3.00	259	27	100	131	129		N	N	?	?		?	?	?	?			07/24/97	08/11/97	08/18/97	173505	36730	41560
88	87		102	24	89	L	11/19/97	B	1	D	K	146	22	3.00	377	109	244	132	308	16,35,H	Y	Y	Y	N		Y	N	Y	N	Y	Y	09/25/97	10/24/97	10/29/97	182091	40630	38973
89	89		105	12	90	L	01/22/98	A	3	N	K	167	35	3.00	212	38	95	40	138		N	N	?	?		?	?	?	?			11/11/97	12/12/97	12/19/97	175377	34880	40326
90	90		102	25	91	L	04/17/98	B	2	D	K	154	26	3.00	382	11	76	20	131	16,35,H	Y	Y	Y	N		Y	N	Y	N			02/26/98	03/16/98	03/23/98	181658	41983	38629
91	91		103	24	96	S	06/02/98	B	1	D	K	141	32	3.00	236	45	145	50	198	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	N			03/26/98	04/27/98	05/02/98	175951	42272	41750
92	95		103	25	98	S	10/29/98	B	2	D	K	147	39	3.00	213	42	139	45	187	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y			08/25/98	09/14/98	09/21/98	176161	45134	44560
93	88		105	13	97	S	12/04/98	A	3	D	K	249	47	3.00	283	21	80	25	116	H	Y	Y	Y	N		Y	N	Y	Y			09/22/98	10/12/98	10/19/98	175329	44497	44200
94	96		103	26	100	S	05/27/99	B	2	D	K	183	24	3.00	235	66	160	72	199	H	Y	Y	Y	N		Y	Y	Y	N			03/16/99	04/15/99	05/20/99	176287	40748	44777
95	93		102	26	99	S	07/23/99	B	1	N	K	360	47	2.92	119	42	161	49	208		N	N	Y	?		?	?	Y	?			12/01/99	06/02/99	06/07/99	180714	57441	32232
96	103		103	27	101	S	12/19/99	B	2	N	K	24	37	3.00	191	13	84	24	153		N	N	Y	?		?	?	Y	?	Y	N	08/26/99	11/02/99	11/13/99	176346	27159	44654
97	99		105	14	92	L	02/11/00	A	3	D	K	298	61	3.00	270	21	75	25	87	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			06/29/99	12/02/99	12/13/99	175882	41818	39039
98	101		104	21	102	S	05/19/00	A	1	D	K	473	56	3.00	236	19	70	27	113	16,35,H	Y	Y	Y	N	Y	Y	N	Y	Y			02/03/00	03/13/00	03/25/00	176456	42344	43728
99	106		104	22	103	S	09/08/00	B	2	D	K	444	26	3.00	283	17	73	17	105	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			04/04/00	08/07/00	08/14/00	176466	41981	43606
100	92		103	28	104	S	10/11/00	A	3	N	E	498	31	3.00	310	14	86	27	113		N	N	?	?		?	?	?	?			07/06/00	08/30/00	09/11/00	176407	42236	44445
101	97		105	15	105	S	11/30/00	B	1	N	K	503	31	3.00	250	10	78	10	84		N	N	?	?		?	?	?	?			09/27/00	10/25/00	10/31/00	175852	48974	41744
102	98		104	23	106	S	02/07/01	A	2	N	E	418	30	3.00	209	8	73	13	102		N	N	?	?		?	?	?	?			11/13/00	12/04/00	01/26/01	176461	45336	42330
103	102		103	29	107	S	03/08/01	B	3	D	K	455	25	2.92	210	10	44	14	100	35,H	N	N	?	?		N	N	N	N			01/10/01	02/02/01	02/12/01	176415	43794	44588
104	100		105	16	108	S	04/19/01	A	1	D	E	434	29	3.00	286	4	42	13	92	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y			02/26/01	03/17/01	03/22/01	175924	45379	43965
105	104		104	24	109	S	07/12/01	B	2	D	K	435	22	3.00	307	24	108	26	126	H, 16?	Y	Y	Y	N	Y	Y	N	N	N			04/16/01	05/29/01	06/21/01	176559	41468	44925
106	105		103	30	110	S	08/10/01	A	3	D	K	380	40	3.00	285	15	108	25	144	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y			05/24/01	06/13/01	07/02/01	176545	43423	42509
107	108		105	17	111	S	12/05/01	B	1	N	K	258	36	3.00	284	17	81	22	95		N	N	?	?		?	?	?	?			09/26/01	10/24/01	10/31/01	176072	44241	44605
108	109		102	27	112	S	03/01/02	A	2	D	K	358	38	3.00	286	14	63	18	98	16,35,H	Y	Y	Y	N	Y	Y	Y?	N	N			11/27/01	01/16/02	01/23/02	181579	34459	44627
109	110		104

GHT, CENTER OF GRAVITY, & PAYLOAD																																	WE
s.)		CENTER OF GRAVITY [CG] (in.)						PAYLOAD	RAINFALL					TEMPERATURE (F)								DEWPOINT (F)						RELATIVE HUMDITY (%rh)						SPE
OV Gross @ Liftoff (lbs.)	Integrated Vehicle Gross @ Liftoff (lbs.)	OV Xcg (in.)	OV Ycg (in.)	OV Zcg (in.)	Shuttle Xcg (in.)	Shuttle Ycg (in.)	Shuttle Zcg (in.)	PAYLOAD (S=secret)	TOTAL on Pad	1-Day MAX	AVG Daily	Launch Day	TOTAL 5 Day Pre-Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	At Tanking Start	At Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad
								DFI	6.00	2.22	0.06	0.00	0.00	60	87	23	67	79	55	65	58	49	75	9	60	68	52	69	100	13	73	93	93	12
								OSTA/DFI	13.11	2.11	0.18	0.00	0.61	76	93	49	68	75	61	63	75	68	78	48	59	62	55	77	100	36	76	93	93	12
								OSS/DFI	2.96	1.45	0.08	0.00	0.00	68	89	41	76	87	65	68	81	59	71	35	68	71	64	74	100	22	77	100	100	12
								DOD/DFI	8.02	2.39	0.24	0.02	1.27	80	91	69	80	88	72	72	85	73	78	64	75	78	71	80	100	45	82	100	100	12
246425	4488857	1116.7	0.2	379.6	1416.7	0.3	418.3	SBS/TELE	4.02	1.12	0.08	0.02	0.02	74	88	51	73	79	66	66	71	67	77	43	65	67	63	78	100	41	79	96	96	12
256987	4490778	1127.6	0.4	382.8	1416.6	0.3	419.1	TDRS A	19.00	1.89	0.15	0.00	0.78	63	84	35	65	78	52	53	76	56	73	23	56	63	49	78	100	25	72	96	96	14
249626	4486449	1122.0	-0.8	381.1	1416.8	0.0	418.6	MULT P/L	6.97	1.78	0.29	0.00	0.00	77	89	63	76	83	69	73	71	70	77	47	69	71	66	79	100	26	77	90	90	12
242793	4495896	1124.7	0.2	382.0	1412.6	0.3	418.0	MULT P/L	4.85	1.53	0.17	0.42	0.88	82	96	71	81	89	73	89	74	75	81	71	75	79	71	80	100	52	84	100	67	10
247813	4506789	1109.7	-0.1	378.9	1411.8	0.2	418.2	S/L 1	5.37	1.03	0.12	0.00	0.05	66	84	41	77	83	71	73	78	57	74	33	68	69	67	75	100	34	78	93	93	11
250405	4505048	1124.4	0.2	381.4	1412.3	0.3	418.5	MULT P/L	2.11	0.53	0.09	0.00	0.53	61	83	38	66	75	57	61	57	53	69	32	58	63	53	77	100	27	78	96	96	13
254404	4509231	1113.5	0.2	383.4	1412.4	0.2	418.9	LDEF/SMM	3.65	2.15	0.19	0.00	2.80	67	86	48	61	71	51	63	57	56	71	34	45	49	41	70	100	25	60	86	86	14
263621	4519789	1118.5	-0.2	382.8	1411.2	0.4	419.5	MULT P/L	15.94	2.76	0.20	0.31	0.31	78	97	53	78	85	71	74	75	70	78	49	73	76	69	77	100	32	82	96	96	10
242543	4497865	1119.1	-0.1	381.6	1417.1	0.2	418.0	MULT P/L	3.37	1.96	0.15	0.00	0.00	76	92	58	74	83	64	67	68	68	76	55	62	65	58	76	100	44	67	84	84	12
263352	4524849	1120.9	0.0	382.6	1413.3	0.2	419.4	MULT P/L	4.25	2.46	0.25	0.00	1.04	75	89	52	63	72	54	56	66	67	77	41	54	59	49	77	100	39	71	93	93	12
								DOD (S)	0.09	0.07	0.00	0.00	0.01	53	80	21	51	67	34	32	64	42	64	8	42	52	32	69	100	26	72	96	96	12
250409	4506364	1126.0	-0.2	381.7	1412.2	0.2	418.6	MULT P/L	0.40	0.32	0.03	0.04	0.04	67	86	45	70	73	66	67	69	56	69	34	57	63	51	69	100	28	69	81	81	14
247254	4501978	1114.5	-0.2	381.4	1411.3	0.3	418.3	S/L 3	0.12	0.09	0.00	0.00	0.00	68	91	33	77	85	68	69	85	59	72	29	64	72	55	73	100	29	68	96	96	11
256376	4514774	1109.8	0.2	379.6	1412.5	0.3	418.8	MULT P/L	3.03	1.03	0.22	0.00	1.91	80	96	68	80	90	69	73	70	72	78	62	73	76	69	77	100	32	75	100	100	12
252733	4514313	1111.5	-0.5	381.8	1412.2	0.2	418.7	(ATO) S/L 2	5.24	1.10	0.17	0.00	0.01	80	94	67	81	88	73	73	86	73	78	66	75	77	72	78	100	44	81	100	100	11
262054	4519949	1120.6	0.2	382.4	1413.3	0.3	419.4	MULT P/L	7.47	1.18	0.34	1.18	2.33	81	91	72	79	85	73	78	73	75	79	70	75	77	72	81	100	50	86	100	100	10
								DOD (S)	9.93	2.13	0.28	1.09	2.23	79	92	68	82	88	75	76	82	73	79	62	76	77	74	82	100	51	83	100	100	12
243751	4505113	1108.4	-0.3	380.1	1410.0	0.2	418.0	S/L DI	3.12	1.47	0.21	0.46	2.63	78	88	67	76	85	67	71	84	72	77	66	70	73	67	80	100	58	79	100	100	10
261444	4515538	1110.3	0.0	379.3	1412.6	0.2	419.2	MULTI P/L	0.19	0.11	0.01	0.00	0.00	75	85	62	73	82	63	77	71	69	76	62	66	70	62	82	100	58	80	100	100	11
254923	4511561	1111.2	0.9	380.6	1411.0	0.3	418.8	MULTI P/L	9.53	4.14	0.23	0.00	5.23	61	83	26	61	70	51	60	51	53	72	17	54	58	49	76	100	26	79	96	96	11
268636	4529681	1119.0	-0.3	384.0	1413.0	0.2	419.9	(FAILED)	7.18	4.14	0.19	0.00	0.18	59	82	25	36	46	25	31	37	50	69	4	13	21	4	74	100	18	36	53	53	11
254617	4522407	1118.1	0.3	380.6	1412.5	0.2	418.7	TDRS C	14.98	2.89	0.17	0.06	0.11	81	94	69	79	87	71	71	86	73	85	62	70	74	65							10
								DOD (S)	4.31	3.28	0.18	0.00	0.03	70	85	51	58	65	51	54	57	61	74	32	40	47	32							11
256235	4522277	1116.3	0.6	380.8	1412.5	0.3	418.8	TRDS D	3.38	1.12	0.09	0.00	0.40	65	85	32	70	81	58	63	62	54	71	11	54	58	49							13
261356	4527426	1123.4	0.5	382.6	1413.4	0.3	419.3	MAGELLAN	2.78	0.79	0.06	0.00	0.52	72	91	51	74	83	65	65	82	62	76	37	64	66	61							12
								DOD (S)	4.33	1.61	0.17	0.28	0.28	83	96	71	84	94	73	84	79	72	78	66	73	77	68							10
257615	4523573	1114.1	0.4	380.7	1412.5	0.2	418.9	GALILEO	13.89	5.47	0.27	1.17	1.17	81	93	66	81	88	73	74	85	72	78	61	71	73	69							10
								DOD (S)	2.22	1.02	0.08	0.59	0.59	70	85	48	65	69	61	62	68	61	71	27	60	67	53							12
256063	4519487	1131.3	-0.8	381.3	1413.2	0.2	418.9	LDEF	5.29	1.38	0.12	0.00	0.00	60	84	24	61	69	52	65	54	51	72	16	55	58	51					96	96	11
								DOD (S)	4.49	1.61	0.13	0.01	0.01	69	85	46	69	75	63	69	63	59	72	31	54	59	49	71	100	30	65	80	80	14
249164	4514688	1114.8	-0.5	384.2	1411.8	0.2	418.6	HST	2.48	0.97	0.06	0.00	0.04	70	86	49	70	80	60	71	67	59	73	34	59	63	54	67	100	29	64	83	83	13
259501	4527138	1115.2	-0.1	381.4	1412.9	0.2	419.0	ULYSSES	2.26	0.84	0.07	0.00	0.59	80	95	65	80	86	74	76	74	71	78	58	69	73	65	76	100	43	73	90	90	10
								DOD (S)	16.84	4.35	0.19	0.00	0.00	78	97	48	72	77	67	76	69	70	79	40	59	62	55	76	100	30	64	76	76	11
256511	4521514	1106.5	-0.5	378.1	1412.1	0.2	418.7	ASTRO	20.52	4.35	0.13	0.00	0.76	74	93	48	72	78	65	71	69	66	83	40	60	63	56	74	100	30	65	81	81	11
255758	4519945	1116.7	-0.3	381.7	1412.4	0.2	418.8	GRO	8.28	3.74	0.38	0.85	0.85	69	87	50	74	79	68	71	74	60	71	44	66	68	64	74	100	38	81	96	96	14
247336	4513048	1111.1	0.0	382.5	1411.2	0.3	418.3	DOD AFP 675	6.98	1.53	0.14	0.00	1.29	69	89	33	82	88	75	78	76	60	76	3	73	75	71	74	100	19	79	96	96	13
251921	4519792	1100.2	-0.1	376.4	1411.4	0.2	418.3	SLS 1	6.48	2.10	0.19	0.13	0.46	78	91	63	79	86	71	78	74	70	77	62	71	74	67	77	100	45	73	90	90	11
259347	4523118	1113.9	-0.2	380.4	1412.6	0.2	419.0	TDRS E	11.73	1.33	0.30	0.00	2.72	81	93	71	83	92	74	74	86	73	78	67	75	78	71	78	100	48	77	96	96	11
240054	4502671	1125.5	-0.9	381.9	1411.2	0.2	417.8	UARS	4.05	2.01	0.13	0.00	1.80	81	94	70	80	88	71	85	81	73	79	66	71	74	67	79	100	42	77	100	100	10
259851	4522576	1116.2	0.0	381.0	1412.7	0.3	419.1	DOD DSP	0.75	0.37	0.02	0.00	0.06	69	83	44	64	73	54	66	54	61	73	37	56	71	41	75	100	31	70	96	96	11
243456	4507474	1104.8	-0.1	378.3	1410.6	0.2	417.8	IML-01	2.97	2.60	0.12	0.00	0.19	60	79	32	55	73	37		66	53	69	26	48	60	35							11
233650	4496035	1113.1	-0.3	377.6	1409.8	0.2	417.2	ATLAS	2.75	1.24	0.08	0.00	0.11	66	86	43	67	71	62	64	67	56	70	34	56	60	51							12
256333	4519154	1119.6	-0.3	383.9	1412.4	0.2	419.0	INTELSTAT	4.57	1.60	0.08	0.01	0.01	67	87	43	70	78	61	66	61	56	72	27	58	65	51							12
257695	4520103	1105.5	-0.5	378.7	1412.0	0.2	418.8	USML-1 EDO	6.14	2.65	0.27	0.02	2.19	80	93	68	80	87	72	72	85	72	78	67	74	77	70							14
256031	4516789	1113.7	-0.4	382.4	1411.9	0.2	418.9	TSS/EUR	11.45	2.92	0.22	0.00	0.00	81	96	68	81	87	75	75	84	73	79	63	74	76	72							12
244568	4506804	1104.1	-0.4	379.2	1410.5	0.3	417.9	S/L J	1.42	0.70	0.07	0.00	0.60	80	92	70	79	86	72	75	84	73	77	67	73	74	71							10
250370	4514565	1109.5	-0.3	377.5	1411.4	0.1	418.2	LAGEOS-2	6.35	2.95	0.24	0.00	0.00	75	88	59	74	78	69	71	77	66	78	51	58	62	54							12
243897	4506587	1112.4	0.1	380.7	1410.7	0.2	418.0	DOD	4.06	2.18	0.16	0.00	0.00	69	86	41	55	68	42	49	55	61	74	34	49	57	40							13
259412	4522840	1116.2	0.3	381.3	1412.6	0.2	419.0	TDRS F	3.05	1.12	0.07	0.00	0.43	67	83	38	74	79	68	70	72	60	71	31	68	70	66				78	96	60	11
237253	4501920	1109.5	-0.3	379.3	1410.1	0.2	417.5	ATLAS 2	2.02	0.70	0.08	0.00	0.27	75	85	35	68	75	61	70	72	57	72	14	54	59	48	70	96	29	61	83	38	28
255468	4519000	1101.5	-0.7	377.5	1411.5	0.3	418.6	S/L D2	8.09	2.51	0.10	0.06	0.06	73	85	10	72	83	61	66	76	51	72	-4	64	68	60	66	100	13	70	93	46	25
252703	4518566	1112.7	-0.1	383.0	1412.0	0.2	418.7	S'HAB 1/EUR	1.21	0.50	0.02	0.04	0.04	83	94	64	82	87	77	66	76	65	77	47	72	74	69	68	96	31	72	87	57	25
261478	4523125	1116.5	-0.6	381.6	1412.8	0.2	419.2	ACTS/ORF	12.44	2.50	0.16	0.00	1.14	83	97	69	79	87	70	73	72	74	80	64	73	76	69	73	100	37	75	93	57	11
256103	4517138	1103.4	-0.4	378.1	1411.5	0.2	418.6	SLS 2 EDO	3.98	1.25	0.12	0.00	1.27	78	92	64	75	82	67	67	79	70	79	53	69	72	66	71	100	29	77	90	64	11
250278	4511794	1113.5	-0.1	381.7	1411.4	0.2	418.5	HST SERV	1.00	0.40	0.03	0.00	0.00	70	87	39	69	77	61	70	65	62	75	29	57	60	54	72	93	42	61	73	49	12
245936	4509010	1104.4	-0.8	380.1	1410.7	0.2	418.1	S'HAB 2	3.72	1.40	0.15	0.00	1.62	61	81	40	50	60	40	46	41	54	71	30	34	38	30	74	96	37	68	82	54	13
256579	4519801	1107.4	-0.6	379.2	1412.0	0.2	418.7	USMP 2/EDO	9.70	6.35	0.40	0.00	0.88	68	83	45	58	70	45	49	54	60	72	30	37	43	30	72	100	21	49	76	21	14
246849	4511411	1098.8	-0.5	378.7	1410.7	0.2	418.1	SRL1	2.04	1.65	0.09	0.00	0.06	71	88	52	75	78	71	49	71	62	77	37	63	65	60	69	96	32	63	71	55	12
259299	4523441	1104.8	-0.4	378.8	1412.2	0.2	418.9	IML 2/EDO	3.92	3.07	0.16	0.00	0.11	82	94	72	83	88	77	77	88	74	78	67	75	78	71	73	93	44	73	87	59	14
241434	4503921	1105.6	-0.6	379.5	1410.4	0.2	417.8	LAINCH - LITE 1	3.38	1.34	0.15	0.00	0.71	81	93	71	80	89	71	74	83	73	79	66	74	77	70	73	96	30	55	79	30	10
247403	4510613	1099.3	-0.5	378.5	1410.7	0.2	418.1	SRL 2	10.47	3.00	0.22	0.00	0.19	79	91	66	78	86	70	75	71	73	82	65	70	74	66	77	100	51	65	79	51	10
244238	4508715	1112.0	-0.1	379.4	1411.1	0.2	417.9	ATLAS 3	4.96	1.50	0.19	0.00	1.97	76	87	60	73	81	64	65	81	68	77	56	62	64	60	72	100	44	58	66	50	11
247625	4511630	1111.6	-0.3	382.4	1411.4	0.2	418.3	S'HAB 3	3.03	2.25	0.12	0.00	0.51	59	77	38	65	76	53	69	54	49	69	22	52	58	45	68	99	25	68	99	37	12
256495	4520187	1117.1	-0.1	381.5	1412.4	0.2	418.9	ASTRO 2/EDO	1.86	1.35	0.08	0.00	0.67	64	82	31	66	73	58		63	54	71	13	59	64	54	76	100	16	87	100	74	13
249088	4511586	1110.0	-0.1	380.1	1411.3	0.2	418.3	S/LM S/MM-1	11.33	3.20	0.18	0.00	4.90	79	95	60	83	92	73	73	90	70	79	56	74	77	71	79	100	36	81	100	61	12
258584	4521772	1120.6	0.0	380.9	1412.9	0.2	419.0	TDRS-G	11.46	5.60	0.20	0.00	1.99	80	95	69	80	87	72		84	73	80	62	74	77	70	82	100	42	85	99	71	12
256384	4519114	1112.9	-0.1	383.3	1412.3	0.2	419.0	WSF 2	20.47	5.65	0.35	0.05	1.09	82	95	71	81	88	73	75	84	76	82	67	75	77	72	85	100	42				12
257327	4521581	1101.6	-0.5	377.1	1411.8	0.2	418.7	USML-2 EDO	15.75	2.75	0.29	0.00	1.38	81	94	70	78	83	73	77	78	74	81	59	72	76	68	85	100	58	87	100	73	11
248266	4512395	1112.5	-0.5	381.6	1411.5	0.2	418.3	S/MM 2	5.36	2.60	0.17	0.00	0.89	75	87	48	63	77	48		48	66	78	37	56	70	41	78	100	41	80	96	64	12
247011	4514647	1117.7	-0.1	381.7	1411.9	0.2	418.2	SFU - RETR	7.04	3.80	0.19	0.00	0.06	59	82	30	54	69	39	51	40	50	73	18	41	47	34	78	100	25	64	91	36	12
261491	4526493	1106.2	-0.4	379.9	1412.7	0.2	419.1	TSS, USMP/EDO	1.87	1.75	0.07	0.00	0.00	61	81	32	71	81	61	62	76	48	68	16	63	65	60	73	100	24	85	100	69	12
246220	4509631	1110.1	-0.1	379.9	1411.2	0.2	418.1	S/MM -3, S'HAB	8.74	4.00	0.36	0.00	2.03	63	86	37	56	66	46	60	46	51	71	23	36	43	29	74	100	31	62	92	31	15
254753	4519162	1106.5	-0.2	380.5	1411.8	0.1	418.7	S'HAB TEAMS	1.27	1.24	0.04	0.00	0.00	74	88	51	77	87	66	75	66	65	74	45	66	71	60	78	100	45	76	96	55	11
256495	4517477	1102.6	-0.4	377.3	1411.4	0.2	418.6	LMS/EDO	5.77	2.40	0.26	3.37	5.53	78	92	64	80	88	72	73	83	70	77	58	73	76	70	81	100	49	86	100	71	12
249440	4510469	1109.6	0.0	379.8	1411.3	0.3	418.3	S/MM-4, S'HAB	9.37	3.35	0.25	0.24	0.24	81	93	68	82	88	75	82	79	73	81	64	76	79	72	79	100	45	82	94	69	11
261817	4524735	1106.1	-0.5	381.1	1412.4	0.2	419.2	ORFEUS-SPAS 2	0.91	0.36	0.03	0.00	0.35	72	88	46	68	79	57	59	79	62	75	34	59	63	55	74	100	30	74	100	48	11
250167	4511011	1110.5	0.1	379.7	1411.6	0.2	418.4	S/MM-5, S'HAB	0.41	0.30	0.01	0.00	0.21	64	82	36	59	68	50	59	52	58	72	25	53	55	50	81	100	36	82	97	67	9
251986	4513855	1112.1	0.1	381.5	1411.8	0.2	418.6	HST, SM-2	0.20	0.18	0.01	0.00	0.05	61	82	32	56	63	48	57	52	54	72	10	49	55	43	78	100	23	82	99	64	11
259967	4521509	1101.6	-0.2	378.0	1411.9	0.1	418.9	MSL 01, EDO	2.47	0.97	0.10	0.00	0.00	71	88	52	66	79	52	52	77	62	73	30	57	61	52	73	100	30	58	72	43	13
249624	4509832	1109.0	0.0	379.7	1411.2	0.2	418.4	S/MM-6, S'HAB	2.98	1.23	0.14	0.00	1.61	73	91	55	73	82	63	79	64	66	79	46	67	70	63	74	100	40	74	91	56	12
260279	4519333	1102.1	-0.3	378.2	1411.6	0.2	419.0	MSL 01, EDO	5.00	1.25	0.24	0.68	1.28	82	93	72	83	90	75	75	90	75	81	66	77	81	72	78	98	52	81	96	66	12
250101	4512125	1104.4	-0.1	379.8	1411.0	0.3	418.4	CHRISTA/SPAS	3.52	1.40	0.14	0.11	2.41	83	95	72	82	88	75	77	84	76	81	68	76	79	73	78	99	53	85	98	71	13
251795	4512024	1109.7	0.1	379.7	1411.5	0.3	418.5	S/MM-7, S'HAB	7.02	1.40	0.18	0.49	1.45	81	93	66	85	90	79	90	81	74	82	61	78	81	75	78	100	19	85	96	74	12
261694	4521900	1104.1	-0.3	378.5	1412.1	0.2	419.1	USMP4, SPTN	3.50	1.50	0.16	0.00	0.00	69	88	48	69	75	63	64	72	59	75	39	58	64	52	76	100	40	78	99	57	11
250583	4511879	1112.7	-0.2	380.3	1411.6	0.2	418.5	S/MM-8, S'HAB	3.55	1.57	0.10	0.30	0.31	66	82	45	70	72	68	73	70	58	73	28	67	70	64	81	100	26	90	100	80	12
262270	4523683	1103.9	-0.3	378.0	1412.4	0.2	419.1	NEUROLAB	0.15	0.11	0.01	0.00	0.00	70	86	46	75	82	68	70	82	60	73	39	67	70	63	76	100	30	72	89	54	15
259973	4514649	1109.0	-0.9	381.3	1412.1	0.1	419.2	S/MM-9, S'HAB	0.52	0.25	0.02	0.00	0.05	78	99	55	89	99	79	84	95	67	79	48	74	77	70	72	100	24	73	99	47	12
265855	4520191	1110.3	-0.5	382.2	1412.9	0.2	419.6	S'HAB, HOST	2.74	0.52	0.07	0.00	0.00	80	91	61	73	84	61	61	82	71	84	46	60	68	52	76	100	42	70	97	42	12
264026	4518489	1111.2	-1.1	383.3	1412.8	0.2	419.6	ISS 2A, NODE, PMA 1,2	5.01	2.37	0.11	0.00	0.12	73	88	54	72	82	61	72	70	64	75	46	65	70	59	74	98	37	78	90	66	10
261812	4514231	1112.3	-0.7	381.3

ATHER DATA

WIND ED (kts)		WIND DIR. (deg)		TOTAL WIND SPEED (fps)						IN-PLANE WIND SPEED (fps)						OUT-OF-PLANE WIND SPEED (fps)						PRESSURE (mb)						ET PRODUCTION					-Y Bipod Ramp (H				
MAX on Pad	MAX Launch Day	AVG on Pad	Launch Day	@ 0 ft.Altitude	@ 10K ft.Altitude	@ 20K ft. Altitude	@ 30Kft.Altitude	@ 40K ft.Altitude	@ 50K ft.Altitude	@ 0 ft.Altitude	@ 10K ft.Altitude	@ 20K ft. Altitude	@ 30Kft.Altitude	@ 40K ft.Altitude	@ 50K ft.Altitude	@ 0 ft.Altitude	@ 10K ft.Altitude	@ 20K ft. Altitude	@ 30Kft.Altitude	@ 40K ft.Altitude	@ 50K ft.Altitude	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	Start Date	Completion Date	ET DD-250	Ship Date	Days in Storage Before Shipment	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day
26	12	234	130	6	32	11	40	56	82	3	32	-11	-40	-53	-72	5	4	0	-1	-18	-40	1019	1033	999	1024	1027	1024			06/29/79							
22	17	141	340	25	33	45	110	129	113	-4	10	-20	-68	-100	-106	-25	-31	-40	-87	-81	-39	1017	1025	1010	1016	1022	1016			02/27/81							
26	11	193	90	5	31	66	76	106	93	5	-29	-66	-73	-102	-89	-1	-12	0	-20	-27	-26	1018	1031	1006	1015	1020	1017			09/28/81							
28	11	152	130	10	15	28	10	11	27	5	-14	-27	-10	-7	-27	9	6	8	1	-9	-5	1015	1021	1006	1019	1018	1015			01/17/82							
18	13	160	90	16	8	30	58	142	78	16	-1	-6	-16	-58	-22	0	-8	-29	-56	-130	-75	1017	1024	1007	1023	1021	1019			05/26/82							
28	12	222	110	13	15	50	93	107	112	11	-15	-49	-92	-107	-111	-7	3	12	-16	4	12	1016	1028	991	1016	1017	1009			09/08/82							
22	12	128	40	1	12	17	39	63	32	1	5	-17	-39	-43	-32	-1	-11	-1	5	-46	-3	1014	1018	1006	1015	1016	1014			07/26/82							
16	9	151	220	6	8	5	14	28	12	-6	-5	-2	2	22	8	-1	-6	5	-14	-17	9	1018	1022	1011	1013	1021	1018			01/12/83							
15	11	222	160	19	45	55	77	71	77	-16	-45	-55	-70	-50	-64	11	-4	-4	-33	-50	-43	1016	1024	1009	1015	1017	1012			05/06/83							
19	9	283	160	0	19	55	104	111	72	0	-13	-54	-97	-106	-72	0	14	-10	-37	-34	-1	1020	1030	1011	1018	1021	1016			03/01/83							
27	12	202	270	15	59	62	142	170	106	-12	-56	-62	-136	-163	-105	-9	-18	-5	-39	-50	-11	1013	1023	995	1013	1023	1019			07/22/83							
18	8	139	90	1	15	12	31	42	20	1	-15	-12	-30	-42	-6	0	-2	-3	-9	4	19	1017	1023	1010	1018	1022	1019			09/13/83							
25	11	126	90	3	9	13	21	75	27	2	2	-5	-12	-4	14	2	9	-12	-17	-75	-23	1016	1023	1007	1022	1019	1015			12/15/83							
16	12	105	40	10	44	45	118	90	76	3	-3	-41	-116	-81	-74	-9	-44	-19	-20	-39	-17	1018	1025	1010	1024	1012	1010			01/27/84							
17	10	265	210	15	79	111	154	162	151	-11	-79	-111	-153	-154	-150	10	-6	-10	21	50	13	1020	1029	1011	1020	1016	1011			11/03/83							
20	12	163	60	17	25	37	62	128	83	13	10	-37	-51	-101	-56	11	23	-2	-35	-79	-62	1020	1027	1013	1026	1023	1019			04/24/84							
14	12	145	300	13	41	38	44	62	61	10	6	-7	5	-17	17	-9	-41	-37	-44	-60	-59	1020	1030	1012	1014	1016	1014			03/16/84							
20	11	147	170	5	20	20	29	51	48	-5	-16	-7	-23	-11	-42	2	12	-19	-18	-50	-24	1017	1022	1012	1020	1018	1014			07/05/84							
21	8	148	60	10	16	13	17	42	38	10	3	7	12	8	28	2	-16	-11	-12	-41	-25	1017	1023	1007	1018	1021	1016			05/24/84							
15	12	159	120	15	35	26	17	24	24	15	31	22	10	20	20	0	16	13	14	14	14	1017	1024	1013	1022	1019	1016			07/25/84							
25	11	95	150	17	6	7	7	11	19	-9	-3	-2	7	-7	6	15	5	7	2	-8	-18	1017	1022	1007	1017	1022	1019			12/20/84							
14	10	115	190	17	43	70	55	63	56	7	-32	-30	-25	-43	-34	15	29	63	49	46	45	1016	1025	1004	1006	1014	1011			11/16/84							
16	8	112	170	3	5	20	11	45	61	2	-4	-14	-9	-45	-60	2	3	-14	-6	-2	-11	1021	1025	1014	1020	1020	1015			08/24/84							
19	14	213	360	10	9	58	172	221	129	-6	4	-55	-171	-219	-127	-8	-8	18	21	27	20	1021	1032	1008	1021	1027	1020			06/18/85							
27	18	246	300	17	72	97	110	153	136	-14	-65	-88	-103	-153	-134	-10	-30	-41	-39	0	-21	1020	1032	1007	1021	1023	1020			03/15/85							
18	12	132	68	10	22	12	24	25	35	9	21	12	24	-14	-30	-5	6	2	-1	-21	-18	1017	1024	1009	1018	1018	1015			04/16/85							
21	13	188	338	22	46	69	146	174	142	4	32	-25	-108	-151	-97	-22	-33	-64	-98	-87	-104	1018	1028	1002	1026	1020	1015			09/24/84							
22	11	224	248	16	10	56	57	81	81	-14	-3	-44	-40	-69	-80	8	-9	-35	-41	-43	-13	1021	1032	1011	1017	1020	1017			12/10/85							
18	9	187	90	11	2	45	61	138	123	8	-1	-45	-61	-134	-116	7	-1	6	1	31	40	1018	1026	1010	1020	1018	1016			05/15/85							
15	12	132	113	10	21	25	16	9	16	-6	-17	-17	-10	-9	7	-8	12	-18	-12	-1	-14	1018	1024	1010	1012	1017	1015			07/16/85							
18	11	123	158	13	19	29	50	41	48	-7	-18	-25	-50	-39	-44	11	6	14	2	-11	-19	1015	1020	1005	1014	1019	1016			01/29/85							
55	13	198	360	16	24	64	78	108	103	-8	-18	-54	-65	-91	-100	14	16	34	44	59	25	1017	1027	1010	1014	1027	1025			04/15/86							
19	7	257	300	4	57	97	118	140	137	-3	-48	-83	-105	-137	-121	-3	31	50	54	27	64	1020	1028	1007	1020	1023	1019			08/14/85							
22	10	166	40	11	17	28	67	166	75	5	13	-20	-9	-70	-28	10	11	-19	-66	-150	-70	1021	1035	1009	1028	1026	1014			10/15/85							
20	11	136	90	11	15	10	78	77	69	11	15	1	-62	-70	-57	0	-3	-10	-47	-31	-39	1019	1029	1006	1020	1029	1026			09/23/85							
15	12	107	100	23	27	14	41	82	63	23	24	-10	-30	-72	-59	0	-11	-10	-27	-38	-22	1017	1022	1011	1018	1020	1017			04/15/86							
19	12	138	80	28	4	14	52	130	75	28	-1	-14	-49	-127	-73	-3	4	-3	-19	-27	-16	1017	1029	1007	1027	1024	1014			06/20/86							
20	12	132	110	21	10	20	93	139	80	21	-8	-20	-89	-138	-77	-1	6	-3	-27	-19	-22	1018	1029	1006	1024	1024	1021			11/08/85							
24	11	130	90	18	8	42	84	127	113	17	-4	-42	-84	-124	-112	-5	7	1	-9	-26	16	1019	1027	1006	1024	1026	1021			01/15/86							
29	11	166	170	12	11	45	61	97	85	-2	-10	-40	-61	-96	-85	12	5	-20	-3	-12	-3	1017	1030	999	1015	1016	1010			09/09/87							
15	8	137	40	6	31	26	3	10	32	-6	-22	-17	1	9	-13	1	-22	-19	-3	-5	-29	1017	1024	1008	1009	1015	1011			07/25/86							
22	12	174	170	16	26	19	56	63	30	3	-16	6	53	60	29	16	20	18	-18	-18	-9	1018	1023	1013	1018	1018	1015			12/18/87							
16	8	123	30	12	18	27	49	78	49	10	17	27	48	72	44	7	-5	2	8	29	21	1017	1021	1013	1017	1020	1018			09/09/86							
16	13	183	320	8	51	61	109	122	79	-7	-49	-58	-99	-117	-69	-4	12	18	46	34	38	1019	1025	1013	1019	1024	1021			07/31/89							
18	9	210	110	10	27	47	81	97	75	10	-27	-41	-74	-50	-35	0	5	-22	-33	-83	-66	1019	1036	1007	1021	1024	1018			05/03/89							
20	14	193	60	23	35	86	157	176	154	18	-10	-51	-81	-93	-93	-15	-34	-70	-135	-149	-123	1018	1026	1008	1015	1014	1011			03/11/87							
19	16	196	350	13	69	147	143	131	87	-8	-58	-127	-119	-107	-58	-10	38	74	80	75	65	1017	1026	1008	1012	1023	1014			11/10/86							
25	19	177	160	22	31	25	67	106	60	11	-18	-23	-65	-87	-60	19	25	11	17	61	-7	1014	1020	1008	1013	1013	1009			10/31/88							
25	10	191	80	10	8	12	31	67	28	-8	-8	9	-27	20	21	-6	2	8	15	64	18	1017	1024	1008	1019	1020	1017			04/22/88							
19	10	124	40	16	17	6	4	7	19	16	17	-3	-4	5	-3	1	-2	-5	0	5	-19	1019	1022	1015	1019	1021	1017			06/08/87							
19	13	123	60	27	31	24	82	139	69	20	14	16	-65	-122	-55	-18	-28	-18	-49	-67	-42	1016	1029	1008	1027	1016	1013			02/01/90							
18	10	173	200	10	80	91	109	107	77	-10	-23	-63	-35	-73	-35	1	-77	-65	-103	-78	-69	1019	1026	1012	1018	1018	1016			08/08/88							
27	11	164	200	9	8	57	78	87	69	0	-8	-45	-68	-81	-60	9	0	35	38	33	33	1021	1027	1009	1020	1016	1010			02/03/89							
58	54	177	113	16	9	22	33	91	119	14	-2	0	10	13	-72	7	-9	-22	-31	-90	-95	1017	1034	1006	1016	1020	1014			10/30/89							
58	18	216	148	16	20	36	65	73	87	-14	-20	-36	-64	-68	-79	8	-4	-3	-14	-27	-37	1017	1034	993	1018	1017	1013			05/10/90							
113	19	128	138	10	8	24	64	110	52	10	7	20	47	52	49	0	4	-14	-44	-97	-16	1016	1024	1006						10/16/90							
22	7	176	80	6	23	12	28	55	48	-5	-20	-9	-27	-44	-48	-2	10	-7	9	32	-3	1017	1024	1013	1020	1017	1013			03/27/91							
22	7	132	30	10	2	7	23	22	28	-3	0	-2	-18	-19	-28	-10	2	7	-14	-11	3	1017	1021	1009	1015	1021	1017			07/26/90							
23	12	188	60	11	19	38	47	90	69	10	-5	-34	-35	-61	-63	-4	-18	-18	-31	-66	-28	1019	1028	1005	1025	1020	1012			06/27/91							
18	12	173	10	15	46	114	131	161	141	2	-25	-86	-62	-83	-71	-15	-39	-75	-116	-138	-122	1023	1033	1007	1027	1017	1013	01/09/89	10/15/91	10/15/91	07/23/93	647				06/27/91	Thu
24	14	158	270	16	47	82	127	139	120	-12	-32	-57	-85	-108	-93	-11	-34	-59	-94	-87	-76	1019	1027	1003	1015	1025	1022	04/28/89	01/16/92	01/21/92	10/01/93	624				09/17/91	Tue
23	12	177	100	32	21	37	84	133	116	16	21	-18	-53	-99	-73	28	3	-32	-65	-89	-90	1017	1026	1011	1024	1018	1015	06/24/89	04/19/92	04/02/92	11/11/93	571				11/17/91	Sun
39	11	180	130	15	29	31	34	44	28	15	25	25	30	40	28	3	15	18	15	18	-3	1018	1023	1014	1021	1022	1019	09/25/89	07/13/92	07/20/92	01/08/94	544				04/07/92	Tue
14	9	101	60	12	3	5	34	64	38	4	-2	-5	-32	-57	-32	11	2	1	-13	-30	-21	1018	1022	1013	1018	1020	1018	01/28/90	01/20/93	01/26/93	05/12/94	477				09/17/92	Thu
13	12	166	80	3	9	23	57	94	120	3	7	21	-20	-71	-86	2	6	9	-53	-62	-83	1016	1021	1011	1016	1014	1011	11/25/89	10/21/92	11/02/92	02/24/94	491				06/30/92	Tue
22	10	116	50	16	5	8	6	13	49	14	5	-8	5	12	5	7	0	-2	2	5	-49	1016	1023	1011	1022	1019	1014	04/15/90	04/16/93	05/17/93	06/08/94	418				01/06/93	Wed
22	9	221	210	10	51	98	174	184	110	-10	-14	-34	-127	-137	-89	-3	-49	-92	-119	-123	-65	1018	1029	1007	1018	1016	1012	06/25/90	07/27/93	08/06/93	07/21/94	359				04/23/93	Fri
24	17	249	340	8	51	56	99	136	87	-7	-44	-53	-83	-131	-85	-4	26	19	54	37	17	1020	1030	1009	1016	1027	1023	08/25/90	10/26/93	11/03/93	09/15/94	324				06/25/93	Fri
21	9	141	280	13	38	11	30	81	65	9	-14	-4	-8	-13	-23	9	-35	-10	-29	-80	-61	1015	1022	1006	1017	1017	1012	01/20/91	01/21/94	02/17/94	11/10/94	293				09/25/93	Sat
30	8	142	60	5	2	16	26	25	14	4	-2	6	8	2	13	-3	1	15	25	25	-5	1016	1022	1012	1016	1016	1012	04/25/91	04/11/94	05/04/94	12/09/94	242	72	72	50	01/06/94	Thu
30	13	135	140	11	37	43	64	68	26	-6	-11	-11	-9	-35	-14	10	35	42	63	58	22	1014	1022	1006	1012	1016	1011	09/28/91	06/02/94	07/01/94	03/09/95	280	71	71	60	03/01/94	Tue
22	11	135	340	9	17	15	73	86	41	0	-10	-14	-59	-64	-31	-9	-14	4	-43	-58	-27	1014	1021	1005	1012	1017	1013	01/04/92	08/12/94	10/04/94	04/06/95	237	75	75	54	04/22/94	Fri
30	14	165	330	19	54	72	82	110	76	2	-39	-37	-61	-91	-30	-19	-38	-62	-55	-62	-70	1017	1025	1006	1018	1017	1013	05/17/92	10/14/94	11/17/94	06/01/95	230	76	76	56	06/24/94	Fri
22	8	233	200	5	32	59	95	124	98	-4	-31	-58	-92	-120	-97	-3	-7	12	-23	-30	-12	1019	1030	1005	1019	1017	1007	07/10/92	01/13/95	02/03/95	07/13/95	181	76	76	51	08/31/64	Mon
23	6	198	40	9	23	51	97	143	56	8	-23	-31	-64	-30	-36	-4	0	-40	-73	-140	-43	1019	1036	1008	1015	1018	1015	09/10/92	02/10/95	03/29/95	08/10/95	181	75	75	47	10/21/94	Fri
24	15	264	260	11	65	98	119	177	149	-1	-33	-56	-88	-155	-125	-11	-56	-80	-80	-86	-81	1017	1031	1004	1016	1011	1004	11/05/92	04/04/95	05/24/95	10/19/95	198	71	71	54	12/08/94	Thu
16	8	121	100	5	14	6	76	119	44	-5	7	-5	-75	-119	-43	1	12	2	-15	0	-9	1020	1026	1013	1018	1024	1021	04/05/93	05/25/95	07/17/95	12/07/95	196	71	71	53	02/17/95	Fri
22	15	142	270	6	24	25	19	29	16	2	-22	-15	-17	-27	-9	-6	-11	-20	-8	-10	-13	1017	1022	1011	1015	1018	1015	06/09/93	07/17/95	09/13/95	01/11/96	178	70	70	58	04/22/95	Sat
24	12	170	160	15	17	23	30	42	34	-5	-17	4	1	5	9	14	-2	-23	-30	-42	-33	1015	1022	1006	1015	1012	1009	12/20/93	12/13/95	03/12/96	04/25/96	134	76	76	54	09/19/95	Tue
20	8	148	210	13	43	67	96	129	128	-13	-39	-63	-59	-72	-121	-2	-17	-22	-76	-107	-42	1019	1031	1007	1015	1025	1022	08/18/93	09/05/95	11/17/95	03/21/96	198	73	73	58	06/10/95	Sat
22	12	181	10	13	57	95	136	175	149	4	-46	-81	-126	-156	-129	-12	-34	-49	-51	-79	-75	1020	1030	1007	1022	1019	1015	02/12/94	02/19/96	04/25/96	09/18/96	212	72	72	57	11/10/95	Fri
18	11	192	320	6	62	115	139	159	122	-4	-62	-114	-135	-155	-116	-5	1	-14	34	36	38	1022	1029	1014	1022	1021	1018	10/20/93	10/23/95	01/18/96	04/11/96	171	72	72	56	07/25/95	Tue
30	10	184	110	11	6	48	68	80	76	10	-5	-44	-33	-56	-69	6	-4	-20	-59	-58	-32	1018	1027	1005	1022	1016	1012	03/25/94	04/22/96	06/17/96	11/07/96	199	71	71	56	01/18/96	Thu
32	9	190	100	5	25	65	100	186	137	1	-19	-53	-80	-138	-100	-5	-16	-37	-60	-124	-93	1016	1025	1002	1016	1020	1017	05/08/94	06/20/96	08/07/96	10/03/96	105	72	72	57	03/15/96	Fri
26	17	156	100	15	20	21	14	25	23	5	-13	-20	-10	8	-2	-14	-16	-8	-10	-24	-23	1016	1021	1010	1015	1020	1018	06/07/94	08/22/96	10/08/96	01/09/97	140	71	71	49	05/17/96	Fri
22	9	184	60	8	20	19	17	1	22	3	-17	-15	12	-1	-22	-7	-10	-12	-12	0	2	1018	1020	1013	1017	1020	1018	07/21/94	11/04/96	12/04/96	03/27/97	143	76	76	55	07/23/96	Tue
30	19	113	180	3	34	46	43	30	38	-3	-34	-42	-38	-12	0	-1	1	-18	-20	-28	-38	1015	1021	1009	1010	1020	1017	08/25/94	01/09/97	01/17/97	04/24/97	105	71	71	52	10/23/96	Wed
17	10	230	360	21	66	88	97	166	160	4	-66	-87	-97	-154	-156	-21	8	-15	-3	62	36	1016	1027	1005	1022	1019	1011	10/04/94	06/24/97	06/26/97	07/10/97	16	73	73	54	04/11/97	Fri
20	13	173	140	16	20	49	49	105	118	-4	-19	-49	-40	-83	-98	15	-5	-2	-28	-65	-66	1018	1033	1003	1014	1018	1012	11/29/94	08/05/97	08/08/97	08/21/97	16	74	74	50	06/07/97	Sat
21	18	177	180	16	19	32	105	170	116	1	-14	-23	-56	-109	-78	16	-13	-22	-89	-130	-86	1018	1032	1005	1018	1025	1022	06/20/95	11/14/97	11/14/97	12/04/97	20	77	77	55	09/17/97	Wed
32	11	163	270	10	10	39	75	96	92	-4	6	-8	10	12	31	-9	-8	-38	-74	-95	-86	1014	1021	1005	1011	1018	1015	06/28/95	01/09/98	01/12/98	01/29/98	20	72	72	56	11/29/97	Sat
18	8	111	40	11	9	35	35	78	89	4	-9	-29	-33	-78	-86	-10	-2	-19	-13	1	-22	1017	1025	1010	1017	1024	1021	02/16/96	05/27/98	06/04/98	06/12/98	16	73	73	56	04/18/98	Sat
22	9	145	100	5	16	27	37	43	35	3	-10	13	35	28	15	4	12	24	-13	-32	-32	1019	1026	1001	1022	1024	1021	12/12/95	03/27/98	03/30/98	04/02/98	6	72	72	46	02/18/98	Wed
30	13	161	210	3	39	42	83	103	66	-2	-29	-32	-66	-80	-46	-2	-27	-28	-50	-65	-47	1015	1021	1008	1016	1020	1016	09/20/96	10/16/98	11/25/98	12/13/98	58	74	74	58	08/06/98	Thu
22	9	123	130	5	16	24	43	73	39	-5	15	23	34	66	32	-1	-6	-8	-26	-32	-22	1018	1024	1014	1016	1023	1020	05/02/96	07/28/98	07/28/98	08/07/98	10	74	74	59	06/10/98	Wed
16	8	187	320	5	27	48	114	140	117	-3	-27	-43	-112	-117	-105	-4	5	21	24	76	51	1020	1031	1008	1019	1024	1020	01/06/97	11/30/98	11/25/99	01/15/99	46	71	71	60	10/07/98	Wed
25	8	229	230	11	36	81	97	148	100	-6	-30	-51	-51	-43	-56	9	-20	-63	-82	-142	-83	1021	1037	1001	1020	1029	1024	04/28/97	04/19/99	04/19/99	04/23/99	4	74	74	52	02/26/99	Fri
24	10	162	120	5	49	27	55	88	94	3	43	27	3	-27	24	4	24	1	-55	-84	-91	1017	1027	1003	1022	1017	1014	03/26/97	01/29/99	02/01/99	04/02/99	63	75	75	58	12/01/98	Tue
22	9	123	30	8	12	12	18	51	31	7	12	12	13	49	31	-5	1	-3	-12	-13	-2	1016	1022	1009	1015	1013	1010	06/10/97	06/22/99	06/22/99	09/22/99	92	74	74	54	05/10/99	Mon
19	12	150	60	20	8	43	101	109	97	20	5	-13	-65	-80	-36	2	6	-41	-77	-74	-90	1015	1024	1009	1023	1018	1015	09/15/97	05/29/99	06/01/99	06/10/99	12	73	73	52	04/02/99	Fri
18

PRODUCTION & FOAM APPLICATION DATA FOR EXTERNAL TANK

PRODUCTION & F

DUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60

NO PRODUCTI

DUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60

NO PRODUCTI

DUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60

NO PRODUCTI

nd Spray)			-Y Bipod Spindle Face (Hand Spray)								-Y Bipod Beneath S.F. (Hand Spray)								+Y Bipod Ramp (Hand Spray)								+Y Bipod Spindle Face (Hand Spray)								+Y Bip		
Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)
1520	BN		76	76	55	06/05/91	Wed	1445	BR		75	75	58	06/14/91	Fri	1030	BN					07/16/91	Tue	1150	BR		76	76	55	06/05/91	Wed	1440	BR		74	74	61
2300	AP		75	75	50	09/03/91	Tue	2330	AR		75	75	58	09/07/91	Sat	130	AP					09/25/91	Wed	2150	AP		78	78	52	08/29/91	Thu	2300	AR		75	75	50
1125	BR		71	71	46	11/27/01	Tue	1240	BR		77	77	50	12/11/91	Wed	1035	BR					01/15/92	Wed	1500	BR		75	75	36	12/05/91	Thu	1330	BN		76	76	51
2125	AT		75	75	58	03/18/92	Wed	2100	BJ		78	78	48	03/26/92	Thu	1845	BJ					04/14/92	Tue	845	BR		75	75	58	03/18/92	Wed	2100	BJ		78	78	46
2045	AP		75	75	58	09/03/92	Thu	1815	AR		76	76	56	09/09/92	Wed	2230	AR					09/30/92	Wed	2040	AP		76	76	52	08/17/92	Mon	2300	AR		75	75	54
640	BR		2	72	57	06/11/02	Tue	1445	BR		74	74	57	06/23/92	Tue	1100	BN					07/02/92	Thu	700	BR		72	72	57	06/11/92	Thu	1435	BR		75	75	54
1110	BR		74	74	56	12/10/92	Thu	1345	BR		74	74	58	12/23/92	Wed	1442	BR					01/21/93	Thu	1510	BR		74	74	56	12/10/92	Thu	1330	BR		74	74	58
1350	AP		75	75	58	03/02/93	Tue	1230	AR		73	73	52	03/10/93	Wed	1445	AR					04/15/93	Thu	1330	AP		74	74	51	03/01/93	Mon	1445	AR		74	74	50
1315	BU		74	74	56	06/03/93	Thu	1240	BR		74	74	60	06/14/93	Mon	1500	BR					07/15/93	Thu	1110	BU		74	74	56	06/03/93	Thu	1233	BR		73	73	54
2150	BE		75	75	56	09/13/93	Mon	2255	BD		76	76	56	09/16/93	Thu	2330	BD					10/14/93	Thu	1330	AL		74	74	57	09/20/93	Mon	1300	BD		75	75	57
2130	AT		73	73	48	12/04/93	Sat	2230	BJ		74	74	38	12/17/93	Fri	100	AT		75	75	36	01/20/94	Thu	115	AT		73	73	60	12/03/93	Fri	2200	BJ		74	74	44
1350	BR		74	74	54	02/10/64	Mon	1100	BN		70	70	56	02/18/94	Fri	1500	BN		72	72	48	03/17/94	Thu	1345	BR		70	70	50	02/11/94	Fri	1030	BN		72	72	55
2115	AT		74	74	58	04/05/94	Tue	300	CY		74	74	64	04/15/94	Fri	100	BJ		76	76	58	05/17/94	Tue	2205	AT		74	74	58	04/05/94	Tue	119	CY		74	74	64
1050	BN		74	74	60	06/15/94	Wed	1000	BE		73	73	60	06/17/94	Fri	950	BD		73	73	57	07/19/94	Tue	1100	BR		73	73	60	06/14/94	Tue	1320	BD		73	73	60
1000	AP		77	77	56	08/15/94	Mon	1340	AR		78	78	52	08/17/94	Wed	1710	AR		76	76	50	09/21/94	Wed	940	AP		77	77	62	08/15/94	Mon	2250	AR		77	77	56
100	AT		72	72	54	10/06/94	Thu	150	BJ		72	72	64	10/08/94	Sat	2250	BJ		75	75	50	11/09/94	Wed	1050	BR		72	72	54	10/06/94	Thu	210	BJ		72	72	64
1440			70	70	54	11/29/94	Tue	640	BR		74	74	40	12/02/94	Fri	610	BR		71	71	59	01/09/95	Mon	1500			70	70	54	11/28/94	Mon	635	RBR		74	74	40
1250	AP		75	75	36	01/31/95	Tue	1030	AP		70	70	29	02/08/95	Wed	530	AP		73	73	54	03/14/95	Tue	1000	AP		73	73	36	02/01/95	Wed	820	AP		71	71	31
1305	BR		73	73	48	03/03/95	Fri	2120	H		73	73	48	04/14/95	Fri	1700	H		70	70	58	04/22/95	Sat	1330	BR		74	74	52	03/27/95	Mon	2250	H		74	74	52
1445	CZ		71	71	60	08/31/95	Thu	1405	CZ		76	76	60	09/06/95	Wed	1330	CZ		74	74	58	09/26/95	Tue	1000	CZ		73	73	54	09/11/95	Mon	1300	AP		71	71	60
1050	BU		75	75	53	05/18/95	Thu	115	H		74	74	56	05/30/95	Tue	2100	H		74	74	54	06/16/95	Fri	300	CI		76	76	46	05/19/95	Fri	2240	BY		73	73	59
2210	BW		73	73	50	10/09/95	Mon	2100	H		74	73	50	10/25/95	Wed	1800	H		73	73	52	11/17/95	Fri	2120	AT		73	73	50	10/06/95	Fri	2230	H		73	73	49
2250	AT		78	78	59	07/11/95	Tue	2240	CR		75	75	59	07/15/95	Sat	1850	CR		75	75	56	07/29/95	Sat	2250	CI		75	75	54	06/28/95	Wed	2320	CR		78	78	54
1110	BN		73	73	42	12/19/96	Thu	1300	BN		68	68	38	01/03/96	Wed	1325	BN		73	73	42	02/02/96	Fri	1400	R	BR	73	73	42	12/19/95	Tue	1300	R2BR		73	73	33
2130	DF		75	75	50	03/06/96	Wed	2145	DF		72	72	44	03/08/96	Fri	2150	DF		73	73	42	04/03/96	Wed	2125	CY		73	73	44	02/29/96	Thu	2030	CY		73	73	46
800	AX		72	71	48	04/30/96	Tue	1400	AX		72	72	49	05/07/96	Tue	1300	DE		71	72	41	05/30/96	Thu	1350	AX		72	71	48	04/30/96	Tue	1400	AX		72	72	49
1855	CY		74	74	64	07/08/96	Mon	2130	CY		76	76	54	07/12/96	Fri	1915	CY		75	75	51	08/23/96	Fri	1415	R	AX	75	75	69	07/09/96	Tue	1100	BD		72	72	48
1440	BD		71	71	60	09/18/96	Wed	1000	AR		72	72	52	10/16/96	Wed	1030	AR		71	71	52	10/23/96	Wed	1440	AR		70	70	57	09/25/96	Wed	1235	AR		71	71	56
1410	BR		74	74	54	03/28/97	Fri	1310	BR		74	74	56	04/02/97	Wed	1500	BR		75	75	49	05/01/97	Thu	1415	BR		73	73	52	03/25/97	Tue	1330	BR		74	74	56
1230	CG		73	73	57	05/29/97	Thu	1055	CI		73	73	58	06/03/97	Tue	1830	CI		75	75	58	06/17/97	Tue	1330	CI		72	72	54	05/29/97	Thu	1730	CI		73	73	56
230	AB		76	76	56	09/03/97	Wed	255	BD	HD	75	75	52	09/08/97	Mon	420	BD	HD	73	73	42	10/07/97	Tue	230	AB		76	76	56	09/03/97	Wed	250	BD		76	76	54
1120	BN	BR	72	72	50	11/19/97	Wed	1455	BR		74	74	56	11/22/97	Sat	1500	BN		72	72	48	12/08/97	Mon	1410	BR		72	72	46	11/18/97	Tue	1445	BR		71	71	57
1345	BD		73	73	61	04/02/98	Thu	2030	DF		74	74	44	04/05/98	Sun	2245	DF		74	74	50	04/25/98	Sat	1100	BD		73	73	60	03/31/98	Tue	2030	DF		73	73	53
1330	AO		73	73	42	02/07/98	Sat	200	BE		73	73	48	02/09/98	Mon	1325	AO		72	72	52	02/28/98	Sat	1350	BR		73	73	42	02/06/98	Fri	1355	AO		73	73	39
1200			75	75	58	07/17/98	Fri	1340	BN		75	75	60	07/22/98	Wed	1515	BN		74	84	27	08/11/98	Tue	1320	BD		75	75	58	07/17/98	Fri	1340	BR		75	75	60
245	BD		74	74	56	05/24/98	Sun	1705	AR		73	73	60	05/28/98	Thu	855	AR		75	75	58	06/19/98	Fri	245	BD		74	74	56	05/24/98	Sun	1700	AR		73	73	60
235	CI		74	74	57	09/18/98	Fri	200	M		74	74	54	09/24/98	Thu	200	M		73	73	53	10/10/98	Sat	1430	BD		72	72	60	10/01/98	Thu	1430	BD		72	72	56
1120	BD	HD	72	72	46	02/18/99	Thu	1030	BD	HD	74	74	48	02/21/99	Sun	1050	BD	HD	72	72	51	03/05/99	Fri	950	BD		72	72	46	02/18/99	Thu	1030	R		74	74	48
2200	AT		77	77	56	11/20/98	Fri	1710	J		74	74	52	11/23/98	Mon	2310	J		75	75	59	12/20/98	Sun	2210	BW		77	77	56	11/20/98	Fri	1715	DF		72	72	52
235	BU		74	74	56	04/27/99	Tue	2145	S		75	75	46	04/30/99	Fri	2305	J		74	74	54	05/10/99	Mon	245	BL		74	74	56	04/27/99	Tue	2145	J		75	75	50
720	BD		73	73	53	03/28/99	Sun	20	M		74	74	54	03/31/99	Wed	852	R		73	73	52	04/20/99	Tue	740	AR		72	72	52	03/26/99	Fri	450	M		73	73	53
115	BU		70	70	60	05/26/99	Wed	1230	CG		71	71	61	05/31/99	Mon	40	T		75	75	58	06/16/99	Wed	1330	BD		70	70	60	05/26/99	Wed	1230	CG		71	71	60
1405	BN		73	73	56	09/28/99	Tue	1450	BR		71	71	54	10/01/99	Fri	1500	BN		72	72	58	10/14/99	Thu	1030	BR		73	73	56	09/28/99	Tue	1450	BR		72	72	55
2315	BW		76	76	56	08/21/99	Sat	2105	O		78	78	56	08/27/99	Fri	2200	O		74	74	57	09/09/99	Thu	2340	BW		78	78	56	08/19/99	Thu	1845	L		77	77	58
2230	BW		71	71	56	11/30/99	Tue	45	T		71	71	56	12/07/99	Tue	500	T		75	75	54	12/17/99	Fri	2310	BW		71	71	56	11/30/99	Tue	45	T		71	71	56
2245	L		74	74	56	02/16/00	Wed	1040	DF		72	72	45	02/21/00	Mon	1330	DF		76	76	48	03/21/00	Tue	2200	AT	BW	76	76	54	02/17/00	Thu	950	DF		75	75	50
2140	F	BD	72	72	55	04/25/00	Tue	1945	A	BD	73	73	56	05/01/00	Mon	2130	D	Q	77	77	55	05/23/00	Tue	2145	F	BD	73	73	57	04/24/00	Mon	1830	A	L	73	73	56
530	M		73	73	52	06/27/00	Tue	500	M		76	76	58	07/11/00	Tue	720	H		74	74	60	08/01/00	Tue	2230	L		75	75	57	06/28/00	Wed	600	H		76	76	58
1100	B	BN	74	74	42	01/12/01	Fri	1450	BN		76	76	58	01/15/01	Mon	1050	BN		71	71	56	01/30/01	Tue	1040	BR	BN	74	74	42	01/12/01	Fri	1445	BR	A	76	76	58
830	BR	BN	74	74	56	05/01/01	Tue	1250	BN		74	74	54	05/03/01	Thu	1320	AY		74	74	53	05/13/01	Sun	1030	BN		74	74	56	05/01/01	Tue	1250	BR		74	74	54
2130	BW		74	74	54	02/20/01	Tue	2050	L		75	75	46	02/23/01	Fri	1410	L		75	75	46	03/18/01	Sun	1350	BD	HD	74	74	54	02/20/01	Tue	1820	J		73	73	56
2200	AB		76	76	55	06/15/01	Fri	430	H	C	76	76	55	06/21/01	Thu	530	H	E	74	74	53	07/26/01	Thu	945	BR		76	76	55	06/15/01	Fri	430	H	C	76	76	55
1425	BR		72	72	56	09/18/01	Tue	1435	BR		72	72	61	09/21/01	Fri	1315	BR		71	71	60	10/10/01	Wed	1425	BR		72	72	56	09/18/01	Tue	1435	BR		72	72	61
1045	BN	BR	73	73	58	08/21/00	Mon	1510	BN		72	72	60	08/25/00	Fri	1015	BN		74	74	58	09/14/00	Thu	1310	BR	BN	73	73	58	08/21/00	Mon	1510	BR		72	72	60

FOAM APPLICATION DATA FOR EXTERNAL TANK — PRODUCTION & FOAM APPLICATION DA

od Beneath S.F. (Hand Spray)					Aft Half of LH/IT Flange Closeout (Hand Spray)										Fwd Half of LH/IT Flange Closeout (Hand Spray)									Intertank Acreage (Machine Spray)															
Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Substrate Temp at Upper Flange -1 (°F)	Substrate Temp at Upper Flange -2 (°F)	Substrate Temp at Upper Flange -3 (°F)	Substrate Temp at Upper Flange -4 (°F)	Substrate Temp at Lower Flange -1 (°F)	Substrate Temp at Lower Flange -2 (°F)	Substrate Temp at Lower Flange -3 (°F)	Substrate Temp at Lower Flange -4 (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel
ON DATA AVAILABLE FOR ET-1 THROUGH ET-60																																		NO PRODUCTION DATA						
ON DATA AVAILABLE FOR ET-1 THROUGH ET-60																																		NO PRODUCTION DATA						
ON DATA AVAILABLE FOR ET-1 THROUGH ET-60																																		NO PRODUCTION DATA						
07/09/91	Tue	1115	BN					10/24/90	Wed	2135	CE							11/06/90	Tue	2040	CE			130								102	15	03/16/90	Fri	1821	AE	HW	IU
09/03/91	Tue	2310	AP					01/04/91	Fri	1300	BB							01/15/91	Tue	1200	AH			126							128	100	14	06/04/90	Mon	1418	DG		
12/12/91	Thu	1030	BR					05/15/91	Wed	1530	AN							05/31/91	Fri	1250	BX			128								98	16	08/17/90	Fri	1921	AS		
03/27/92	Fri	2045	AT		82	76	54	08/01/91	Thu	1700	AN				74	74	46	08/16/91	Fri	2300	AW			132								102	14	10/31/90	Wed	1056	CA		
08/20/92	Thu	2035	AP		73	72	56	05/20/92	Wed	1315	BB				77	73	56	06/16/92	Tue	1053	BB			129								98	15	06/13/91	Thu	1426	Z	IJ	HC
06/30/92	Tue	1045	BA		74	74	46	12/12/91	Thu	1630	AQ				74	74	34	01/10/92	Fri	1230	BB			125								102	10	12/07/90	Fri	1739		HJ	GC
12/23/92	Wed	1438	BR		77	75	58	08/19/92	Wed	1445	BX				76	75	56	09/01/92	Tue	1130	BB			126								109	22	09/06/91	Fri	1916		EW	GS
03/12/93	Fri	1500	AR		85	85	23	11/06/92	Fri	1930	BZ				72	72	50	11/17/92	Tue	1210	AH			130			145				131	104	10	12/18/91	Wed	1305	BK		
06/17/93	Thu	1440	BR		71	71	40	02/12/93	Fri	1450	AH				75	75	46	02/26/93	Fri	1115	BX			127								104	12	02/14/92	Fri	1416	AI	IJ	GC
09/22/93	Wed	1225	BD		75	77	51	05/25/93	Tue	1100	AN				78	74	54	06/04/93	Fri	1355	AN			130								102	20	07/09/92	Thu	1143		HX	IT
12/18/93	Sat	2045	AT		79	74	54	08/13/93	Fri	1215	BB				77	75	48	08/24/93	Tue	1340	BX			126								97	10	12/02/92	Wed	1405	DK		
03/02/94	Wed	1330	BN		75	73	57	10/13/93	Wed	1025	BO				77	76	40	10/28/93	Thu	1130	BO			126								102	10	03/11/93	Thu	2313	AU	HW	JB
04/15/94	Fri	110	BJ		73	77	36	01/11/94	Tue	730	BX				73	74	30	01/21/94	Fri	1350	BO			132								104	10	04/05/93	Mon	1915		HI	IT
06/17/94	Fri	940	BD		72	72	38	03/03/94	Thu	1415	BX				72	76	42	03/15/94	Tue	1400	CF			126								98	20	06/16/93	Wed	1149	DJ	GV	II
08/24/94	Wed	1300	AR		75	68	56	04/20/94	Wed	1410	BO				73	73	46	04/29/94	Fri	1415	BB			126								97	21	10/21/93	Thu	1957	AA		
10/08/94	Sat	2300	BJ		76	77	56	07/12/95	Wed	1100	BO				74	74	52	07/19/94	Tue	1345	BO			130								100	9	02/02/94	Wed	1340	CM	JB	II
12/02/94	Fri	600	BR		74	74	46	09/09/94	Fri	1430	CK				74	74	54	09/15/94	Thu	1400	BO			132								100	18	03/26/94	Sat	1322	V		
02/09/95	Thu	1300	AP		74	75	42	11/01/94	Tue	1550	AE				76	57	52	11/09/94	Wed	1415	BX			125								101	18	05/05/94	Thu	1555	BS	JB	HW
04/14/95	Fri	1700	H		72	77	32	01/03/95	Tue	1435	BX				74	74	52	01/16/95	Mon	2115	CK			125								96	19	06/17/94	Fri	1331		HL	HI
09/14/95	Thu	1300	CZ		75	75	54	05/31/95	Wed	1055	BX				74	74	54	06/08/95	Thu	1345	BX			131				127				99	19	12/15/94	Thu	2223	AM	GJ	IM
05/26/95	Fri	2315	BY		74	76	34	02/22/95	Wed	1105	BX				73	76	36	03/03/95	Fri	1640	BX			125				125				100	20	09/10/94	Sat	621	CC	FZ	HI
10/17/95	Tue	2300	H		77	74	54	07/14/95	Fri	1430	BO				73	72	58	07/21/95	Fri	1345	BO			130				139				100	20	01/31/95	Tue	1420	BV	JC	HW
07/07/95	Fri	1800	CR		75	75	50	04/08/95	Sat	1145	BX				75	75	54	04/20/95	Thu	710	BX			127				125				97	21	11/05/94	Sat	857		HW	GD
01/09/96	Tue	1335	BR		74	74	52	09/18/95	Mon	1500	BX				73	73	52	09/26/95	Tue	1440	BX			126				131				98	24	04/22/95	Sat	0632	DM	GJ	HI
03/04/96	Mon	2245	CY		73	73	46	11/14/95	Tue	1345	BX				75	75	52	11/28/95	Tue	1340	BX			127				139				100	18	06/10/95	Sat	730		JB	HI
05/07/96	Tue	1300	DE		73	74F	46	01/31/96	Wed	1800	CF				76	78	48	02/08/96	Thu	1345	BX			125				134				99	19	06/23/95	Fri	932		HI	FW
07/11/96	Thu	1455	BD		74	75	35	04/10/96	Wed	1410	BX				74	75	46	04/18/96	Thu	1930	BX			128				135				100	20	08/22/95	Tue	1325	CH		
10/10/96	Thu	830	AR		75	75	54	06/17/96	Mon	1505	BX				82	79	52	06/27/96	Thu	1430	BX			130				126				105	19	12/05/95	Tue	1416		FZ	DD
04/02/97	Wed	1500	BR		75	75	56	01/05/97	Sun	1500	BX				95	95	22	01/09/97	Thu	1440	BX			131				129				105	10	12/21/95	Thu	1510		FN	DD
06/04/97	Wed	1500	CI		78	77	53	03/17/97	Mon	1430	DA				76	76	50	03/21/97	Fri	1410				136				128				96	19	03/14/96	Thu	1407	CH		
09/09/97	Tue	230	BD		76	78	56	07/26/97	Sat	1230	DA				76	76	54	07/30/97	Wed	1615	BX			126				137				102	16	05/23/96	Thu	1338	BS	HI	FF
12/01/97	Mon	1350	BR		74	74	42	10/22/97	Wed	1450	AH	BX			78	72	59	10/26/97	Sun	820	AH			138				127				92	20	10/02/96	Wed	2219	CA		
04/07/98	Tue	2150	DF		74	73	58	03/05/98	Thu	2230	CK				74	74	36	03/09/98	Mon	810	BX			134				125				102	16	01/22/97	Wed	1638		FZ	HI
02/08/98	Sun	1430	AO		74	77	35	01/11/98	Sun	1225	CD				76	76	46	01/15/98	Thu	1350	BX			135				130				103	8	12/07/96	Sat	1305	CH		
07/22/98	Wed	1515	BR		74	74	46	06/04/98	Thu	1800	DA				80	80	40	06/11/98	Thu	805	CD			125				129				102	20	10/07/97	Tue	1457		GJ	IM
05/28/98	Thu	850	AR		78	78	52	04/16/98	Thu	1410	BO	BX			76	76	46	04/20/98	Mon	1630	BX			126				127				101	22	08/19/97	Tue	655		IH	DD
10/04/98	Sun	1225	BD		75	75	56	08/02/98	Sun	2045	BX				75	75	54	08/07/98	Fri	2045	BX			125				128				102	18	10/31/97	Fri	1521	DM	HI	GD
02/21/99	Sun	1100	R		78	79	42	01/16/99	Sat	1125	BX				78	78	52	01/20/99	Wed	1935	DA			125				125				100	21	09/15/98	Tue	1227		HT	GH
11/22/98	Sun	2030	DF		76	80	46	10/26/98	Mon	1520	DA				80	80	50	10/31/98	Sat	1450	BX			126				126				103	17	12/22/97	Mon	1956		GJ	IM
04/30/99	Fri	100	S		78	78	48	02/06/99	Sat	1900	BX				78	79	52	02/09/99	Tue	2200	BX			125				127				105	18	04/14/98	Tue	127		GJ	IM
04/06/99	Tue	1450	R		74	76	30	02/23/99	Tue	540	BX				71	73	39	03/03/99	Wed	1350	BO			123				125				197	23	06/08/98	Mon	142			
06/01/99	Tue	630	T		75	72	53	05/02/99	Sun	2315	CX				76	76	54	05/06/99	Thu	1400	AS			125							130	100	23	08/23/98	Sun	1523	BC		
10/04/99	Mon	1300	BR		75	75	58	08/19/99	Thu	2348	CL	CX			76	76	56	08/23/99	Mon	600	DA	BX		128				125				105	15	11/22/98	Sun	1544		IF	HF
08/24/99	Tue	1900	L		78	78	52	07/30/99	Fri	1410	BX				77	77	54	08/02/99	Mon	1445	BX			126				127				103	12	12/23/98	Wed	504	AK	GJ	IF
12/07/99	Tue	500	T		77	79	47	10/31/99	Sun	1410	AS				76	76	48	11/05/99	Fri	635	BX			125				125				104	19	03/14/99	Sun	1247	AV	IF	FQ
02/23/00	Wed	850	DF		75	75	49	01/05/00	Wed	1415	GF	GF			74	75	48	01/09/00	Sun	830	DA	GF		126				125				105	15	04/21/99	Wed	1441		HM	IF
05/01/00	Mon	2130	D	Q	74	74	52	02/26/00	Sat	940	BX				73	75	50	03/03/00	Fri	1205	DA			125				125				101	18	06/07/99	Mon	1948		FZ	EZ
07/11/00	Tue	715	H		76	76	44	04/26/00	Wed	1050	BX				74	74	56	05/05/00	Fri	545	BX			126				125				105	17	07/07/99	Wed	2105	CT	FN	IF
01/15/01	Mon	1400	BR		76	78	49	12/14/00	Thu	700	DA				80	80	40	12/17/00	Sun	1650	BX			126				127				103	20	12/16/99	Thu	1213		FG	IF
05/04/01	Fri	810	BR		78	78	50	04/11/01	Wed	1400	CK	GF			78	78	52	04/17/01	Tue	550	DA	GF		127				125				105	17	05/15/00	Mon	1527		GJ	IM
02/22/01	Thu	2300	J		73	73	32	01/22/01	Mon	1130	AS	AH	GZ	CK	78	79	44	01/28/01	Sun	630	DA	GF		128				126				102	5	04/04/00	Tue	1606		GJ	IF
06/21/01	Thu	525	H	E	75	75	48	05/15/01	Tue	1400	DA				74	76	46	05/19/01	Sat	845	DA			127	127	128	130	126	126	126	127	101	20	06/29/00	Thu	319		GM	IM
09/21/01	Fri	1315	BR		75	76	52	07/13/01	Fri	1400	DA	GF	IC	BX	75	76	53	07/24/01	Tue	1355	BX	DA	IC	127				133				98	22	01/24/00	Mon	1722		EN	FL
08/25/00	Fri	1015	BR		74	74	54	06/15/00	Thu	1150	BX				76	76	54	06/25/00	Sun	1440	BX			130				129				105	19	08/16/99	Mon	2001	CT	GJ	DD

TA FOR EXTERNAL TANK

AVAILABLE FOR ET-1 THROUGH ET-60

AVAILABLE FOR ET-1 THROUGH ET-60

AVAILABLE FOR ET-1 THROUGH ET-60

			LO2 Tank Acreage (Machine Spray)													LH2 Barrel Acreage (Machine Spray)													
Personnel	Personnel	Personnel	St380 Substrate Temp (°F)	St800 Substrate Temp (°F)	St840 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	St2088 Substrate Temp (°F)	St1129 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	PRCB # (PCBD ...) & Date
HJ			149	127	126	100	12	07/09/90	Mon	2127	V					125	127	99	21	08/16/90	Thu	142		HG	HF	FA		
			144	127	129	104	8	09/26/90	Wed	1552	BM					126	154	100	15	09/26/90	Wed	1408	CO					
			154	132	130	99	10	03/08/91	Fri	1058	CJ	HX	IT	JA		126	142	99	19	12/14/90	Fri	1557	AJ	HB	FE	GH	JA	
			141	127	125	94	18	05/09/91	Thu	1549	AE					127	152	99	15	05/07/91	Tue	1430	CB					
JC	JA		155	127	128	101	17	10/03/91	Thu	1515	X	IJ	GC	HA	GS	127	129	103	7	01/17/92	Fri	1549	V	FE	GD	HW		
HX			137			99	15	08/27/91	Tue	1729		HX	IT	GI		100	106	100	22	08/06/91	Tue	1655		HB	GD	FE		
DX	EC		145	127	133	100	15	05/15/92	Fri	1655		DD	HY	EC	GT	125	132	103	11	04/29/92	Wed	2217	GS	HW	HB	FE	GL	
			147	127	127	103	16	08/18/92	Tue	1420	BS					128	148	103	20	08/06/92	Thu	2250	V					
EC	GS		159	128	130	97	18	11/18/92	Wed	1415	AZ	DD	GC	IX	EC	127	145	103	17	10/09/92	Fri	1516	DH	IL	HE	IX	FE	
JB	GS		137	130	126	130	10	03/24/93	Wed	1138		HW	GD	IX	JB	126	131	99	23	12/15/92	Tue	2134		HB	FE	GX	IX	
			128	131	128	98	24	05/07/93	Fri	2258	DM					125	135	103	14	04/23/93	Fri	1606	DJ					
FF			157	127	135	98	18	07/30/93	Fri	1958	AZ	HW	GD			132	150	105	17	07/13/93	Tue	1345	BX	HX	FE	IE	GT	
JB	HO		157	127	128	102	15	10/05/93	Tue	1559		II	HL	HY	GS	125	153	103	19	09/23/93	Thu	1435		HX	DX	FE	GS	
IT	EC		139	125	130	101	13	01/10/94	Mon	1522	GS	JB	II	HW	FQ	126	151	98	20	11/19/93	Fri	1520	DK	HX	FE	HY		
			135	125	131	98	10	02/11/94	Fri	1630	BP					125	142	101	14	01/14/94	Fri	1053	CB					
FF	HO		154	126	126	104	17	05/13/94	Fri	1508	BS	II	GD	HO	HW	125	134	102	11	03/12/94	Sat	1520						
				140		93	21	07/09/94	Sat	1601	CT					125	140	103	22	05/28/94	Sat	1910	AW					
FQ	HO		146	137	131	92	18	08/06/94	Sat	1721	CT	IM	FF	HO	GK	125	139	101	24	08/05/94	Fri	1603	DO					
FQ	GS		139	126	129	100	14	09/28/94	Wed	1226		IM	FQ	GT		126	139	102	20	09/16/94	Fri	1515		HQ	FE	ET		
FQ	ET		149	126	134	104	15	03/31/95	Fri	1325	BS	HI	FW			123	140	102	19	03/30/95	Thu	830	DJ	GP	II	HV	GS	
FQ	GT		147	125	126	97	12	12/02/94	Fri	1323	V	HW	GD	HO		128	135	105	19	11/03/94	Thu	1827	AG	FE	GB	DX	ET	
FQ	HO		146	125	127	105	18	05/09/95	Tue	1537	AB	HI	GD	HO		132	141	105	19	05/19/95	Fri	726	AW	DZ	II	HY	HO	
HO			145	125	126	104	14	02/14/95	Tue	1610	V	JC	FQ	HO		129	140	102	13	01/19/95	Thu	1348		EE	II	FS	HO	
GD			153	127	133	100	18	07/21/95	Fri	1915	CT	DD	FW	FZ		126	127	101	22	07/07/95	Fri	1457	DB	DZ	II	HY		
FW	GV		145	126	130	100	23	09/12/95	Tue	0410 .		FZ	DD	GD	HO	125	131	88	25	09/23/95	Sat	1703		DZ	II	GE	HO	
ET			137	126	130	104	16	11/14/95	Tue	1148		HW	GD	HO		127	133	99	19	11/17/95	Fri	2250		DZ	HB	GE	HO	
			141	126	127	105	11	01/13/96	Sat	1819	BV	FZ	HW	GD	HO	129	155	97	25	01/26/96	Fri	2058	Y	DZ	IF	FD	HO	
FW	EI		152	126	128	105	10	03/22/96	Fri	2121		FZ	HW	GD	HO	126	134	100	22	04/28/96	Sun	0913		DZ	IF	FW	HO	
FO	ET		134			95	22	06/10/96	Mon	1553	V	FZ	DD	GD	IX	125	127	94	14	11/13/96	Wed	600		DZ	GR	FS	HO	S062127, 1/13/00
			149	128	127	101	10	09/29/96	Sun	1158	CH					127	134	95	10	12/21/96	Sat	1034	AF					
HO			150	125	127	105	8	02/07/97	Fri	1148	CN	FC	HI	GH	BS	129	141	95	24	06/03/97	Tue	2232	GB	EE	II	HZ	HP	
			142	130	132	102	19	08/18/97	Mon	1202	DI					130	146	100F	21	09/19/97	Fri	1724		FE	HX	FD	HT	
FO	IX		140	126	126	104	18	02/04/98	Wed	638		FB	HX	GH	GW	126	131	99	20	01/29/98	Thu	1210		DZ	HX	FQ	EI	
			154	127	128	102	19	12/04/97	Thu	1511	DM					128	147	99	22	12/04/97	Thu	2125		DZ	IF	IK	GW	
GD	HP		126	130	149	100	20	04/26/98	Sun	657		GJ	DD	JD	EI	126	148	94	23	05/01/98	Fri	1315		DZ	FL	HY	EI	
DX	HK		158	131	132	103	9	03/13/98	Fri	1317		HR	IM	FW	EI	125	150	102	12	03/03/98	Tue	1932		DZ	HH	FW	GW	
FF			156	125	132	103	19	06/28/98	Sun	1313	BC	GJ	IF	GH	GW	127	153	99	23	06/22/98	Mon	1459	AF	EE	DD	HY	GW	
GY			157	128	142	99	20	12/02/98	Wed	359		GJ	FZ	JD	HF	126	134	98	21	12/03/98	Thu	1226		DZ	II	HY	EY	
FQ	EI		143	125	125	103	18	09/17/98	Thu	145	CA	HN	IF	JD	EI	127	131	101	21	09/19/03	Fri	1353	DJ	DZ	II	HY	GW	
FW	EI		141	125	128	104	17	10/14/98	Wed	1345		GJ	IM	GD	HQ	126	145	102	19	11/24/98	Tue	1830		DZ	II	HY	EY	
			160	128	131	105	17	01/20/99	Wed	124		GM	DD	GD	FF	126	140	100	22	01/19/99	Tue	1415		DZ	II	HY	FF	
		G	156	126	136	105	12	03/10/99	Wed	1529	AN					126	143	103	19	04/04/99	Sun	2146		EE	HB	GE	EI	
			159	125	131	100	72	07/21/99	Wed	1418		GJ	FZ	EZ	EY	126	140	196	22	05/13/99	Thu	0		DZ	HI	GE	EI	
JD			130	126	126	105	19	06/30/99	Wed	2036	P	GJ	FL	FI		143	127	103	19	07/01/99	Thu	2200	CP	DZ	II	HY	DT	
EI	BT		144	125	127	100	17	09/12/99	Sun	630	CN	GJ	EU	EZ	EY	142	125	105	18	10/07/99	Thu	1708	CS	DZ	DD	HY	EY	
EZ	EI		150	128	128	101	21	10/03/99	Sun	811		FY	HX	HM	EY	126	143	106	16	12/02/99	Thu	536		DZ	HH	GW		
EY	EN		152	130	125	104	20	12/04/99	Sat	314	N	GJ	IF	GD	GW	126	143	104	19	01/22/00	Sat	1201		EV	HH	DX	EI	
EZ	FF		148	125	128	105	15	01/16/00	Sun	702	N	GJ	EU	GW		126	144	105	19	03/15/00	Wed	1518	DB	EE	DD	GU	EI	
GD	EI		154	128	125	105	19	08/11/00	Fri	520		HR	FL	HM	IY	128	143	90	23	11/24/00	Fri	2228		EE	II	HY	EI	
EZ			151	125	129	105	16	10/30/00	Mon	1451		HR	DD	JD	EI	143	126	94	20	03/14/01	Wed	1126		IB	II	GD	FF	
GD	EI		146	125	127	105	15	09/07/00	Thu	1624		GJ	IG	EZ	EI	129	143	100	18	12/13/00	Wed	2252		IB	DD	HY	EI	
GE	EI		156	130	135	101	15	12/22/00	Fri	1457		IF	FW	EI		129	156	89	22	04/20/01	Fri	1538		FR	DD	HY	EI	S06215, 12/19/02
EZ	EI		154	127	135F	99	11	03/26/01	Mon	156	CQ	IV	HM	EI	AK	133	160	102	17	06/01/01	Fri	1441		DZ	II	DX	HF	
GA	EY		150	125	127	92	26	03/04/00	Sat	729	DN	IF	IM	EZ	EI	127	141	99	17	04/26/00	Wed	1851	CW	DZ	DD	HY	EI	

S044812A, 2/6/90

S044824C, 6/14/91

S044848H, 9/1/92

S044876C, 8/6/92

S044880A, 11/30/92

S044897L, 5/23/94

	ET Age @ Launch (days)	ET Exposure (days)	Tanking Time (hrs)	Mission Time (hrs)	LS >1	LS Tot	OV> 1	OV Tot	Camera	-Y bipod visible?	+Y bipod visible	FOAM LOSS NOTED?	Bipod	NEAR Bipod?	Flange	Intertank	Thrust Panel	Other		Dry OV (incl. SSMEs) (lbs.)	Cargo & Crew (lbs.)	OV Consumables (lbs.)
	TIMES				TILE Damage															WEIGHTS (lb		
Average of All ETs	688	38	3	217	23	101	31	143											Average of all ETs	175013	40457	39754
Std Dev of All ETs	543	22	0	84	34	83	40	91											Std Dev of all ETs	3764	7443	4189
+/- 95% C.I. for All ETs	100	4	0	16	6	15	7	17											+/- 95% C.I. for all ETs	694	1372	772
Average of ETs with Foam Loss	652	39	3	240	23	103	31	149											Average of all ETs with Foam Loss	176277	39481	39547
Std Dev of ETs with Foam Loss	527	25	0	83	26	67	32	74											Std Dev of all ETs with Foam Loss	4047	6277	4168
+/- 95% C.I. for ETs with Foam Loss	128	6	0	20	6	16	8	18											+/- 95% C.I. for all ETs with Foam Loss	984	1526	1013
Average of ETs w/Bipod Foam Loss	888	30	3	278	20	112	28	175											Average of all ETs w/Bipod Foam Loss	178864	38063	40391
Std Dev of ETs w/Bipod Foam Loss	470	8	0	79	14	47	15	82											Std Dev of all ETs w/Bipod Foam Loss	4631	4847	2984
+/- 95% C.I. for ETs w/Bipod Foam Loss	348	6	0	58	10	35	11	60											+/- 95% C.I. for all ETs w/Bipod Foam Loss	3430	3591	2211
Average of ETs w/o Foam Loss	677	48	3	205	14	117	20	159											Average of all ETs w/o Foam Loss	173582	39996	39721
Std Dev of ETs w/o Foam Loss	499	24	0	104	15	111	16	113											Std Dev of all ETs w/o Foam Loss	1328	8336	6078
+/- 95% C.I. for ETs w/o Foam Loss	346	17	0	72	10	77	11	78											+/- 95% C.I. for all ETs w/o Foam Loss	920	5777	4212
Average of ETs w/unknown Foam Loss	747	34	3	182	24	95	34	130											Average of all ETs w/unknown Foam Loss	173039	42303	40133
Std Dev of ETs w/unknown Foam Loss	584	15	1	71	45	102	52	110											Std Dev of all ETs w/unknown Foam Loss	2419	8943	3896
+/- 95% C.I. for ETs w/unknown Foam Loss	181	5	0	22	14	31	16	34											+/- 95% C.I. for all ETs w/unknown Foam Loss	750	2771	1207

MISSION DATA

1	1		102	1	1	H	04/12/81	A	1	D	E	653	105	3.50	54				247	16	Y	Y	Y	N		N	N	N	Y			11/03/80	11/24/80	12/29/80			
3	3		102	3	3	H	03/22/82	A	1	D	W	175	35	3.00	192				113	Y	Y	Y	Y	N		Y	Y	N	Y			01/04/82	02/03/82	02/16/82			
4	4		102	4	4	H	06/27/82	A	1	D	E	161	33	3.00	169				122	Y	Y	Y	Y	N		Y	Y	N	Y			04/17/82	05/19/82	05/26/82			
5	5		102	5	5	H	11/11/82	A	1	D	E	169	52	3.00	122				161	Y	Y	Y	Y	N	Y	Y	Y	N	Y			08/19/82	09/10/82	09/21/82	172566	35902	37957
6	6		99	1	8	L	04/04/83	A	2	D	E	208	126	4.00	120	21	89	36	120	35	Y	Y	Y	N		Y	N	N	Y			10/21/82	11/23/82	11/30/82	168736	51032	37219
7	7		99	2	6	H	06/18/83	A	1	D	E	327	24	3.00	146	41	153	48	253	35	Y	Y	Y	-Y		Y	Y	N	Y			03/02/83	05/24/83	05/26/83	169044	41134	39448
10	11	41B	99	4	10	L	02/03/84	A	2	D	K	339	23	5.00	191	11	19	34	63	35	Y	Y	Y	N	Y	Y	Y	N	Y			01/03/84	01/08/84	01/12/84	169166	37743	43496
13	17	41G	99	6	15	L	10/05/84	A	1	D	K	295	23	3.00	197	25	69	36	154	35	Y	Y	Y	N		N	Y	N	Y			06/19/84	09/10/84	09/13/84	170667	27994	43882
17	24	51B	99	7	17	L	04/29/85	A	2	D	E	409	33	3.00	168	45	110	62	140	35	Y	N	Y	?		N	Y	N	Y			01/09/85	04/11/85	04/15/85	170953	35422	40879
19	26	51F	99	8	19	L	07/29/85	A	2	D	E	431	31	3.00	191	179	482	226	553	35	Y	Y	Y	N		Y	Y	N	Y			05/31/85	06/26/85	06/29/85	170948	38742	43043
22	30	61A	99	9	24	L	10/30/85	A	1	D	E	348	15	3.00	169	24	129	34	183	35	Y	Y	Y	N	Y	Y	N	N	Y			09/30/85	10/12/85	10/16/85	171084	36388	36279
24	32	61C	102	7	30	L	01/12/86	A	1	D	E	208	42	3.00	146	20	134	39	193	16	Y	Y	Y	N		N	Y	N	Y			11/14/85	11/22/85	12/02/85	176549	37894	40480
28	29R		103	8	36	L	03/13/89	B	2	D	E	1189	39	3.00	120	18	100	23	132	H	Y	Y	Y	N	Y	Y	N	Y	Y			12/15/88	01/25/89	02/03/89	172149	52640	31446
30	28R		102	8	31	L	08/08/89	B	2	D	E	1484	25	3.00	121	13	60	20	74	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		Y	05/22/89	07/04/89	07/15/89			
33	32R		102	9	32	L	01/09/90	A	3	D	E	1609	43	3.00	261	13	111	15	120	16,35	Y	Y	Y	-Y	Y	Y	Y	N	Y	Y	Y	11/01/89	11/21/89	11/28/89	179735	31735	44593
38	35		102	10	35	L	12/02/90	B	3	N	E	1850	164	3.00	215	15	132	17	147	H	Y	Y	Y	N		Y	N	N	Y	Y	Y	03/22/90	08/02/90	10/14/90	178847	38800	38864
39	37		104	8	37	L	04/05/91	B	1	D	E	1906	22	3.00	144	7	91	11	115	H	N	N	Y	?		Y	N	N	N			02/04/91	03/08/91	03/15/91	172272	46082	37404
41	40		102	11	41	L	06/05/91	B	3	D	E	1776	35	3.00	218	23	153	25	197	H,16?	Y	Y	Y	N		Y	N	N	N			04/17/91	04/25/91	05/02/91	180375	39117	32429
45	42		103	14	52	L	01/22/92	A	3	D	E	994	35	3.00	193	38	159	44	209	H	Y	N	Y	?	Y	N	Y	N	N	N	N	11/04/91	12/13/91	12/19/91	172707	37890	32859
46	45		104	11	44	L	03/24/92	A	1	D	K	1840	34	3.50	214	18	122	22	172	H	Y	N	Y	?	Y	Y	N	N	N			01/22/92	02/13/92	02/20/92	172140	25963	35547
48	50		102	12	50	L	06/25/92	A	3	D	K	1333	23	3.00	332	28	141	45	184	16,35,H	Y	Y	Y	-Y		Y	N	N	Y	Y	Y	04/09/92	05/29/92	06/03/92	180784	38315	38596
50	47		105	2	45	L	09/12/92	B	2	D	K	1923	19	3.00	191	3	48	11	108	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	07/13/92	08/20/92	08/25/92	172859	38812	32897
51	52		102	13	55	L	10/22/92	B	3	D	K	994	27	2.50	237	6	152	16	290	16,35,H	Y	Y	Y	-Y		Y	Y	N	Y			09/09/92	09/20/92	09/26/92	181201	32341	36828
52	53		103	15	49	L	12/02/92	A	1	D	E	1577	25	3.00	175	11	145	23	240	H	Y	Y	Y	N	Y	Y	N	N	N			10/13/92	11/03/92	11/08/92	173438	33943	36516
53	54		105	3	51	L	01/13/93	B	2	D	K	1440	42	3.00	144	14	80	14	131	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			11/05/92	11/23/92	12/03/92	173073	54495	31844
54	56		103	16	54	L	04/08/93	B	1	N	K	1256	25	3.00	222	18	94	36	156	H	Y	Y	Y	N		N	Y	N	N	N	Y	02/10/93	03/02/93	03/15/93	173563	27278	36412
55	55		102	14	56	L	04/26/93	A	3	D	E	1082	79	3.00	240	10	128	13	143	H,16?	Y	Y	Y	N	Y	Y	N	N	Y			01/12/93	02/02/93	02/07/93	180891	39484	35093
56	57		105	4	58	L	06/21/93	B	2	D	K	979	55	3.00	240	10	75	12	106	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y			03/08/93	03/25/93	04/28/93	173363	35196	44144
57	51		103	17	59	L	09/12/93	B	3	D	K	900	80	3.00	236	8	100	18	154	H	Y	Y	Y	N	Y	Y	N	N	Y			06/02/93	06/18/93	06/25/93	173664	52473	35341
58	58		102	15	57	L	10/18/93	B	1	D	E	1180	33	3.00	336	23	78	26	155	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	N		07/21/93	08/12/93	09/16/93	181268	38442	36393
61	62		102	16	62	L	03/04/94	B	1	D	K	773	23	3.00	335	7	36	16	97	16,35,H	Y	Y	Y	-Y	Y	Y	Y	N	Y			01/20/94	02/03/94	02/10/94	181475	36350	38754
62	59		105	6	63	L	04/09/94	A	2	D	E	737	22	3.00	270	10	47	19	77	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			02/23/94	03/14/94	03/19/94	173853	40423	32573
63	65		102	17	64	L	07/08/94	A	3	D	K	718	24	3.00	354	17	123	21	151	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y			05/03/94	06/09/94	06/15/94	181576	39732	37991
65	68		105	7	65	L	09/30/94	A	1	D	E	697	47	3.00	270	9	59	15	110	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			06/16/94	07/21/94	09/13/94	173891	40911	32601
66	66		104	13	67	L	11/03/94	B	3	D	E	535	25	3.00	263	22	111	28	148	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			09/14/94	10/04/94	10/10/94	173051	30635	40552
69	71		104	14	70	L	06/27/95	A	3	D	K	495	63	3.00	235	24	149	25	164	16	Y	Y	Y	N	Y	Y	Y	N	Y			03/15/95	04/20/95	04/26/95	173189	33963	41936
71	69		105	9	72	L	09/07/95	A	1	D	K	433	59	3.00	260	22	175	27	198	16	Y	Y	Y	N		N	N	N	Y			05/31/95	06/28/95	08/08/95	173869	37782	44733
72	73		103	18	73	L	10/20/95	B	3	D	K	381	54	3.00	382	17	102	26	147	16,35,H	Y	Y	Y	N		N	N	N	Y			08/05/95	08/21/95	08/28/95	182071	39838	35418
73	74		104	15	74	L	11/12/95	A	2	D	K	360	33	3.00	197	17	78	21	116	16,35	Y	Y	Y	N		Y	N	N	N			09/11/95	10/03/95	10/11/95	173255	30086	44925
75	75		102	19	76	L	02/22/96	B	3	D	K	330	25	2.92	338	11	55	17	96	H,16,35	Y	Y	Y	N		Y	N	N	Y			01/08/96	01/24/96	01/29/96	181514	38894	41083
77	77		105	11	78	L	05/19/96	B	1	D	K	307	34	3.17	241	15	48	17	81	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			03/21/96	04/08/96	04/16/96	174484	40955	39314
78	78		102	20	79	L	06/20/96	B	3	D	K	281	23	3.17	406	5	35	12	85	16,35,H	Y	Y	Y	N	Y	Y	N	N	N			05/03/96	05/21/96	05/29/96	182433	37873	36189
80	80		102	21	80	L	11/19/96	B	3	D	K	368	35	3.00	424	4	34	8	93	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			09/26/96	10/10/96	10/16/96	181558	37388	42871
83	83		102	22	84	L	04/04/97	A	3	D	K	291	25	3.50	95	7	38	13	81	16,H	Y	Y	Y	N	Y	Y	N	N	Y			01/30/97	03/05/97	03/11/97	181532	40462	37973
84	84		104	19	85	L	05/15/97	A	2	N	K	281	22	3.17	221	10	67	13	103	H	Y	Y	Y	N	Y	Y	Y	N	N			03/24/97	04/20/97	04/24/97	173265	34927	41432
85	94		102	23	86	L	07/01/97	A	1	D	K	266	21	3.00	371	11	34	12	90	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			05/12/97	06/04/97	06/11/97	181842	40448	37989
88	87		102	24	89	L	11/19/97	B	1	D	K	146	22	3.00	377	109	244	132	308	16,35,H	Y	Y	Y	N		Y	N	Y	N	Y	Y	09/25/97	10/24/97	10/29/97	182091	40630	38973
90	90		103	25	91	L	04/17/98	B	2	D	K	154	26	3.00	382	11	76	20	131	16,35,H	Y	Y	Y	N		Y	N	Y	N			02/26/98	03/16/98	03/23/98	181658	41983	38629
91	91		103	24	96	S	06/02/98	B	1	D	K	141	32	3.00	236	45	145	50	198	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	N			03/26/98	04/27/98	05/02/98	175951	42272	41750
92	95		103	25	98	S	10/29/98	B	2	D	K	147	39	3.00	213	42	139	45	187	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y			08/25/98	09/14/98	09/21/98	176161	45134	44560
93	88		105	13	97	S	12/04/98	A	3	D	K	249	47	3.00	283	21	80	25	116	H	Y	Y	Y	N		Y	N	Y	Y			09/22/98	10/12/98	10/19/98	175329	44497	44200
94	96		103	26	100	S	05/27/99	B	2	D	K	183	24	3.00	235	66	160	72	199	H	Y	Y	Y	N		Y	Y	Y	N			03/16/99	04/15/99	05/20/99	176287	40748	44777
95	93		102	26	99	S	07/23/99	B	1	N	K	360	47	2.92	119	42	161	49	208		N	N	Y	?		?	?	Y	?			12/01/99	06/02/99	06/07/99	180714	57441	32232
96	103		103	27	101	S	12/19/99	B	2	N	K	24	37	3.00	191	13	84	24	153		N	N	Y	?		?	?	Y	?	Y	N	08/26/99	11/02/99	11/13/99	176346	27159	44654
97	99		105	14	92	L	02/11/00	A	3	D	K	298	61	3.00	270	21	75	25	87	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			06/29/99	12/02/99	12/13/99	175882	41818	39039
98	101		104	21	102	S	05/19/00	A	1	D	K	473	56	3.00	236	19	70	27	113	16,35,H	Y	Y	Y	N	Y	Y	N	Y	Y			02/03/00	03/13/00	03/25/00	176456	42344	43728
99	106		104	22	103	S	09/08/00	B	2	D	K	444	26	3.00	283	17	73	17	105	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y			04/04/00	08/07/00	08/14/00	176466	41981	43606
104	100		105	16	108	S	04/19/01	A	1	D	E	434	29	3.00	286	4	42	13	92	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y			02/26/01	03/17/01	03/22/01	175924	45379	43965
105	104		104	24	109	S	07/12/01	B	2	D	K	435	22	3.00	307	24	108	26	126	H, 16?	Y	Y	Y	N	Y	Y	N	N	N			04/16/01	05/29/01	06/21/01	176559	41468	44925
106	105		103	30	110	S	08/10/01	A	3	D	K	380	40	3.00	285	15	108	25	144	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y			05/24/01	06/13/01	07/02/01	176545	43423	42509
108	109		104	27	112	S	03/01/02	A	2	D	K	358	38	3.00	286	14	63	18	98	16,35,H	Y	Y	Y	N	Y	Y	Y?	N	N			11/27/01	01/16/02	01/23/02	181579	34459	44627
109	110		104	25	114	S	04/08/02	B	3	D	K	294	28	3.00	250	18	70	22	110	16,35,H	Y	Y	Y	N	Y	Y	N	N	N			01/21/02	03/06/02	03/12/02	177273	42766	44724
110	111		105	18	113	S	06/05/02	A	1	D	E	401	38	3.00	333	21	47	26	79	16,35,H	Y	Y	Y	N	Y	Y	Y	N	N			02/28/02	04/22/02	04/29/02	176970	42362	44715
111	112		104	26	115	S	10/07/02	B	3	D	K	376	28	3.00	250	22	81	25	106	16,35	Y	Y	Y	-Y	Y	Y	N	Y	Y	Y		06/25/02	09/04/02	09/10/02	177322	44073	44417
113	107		102	28	93	L	01/16/03	A	1	D		805	39	3.00	382					H	N	N	Y	-Y		?	?	?	?			11/04/02	11/20/02	12/09/02	182487	42493	40101

OV Gross @ Liftoff (lbs.)	Integrated Vehicle Gross @ Liftoff (lbs.)	OV Xcg (in.)	OV Ycg (in.)	OV Zcg (in.)	Shuttle Xcg (in.)	Shuttle Ycg (in.)	Shuttle Zcg (in.)		TOTAL on Pad	1-Day MAX	AVG Daily	Launch Day	TOTAL 5 Day Pre-Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	At Tanking Start	At Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad
...s.)		CENTER OF GRAVITY [CG] (in.)							RAINFALL					TEMPERATURE (F)								DEWPOINT (F)						RELATIVE HUMDITY (%rh)						SPE
255224	4515290	1111.9	-0.2	380.8	1412.2	0.2	418.8		5.45	1.92	0.14	0.11	0.73	72	89	51	71	80	63	68	71	64	75	42	62	67	57	76	99	35	73	91	69	12
7668	8524	6.5	0.3	1.8	1.2	0.1	0.6		4.57	1.39	0.09	0.39	1.10	8	5	15	10	8	11	11	12	8	4	19	12	10	13	4	2	11	10	10	21	3
1414	1572	1.2	0.1	0.3	0.2	0.0	0.1		0.84	0.26	0.02	0.07	0.20	1	1	3	2	2	2	2	2	2	1	3	2	2	2	1	0	2	2	2	4	0
255305	4514796	1110.2	-0.3	380.3	1412.3	0.2	418.8		5.36	1.95	0.14	0.11	0.74	73	89	52	73	81	64	68	74	64	76	44	64	68	59	75	99	35	73	91	66	13
7801	9231	6.7	0.4	1.8	1.5	0.1	0.6		4.59	1.39	0.09	0.44	1.26	7	4	15	8	7	10	10	10	8	4	18	9	8	11	4	2	11	9	9	21	3
1896	2244	1.6	0.1	0.4	0.4	0.0	0.1		1.11	0.34	0.02	0.11	0.31	2	1	4	2	2	2	2	3	2	1	4	2	2	3	1	0	3	2	2	5	1
257318	4515393	1112.9	-0.5	379.9	1413.0	0.2	418.9		6.83	3.04	0.24	0.01	0.46	71	87	51	69	77	60	64	70	63	75	43	59	64	54	76	99	32	71	91	66	12
6352	13198	10.0	0.2	1.9	1.8	0.1	0.5		3.79	2.27	0.13	0.02	0.83	9	5	17	10	8	12	12	13	10	3	20	14	12	16	3	2	12	15	9	30	1
4706	9777	7.4	0.2	1.4	1.3	0.1	0.4		2.81	1.68	0.10	0.01	0.61	7	4	13	7	6	9	9	9	7	3	15	10	9	12	2	1	9	11	7	22	1
253298	4516356	1113.7	-0.1	381.0	1411.9	0.2	418.6		8.27	2.48	0.16	0.04	0.66	73	90	53	70	78	63	66	71	65	77	44	62	66	58	78	99	33	80	95	71	12
4438	5411	5.5	0.4	0.9	0.8	0.0	0.3		5.57	1.64	0.08	0.08	0.75	10	7	17	12	11	13	13	17	10	5	23	15	14	15	3	2	11	7	7	13	1
3075	3750	3.8	0.3	0.6	0.5	0.0	0.2		3.86	1.13	0.05	0.06	0.52	7	5	12	9	8	9	9	12	7	4	16	10	10	11	2	1	8	5	5	9	1
255475	4515958	1114.4	-0.1	381.7	1412.2	0.2	418.9		5.04	1.77	0.14	0.14	0.74	72	88	50	69	78	61	68	67	63	75	40	59	64	54	76	##	35	72	90	74	12
8056	7809	5.6	0.3	1.5	0.8	0.1	0.6		4.24	1.34	0.10	0.32	0.88	8	5	14	11	10	13	13	13	9	4	19	14	13	16	4	1	11	11	11	23	1
2497	2420	1.7	0.1	0.5	0.2	0.0	0.2		1.31	0.42	0.03	0.10	0.27	2	2	4	3	3	4	4	4	3	1	6	4	4	5	1	0	3	3	3	7	0
...GHT, CENTER OF GRAVITY, & PAYLOAD																																		WE
								DFI	6.00	2.22	0.06	0.00	0.00	60	87	23	67	79	55	65	58	49	75	9	60	68	52	69	100	13	73	93	93	12
								OSS/DFI	2.96	1.45	0.08	0.00	0.00	68	89	41	76	87	65	68	81	59	71	35	68	71	64	74	100	22	77	100	100	12
								DOD/DFI	8.02	2.39	0.24	0.02	1.27	80	91	69	80	88	72	72	85	73	78	64	75	78	71	80	100	45	82	100	100	12
246425	4488857	1116.7	0.2	379.6	1416.7	0.3	418.3	SBS/TELE	4.02	1.12	0.08	0.02	0.02	74	88	51	73	79	66	66	71	67	77	43	65	67	63	78	100	41	79	96	96	12
256987	4490778	1127.6	0.4	382.8	1416.6	0.3	419.1	TDRS A	19.00	1.89	0.15	0.00	0.78	63	84	35	65	78	52	53	76	56	73	23	56	63	49	78	100	25	72	96	96	14
249626	4486449	1122.0	-0.8	381.1	1416.8	0.0	418.6	MULT P/L	6.97	1.78	0.29	0.00	0.00	77	89	63	76	83	69	73	71	70	77	47	69	71	66	79	100	26	77	90	90	12
250405	4505048	1124.4	0.2	381.4	1412.3	0.3	418.5	MULT P/L	2.11	0.53	0.09	0.00	0.53	61	83	38	66	75	57	61	57	53	69	32	58	63	53	77	100	27	78	96	96	13
242543	4497865	1119.1	-0.1	381.6	1417.1	0.2	418.0	MULT P/L	3.37	1.96	0.15	0.00	0.00	76	92	58	74	83	64	67	68	68	76	55	62	65	58	76	100	44	67	84	84	12
247254	4501978	1114.5	-0.2	381.4	1411.3	0.3	418.3	S/L 3	0.12	0.09	0.00	0.00	0.00	68	91	33	77	85	68	69	85	59	72	29	64	72	55	73	100	29	68	96	96	11
252733	4514313	1111.5	-0.5	381.8	1412.2	0.2	418.7	(ATO) S/L 2	5.24	1.10	0.17	0.00	0.01	80	94	67	81	88	73	73	86	73	78	66	75	77	72	78	100	44	81	100	100	11
243751	4505113	1108.4	-0.3	380.1	1410.0	0.2	418.0	S/L DI	3.12	1.47	0.21	0.46	2.63	78	88	67	76	85	67	71	84	72	77	66	70	73	67	80	100	58	79	100	100	10
254923	4511561	1111.2	0.9	380.6	1411.0	0.3	418.8	MULTI P/L	9.53	4.14	0.23	0.00	5.23	61	83	26	61	70	51	60	51	53	72	17	54	58	49	76	100	26	79	96	96	11
256235	4522277	1116.3	0.6	380.8	1412.5	0.3	418.8	TRDS D	3.38	1.12	0.09	0.00	0.40	65	85	32	70	81	58	63	62	54	71	11	54	58	49							13
								DOD (S)	4.33	1.61	0.17	0.28	0.28	83	96	71	84	94	73	84	79	72	78	66	73	77	68							10
256063	4519487	1131.3	-0.8	381.3	1413.2	0.2	418.9	LDEF	5.29	1.38	0.12	0.00	0.00	60	84	24	61	69	52	65	54	51	72	16	55	58	51					96	96	11
256511	4521514	1106.5	-0.5	378.1	1412.1	0.2	418.7	ASTRO	20.52	4.35	0.13	0.00	0.76	74	93	48	72	78	65	71	69	66	83	40	60	63	56	74	100	30	65	81	81	11
255758	4519945	1116.7	-0.3	381.7	1412.4	0.2	418.8	GRO	8.28	3.74	0.38	0.85	0.85	69	87	50	74	79	68	71	74	60	71	44	66	68	64	74	100	38	81	96	96	14
251921	4519792	1100.2	-0.1	376.4	1411.4	0.2	418.3	SLS 1	6.48	2.10	0.19	0.13	0.46	78	91	63	79	86	71	78	74	70	77	62	71	74	67	77	100	45	73	90	90	11
243456	4507474	1104.8	-0.1	378.3	1410.6	0.2	417.8	IML-01	2.97	2.60	0.12	0.00	0.19	60	79	32	55	73	37		66	53	69	26	48	60	35							11
233650	4496035	1113.1	-0.3	377.6	1409.8	0.2	417.2	ATLAS	2.75	1.24	0.08	0.00	0.11	66	86	43	67	71	62	64	67	56	70	34	56	60	51							12
257695	4520103	1105.5	-0.5	378.7	1412.0	0.2	418.8	USML-1 EDO	6.14	2.65	0.27	0.02	2.19	80	93	68	80	87	72	72	85	72	78	67	74	77	70							14
244568	4506804	1104.1	-0.4	379.2	1410.5	0.3	417.9	S/L J	1.42	0.70	0.07	0.00	0.60	80	92	70	79	86	72	75	84	73	77	67	73	74	71							10
250370	4514565	1109.5	-0.3	377.5	1411.4	0.1	418.2	LAGEOS-2	6.35	2.95	0.24	0.00	0.00	75	88	59	74	78	69	71	77	66	78	51	58	62	54							12
243897	4506587	1112.4	0.1	380.7	1410.7	0.2	418.0	DOD	4.06	2.18	0.16	0.00	0.00	69	86	41	55	68	42	49	55	61	74	34	49	57	40							13
259412	4522840	1116.2	0.3	381.3	1412.6	0.2	419.0	TDRS F	3.05	1.12	0.07	0.00	0.43	67	83	38	74	79	68	70	72	60	71	31	68	70	66				78	96	60	11
237253	4501920	1109.5	-0.3	379.3	1410.1	0.2	417.5	ATLAS 2	2.02	0.70	0.08	0.00	0.27	75	85	35	68	75	61	70	72	57	72	14	54	59	48	70	96	29	61	83	38	28
255468	4519000	1101.5	-0.7	377.5	1411.5	0.3	418.6	S/L D2	8.09	2.51	0.10	0.06	0.06	73	85	10	72	83	61	66	76	51	72	-4	64	68	60	66	100	13	70	93	46	25
252703	4518566	1112.7	-0.1	383.0	1412.0	0.2	418.7	S'HAB 1/EUR	1.21	0.50	0.02	0.04	0.04	83	94	64	82	87	77	66	76	65	77	47	72	74	69	68	96	31	72	87	57	25
261478	4523125	1116.5	-0.6	381.6	1412.8	0.2	419.2	ACTS/ORF	12.44	2.50	0.16	0.00	1.14	83	97	69	79	87	70	73	72	74	80	64	73	76	69	73	100	37	75	93	57	11
256103	4517138	1103.4	-0.4	378.1	1411.5	0.2	418.6	SLS 2 EDO	3.98	1.25	0.12	0.00	1.27	78	92	64	75	82	67	67	79	70	79	53	69	72	66	71	100	29	77	90	64	11
256579	4519801	1107.4	-0.6	379.2	1412.0	0.2	418.7	USMP 2/EDO	9.70	6.35	0.40	0.00	0.88	68	83	45	58	70	45	49	54	60	72	30	37	43	30	72	100	21	49	76	21	14
246849	4511411	1098.8	-0.5	378.7	1410.7	0.2	418.1	SRL1	2.04	1.65	0.09	0.00	0.06	71	88	52	75	78	71	49	71	62	77	37	63	65	60	69	96	32	63	71	55	12
259299	4523441	1104.8	-0.4	378.8	1412.2	0.2	418.9	IML 2/EDO	3.92	3.07	0.16	0.00	0.11	82	94	72	83	88	77	77	88	74	78	67	75	78	71	73	93	44	73	87	59	14
247403	4510613	1099.3	-0.5	378.5	1410.7	0.2	418.1	SRL 2	10.47	3.00	0.22	0.00	0.19	79	91	66	78	86	70	75	71	73	82	65	70	74	66	77	100	51	65	79	51	10
244238	4508715	1112.0	-0.1	379.4	1411.1	0.2	417.9	ATLAS 3	4.96	1.50	0.19	0.00	1.97	76	87	60	73	81	64	65	81	68	77	56	62	64	60	72	100	44	58	66	50	11
249088	4511586	1110.0	-0.1	380.1	1411.3	0.2	418.3	S/LM S/MM-1	11.33	3.20	0.18	0.00	4.90	79	95	60	83	92	73	73	90	70	79	56	74	77	71	79	100	36	81	100	61	12
256384	4519114	1112.9	-0.1	383.3	1412.3	0.2	419.0	WSF 2	20.47	5.65	0.35	0.05	1.09	82	95	71	81	88	73	75	84	76	82	67	75	77	72	85	100	42				12
257327	4521581	1101.6	-0.5	377.1	1411.8	0.2	418.7	USML-2 EDO	15.75	2.75	0.29	0.00	1.38	81	94	70	78	83	73	77	78	74	81	59	72	76	68	85	100	58	87	100	73	11
248266	4512395	1112.5	-0.5	381.6	1411.5	0.2	418.3	S/MM 2	5.36	2.60	0.17	0.00	0.89	75	87	48	63	77	48		48	66	78	37	56	70	41	78	100	41	80	96	64	12
261491	4526493	1106.2	-0.4	379.9	1412.7	0.2	419.1	TSS, USMP/EDO	1.87	1.75	0.07	0.00	0.00	61	81	32	71	81	61	62	76	48	68	16	63	65	60	73	100	24	85	100	69	12
254753	4519162	1106.5	-0.2	380.5	1411.8	0.1	418.7	S'HAB TEAMS	1.27	1.24	0.04	0.00	0.00	74	88	51	77	87	66	75	66	65	74	45	66	71	60	78	100	45	76	96	55	11
256495	4517477	1102.6	-0.4	377.3	1411.4	0.2	418.6	LMS/EDO	5.77	2.40	0.26	3.37	5.53	78	92	64	80	88	72	73	83	70	77	58	73	76	70	81	100	49	86	100	71	12
261817	4524735	1106.1	-0.5	381.1	1412.4	0.2	419.2	ORFEUS-SPAS 2	0.91	0.36	0.03	0.00	0.35	72	88	46	68	79	57	59	79	62	75	34	59	63	55	74	100	30	74	100	48	11
259967	4521509	1101.6	-0.2	378.0	1411.9	0.1	418.9	MSL 01, EDO	2.47	0.97	0.10	0.00	0.00	71	88	52	66	79	52	52	77	62	73	30	57	61	52	73	100	30	58	72	43	13
249624	4509832	1109.0	0.0	379.7	1411.2	0.2	418.4	S/MM-6, S'HAB	2.98	1.23	0.14	0.00	1.61	73	91	55	73	82	63	79	64	66	79	46	67	70	63	74	100	40	74	91	56	12
260279	4519333	1102.1	-0.3	378.2	1411.6	0.2	419.0	MSL 01, EDO	5.00	1.25	0.24	0.68	1.28	82	93	72	83	90	75	75	90	75	81	66	77	81	72	78	98	52	81	96	66	12
261694	4521900	1104.1	-0.3	378.5	1412.1	0.2	419.1	USMP4, SPTN	3.50	1.50	0.16	0.00	0.00	69	88	48	69	75	63	64	72	59	75	39	58	64	52	76	100	40	78	99	57	11
262270	4523683	1103.9	-0.3	378.0	1412.4	0.2	419.1	NEUROLAB	0.15	0.11	0.01	0.00	0.00	70	86	46	75	82	68	70	82	60	73	39	67	70	63	76	100	30	72	89	54	15
259973	4514649	1109.0	-0.9	381.3	1412.1	0.1	419.2	S/MM-9, S'HAB	0.52	0.25	0.02	0.00	0.05	78	99	55	89	99	79	84	95	67	79	48	74	77	70	72	100	24	73	99	47	12
265855	4520191	1110.3	-0.5	382.2	1412.9	0.2	419.6	S'HAB, HOST	2.74	0.52	0.07	0.00	0.00	80	91	61	73	84	61	61	82	71	84	46	60	68	52	76	100	42	70	97	42	12
264026	4518489	1111.2	-1.1	383.3	1412.8	0.2	419.6	ISS 2A, NODE, PMA 1,2	5.01	2.37	0.11	0.00	0.12	73	88	54	72	82	61	72	70	64	75	46	65	70	59	74	98	37	78	90	66	10
261812	4514231	1112.3	-0.7	381.3	1412.2	0.2	419.3	ISS 2A, 1, S'HAB	2.06	0.91	0.09	0.21	0.24	75	91	55	80	88	72	75	72	66	77	45	73	75	70	74	100	33	75	98	51	14
270387	4524972	1120.6	0.0	380.8	1413.9	0.2	419.8	CHANDRA (AXAF)	6.90	3.06	0.15	0.00	0.00	80	93	68	83	91	75	91	75	73	82	61	74	77	70	75	100	22	63	81	45	11
248159	4506419	1114.3	-0.1	381.3	1411.7	0.2	418.4	HST REPAIR 3A	5.13	1.72	0.14	0.00	2.39	66	81	43	61	70	52	68	61	59	70	34	56	59	52	79	100	36	83	98	68	11
256739	4520450	1104.7	0.2	381.4	1412.1	0.3	418.9	SRTM	6.00	1.76	0.10	0.00	0.00	60	81	34	60	75	45	46	72	51	70	21	48	54	41	74	100	27	68	90	45	12
262528	4519455	1110.8	-0.2	380.6	1412.6	0.2	419.3	ISS 2A.2a, S'HAB	2.23	0.71	0.04	0.00	0.05	72	90	43	73	82	63	73	63	60	73	30	64	66	61	70	100	29	67	81	53	13
262053	4519178	1110.9	0.0	380.6	1412.6	0.2	419.3	ISS 2a.2B, S'HAB	6.88	5.58	0.25	0.01	3.81	81	93	66	82	88	75	77	82	73	79	64	77	79	75	77	98	50	84	97	71	12
265268	4522246	1108.2	-0.5	381.9	1412.7	0.2	419.5	ISS 6A, MPLM, SSRMS	1.92	1.71	0.07	0.00	0.00	68	88	45	59	72	45	45	70	59	73	37	46	54	37	71	97	27	54	78	30	13
262952	4520159	1110.9	0.1	381.8	1412.8	0.3	419.4	ISS 7A, AIRLOCK	2.52	0.60	0.11	0.65	1.38	78	88	66	81	88	73	81	75	72	77	63	75	77	72	77	97	52	76	92	59	13
262477	4518170	1113.0	-0.6	382.3	1412.8	0.2	419.4	ISS 7A.1, MPLM	5.06	1.40	0.13	0.00	0.00	79	90	70	81	90	72	72	84	73	79	66	75	77	72	78	95	52	76	93	58	13
260665	4515646	1113.8	-0.8	381.0	1412.6	0.2	419.2	HST SM-03B	4.21	2.04	0.13	0.00	0.00	64	86	37	56	66	45	46	55	55	72	19	44	54	34	75	99	21	58	72	44	12
264763	4520964	1110.2	-0.8	381.8	1413.0	0.2	419.5	ISS 8A, ITS, SO, MT	1.19	1.08	0.04	0.00	0.03	70	88	54	70	75	64	66	75	61	73	45	55	57	52	73	100	32	61	69	52	12
264047	4518077	1112.2	-0.5	383.0	1412.9	0.2	419.5	ISS-UF2	1.85	0.63	0.05	0.00	0.00	77	93	61	78	84	72	72	82	66	75	54	71	73	68	77	100	24	80	86	74	12
265812	4521314	1109.8	-0.2	383.0	1412.8	0.3	419.7	ISS-9A	0.55	0.31	0.02	0.05	0.05	79	90	66	77	84	70	72	82	72	77	66	73	75	70	78	96	48	82	95	69	11
265081	4526034	1104.7	-0.5	378.5	1412.6	0.2	419.3	FREESTAR	12.78	5.88	0.33	0.00	0.07	57	79	34	58	70	45	46	64	50	70	27	49	59	39	75	100	31	77	99	55	12

MAX on Pad	MAX Launch Day	AVG on Pad	Launch Day																		AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day				Days in Storage Before Shipment	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)		
WIND ED (kts)		WIND DIR.																			PRESSURE (mb)						ET PRODUCTION				-Y Bipod Ramp (H		
23	12	169	156	12	26	42	68	94	75	2	-11	-26	-44	-61	-49	0	-5	-11	-24	-33	-27	1018	1026	1008	1019	1020	1016		Avg. ET-61 thru 115			179	73	73	54		
11	5	42	100	6	18	30	42	52	41	9	22	32	47	62	50	9	20	28	41	54	40	2	4	4	4	4	4		Std Dev ET-61 thru 115			168	2	2	4		
2	1	8	18	1	3	5	8	10	8	2	4	6	9	11	9	2	4	5	8	10	7	0	1	1	1	1	1	+/-	95% C.I. ET-61 thru 115			45	0	0	1		
25	12	166	152	12	24	38	63	91	73	4	-9	-23	-38	-53	-44	0	-4	-10	-26	-37	-29	1018	1026	1007	1018	1020	1016		Avg. ET-61 thru 115			170	73	73	54		
14	6	40	95	6	16	25	39	51	41	9	19	28	44	60	50	9	19	26	38	55	40	2	4	4	4	4	4		Std Dev ET-61 thru 115			172	2	2	5		
3	2	10	23	2	4	6	9	12	10	2	5	7	11	15	12	2	5	6	9	13	10	0	1	1	1	1	1	+/-	95% C.I. ET-61 thru 115			57	1	1	2		
21	12	174	140	13	33	52	86	116	86	4	-15	-34	-65	-93	-73	-3	-6	-9	-23	-35	-21	1017	1025	1007	1018	1020	1016		Avg. ET-61 thru 115			249	74	74	58		
3	4	66	113	10	16	37	36	47	54	10	25	44	45	57	51	12	25	34	50	57	46	3	5	2	5	5	5		Std Dev ET-61 thru 115			325	1	1	0		
2	3	49	83	7	12	27	27	35	40	8	18	32	33	42	37	9	19	25	37	42	34	2	4	1	4	4	3	-	95% C.I. ET-61 thru 115			368	1	1	##		
22	12	174	172	12	30	49	74	93	72	-2	-16	-30	-43	-57	-46	-6	-4	-13	-13	-15	-18	1018	1026	1009	1019	1019	1015		Avg. ET-61 thru 115			304	73	73	53		
4	3	38	140	6	21	43	51	59	50	6	28	49	54	68	56	11	21	32	60	69	50	3	4	3	4	4	4		Std Dev ET-61 thru 115			205	2	2	3		
3	2	26	97	5	15	30	35	41	34	4	19	34	37	47	39	8	14	22	42	48	34	2	3	2	3	3	3	+/-	95% C.I. ET-61 thru 115			180	2	2	3		
21	11	174	159	12	29	46	75	99	78	1	-13	-31	-54	-74	-58	1	-6	-12	-23	-31	-25	1018	1026	1008	1019	1020	1016		Avg. ET-61 thru 115			156	73	73	55		
7	3	46	102	6	21	34	45	54	40	10	26	33	50	62	47	9	21	32	42	50	39	2	4	4	4	4	4		Std Dev ET-61 thru 115			133	2	2	3		
2	1	14	31	2	6	10	14	17	12	3	8	10	15	19	15	3	6	10	13	16	12	1	1	1	1	1	1	+/-	95% C.I. ET-61 thru 115			70	1	1	2		
ATHER DATA																																			
26	12	234	130	6	32	11	40	56	82	3	32	-11	-40	-53	-72	5	4	0	-1	-18	-40	1019	1033	999	1024	1027	1024				06/29/79						
26	11	193	90	5	31	66	76	106	93	5	-29	-66	-73	-102	-89	-1	-12	0	-20	-27	-26	1018	1031	1006	1015	1020	1017				09/28/81						
28	11	152	130	10	15	28	10	11	27	5	-14	-27	-10	-7	-27	9	6	8	1	-9	-5	1015	1021	1006	1019	1018	1015				01/17/82						
18	13	160	90	16	8	30	58	142	78	16	-1	-6	-16	-58	-22	0	-8	-29	-56	-130	-75	1017	1024	1007	1023	1021	1019				05/26/82						
28	12	222	110	13	15	50	93	107	112	11	-15	-49	-92	-107	-111	-7	3	12	-16	4	12	1016	1028	991	1016	1017	1009				09/08/82						
22	12	128	40	1	12	17	39	63	32	1	5	-17	-39	-43	-32	-1	-11	-1	5	-46	-3	1014	1018	1006	1015	1016	1014				07/26/82						
19	9	283	160	0	19	55	104	111	72	0	-13	-54	-97	-106	-72	0	14	-10	-37	-34	-1	1020	1030	1011	1018	1021	1016				03/01/83						
25	11	126	90	3	9	13	21	75	27	2	2	-5	-12	-4	14	2	9	-12	-17	-75	-23	1016	1023	1007	1022	1019	1015				12/15/83						
14	12	145	300	13	41	38	44	62	61	10	6	-7	5	-17	17	-9	-41	-37	-44	-60	-59	1020	1030	1012	1014	1016	1014				03/16/84						
21	8	148	60	10	16	13	17	42	38	10	3	7	12	8	28	2	-16	-11	-12	-41	-25	1017	1023	1007	1018	1021	1016				05/24/84						
14	10	115	190	17	43	70	55	63	56	7	-32	-30	-25	-43	-34	15	29	63	49	46	45	1016	1025	1004	1006	1014	1011				11/16/84						
19	14	213	360	10	9	58	172	221	129	-6	4	-55	-171	-219	-127	-8	-8	18	21	27	20	1021	1032	1008	1021	1027	1020				06/18/85						
22	11	224	248	16	10	56	57	81	81	-14	-3	-44	-40	-69	-80	8	-9	-35	-41	-43	-13	1021	1032	1011	1017	1020	1017				12/10/85						
15	12	132	113	10	21	25	16	9	16	-6	-17	-17	-10	-9	7	-8	12	-18	-12	-1	-14	1018	1024	1010	1012	1017	1015				07/16/85						
19	7	257	300	4	57	97	118	140	137	-3	-48	-83	-105	-137	-121	-3	31	50	54	27	64	1020	1028	1007	1020	1023	1019				08/14/85						
20	12	132	110	21	10	20	93	139	80	21	-8	-20	-89	-138	-77	-1	6	-3	-27	-19	-22	1018	1029	1006	1024	1024	1021				11/08/85						
24	11	130	90	18	8	42	84	127	113	17	-4	-42	-84	-124	-112	-5	7	1	-9	-26	16	1019	1027	1006	1024	1026	1021				01/15/86						
15	8	137	40	6	31	26	3	10	32	-6	-22	-17	1	9	-13	1	-22	-19	-3	-5	-29	1017	1024	1008	1009	1015	1011				07/25/86						
18	9	210	110	10	27	47	81	97	75	10	-27	-41	-74	-50	-35	0	5	-22	-33	-83	-66	1019	1036	1007	1021	1024	1018				05/03/89						
20	14	193	60	23	35	86	157	176	154	18	-10	-51	-81	-93	-93	-15	-34	-70	-135	-149	-123	1018	1026	1008	1015	1014	1011				03/11/87						
25	19	177	160	22	31	25	67	106	60	11	-18	-23	-65	-87	-60	19	25	11	17	61	-7	1014	1020	1008	1013	1013	1009				10/31/88						
19	10	124	40	16	17	6	4	7	19	16	17	-3	-4	5	-3	1	-2	-5	0	5	-19	1019	1022	1015	1019	1021	1017				06/08/87						
19	13	123	60	27	31	24	82	139	69	20	14	16	-65	-122	-55	-18	-28	-18	-49	-67	-42	1016	1029	1008	1027	1016	1013				02/01/90						
18	10	173	200	10	80	91	109	107	77	-10	-23	-63	-35	-73	-35	1	-77	-65	-103	-78	-69	1019	1026	1012	1018	1018	1016				08/08/88						
27	11	164	200	9	8	57	78	87	69	0	-8	-45	-68	-81	-60	9	0	35	38	33	33	1021	1027	1009	1020	1016	1010				02/03/89						
58	54	177	113	16	9	22	33	91	119	14	-2	0	10	13	-72	7	-9	-22	-31	-90	-95	1017	1034	1006	1016	1020	1014				10/30/89						
58	18	216	148	16	20	36	65	73	87	-14	-20	-36	-64	-68	-79	8	-4	-3	-14	-27	-37	1017	1034	993	1018	1017	1013				05/10/90						
113	19	128	138	10	8	24	64	110	52	10	7	20	47	52	49	0	4	-14	-44	-97	-16	1016	1024	1006							10/16/90						
22	7	176	80	6	23	12	28	55	48	-5	-20	-9	-27	-44	-48	-2	10	-7	9	32	-3	1017	1024	1013	1020	1017	1013				03/27/91						
22	7	132	30	10	2	7	23	22	28	-3	0	-2	-18	-19	-28	-10	2	7	-14	-11	3	1017	1021	1009	1015	1021	1017				07/26/90						
24	14	158	270	16	47	82	127	139	120	-12	-32	-57	-85	-108	-93	-11	-34	-59	-94	-87	-76	1019	1027	1003	1015	1025	1022	04/28/89	01/16/92	01/21/92	10/01/93	624				09/17/91	Tue
23	12	177	100	32	21	37	84	133	116	16	21	-18	-53	-99	-73	28	3	-32	-65	-89	-90	1017	1026	1011	1024	1018	1015	06/24/89	04/19/92	04/02/92	11/11/93	571				11/17/91	Sun
39	11	180	130	15	29	31	34	44	28	15	25	25	30	40	28	3	15	18	15	18	-3	1018	1023	1014	1021	1022	1019	09/25/89	07/13/92	07/20/92	01/08/94	544				04/07/92	Tue
13	12	166	80	3	9	23	57	94	120	3	7	21	-20	-71	-86	2	6	9	-53	-62	-83	1016	1021	1011	1016	1014	1011	11/25/89	10/21/92	11/02/92	02/24/94	491				06/30/92	Tue
22	10	116	50	16	5	8	6	13	49	14	5	-8	5	12	5	7	0	-2	2	5	-49	1016	1023	1011	1022	1019	1014	04/15/90	04/16/93	05/17/93	06/08/94	418				01/06/93	Wed
21	9	141	280	13	38	11	30	81	65	9	-14	-4	-8	-13	-23	9	-35	-10	-29	-80	-61	1015	1022	1006	1017	1017	1012	01/20/91	01/21/94	02/17/94	11/10/94	293				09/25/93	Sat
30	13	135	140	11	37	43	64	68	26	-6	-11	-11	-9	-35	-14	10	35	42	63	58	22	1014	1022	1006	1012	1016	1011	09/28/91	06/02/94	07/01/94	03/09/95	280	71	71	60	03/01/94	Tue
22	11	135	340	9	17	15	73	86	41	0	-10	-14	-59	-64	-31	-9	-14	4	-43	-58	-27	1014	1021	1005	1012	1017	1013	01/04/92	08/12/94	10/04/94	04/06/95	237	75	75	54	04/22/94	Fri
30	14	165	330	19	54	72	82	110	76	2	-39	-37	-61	-91	-30	-19	-38	-62	-55	-62	-70	1017	1025	1006	1018	1017	1013	05/17/92	10/14/94	11/17/94	06/01/95	230	76	76	56	06/24/94	Fri
23	6	198	40	9	23	51	97	143	56	8	-23	-31	-64	-30	-36	-4	0	-40	-73	-140	-43	1019	1036	1008	1015	1018	1015	09/10/92	02/10/95	03/29/95	08/10/95	181	75	75	47	10/21/94	Fri
16	8	121	100	5	14	6	76	119	44	-5	7	-5	-75	-119	-43	1	12	2	-15	0	-9	1020	1026	1013	1018	1024	1021	04/05/93	05/25/95	07/17/95	12/07/95	196	71	71	53	02/17/95	Fri
22	15	142	270	6	24	25	19	29	16	2	-22	-15	-17	-27	-9	-6	-11	-20	-8	-10	-13	1017	1022	1011	1015	1018	1015	06/09/93	07/17/95	09/13/95	01/11/96	178	70	70	58	04/22/95	Sat
20	8	148	210	13	43	67	96	129	128	-13	-39	-63	-59	-72	-121	-2	-17	-22	-76	-107	-42	1019	1031	1007	1015	1025	1022	08/18/93	09/05/95	11/17/95	03/21/96	198	73	73	58	06/10/95	Sat
30	10	184	110	11	6	48	68	80	76	10	-5	-44	-33	-56	-69	6	-4	-20	-59	-58	-32	1018	1027	1005	1022	1016	1012	03/25/94	04/22/96	06/17/96	11/07/96	199	71	71	56	01/18/96	Thu
32	9	190	100	5	25	65	100	186	137	1	-19	-53	-80	-138	-100	-5	-16	-37	-60	-124	-93	1016	1025	1002	1016	1020	1017	05/08/94	06/20/96	08/07/96	10/03/96	105	72	72	57	03/15/96	Fri
26	17	156	100	15	20	21	14	25	23	5	-13	-20	-10	8	-2	-14	-16	-8	-10	-24	-23	1016	1021	1010	1015	1020	1018	06/07/94	08/22/96	10/08/96	01/09/97	140	71	71	49	05/17/96	Fri
17	10	230	360	21	66	88	97	166	160	4	-66	-87	-97	-154	-156	-21	8	-15	-3	62	36	1016	1027	1005	1022	1019	1011	10/04/94	06/24/97	06/26/97	07/10/97	16	73	73	54	04/11/97	Fri
21	18	177	180	16	19	32	105	170	116	1	-14	-23	-56	-109	-78	16	-13	-22	-89	-130	-86	1018	1032	1005	1018	1025	1022	06/20/95	11/14/97	11/14/97	12/04/97	20	77	77	55	09/17/97	Wed
32	11	163	270	10	10	39	75	96	92	-4	6	-8	10	12	31	-9	-8	-38	-74	-95	-86	1014	1021	1005	1011	1018	1015	06/28/95	01/09/98	01/12/98	01/29/98	20	72	72	56	11/29/97	Sat
18	8	111	40	11	9	35	35	78	89	4	-9	-29	-33	-78	-86	-10	-2	-19	-13	1	-22	1017	1025	1010	1017	1024	1021	02/16/96	05/27/98	06/04/98	06/12/98	16	73	73	56	04/18/98	Sat
22	9	145	100	5	16	27	37	43	35	3	-10	13	35	28	15	4	12	24	-13	-32	-32	1019	1026	1001	1022	1024	1021	12/12/95	03/27/98	03/30/98	04/02/98	6	72	72	46	02/18/98	Wed
30	13	161	210	3	39	42	83	103	66	-2	-29	-32	-66	-80	-46	-2	-27	-28	-50	-65	-47	1015	1021	1008	1016	1020	1016	09/20/96	10/16/98	11/25/98	12/13/98	58	74	74	58	08/06/98	Thu
22	9	123	130	5	16	24	43	73	39	-5	15	23	34	66	32	-1	-6	-8	-26	-32	-22	1018	1024	1014	1016	1023	1020	05/02/96	07/28/98	07/28/98	08/07/98	10	74	74	59	06/10/98	Wed
16	8	187	320	5	27	48	114	140	117	-3	-27	-43	-112	-117	-105	-4	5	21	24	76	51	1020	1031	1008	1019	1024	1020	01/06/97	11/30/98	11/25/99	01/15/99	46	71	71	60	10/07/98	Wed
25	8	229	230	11	36	81	97	148	100	-6	-30	-51	-51	-43	-56	9	-20	-63	-82	-142	-83	1021	1037	1001	1020	1029	1024	04/28/97	04/19/99	04/19/99	04/23/99	4	74	74	52	02/26/99	Fri
24	10	162	120	5	49	27	55	88	94	3	43	27	3	-27	24	4	24	1	-55	-84	-91	1017	1027	1003	1022	1017	1014	03/26/97	01/29/99	02/01/99	04/02/99	63	75	75	58	12/01/98	Tue
22	9	123	30	8	12	12	18	51	31	7	12	12	13	49	31	-5	1	-3	-12	-13	-2	1016	1022	1009	1015	1013	1010	06/10/97	06/22/99	06/22/99	09/22/99	92	74	74	54	05/10/99	Mon
23	11	163	360	15	25	39	70	64	65	12	-12	-1	-9	1	-26	9	-22	-39	-69	-64	-59	1018	1028	1009	1026	1017	1011	05/29/98	02/07/00	02/10/00	07/13/00	157	73	73	50	12/14/99	Tue
26	26	151	220	8	31	17	9	31	19	-8	-30	-15	5	30	18	-1	-8	-9	-8	-7	-6	1019	1026	1012	1014	1020	1017	07/22/98	05/02/00	05/03/00	10/20/00	171	74	74	54	03/02/00	Thu
26	14	185	230	11	4	6	11	38	7	8	1	0	-9	-38	7	8	-4	-6	-6	-3	-2	1017	1024	1010	1019	1023	1019	08/25/98	07/14/00	07/26/00	11/02/00	111	74	74	56	05/05/00	Fri
19	16	184	90	21	16	65	113	186	129	21	4	-65	-111	-170	-125	-4	15	6	20	76	33	1021	1028	1008	1026	1025	1021	04/26/99	03/06/01	03/08/01	05/03/01	58	72	72	36	01/20/01	Sat
17	17	141	120	23	32	20	29	58	105	-2	-10	-15	-20	-24	-70	23	30	13	-21	-53	-78	1019	1027	1012	1025	1021	1017	11/03/99	06/15/01	06/18/01	08/30/01	76	73	73	53	05/07/01	Mon
20	11	115	110	8	23	0	13	25	33	2	13	0	-11	-19	20	8	19	0	-7	-16	-26	1017	1025	1008	1016	1014	1012	10/05/99	04/27/01	04/30/01	05/17/01	20	70	70	56	03/12/01	Mon
20	10	105	10	13	18	23	50	46	21	9	8	15	20	6	-4	-9	-16	-17	-46	-46	-21	1015	1021	1009	1016	1018	1015	01/24/00	09/24/01	09/26/01	12/14/01	81	74	74	58	07/13/01	Fri
19	9	271	140	6	38	94	122	179	161	5	-37	-90	-112	-158	-148	3	-10	-27	-48	-84	-63	1020	1029	1007	1023	1026	1021	06/11/99	11/01/00	11/02/00	12/14/00	43	73	73	58	09/01/00	Fri

NO PRO

	-Y Bipod Spindle Face (Hand Spray)			-Y Bipod Beneath S.F. (Hand Spray)			+Y Bipod Ramp (Hand Spray)			+Y Bipod Spindle Face (Hand Spray)			+Y Bip		
	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)
	72	74	54	74	74	53	74	74	52	74	74	54	74	74	53
	10	2	5	2	2	7	2	2	7	2	2	6	2	2	7
	3	0	1	1	1	2	0	1	2	1	1	2	0	0	2
	72	74	53	74	74	53	74	74	51	74	74	52	74	74	53
	12	1	6	2	2	7	2	2	7	2	2	7	2	2	7
	4	0	2	1	1	2	1	1	2	1	1	2	1	1	2
	75	75	54	74	74	58	74	74	56	76	76	55	74	74	55
	2	2	4	2	2	3	0	0	4	3	3	3	2	2	5
	2	2	5	2	2	3	##	##	4	3	3	3	2	2	6
	74	74	56	75	75	55	75	75	50	74	74	56	74	74	55
	3	3	5	1	1	10	1	1	12	1	1	2	3	3	7
	2	2	4	1	1	8	1	1	11	1	1	2	2	2	6
	73	73	56	74	74	54	73	73	56	73	73	56	74	74	54
	2	2	4	2	2	5	2	2	4	3	3	5	2	2	6
	1	1	2	1	1	3	1	1	2	1	1	3	1	1	3

PRODUCTION & FOAM APPLICATION DATA FOR EXTERNAL TANK *PRODUCTION &*

DUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60 **NO PRODUCTI**

2300	AP		75	75	50	09/03/91	Tue	2330	AR		75	75	58	09/07/91	Sat	130	AP					09/25/91	Wed	2150	AP		78	78	52	08/29/91	Thu	2300	AR		75	75	50
1125	BR		71	71	46	11/27/01	Tue	1240	BR		77	77	50	12/11/91	Wed	1035	BR					01/15/92	Wed	1500	BR		75	75	36	12/05/91	Thu	1330	BN		76	76	51
2125	AT		75	75	58	03/18/92	Wed	2100	BJ		78	78	48	03/26/92	Thu	1845	BJ					04/14/92	Tue	845	BR		75	75	58	03/18/92	Wed	2100	BJ		78	78	46
640	BR		2	72	57	06/11/02	Tue	1445	BR		74	74	57	06/23/92	Tue	1100	BN					07/02/92	Thu	700	BR		72	72	57	06/11/92	Thu	1435	BR		75	75	54
1110	BR		74	74	56	12/10/92	Thu	1345	BR		74	74	58	12/23/92	Wed	1442	BR					01/21/93	Thu	1510	BR		74	74	56	12/10/92	Thu	1330	BR		74	74	58
2150	BE		75	75	56	09/13/93	Mon	2255	BD		76	76	56	09/16/93	Thu	2330	BD					10/14/93	Thu	1330	AL		74	74	57	09/20/93	Mon	1300	BD		75	75	57
1350	BR		74	74	54	02/10/64	Mon	1100	BN		70	70	56	02/18/94	Fri	1500	BN		72	72	48	03/17/94	Thu	1345	BR		70	70	50	02/11/94	Fri	1030	BN		72	72	55
2115	AT		74	74	58	04/05/94	Tue	300	CY		74	74	64	04/15/94	Fri	100	BJ		76	76	58	05/17/94	Tue	2205	AT		74	74	58	04/05/94	Tue	119	CY		74	74	64
1050	BN		74	74	60	06/15/94	Wed	1000	BE		73	73	60	06/17/94	Fri	950	BD		73	73	57	07/19/94	Tue	1100	BR		73	73	60	06/14/94	Tue	1320	BD		73	73	60
100	AT		72	72	54	10/06/94	Thu	150	BJ		72	72	64	10/08/94	Sat	2250	BJ		75	75	50	11/09/94	Wed	1050	BR		72	72	54	10/06/94	Thu	210	BJ		72	72	64
1250	AP		75	75	36	01/31/95	Tue	1030	AP		70	70	29	02/08/95	Wed	530	AP		73	73	54	03/14/95	Tue	1000	AP		73	73	36	02/01/95	Wed	820	AP		71	71	31
1305	BR		73	73	48	03/03/95	Fri	2120	H		73	73	48	04/14/95	Fri	1700	H		70	70	58	04/22/95	Sat	1330	BR		74	74	52	03/27/95	Mon	2250	H		74	74	52
1050	BU		75	75	53	05/18/95	Thu	115	H		74	74	56	05/30/95	Tue	2100	H		74	74	54	06/16/95	Fri	300	CI		76	76	46	05/19/95	Fri	2240	BY		73	73	59
1110	BN		73	73	42	12/19/96	Thu	1300	BN		68	68	38	01/03/96	Wed	1325	BN		73	73	42	02/02/96	Fri	1400	R	BR	73	73	42	12/19/95	Tue	1300	R2BR		73	73	33
2130			75	75	50	03/06/96	Wed	2145	DF		72	72	44	03/08/96	Fri	2150	DF		73	73	42	04/03/96	Wed	2125	CY		73	73	44	02/29/96	Thu	2030	CY		73	73	46
800	AX		72	71	48	04/30/96	Tue	1400	AX		72	72	49	05/07/96	Tue	1300	DE		71	72	41	05/30/96	Thu	1350	AX		72	71	48	04/30/96	Tue	1400	AX		72	72	49
1410	BR		74	74	54	03/28/97	Fri	1310	BR		74	74	56	04/02/97	Wed	1500	BR		75	75	49	05/01/97	Thu	1415	BR		73	73	52	03/25/97	Tue	1330	BR		74	74	56
230	AB		76	76	56	09/03/97	Wed	255	BD	HD	75	75	52	09/08/97	Mon	420	BD	HD	73	73	42	10/07/97	Tue	230	AB		76	76	56	09/03/97	Wed	250	BD		76	76	54
1120	BN	BR	72	72	50	11/19/97	Wed	1455	BR		74	74	56	11/22/977	/22/9	1500	BN		72	72	48	12/08/97	Mon	1410	BR		72	72	46	11/18/97	Tue	1445	BR		71	71	57
1345	BD		73	73	61	04/02/98	Thu	2030	DF		74	74	44	04/05/98	Sun	2245	DF		74	74	50	04/25/98	Sat	1100	BD		73	73	60	03/31/98	Tue	2030	DF		73	73	53
1330	AO		73	73	42	02/07/98	Sat	200	BE		73	73	48	02/09/98	Mon	1325	AO		72	72	52	02/28/98	Sat	1350	BR		73	73	42	02/06/98	Fri	1355	AO		73	73	39
1200			75	75	58	07/17/98	Fri	1340	BN		75	75	60	07/22/98	Wed	1515	BN		74	84	56	08/11/98	Tue	1320	BD		75	75	58	07/17/98	Fri	1340	BR		75	75	60
245	BD		74	74	56	05/24/98	Sun	1705	AR		73	73	60	05/28/98	Thu	855	AR		75	75	58	06/19/98	Fri	245	BD		74	74	56	05/24/98	Sun	1700	AR		73	73	60
235	CI		74	74	57	09/18/98	Fri	200	M		74	74	54	09/24/98	Thu	200	M		73	73	53	10/10/98	Sat	1430	BD		72	72	60	10/01/98	Thu	1430	BD		72	72	56
1120	BD	HD	72	72	46	02/18/99	Thu	1030	BD	HD	74	74	48	02/21/99	Sun	1050	BD	HD	72	72	51	03/05/99	Fri	950	BD		72	72	46	02/18/99	Thu	1030	R		74	74	48
2200	AT		77	77	56	11/20/98	Fri	1710	J		74	74	52	11/23/98	Mon	2310	J		75	75	59	12/20/98	Sun	2210	BW		77	77	56	11/20/98	Fri	1715	DF		72	72	52
235	BU		74	74	56	04/27/99	Tue	2145	S		75	75	46	04/30/99	Fri	2305	J		74	74	54	05/10/99	Mon	245	BL		74	74	56	04/27/99	Tue	2145	J		75	75	50
2230	BW		71	71	56	11/30/99	Tue	45	T		71	71	56	12/07/99	Tue	500	T		75	75	54	12/17/99	Fri	2310	BW		71	71	56	11/30/99	Tue	45	T		71	71	56
2245	L		74	74	56	02/16/00	Wed	1040	DF		72	72	45	02/21/00	Mon	1330	DF		76	76	48	03/21/00	Tue	2200	AT	BW	76	76	54	02/17/00	Thu	950	DF		75	75	50
2140	F	BD	72	72	55	04/25/00	Tue	1945	A	BD	73	73	56	05/01/00	Mon	2130	D	Q	77	77	55	05/23/00	Tue	2145	F	BD	73	73	57	04/24/00	Mon	1830	A	L	73	73	56
1100	B	BN	74	74	42	01/12/01	Fri	1450	BN		76	76	58	01/15/01	Mon	1050	BN		71	71	56	01/30/01	Tue	1040	BR	BN	74	74	42	01/12/01	Fri	1445	BR	A	76	76	58
830	BR	BN	74	74	56	05/01/01	Tue	1250	BN		74	74	54	05/03/01	Thu	1320	AY		74	74	53	05/13/01	Sun	1030	BN		74	74	56	05/01/01	Tue	1250	BR		74	74	54
2130	BW		74	74	54	02/20/01	Tue	2050	L		75	75	46	02/23/01	Fri	1410	L		75	75	46	03/18/01	Sun	1350	BD	HD	74	74	54	02/20/01	Tue	1820	J		73	73	56
2200	AB		76	76	55	06/15/01	Fri	430	H	C	76	76	55	06/21/01	Thu	530	H	E	74	74	53	07/26/01	Thu	945	BR		76	76	55	06/15/01	Fri	430	H	C	76	76	55
1045	BN	BR	73	73	58	08/21/00	Mon	1510	BN		72	72	60	08/25/00	Fri	1015	BN		74	74	58	09/14/00	Thu	1310	BR	BN	73	73	58	08/21/00	Mon	1510	BR		72	72	60

Aft Half of LH/IT Flange Closeout (Hand Spray)			Fwd Half of LH/IT Flange Closeout (Hand Spray)			Intertank Acreage (Machine Spray)									
Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Substrate Temp at Upper Flange -1(°F)	Substrate Temp at Upper Flange -2(°F)	Substrate Temp at Upper Flange -3(°F)	Substrate Temp at Upper Flange -4(°F)	Substrate Temp at Lower Flange -1(°F)	Substrate Temp at Lower Flange -2(°F)	Substrate Temp at Lower Flange -3(°F)	Substrate Temp at Lower Flange -4(°F)	Cell Temp (°F)	Cell Humidity (%rh)
75	75	48	76	76	48	128	127	128	138	128	126	126	129	103	17
2	3	8	4	4	8	3	###	###	11	4	###	###	2	13	4
1	1	2	1	1	2	1	###	###	3	1	###	###	0	4	1
75	76	47	76	76	47	128	127	128	130	128	126	126	128	102	17
2	2	8	4	5	8	3	###	###	###	4	###	###	1	3	5
1	1	3	1	2	3	1	###	###	###	1	###	###	0	1	2
75	75	51	75	76	50	128	127	128	130	128	126	126	128	102	18
1	1	4	1	0	6	2	###	###	###	2	###	###	1	3	3
1	1	5	2	##	6	2	###	###	###	2	###	###	1	3	4
75	74	50	75	75	51	128	###	###	###	126	###	###	###	100	15
3	2	7	1	1	4	2	###	###	###	1	###	###	###	3	4
3	2	6	1	0	4	2	###	###	###	1	###	###	###	3	4
76	75	48	75	75	52	128	###	###	145	129	###	###	131	108	18
3	4	11	3	2	5	3	###	###	###	5	###	###	1	26	4
2	2	6	1	1	3	2	###	###	###	3	###	###	0	14	2

od Beneath S.F. (Hand Spray)

FOAM APPLICATION DATA FOR EXTERNAL TANK

PRODUCTION & FOAM APPLICATION DA

ON DATA AVAILABLE FOR ET-1 THROUGH ET-60

NO PRODUCTION DATA

09/03/91	Tue	2310	AP					01/04/91	Fri	1300	BB							01/15/91	Tue	1200	AH			126							128	100	14	06/04/90	Mon	1418	DG		
12/12/91	Thu	1030	BR					05/15/91	Wed	1530	AN							05/31/91	Fri	1250	BX			128								98	16	08/17/90	Fri	1921	AS		
03/27/92	Fri	2045	AT		82	76	54	08/01/91	Thu	1700	AN				74	74	46	08/16/91	Fri	2300	AW			132								102	14	10/31/90	Wed	1056	CA		
06/30/92	Tue	1045	BA		74	74	46	12/12/91	Thu	1630	AQ				74	74	34	01/10/92	Fri	1230	BB			125								102	10	12/07/90	Fri	1739		HJ	GC
12/23/92	Wed	1438	BR		77	75	58	08/19/92	Wed	1445	BX				76	75	56	09/01/92	Tue	1130	BB			126								109	22	09/06/91	Fri	1916		EW	GS
09/22/93	Wed	1225	BD		75	77	51	05/25/93	Tue	1100	AN				78	74	54	06/04/93	Fri	1355	AN			130								102	20	07/09/92	Thu	1143		HX	IT
03/02/94	Wed	1330	BN		75	73	57	10/13/93	Wed	1025	BO				77	76	40	10/28/93	Thu	1130	BO			126								102	10	03/11/93	Thu	2313	AU	HW	JB
04/15/94	Fri	110	BJ		73	77	36	01/11/94	Tue	730	BX				73	74	30	01/21/94	Fri	1350	BO			132								104	10	04/05/93	Mon	1915		HI	IT
06/17/94	Fri	940	BD		72	72	38	03/03/94	Thu	1415	BX				72	76	42	03/15/94	Tue	1400	CF			126								98	20	06/16/93	Wed	1149	DJ	GV	II
10/08/94	Sat	2300	BJ		76	77	56	07/12/95	Wed	1100	BO				74	74	52	07/19/94	Tue	1345	BO			130								100	9	02/02/94	Wed	1340	CM	JB	II
02/09/95	Thu	1300	AP		74	75	42	11/01/94	Tue	1550	AE				76	57	52	11/09/94	Wed	1415	BX			125								101	18	05/05/94	Thu	1555	BS	JB	HW
04/14/95	Fri	1700	H		72	77	32	01/03/95	Tue	1435	BX				74	74	52	01/16/95	Mon	2115	CK			125								96	19	06/17/94	Fri	1331		HL	HI
05/26/95	Fri	2315	BY		74	76	34	02/22/95	Wed	1105	BX				73	76	36	03/03/95	Fri	1640	BX			125				125				100	20	09/10/94	Sat	621	CC	FZ	HI
01/09/96	Tue	1335	BR		74	74	52	09/18/95	Mon	1500	BX				73	73	52	09/26/95	Tue	1440	BX			126				131				98	24	04/22/95	Sat	0632	DM	GJ	HI
03/04/96	Mon	2245	CY		73	73	46	11/14/95	Tue	1345	BX				75	75	52	11/28/95	Tue	1340	BX			127				139				100	18	06/10/95	Sat	730		JB	HI
05/07/96	Tue	1300	DE		73	74F	46	01/31/96	Wed	1800	CF				76	78	48	02/08/96	Thu	1345	BX			125				134				99	19	06/23/95	Fri	932		HI	FW
04/02/97	Wed	1500	BR		75	75	56	01/05/97	Sun	1500	BX				95	95	22	01/09/97	Thu	1440	BX			131				129				105	10	12/21/95	Thu	1510		FN	DD
09/09/97	Tue	230	BD		76	78	56	07/26/97	Sat	1230	DA				76	76	54	07/30/97	Wed	1615	BX			126				137				102	16	05/23/96	Thu	1338	BS	HI	FF
12/01/97	Mon	1350	BR		74	74	42	10/22/97	Wed	1450	AH	BX			78	72	59	10/26/97	Sun	820	AH			138				127				92	20	10/02/96	Wed	2219	CA		
04/07/98	Tue	2150	DF		74	73	58	03/05/98	Thu	2230	CK				74	74	36	03/09/98	Mon	810	BX			134				125				102	16	01/22/97	Wed	1638		FZ	HI
02/08/98	Sun	1430	AO		74	77	35	01/11/98	Sun	1225	CD				76	76	46	01/15/98	Thu	1350	BX			135				130				103	8	12/07/96	Sat	1305	CH		
07/22/98	Wed	1515	BR		74	74	46	06/04/98	Thu	1800	DA				80	80	40	06/11/98	Thu	805	CD			125				129				102	20	10/07/97	Tue	1457		GJ	IM
05/28/98	Thu	850	AR		78	78	52	04/16/98	Thu	1410	BO	BX			76	76	46	04/20/98	Mon	1630	BX			126				127				101	22	08/19/97	Tue	655		IH	DD
10/04/98	Sun	1225	BD		75	75	56	08/02/98	Sun	2045	BX				75	75	54	08/07/98	Fri	2045	BX			125				128				102	18	10/31/97	Fri	1521	DM	HI	GD
02/21/99	Sun	1100	R		78	79	42	01/16/99	Sat	1125	BX				78	78	52	01/20/99	Wed	1935	DA			125				125				100	21	09/15/98	Tue	1227		HT	GH
11/22/98	Sun	2030	DF		76	80	46	10/26/98	Mon	1520	DA				80	80	50	10/31/98	Sat	1450	BX			126				126				103	17	12/22/97	Mon	1956		GJ	IM
04/30/99	Fri	100	S		78	78	48	02/06/99	Sat	1900	BX				78	79	52	02/09/99	Tue	2200	BX			125				127				105	18	04/14/98	Tue	127		GJ	IM
12/07/99	Tue	500	T		77	79	47	10/31/99	Sun	1410	AS				76	76	48	11/05/99	Fri	635	BX			125				125				104	19	03/14/99	Sun	1247	AV	IF	FQ
02/23/00	Wed	850	DF		75	75	49	01/05/00	Wed	1415	GF	GF			74	75	48	01/09/00	Sun	830	DA	GF		126				125				105	15	04/21/99	Wed	1441		HM	IF
05/01/00	Mon	2130	D	Q	74	74	52	02/26/00	Sat	940	BX				73	75	50	03/03/00	Fri	1205	DA			125				125				101	18	06/07/99	Mon	1948		FZ	EZ
01/15/01	Mon	1400	BR		76	78	49	12/14/00	Thu	700	DA				80	80	40	12/17/00	Sun	1650	BX			126				127				103	20	12/16/99	Thu	1213		FG	IF
05/04/01	Fri	810	BR		78	78	50	04/11/01	Wed	1400	CK	GF			78	78	52	04/17/01	Tue	550	DA	GF		127				125				105	17	05/15/00	Mon	1527		GJ	IM
02/22/01	Thu	2300	J		73	73	32	01/22/01	Mon	1130	AS	AH	GZ	CK	78	79	44	01/28/01	Sun	630	DA	GF		128				126				102	5	04/04/00	Tue	1606		GJ	IF
06/21/01	Thu	525	H	E	75	75	48	05/15/01	Tue	1400	DA				74	76	46	05/19/01	Sat	845	DA			127	127	128	130	126	126	126	127	101	20	06/29/00	Thu	319		GM	IM
08/25/00	Fri	1015	BR		74	74	54	06/15/00	Thu	1150	BX				76	76	54	06/25/00	Sun	1440	BX			130				129				105	19	08/16/99	Mon	2001	CT	GJ	DD

St380 Substrate Temp (°F)	St800 Substrate Temp (°F)	St840 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	St2058 Substrate Temp (°F)	St1129 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)
147	127	129	102	17	127	140	102	19
8	3	4	5	9	6	10	14	4
2	1	1	1	2	1	3	4	1
147	127	130	102	17	127	139	99	19
8	3	5	6	4	6	11	4	4
3	1	2	2	1	2	4	1	1
150	127	130	99	16	127	150	96	18
6	3	4	6	9	2	8	6	4
7	3	5	7	10	2	9	7	4
146	127	129	101	17	126	137	102	17
11	2	3	3	5	2	7	2	3
10	2	3	3	4	2	6	2	3
149	127	129	102	19	129	141	108	18
9	4	3	4	16	5	9	25	5
5	2	1	2	8	3	5	13	3

LO2 Tank Acreage (Machine Spray) | LH2 Barrel Acreage (Machine Spray)

TA FOR EXTERNAL TANK

AVAILABLE FOR ET-1 THROUGH ET-60

																												S044812A, 2/6/90
																												S044824C, 6/14/91
																												S044848H, 9/1/92
																												S044876C, 8/6/92
																												S044880A, 11/30/92
																												S044897L, 5/23/94
			144	127	129	104	8	09/26/90	Wed	1552	BM					126	154	100	15	09/26/90	Wed	1408	CO					
			154	132	130	99	10	03/08/91	Fri	1058	CJ	HX	IT	JA		126	142	99	19	12/14/90	Fri	1557	AJ	HB	FE	GH	JA	
			141	127	125	94	18	05/09/91	Thu	1549	AE					127	152	99	15	05/07/91	Tue	1430	CB					
HX			137			99	15	08/27/91	Tue	1729		HX	IT	GI		100	106	100	22	08/06/91	Tue	1655		HB	GD	FE		
DX	EC		145	127	133	100	15	05/15/92	Fri	1655		DD	HY	EC	GT	125	132	103	11	04/29/92	Wed	2217	GS	HW	HB	FE	GL	
JB	GS		137	130	126	130	10	03/24/93	Wed	1138		HW	GD	IX	JB	126	131	99	23	12/15/92	Tue	2134		HB	FE	GX	IX	
FF			157	127	135	98	18	07/30/93	Fri	1958	AZ	HW	GD			132	150	105	17	07/13/93	Tue	1345	BX	HX	FE	IE	GT	
JB	HO		157	127	128	102	15	10/05/93	Tue	1559		II	HL	HY	GS	125	153	103	19	09/23/93	Thu	1435		HX	DX	FE	GS	
IT	EC		139	125	130	101	13	01/10/94	Mon	1522	GS	JB	II	HW	FQ	126	151	98	20	11/19/93	Fri	1520	DK	HX	FE	HY		
FF	HO		154	126	126	104	17	05/13/94	Fri	1508	BS	II	GD	HO	HW	125	134	102	11	03/12/94	Sat	1520						
FQ	HO		146	137	131	92	18	08/06/94	Sat	1721	CT	IM	FF	HO	GK	125	139	101	24	08/05/94	Fri	1603	DO					
FQ	GS		139	126	129	100	14	09/28/94	Wed	1226		IM	FQ	GT		126	139	102	20	09/16/94	Fri	1515		HQ	FE	ET		
FQ	GT		147	125	126	97	12	12/02/94	Fri	1323	V	HW	GD	HO		128	135	105	19	11/03/94	Thu	1827	AG	FE	GB	DX	ET	
GD			153	127	133	100	18	07/21/95	Fri	1915	CT	DD	FW	FZ		126	127	101	22	07/07/95	Fri	1457	DB	DZ	II	HY		
FW	GV		145	126	130	100	23	09/12/95	Tue	0410 .		FZ	DD	GD	HO	125	131	88	25	09/23/95	Sat	1703		DZ	II	GE	HO	
ET			137	126	130	104	16	11/14/95	Tue	1148		HW	GD	HO		127	133	99	19	11/17/95	Fri	2250		DZ	HB	GE	HO	
FO	ET		134			95	22	06/10/96	Mon	1553	V	FZ	DD	GD	IX	125	127	94	14	11/13/96	Wed	600		DZ	GR	FS	HO	S062127, 1/13/00
HO			150	125	127	105	8	02/07/97	Fri	1148	CN	FC	HI	GH	BS	129	141	95	24	06/03/97	Tue	2232	GB	EE	II	HZ	HP	
			142	130	132	102	19	08/18/97	Mon	1202	DI					130	146	100F	21	09/19/97	Fri	1724		FE	HX	FD	HT	
FO	IX		140	126	126	104	18	02/04/98	Wed	638		FB	HX	GH	GW	126	131	99	20	01/29/98	Thu	1210		DZ	HX	FQ	EI	
			154	127	128	102	19	12/04/97	Thu	1511	DM					128	147	99	22	12/04/97	Thu	2125		DZ	IF	IK	GW	
GD	HP		126	130	149	100	20	04/26/98	Sun	657		GJ	DD	JD	EI	126	148	94	23	05/01/98	Fri	1315		DZ	FL	HY	EI	
DX	HK		158	131	132	103	9	03/13/98	Fri	1317		HR	IM	FW	EI	125	150	102	12	03/03/98	Tue	1932		DZ	HH	FW	GW	
FF			156	125	132	103	19	06/28/98	Sun	1313	BC	GJ	IF	GH	GW	127	153	99	23	06/22/98	Mon	1459	AF	EE	DD	HY	GW	
GY			157	128	142	99	20	12/02/98	Wed	359		GJ	FZ	JD	HF	126	134	98	21	12/03/98	Thu	1226		DZ	II	HY	EY	
FQ	EI		143	125	125	103	18	09/17/98	Thu	145	CA	HN	IF	JD	EI	127	131	101	21	09/19/03	Fri	1353	DJ	DZ	II	HY	GW	
FW	EI		141	125	128	104	17	10/14/98	Wed	1345		GJ	IM	GD	HQ	126	145	102	19	11/24/98	Tue	1830		DZ	II	HY	EY	
EI	BT		144	125	127	100	17	09/12/99	Sun	630	CN	GJ	EU	EZ	EY	142	125	105	18	10/07/99	Thu	1708	CS	DZ	DD	HY	EY	
EZ	EI		150	128	128	101	21	10/03/99	Sun	811		FY	HX	HM	EY	126	143	106	16	12/02/99	Thu	536		DZ	HH	GW		
EY	EN		152	130	125	104	20	12/04/99	Sat	314	N	GJ	IF	GD	GW	126	143	104	19	01/22/00	Sat	1201		EV	HH	DX	EI	
GD	EI		154	128	125	105	19	08/11/00	Fri	520		HR	FL	HM	IY	128	143	90	23	11/24/00	Fri	2228		EE	II	HY	EI	
EZ			151	125	129	105	16	10/30/00	Mon	1451		HR	DD	JD	EI	143	126	94	20	03/14/01	Wed	1126		IB	II	GD	FF	
GD	EI		146	125	127	105	15	09/07/00	Thu	1624		GJ	IG	EZ	EI	129	143	100	18	12/13/00	Wed	2252		IB	DD	HY	EI	
GE	EI		156	130	135	101	15	12/22/00	Fri	1457		IF	FW	EI		129	156	89	22	04/20/01	Fri	1538		FR	DD	HY	EI	S06215, 12/19/02
GA	EY		150	125	127	92	26	03/04/00	Sat	729	DN	IF	IM	EZ	EI	127	141	99	17	04/26/00	Wed	1851	CW	DZ	DD	HY	EI	

MISSION DATA

	STS		OV		ET		LAUNCH& LAND					TIMES				TILE Damage				IMAGERY			FOAM LOSS													RAINFALL			
#	STS	STS aka	OV	OV flt #	ET	ET wt.	Date	Pad	MLP	Day or Night	Landing Location	ET Age @ Launch (days)	ET Exposure (days)	Tanlking Time (hrs)	Mission Time (hrs)	LS >1	LS Tot	OV> 1	OV Tot	Camera	-Y bipod visible?	+Y bipod visible	FOAM LOSS NOTED?	Bipod	NEAR Bipod?	Flange	Intertank	Thrust Panel	Other	Cause	Corrective Action	SRB Mate/Demate	Orbiter Mate/Demate	Rollout/Rollback	TOTAL on Pad	1-Day MAX	AVG Daily	Launch Day
7	7		99	2	6	H	06/18/83	A	1	D	E	327	24	3.00	146	41	153	48	253	35	Y	Y	Y	-Y		Y	Y	N	Y			03/02/83	05/24/83	05/26/83	6.97	1.78	0.29	0.00
33	32R		102	9	32	L	01/09/90	A	3	D	E	1609	43	3.00	261	13	111	15	120	16,35	Y	Y	Y	-Y	Y	Y	Y	N	Y	Y	Y	11/01/89	11/21/89	11/28/89	5.29	1.38	0.12	0.00
48	50		102	12	50	L	06/25/92	A	3	D	K	1333	23	3.00	332	28	141	45	184	16,35,H	Y	Y	Y	-Y		Y	N	N	Y	Y	Y	04/09/92	05/29/92	06/03/92	6.14	2.65	0.27	0.02
51	52		102	13	55	L	10/22/92	B	3	D	K	994	27	2.50	237	6	152	16	290	16,35,H	Y	Y	Y	-Y		Y	Y	N	Y			09/09/92	09/20/92	09/26/92	6.35	2.95	0.24	0.00
61	62		102	16	62	L	03/04/94	B	1	D	K	773	23	3.00	335	7	36	16	97	16,35,H	Y	Y	Y	-Y	Y	Y	Y	N	Y			01/20/94	02/03/94	02/10/94	9.70	6.35	0.40	0.00
111	112		104	26	115	S	10/07/02	B	3	D	K	376	28	3.00	250	22	81	25	106	16,35	Y	Y	Y	-Y	Y	Y	N	Y	Y	Y		06/25/02	09/04/02	09/10/02	0.55	0.31	0.02	0.05
113	107		102	28	93	L	01/16/03	A	1	D		805	39	3.00	382					H	N	N	Y	-Y		?	?	?	?			11/04/02	11/20/02	12/09/02	12.78	5.88	0.33	0.00
							Average of all ETs					688	38	3	217	23	101	31	143													Average of all ETs			5.45	1.92	0.14	0.11
							Std Dev of all ETs					543	22	0	84	34	83	40	91													Std Dev of all ETs			4.57	1.39	0.09	0.39
							+/- 95% C.I. for all ETs					100	4	0	16	6	15	7	17													+/- 95% C.I. for all ETs			0.84	0.26	0.02	0.07
							Average of all ETs w/Bipod Foam Loss					888	30	3	278	20	112	28	175													Average of all ETs w/Bipod Foam Loss			6.83	3.04	0.24	0.01
							Std Dev of all ETs w/Bipod Foam Loss					470	8	0	79	14	47	15	82													Std Dev of all ETs w/Bipod Foam Loss			3.79	2.27	0.13	0.02
							+/- 95% C.I. for all ETs w/Bipod Foam Loss					348	6	0	58	10	35	11	60													+/- 95% C.I. for all ETs w/Bipod Foam Loss			2.81	1.68	0.10	0.01

WEATHER DATA

	TEMPERATURE (F)								DEWPOINT (F)						RELATIVE HUMDITY (%rh)						WIND SPEED (kts)			WIND DIR.		PRESSURE (mb)						ET PRODUCTION							
TOTAL 5 Day Pre-Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	At Tanking Start	At Launch	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	AVG on Pad	MAX on Pad	MAX Launch Day	AVG on Pad	Launch Day	AVG on Pad	MAX on Pad	MIN on Pad	AVG Launch Day	MAX Launch Day	MIN Launch Day	Start Date	Completion Date	ET DD-250	Ship Date	Days in Storage Before Shipment	Substrate Temp (°F)	Cell Temp (°F)
0.00	77	89	63	76	83	69	73	71	70	77	47	69	71	66	79	100	26	77	90	90	12	22	12	128	40	###	1018	1006	1015	1016	1014			07/26/82				
0.00	60	84	24	61	69	52	65	54	51	72	16	55	58	51					96	96	11	19	7	257	300	###	1028	1007	1020	1023	1019			08/14/85				
2.19	80	93	68	80	87	72	72	85	72	78	67	74	77	70							14	25	19	177	160	###	1020	1008	1013	1013	1009			10/31/88				
0.00	75	88	59	74	78	69	71	77	66	78	51	58	62	54							12	19	13	123	60	###	1029	1008	1027	1016	1013			02/01/90				
0.88	68	83	45	58	70	45	49	54	60	72	30	37	43	30	72	100	21	49	76	21	14	24	14	158	270	###	1027	1003	1015	1025	1022	####	01/16/92	01/21/92	10/01/93	624		
0.05	79	90	66	77	84	70	72	82	72	77	66	73	75	70	78	96	48	82	95	69	11	20	10	105	10	###	1021	1009	1016	1018	1015	####	09/24/01	09/26/01	12/14/01	81	74	74
0.07	57	79	34	58	70	45	46	64	50	70	27	49	59	39	75	100	31	77	99	55	12	19	9	271	140	###	1029	1007	1023	1026	1021	####	11/01/00	11/02/00	12/14/00	43	73	73
0.73	72	89	51	71	80	63	68	71	64	75	42	62	67	57	76	99	35	73	91	69	12	23	12	169	156	###	1026	1008	1019	1020	1016		**Avg. ET-61 thru 115**			179	73	73
1.10	8	5	15	10	8	11	11	12	8	4	19	12	10	13	4	2	11	10	10	21	3	11	5	42	100	2	4	4	4	4	4		**Std Dev ET-61 thru 115**			168	2	2
0.20	1	1	3	2	2	2	2	2	2	1	3	2	2	2	1	0	2	2	2	4	0	2	1	8	18	0	1	1	1	1	1		**+/- 95% C.I. ET-61 thru 115**			45	0	0
0.46	71	87	51	69	77	60	64	70	63	75	43	59	64	54	76	99	32	71	91	66	12	21	12	174	140	###	1025	1007	1018	1020	1016		**Avg. ET-61 thru 115**			249	74	74
0.83	9	5	17	10	8	12	12	13	10	3	20	14	12	16	3	2	12	15	9	30	1	3	4	66	113	3	5	2	5	5	5		**Std Dev ET-61 thru 115**			325	1	1
0.61	7	4	13	7	6	9	9	9	7	3	15	10	9	12	2	1	9	11	7	22	1	2	3	49	83	2	4	1	4	4	3		**+/- 95% C.I. ET-61 thru 115**			368	1	1

NO

NO PRODUCTIO

-Y Bipod Ramp (Hand Spray)						-Y Bipod Spindle Face (Hand Spray)								-Y Bipod Beneath S.F. (Hand Spray)					
Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time
PRODUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60																			NO PR
	09/17/91	Tue	2300	AP		75	75	50	09/03/91	Tue	2330	AR		75	75	58	09/07/91	Sat	130
58	07/13/01	Fri	2200	AB		76	76	55	06/15/01	Fri	430	H	C	76	76	55	06/21/01	Thu	530
58	09/01/00	Fri	1045	BN	BR	73	73	58	08/21/00	Mon	1510	BN		72	72	60	08/25/00	Fri	1015
54						72	74	54						74	74	53			
4						10	2	5						2	2	7			
1						3	0	1						1	1	2			
58						75	75	54						74	74	58			
0						2	2	4						2	2	3			
#NUM!						2	2	5						2	2	3			

PRODUCTION & FOAM APPLICATION DATA FOR EXTERNAL

		+Y Bipod Ramp (Hand Spray)								+Y Bipod Spindle Face (Hand Spray)									
Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)
ODUCTION DATA AVAILABLE FOR ET-1 THROUGH ET-60																	NO PRODUCT		
AP					09/25/91	Wed	2150	AP		78	78	52	08/29/91	Thu	2300	AR		75	75
H	E	74	74	53	07/26/01	Thu	945	BR		76	76	55	06/15/01	Fri	430	H	C	76	76
BN		74	74	58	09/14/00	Thu	1310	BR	BN	73	73	58	08/21/00	Mon	1510	BR		72	72
		74	74	52						74	74	54						74	74
		2	2	7						2	2	6						2	2
		0	1	2						1	1	2						0	0
		74	74	56						76	76	55						74	74
		0	0	4						3	3	3						2	2
		#NUM!	#NUM!	4						3	3	3						2	2

TANK PRODUCTION & FOAM APPLICATION DATA FOR EXTERNAL TANK

+Y Bipod Beneath S.F. (Hand Spray)						Aft Half of LH/IT Flange Closeout (Hand Spray)										Fwd Half of LH/IT			
Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date
ION DATA AVAILABLE FOR ET-1 THROUGH ET-60																NO PRODUCTION DATA AVA			
50	09/03/91	Tue	2310	AP					01/04/91	Fri	1300	BB							01/15/91
55	06/21/01	Thu	525	H	E	75	75	48	05/15/01	Tue	1400	DA				74	76	46	05/19/01
60	08/25/00	Fri	1015	BR		74	74	54	06/15/00	Thu	1150	BX				76	76	54	06/25/00
53						75	75	48								76	76	48	
7						2	3	8								4	4	8	
2						1	1	2								1	1	2	
55						75	75	51								75	76	50	
5						1	1	4								1	0	6	
6						1	1	5								2	#NUM!	6	

PRODUCTION & FOAM APPLICATION DATA FOR EXTERNAL TANK

Flange Closeout (Hand Spray)					Intertank Acreage (Machine Spray)														
Complete Day	Complete Time	Personnel	Personnel	Personnel	Substrate Temp at Upper Flange -1 (°F)	Substrate Temp at Upper Flange -2 (°F)	Substrate Temp at Upper Flange -3 (°F)	Substrate Temp at Upper Flange -4 (°F)	Substrate Temp at Lower Flange -1 (°F)	Substrate Temp at Lower Flange -2 (°F)	Substrate Temp at Lower Flange -3 (°F)	Substrate Temp at Lower Flange -4 (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel
ILABLE FOR ET-1 THROUGH ET-60															NO PRODUCTION DATA AVAILAE				
Tue	1200	AH			126							128	100	14	06/04/90	Mon	1418	DG	
Sat	845	DA			127	127	128	130	126	126	126	127	101	20	06/29/00	Thu	319		GM
Sun	1440	BX			130				129				105	19	08/16/99	Mon	2001	CT	GJ
					128	127	128	138	128	126	126	129	103	17					
					3	#DIV/0!	#DIV/0!	11	4	#DIV/0!	#DIV/0!	2	13	4					
					1	#DIV/0!	#DIV/0!	3	1	#DIV/0!	#DIV/0!	0	4	1					
					128	127	128	130	128	126	126	128	102	18					
					2	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!	#DIV/0!	1	3	3					
					2	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!	#DIV/0!	1	3	4					

				LO2 Tank Acreage (Machine Spray)															
Personnel	Personnel	Personnel	Personnel	St380 Substrate Temp (°F)	St800 Substrate Temp (°F)	St840 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	St2058 Substrate Temp (°F)	St1129 Substrate Temp (°F)	Cell Temp (°F)
BLE FOR ET-1 THROUGH ET-60																NO PRODUCTION DATA AVAILABLE FO			
				144	127	129	104	8	09/26/90	Wed	1552	BM					126	154	100
IM	GE	EI		156	130	135	101	15	12/22/00	Fri	1457		IF	FW	EI		129	156	89
DD	GA	EY		150	125	127	92	26	03/04/00	Sat	729	DN	IF	IM	EZ	EI	127	141	98.5
				147	127	129	102	17									127	140	102
				8	3	4	5	9									6	10	14
				2	1	1	1	2									1	3	4
				150	127	130	99	16									127	150	96
				6	3	4	6	9									2	8	6
				7	3	5	7	10									2	9	7

LH2 Barrel Acreage (Machine Spray)

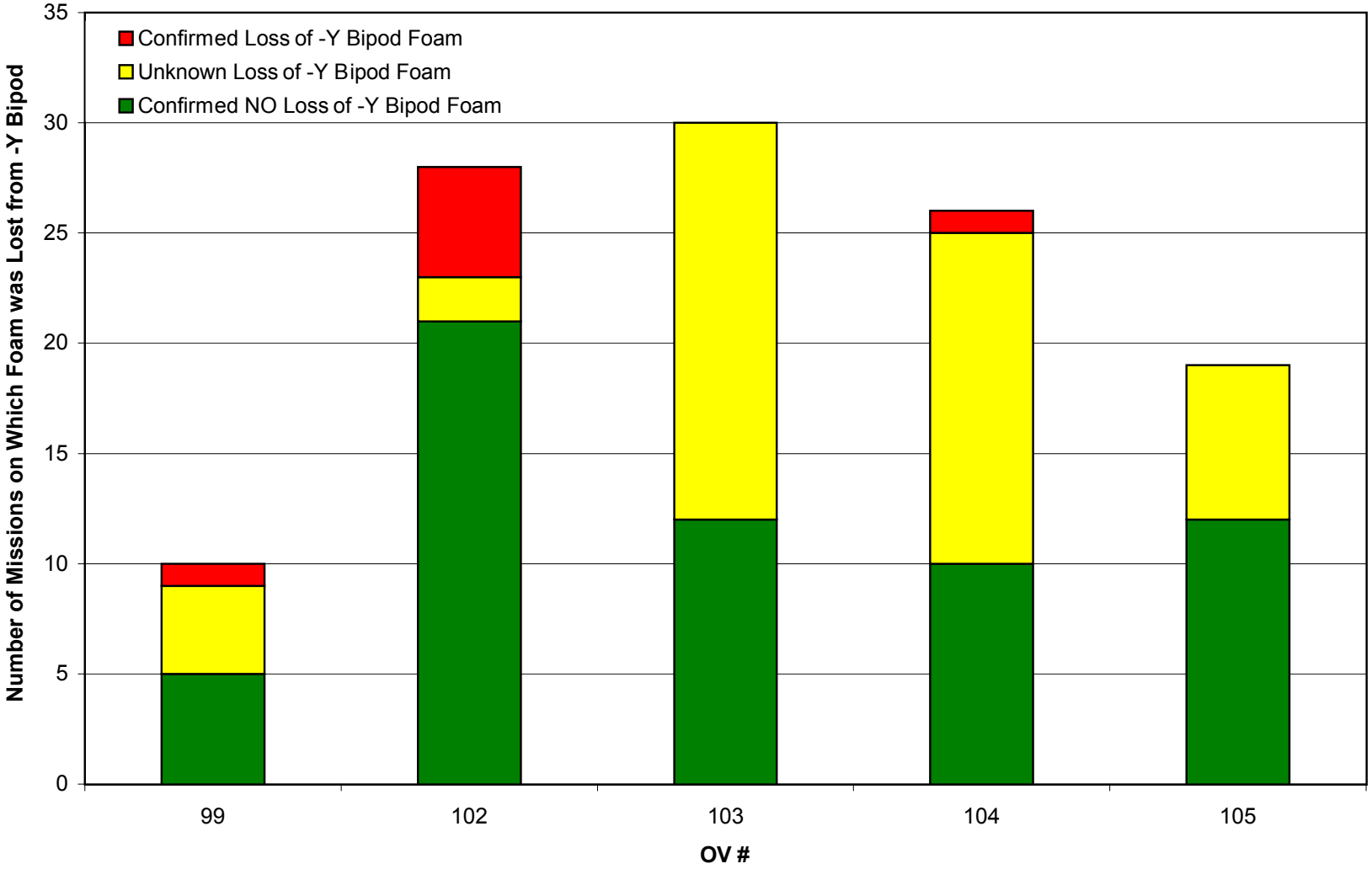
Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	PAYLOAD (S=secret)	PRCB # (PCBD ...) & Date
R ET-1 THROUGH ET-60									MULT P/L	
									LDEF	S044812A, 2/6/90
									USML-1 EDO	S044876C, 8/6/92
									LAGEOS-2	
15	09/26/90	Wed	1408	CO					USMP 2/EDO	
22	04/20/01	Fri	1538		FR	DD	HY	EI	ISS-9A	S06215, 12/19/02
17	04/26/00	Wed	1851	CW	DZ	DD	HY	EI	FREESTAR	
19										
4										
1										
18										
4										
4										

MISSION DATA

	STS		OV		ET		IMAGERY			FOAM LOSS								
#	STS	STS aka	OV	OV flt #	ET	ET wt.	Camera	-Y bipod visible?	+Y bipod visible	FOAM LOSS NOTED?	Bipod	NEAR Bipod?	Flange	Intertank	Thrust Panel	Other	Cause	Corrective Action
6	6		99	1	8	L	35	Y	Y	Y	N		Y	N	N	Y		
7	7		99	2	6	H	35	Y	Y	Y	-Y		Y	Y	N	Y		
8	8		99	3	9	L		N	N	?	?		?	?	?	?		
10	11	41B	99	4	10	L	35	Y	Y	Y	N	Y	Y	Y	N	Y		
11	13	41C	99	5	12	L		N	N	?	?		?	?	?	?		
13	17	41G	99	6	15	L	35	Y	Y	Y	N		N	Y	N	Y		
17	24	51B	99	7	17	L	35	Y	N	Y	?		N	Y	N	Y		
19	26	51F	99	8	19	L	35	Y	Y	Y	N		Y	Y	N	Y		
22	30	61A	99	9	24	L	35	Y	Y	Y	N	Y	Y	N	N	Y		
25	33	51L	99	10	26	L		N	N	?	?		?	?	?	?		
1	1		102	1	1	H	16	Y	Y	Y	N		N	N	N	Y		
2	2		102	2	2	H	Y	Y	Y	N	N		N	N	N	N		
3	3		102	3	3	H	Y	Y	Y	Y	N		Y	Y	N	Y		
4	4		102	4	4	H	Y	Y	Y	Y	N		Y	Y	N	Y		
5	5		102	5	5	H	Y	Y	Y	Y	N	Y	Y	Y	N	Y		
9	9		102	6	11	L		N	N	?	?		?	?	?	?		
24	32	61C	102	7	30	L	16	Y	Y	Y	N		N	Y	N	Y		
30	28R		102	8	31	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		Y
33	32R		102	9	32	L	16,35	Y	Y	Y	-Y	Y	Y	Y	N	Y	Y	Y
38	35		102	10	35	L	H	Y	Y	Y	N		Y	N	N	Y	Y	Y
41	40		102	11	41	L	H,16?	Y	Y	Y	N		Y	N	N	N		
48	50		102	12	50	L	16,35,H	Y	Y	Y	-Y		Y	N	N	Y	Y	Y
51	52		102	13	55	L	16,35,H	Y	Y	Y	-Y		Y	Y	N	Y		
55	55		102	14	56	L	H,16?	Y	Y	Y	N	Y	Y	N	N	Y		
58	58		102	15	57	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	N	
61	62		102	16	62	L	16,35,H	Y	Y	Y	-Y	Y	Y	Y	N	Y		
63	65		102	17	64	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
72	73		102	18	73	L	16,35,H	Y	Y	Y	N		N	N	N	Y		
75	75		102	19	76	L	H,16,35	Y	Y	Y	N		Y	N	N	Y		
78	78		102	20	79	L	16,35,H	Y	Y	Y	N	Y	Y	N	N	N		
80	80		102	21	80	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
83	83		102	22	84	L	16,H	Y	Y	Y	N	Y	Y	N	N	Y		
85	94		102	23	86	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
88	87		102	24	89	L	16,35,H	Y	Y	Y	N		Y	N	Y	N	Y	Y
90	90		102	25	91	L	16,35,H	Y	Y	Y	N		Y	N	Y	N		
95	93		102	26	99	S		N	N	Y	?		?	?	Y	?		
108	109		102	27	112	S	16,35,H	Y	Y	Y	N	Y	Y	Y?	N	N		
113	107		102	28	93	L	H	N	N	Y	-Y		?	?	?	?		
12	14	41D	103	1	13	L		N	N	?	?		?	?	?	?		
14	19	51A	103	2	16	L		N	N	?	?		?	?	?	?		
15	20	51C	103	3	14	L		N	N	?	?		?	?	?	?		
16	23	51D	103	4	18	L		N	N	?	?		?	?	?	?		
18	25	51G	103	5	20	L		N	N	?	?		?	?	?	?		
20	27	51I	103	6	21	L		N	N	?	?		?	?	?	?		
26	26R		103	7	28	L	H	Y	Y	N	N		N	N	N	N		
28	29R		103	8	36	L	H	Y	Y	Y	N	Y	Y	N	Y	Y		
32	33R		103	9	38	L		N	N	?	?		?	?	?	?		
35	31R		103	10	34	L		N	N	?	?		?	?	?	?		
36	41		103	11	39	L	H	N	N	?	?		N	N	N	N		
40	39		103	12	46	L	H	N	N	?	?		N	N	N	N		
43	48		103	13	42	L		N	N	?	?		?	?	?	?		
45	42		103	14	52	L	H	Y	N	Y	?	Y	N	Y	N	N	N	N
52	53		103	15	49	L	H	Y	Y	Y	N	Y	Y	N	N	N		
54	56		103	16	54	L	H	Y	Y	Y	N		N	Y	N	N	N	Y
57	51		103	17	59	L	H	Y	Y	Y	N	Y	Y	N	N	Y		
60	60		103	18	61	L	H	Y	Y	N	N		N	N	N	N		
64	64		103	19	66	L		N	N	?	?		?	?	?	?		
67	63		103	20	68	L		N	N	?	?		?	?	?	?		
70	70		103	21	71	L	H	Y	Y	N	N		N	N	N	N		
82	82		103	22	81	L	H	Y	Y	N	N		N	N	N	N		
86	85		103	23	87	L	H	Y	N	?	?		N	N	N	N		
91	91		103	24	96	S	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	N		
92	95		103	25	98	S	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y		
94	96		103	26	100	S	H	Y	Y	Y	N		Y	Y	Y	N		
96	103		103	27	101	S		N	N	Y	?		?	?	Y	?	Y	N
100	92		103	28	104	S		N	N	?	?		?	?	?	?		
103	102		103	29	107	S	35,H	N	N	?	?		N	N	N	N		
106	105		103	30	110	S	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y		
21	28	51J	104	1	25	L		N	N	?	?		?	?	?	?		
23	31	61B	104	2	22	L		N	N	?	?		?	?	?	?		
27	27R		104	3	23	L		N	N	?	?		?	?	?	?		
29	30R		104	4	29	L		N	N	?	?		?	?	?	?		
31	34		104	5	27	L		Y	N	?	?		?	?	?	?		
34	36		104	6	33	L		N	N	?	?		?	?	?	?		
37	38		104	7	40	L		N	N	?	?		?	?	?	?		
39	37		104	8	37	L	H	N	N	Y	?		Y	N	N	N		
42	43		104	9	47	L	H	Y	N	?	?		?	?	?	?	Y	
44	44		104	10	53	L		N	N	?	?		?	?	?	?		
46	45		104	11	44	L	H	Y	N	Y	?	Y	Y	N	N	N		
49	46		104	12	48	L	H	Y	Y	N	N		N	N	N	N		
66	66		104	13	67	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
69	71		104	14	70	L	16	Y	Y	Y	N	Y	Y	Y	N	Y		
73	74		104	15	74	L	16,35	Y	Y	Y	N		Y	N	N	N		
76	76		104	16	77	L		N	N	?	?		?	?	?	?		
79	79		104	17	82	L	H	Y	Y	N	N		N	N	N	N		
81	81		104	18	83	L	H	N	N	?	?		Y	N	N	N		
84	84		104	19	85	L	H	Y	Y	Y	N	Y	Y	Y	N	N		
87	86		104	20	88	L		N	N	?	?		?	?	?	?		
98	101		104	21	102	S	16,35,H	Y	Y	Y	N	Y	Y	N	Y	Y		
99	106		104	22	103	S	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
102	98		104	23	106	S		N	N	?	?		?	?	?	?		
105	104		104	24	109	S	H, 16?	Y	Y	Y	N	Y	Y	N	N	N		
109	110		104	25	114	S	16,35,H	Y	Y	Y	N	Y	Y	N	N	N		
111	112		104	26	115	S	16,35	Y	Y	Y	-Y	Y	Y	N	Y	Y	Y	
47	49		105	1	43	L		N	N	?	?		?	?	?	?		
50	47		105	2	45	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N
53	54		105	3	51	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
56	57		105	4	58	L	16,35,H	Y	Y	Y	N	Y	Y	Y	Y	Y		
59	61		105	5	60	L	H	N	N	?	?		?	?	?	?		
62	59		105	6	63	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
65	68		105	7	65	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
68	67		105	8	69	L	H	Y	Y	N	N		N	N	N	N		
71	69		105	9	72	L	16	Y	Y	Y	N		N	N	N	Y		
74	72		105	10	75	L	H,16	N	N	?	?		N	N	N	N		
77	77		105	11	78	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
89	89		105	12	90	L		N	N	?	?		?	?	?	?		
93	88		105	13	97	S	H	Y	Y	Y	N		Y	N	Y	Y		
97	99		105	14	92	L	16,35,H	Y	Y	Y	N	Y	Y	Y	N	Y		
101	97		105	15	105	S		N	N	?	?		?	?	?	?		
104	100		105	16	108	S	16,35,H	Y	Y	Y	N	Y	Y	N	N	Y		
107	108		105	17	111	S		N	N	?	?		?	?	?	?		
110	111		105	18	113	S	16,35,H	Y	Y	Y	N	Y	Y	Y	N	N		
112	113		105	19	116	S		N	N	?	?		?	?	?	?		
							79	72	66	65	7	39	55	34	12	45		
										Y	Y		Y	Y	Y	Y	=	Y
										8	60		21	41	66	31		
										N	N		N	N	N	N	=	N
										40	46		37	37	35	37		
										?	?		?	?	?	?	=	?

Camera
-Y bipod visible?
+Y bipod visible
FOAM LOSS NOTED?
Bipod
NEAR Bipod?
Flange
Intertank
Thrust Panel
Other

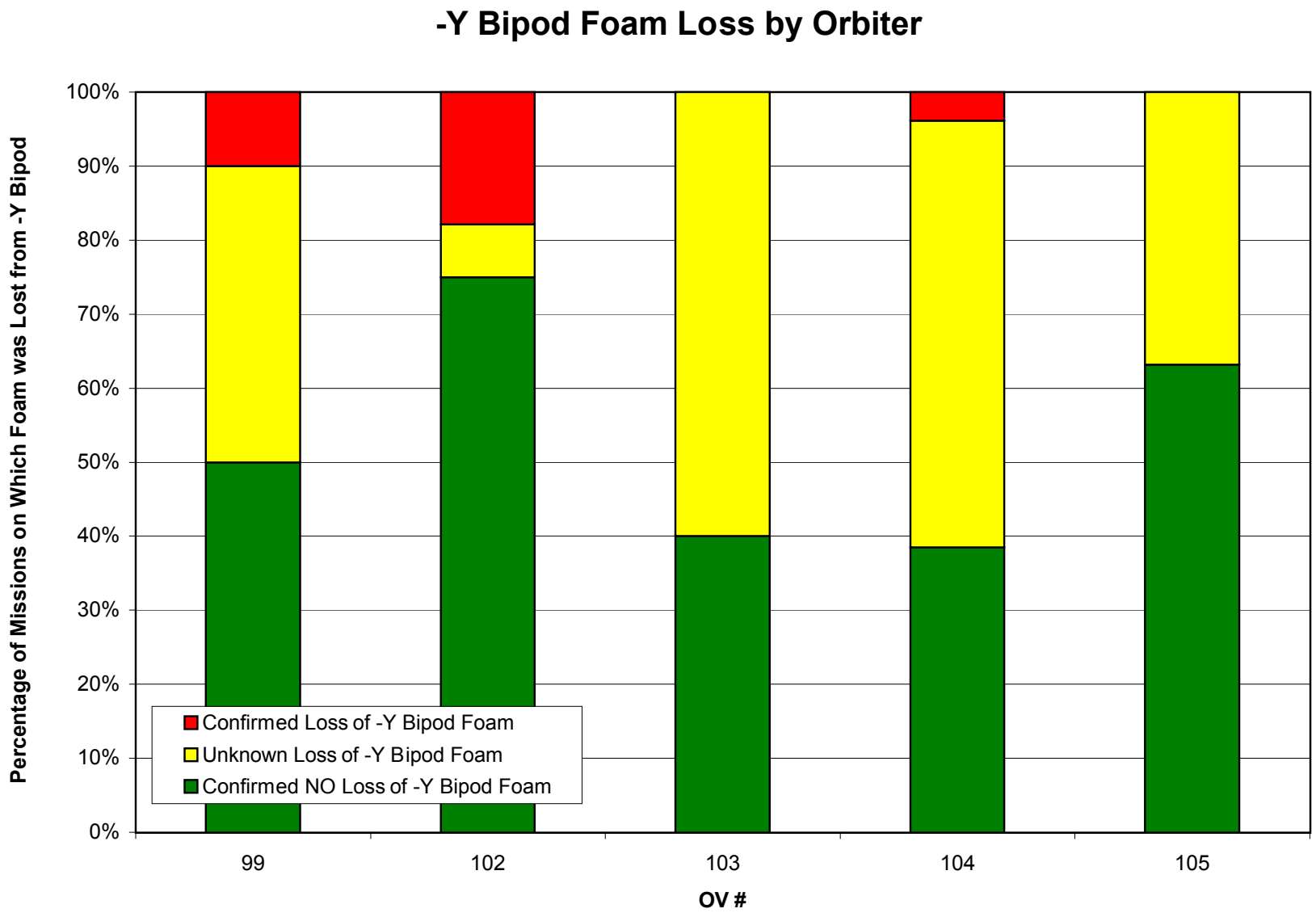
-Y Bipod Foam Loss by Orbiter



ET & Foam Data Trend

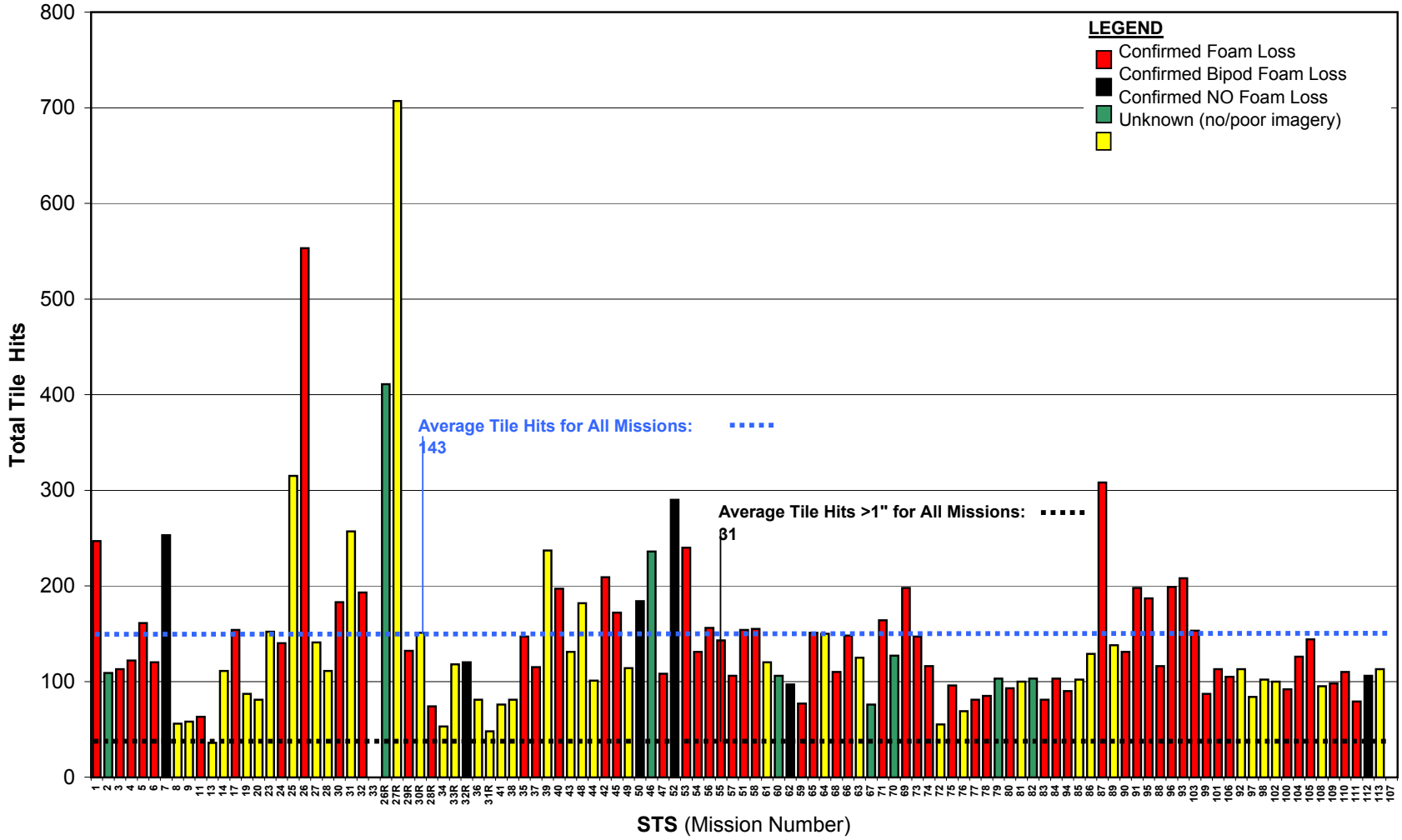
ET & Foam Data Trending.xls

CAB099-0023


-Y Bipod Foam Loss by Orbiter
Percentage of Missions on Which Foam was Lost from -Y Bipod
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Confirmed Loss of -Y Bipod Foam
Unknown Loss of -Y Bipod Foam
Confirmed NO Loss of -Y Bipod Foam
99
102
103
104
105
OV #

Total (Upper & Lower Surface) Tile Hits

From Post-Mission Examinations of Orbiter



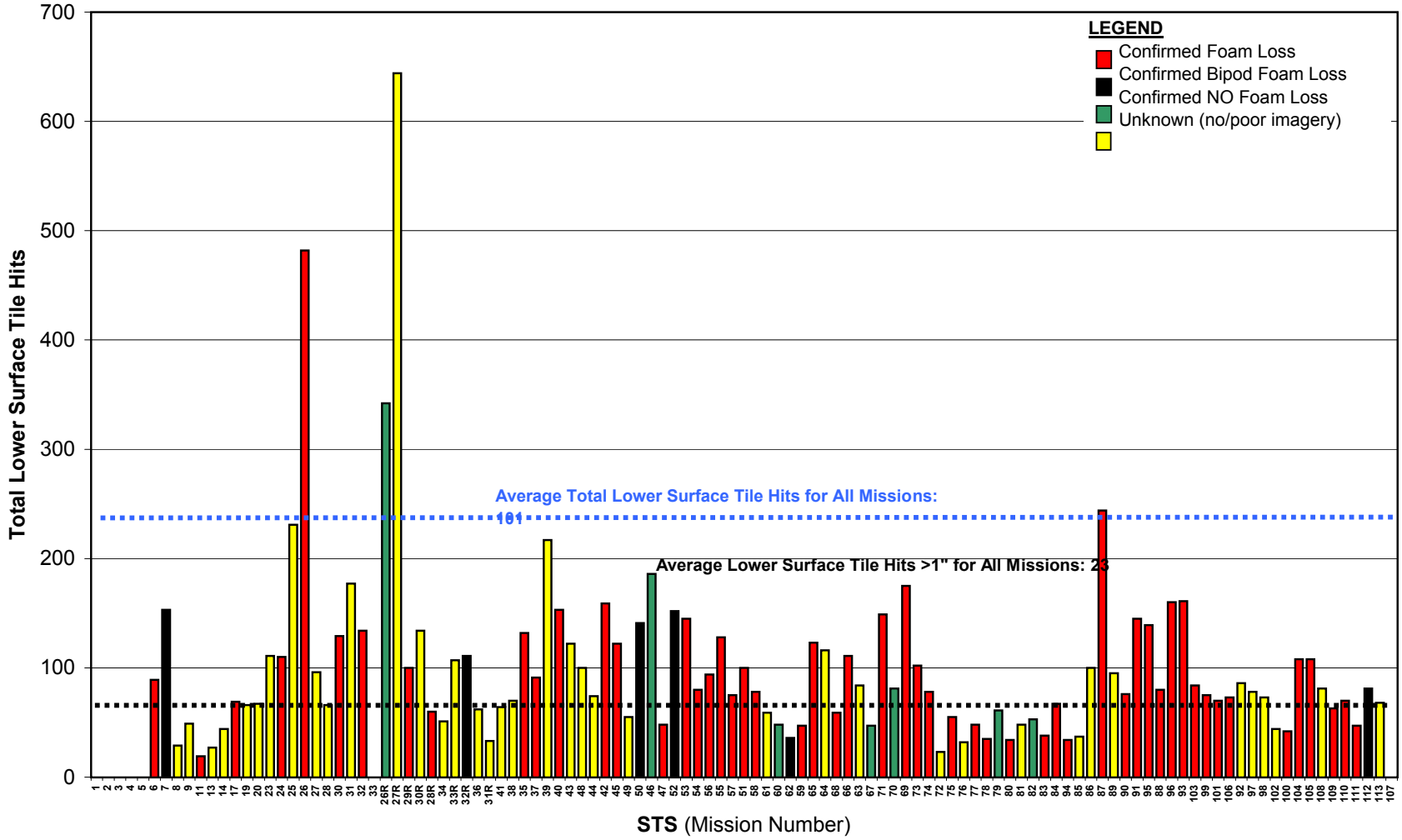
ET & Foam Data Trend

ET & Foam Data Trending.xls

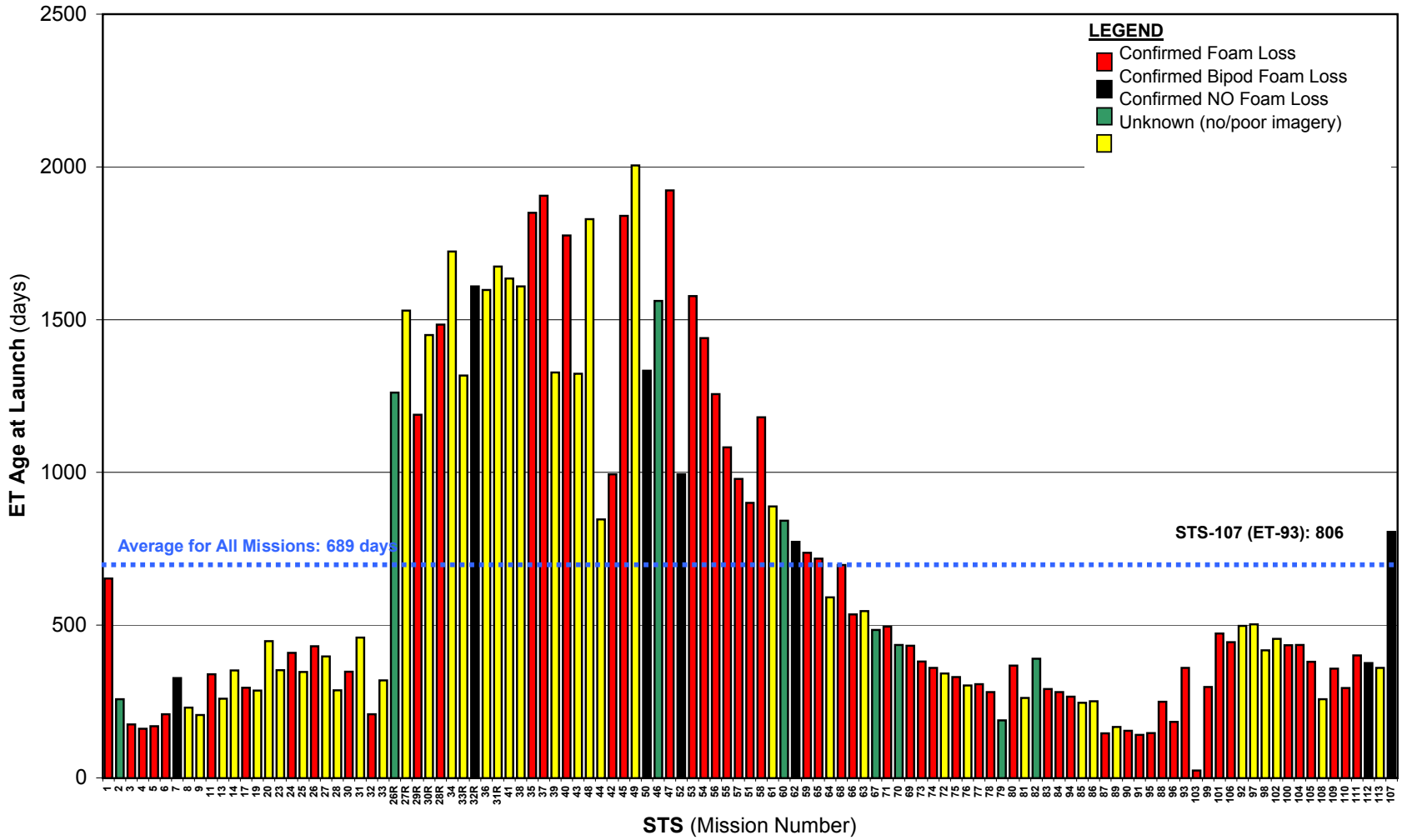
CAB099-0025

Lower Surface Tile Hits

From Post-Mission Examinations of Orbiter



External Tank Age

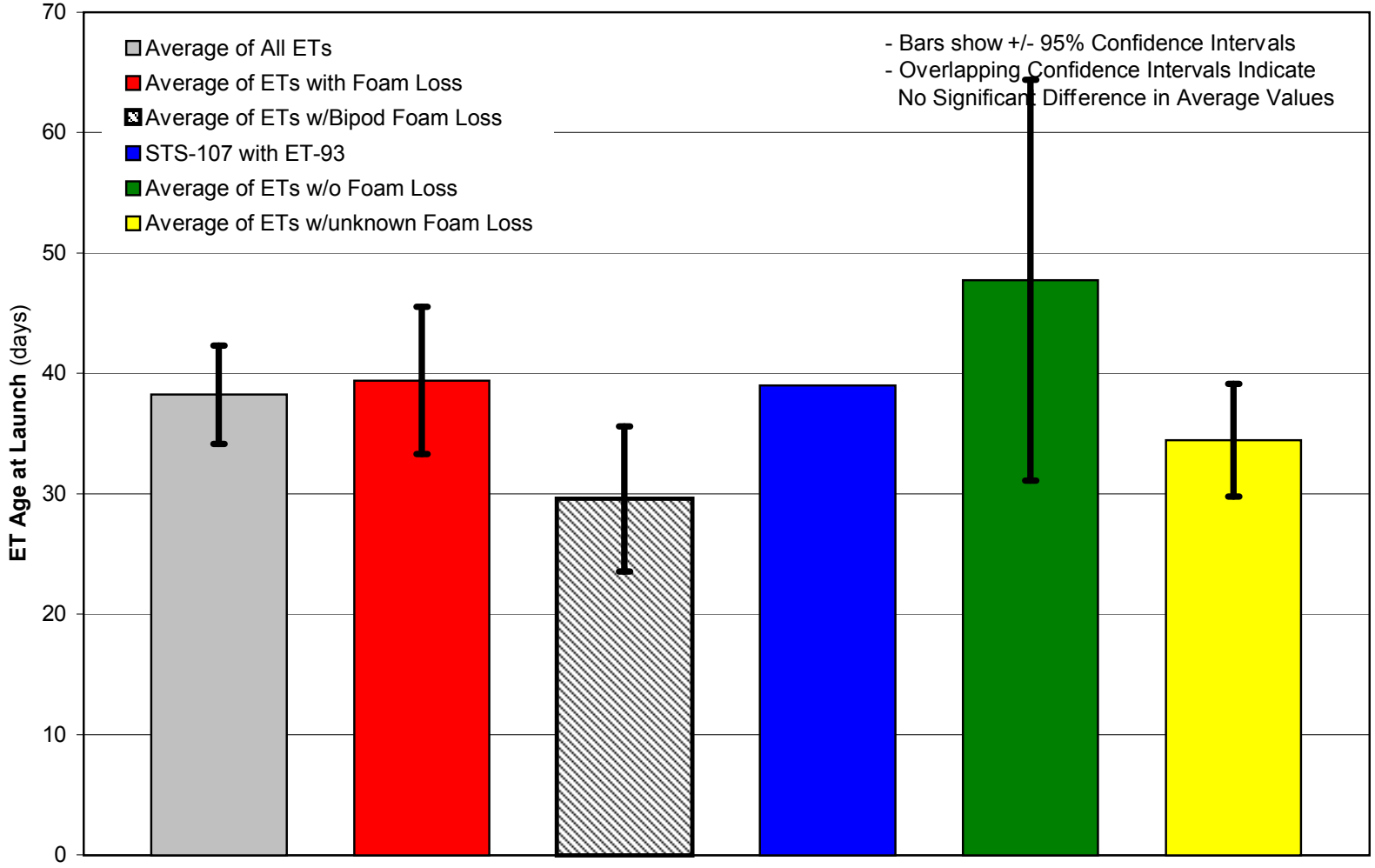


ET & Foam Data Trend

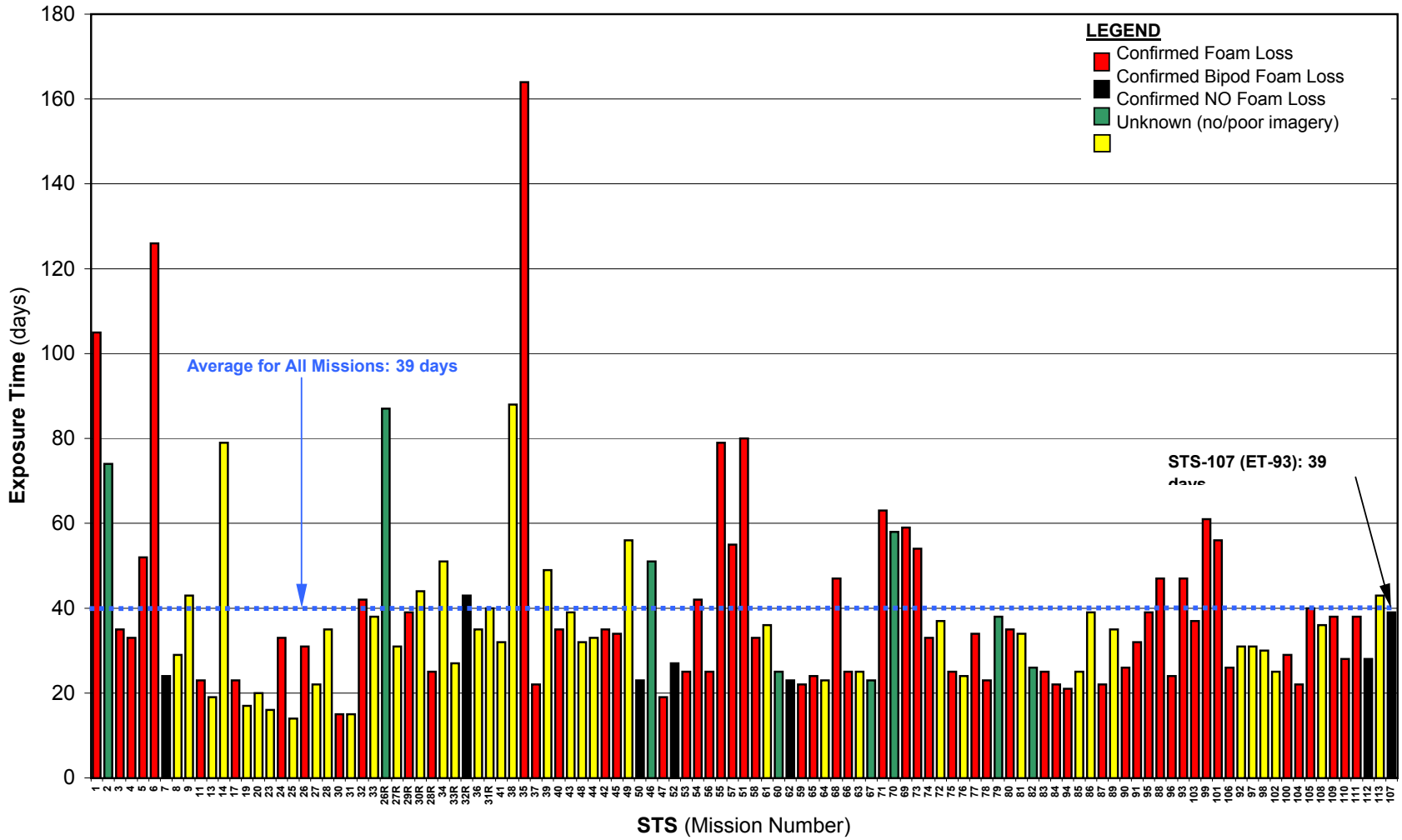
ET & Foam Data Trending.xls

CAB099-0027

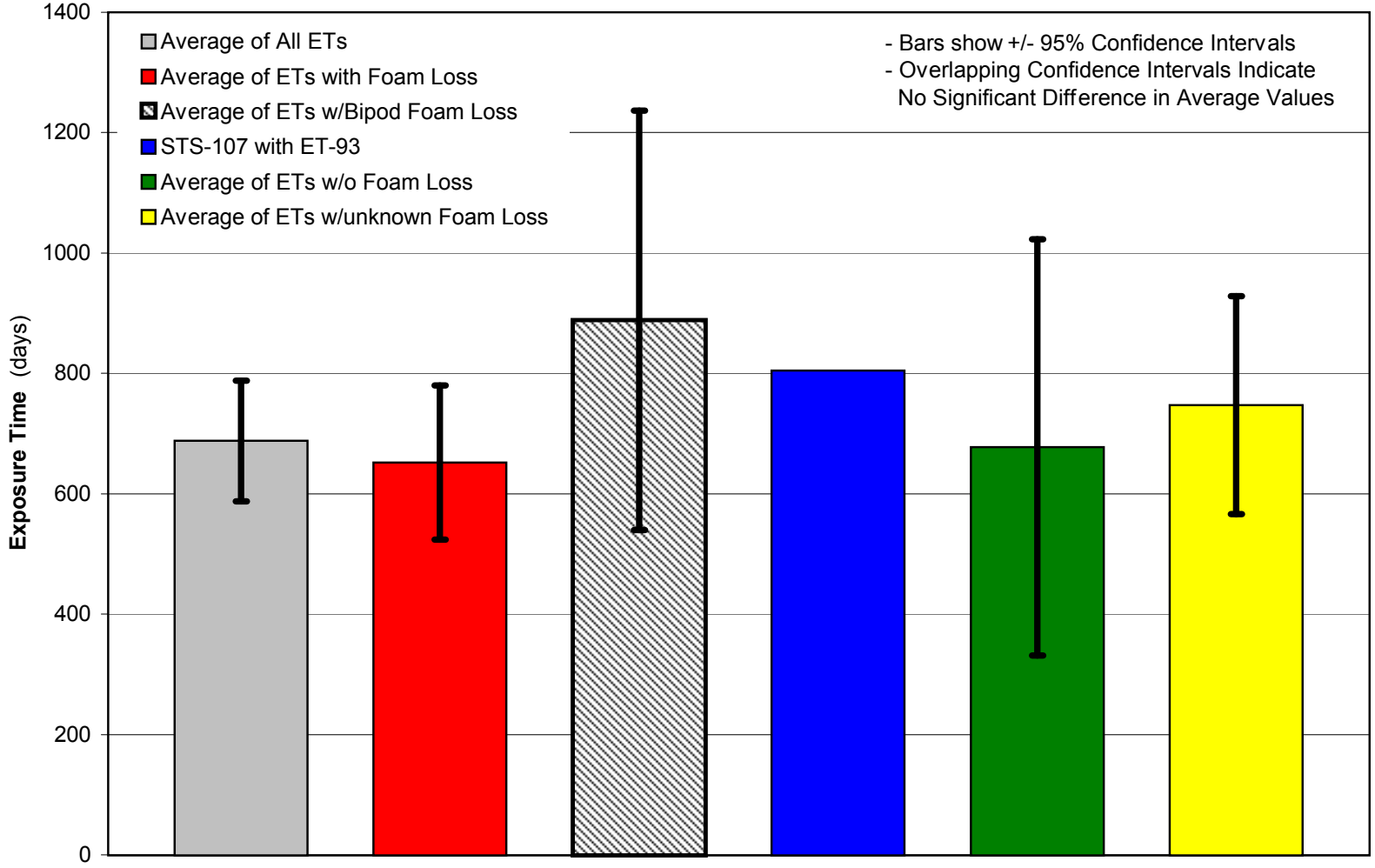
External Tank Age



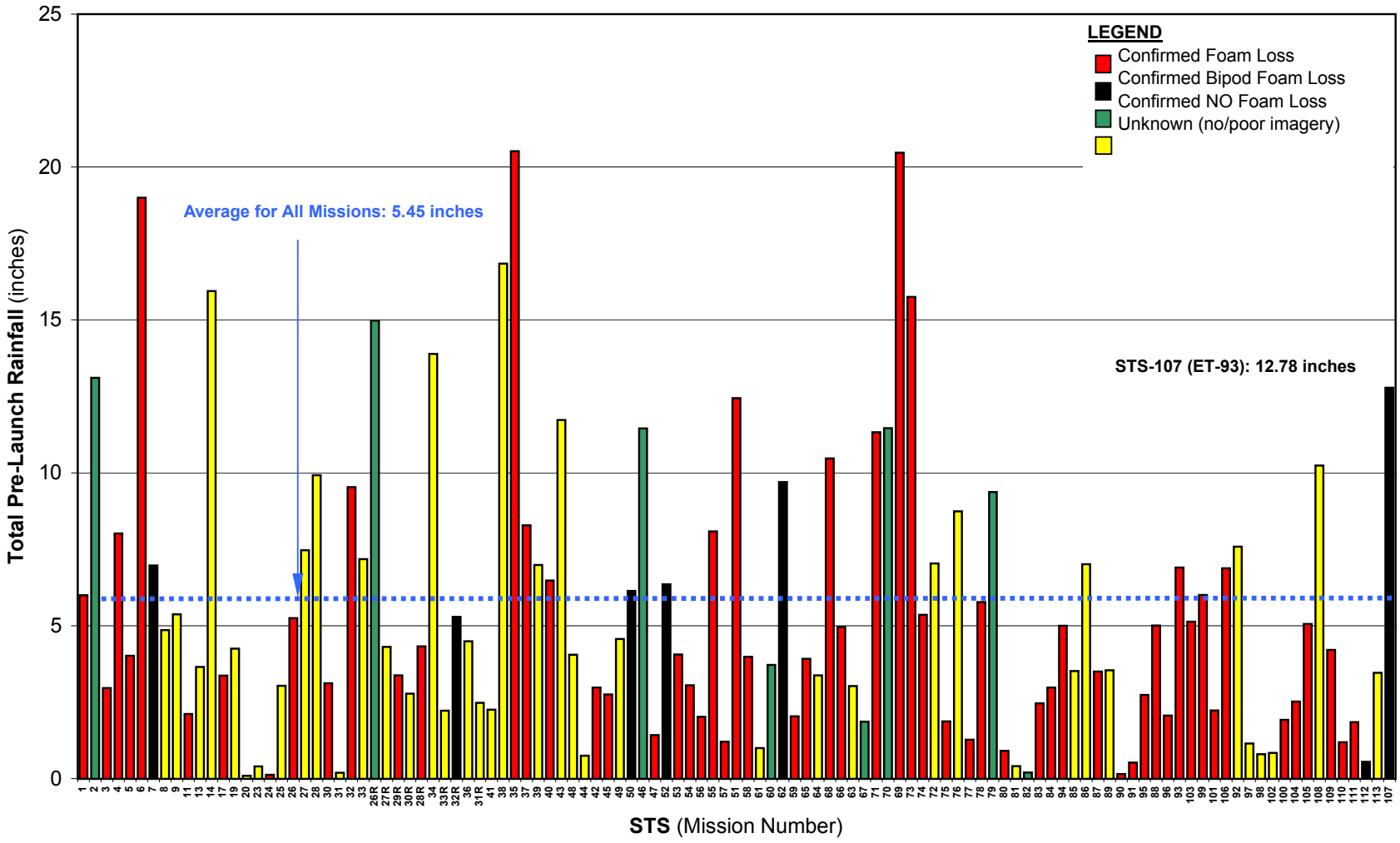
External Tank Pre-Launch Exposure Time



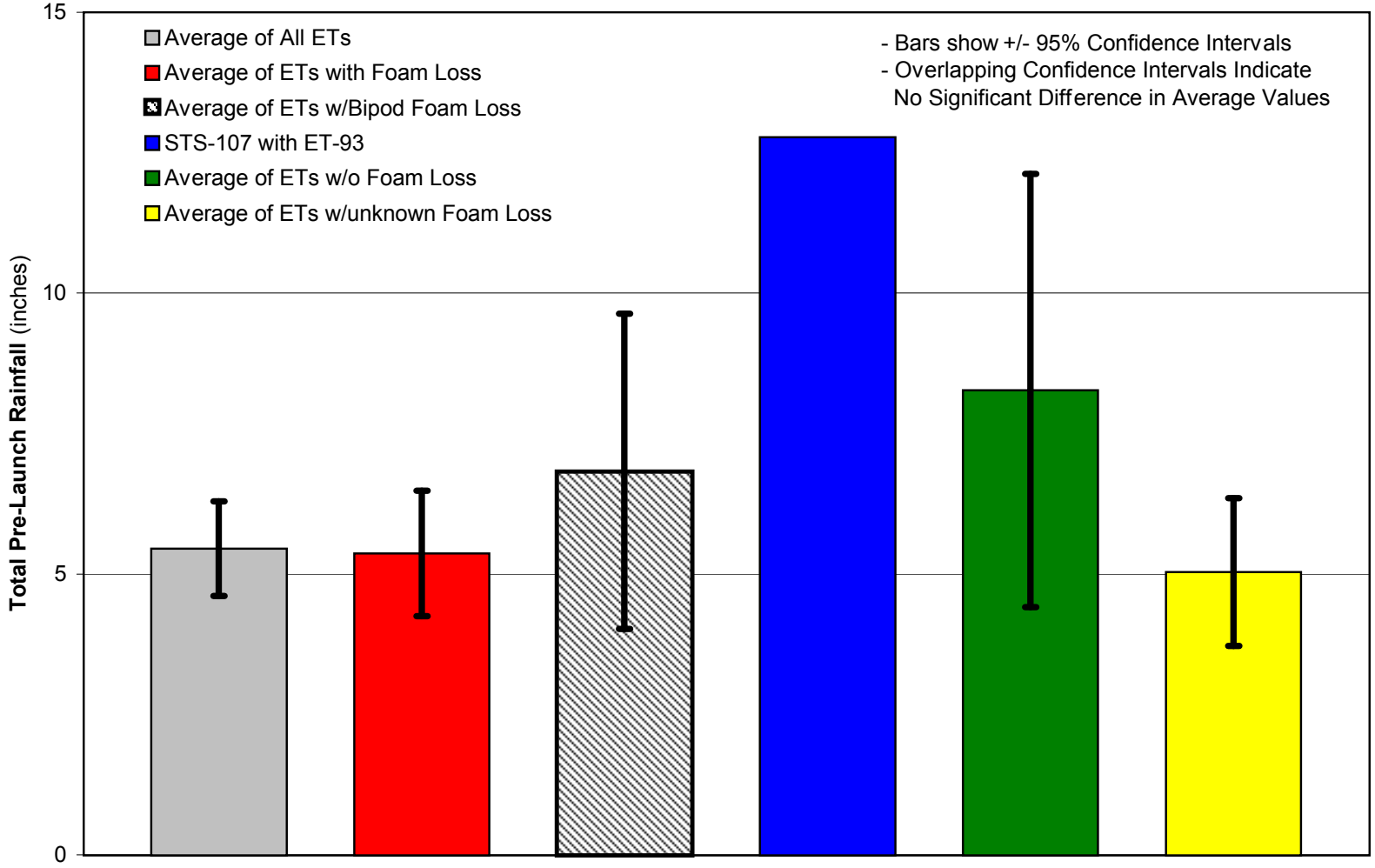
External Tank Pre-Launch Exposure Time



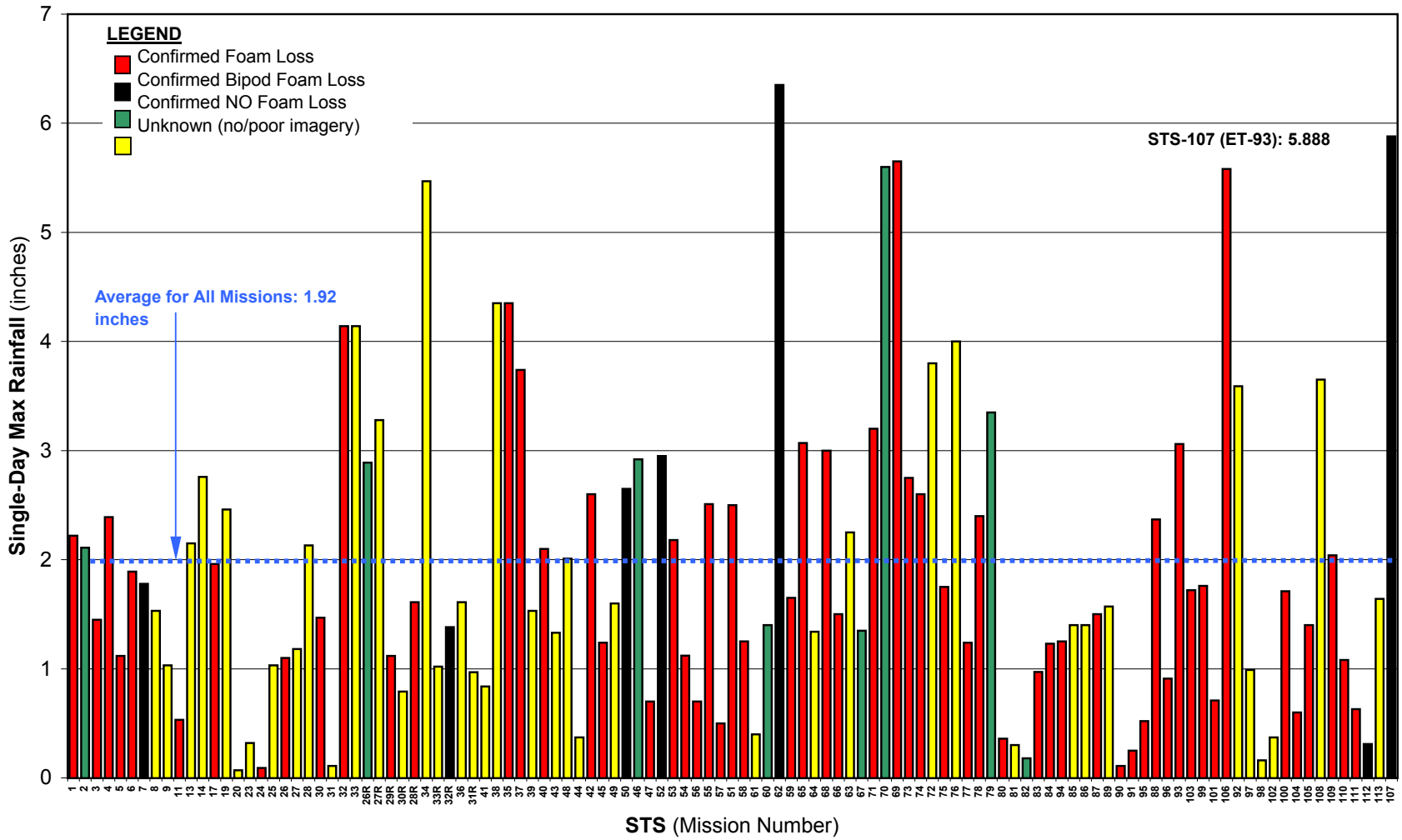
Total Pre-Launch Rainfall



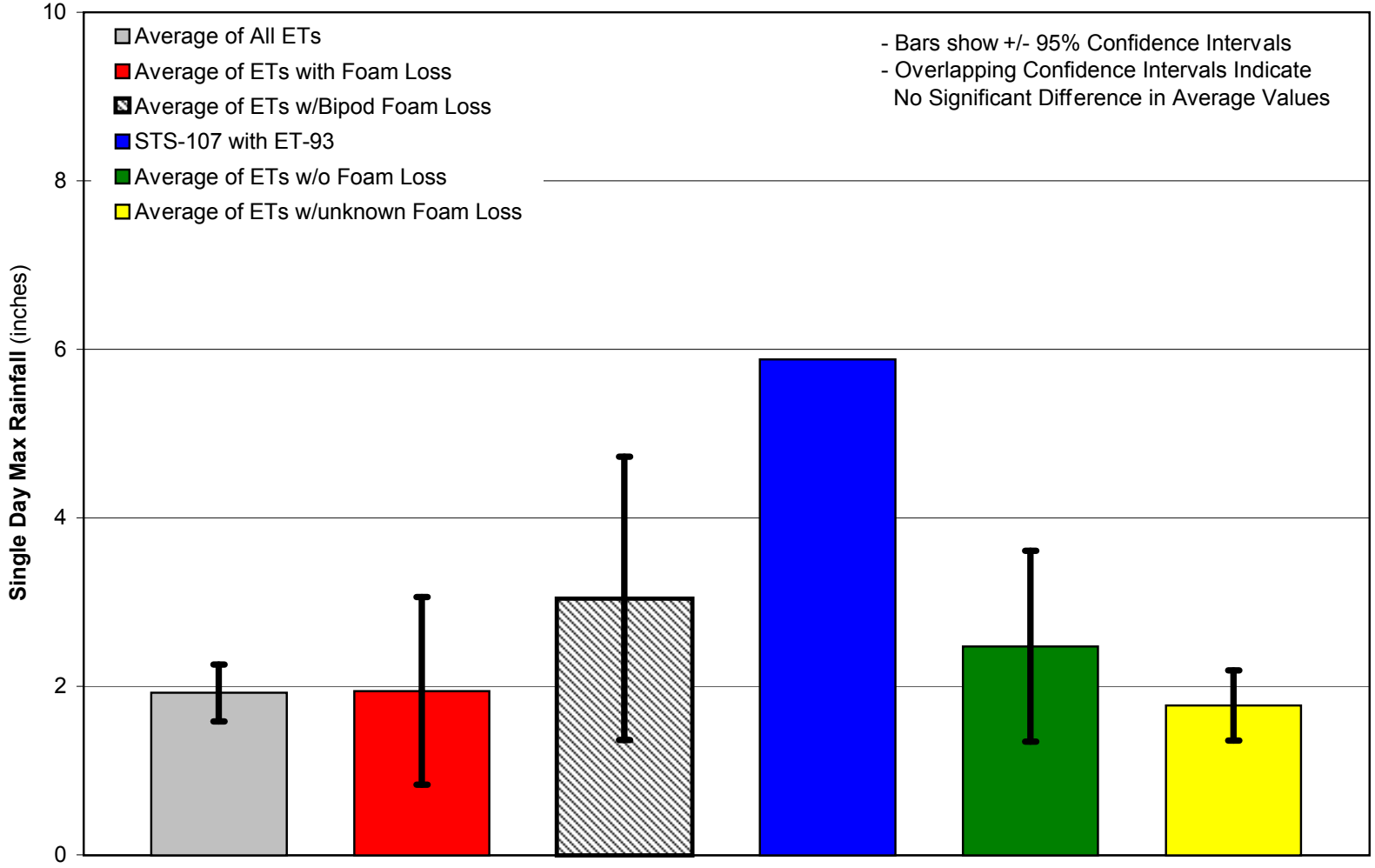
Total Pre-Launch Rainfall



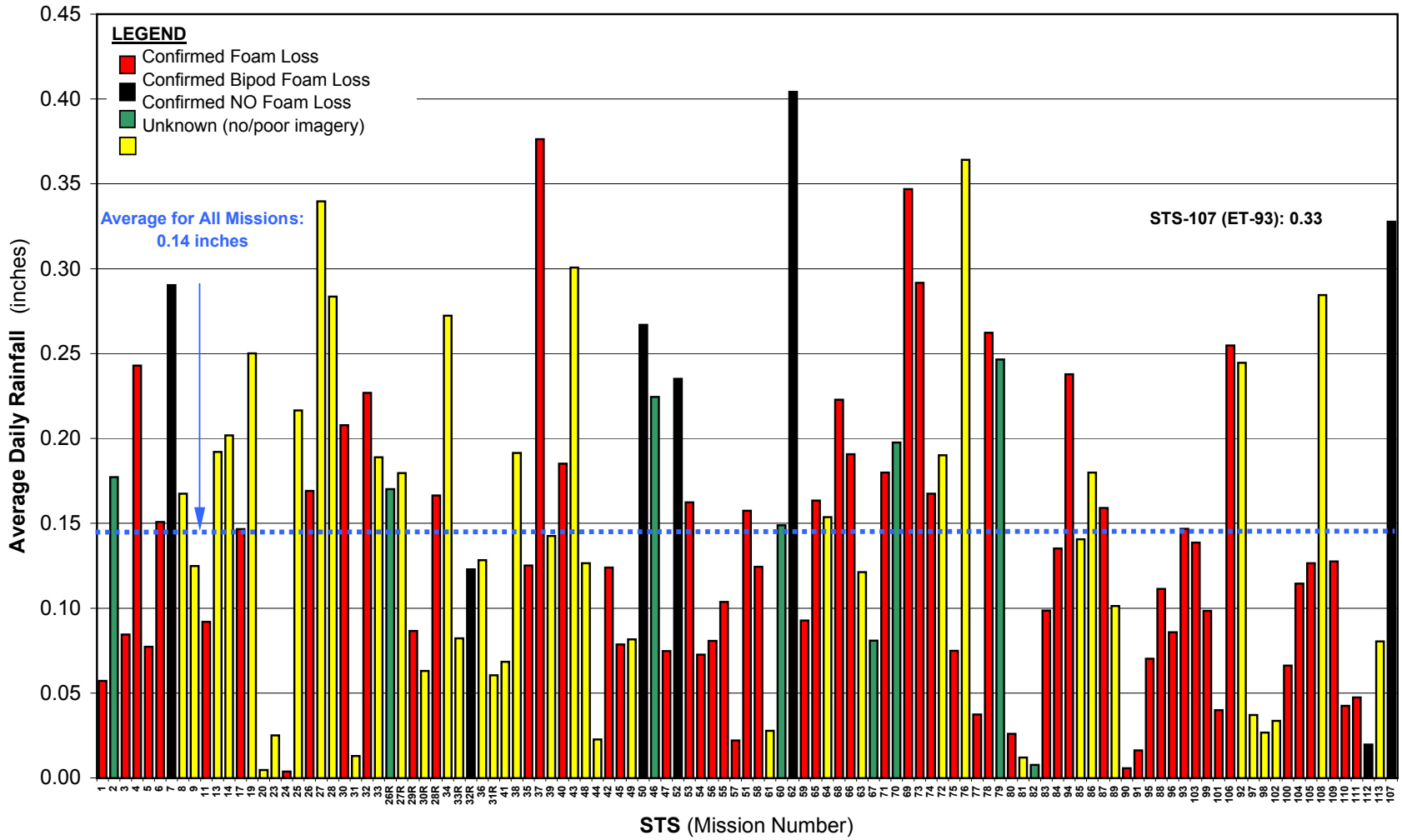
Single-Day Maximum Rainfall During Pre-Launch Period



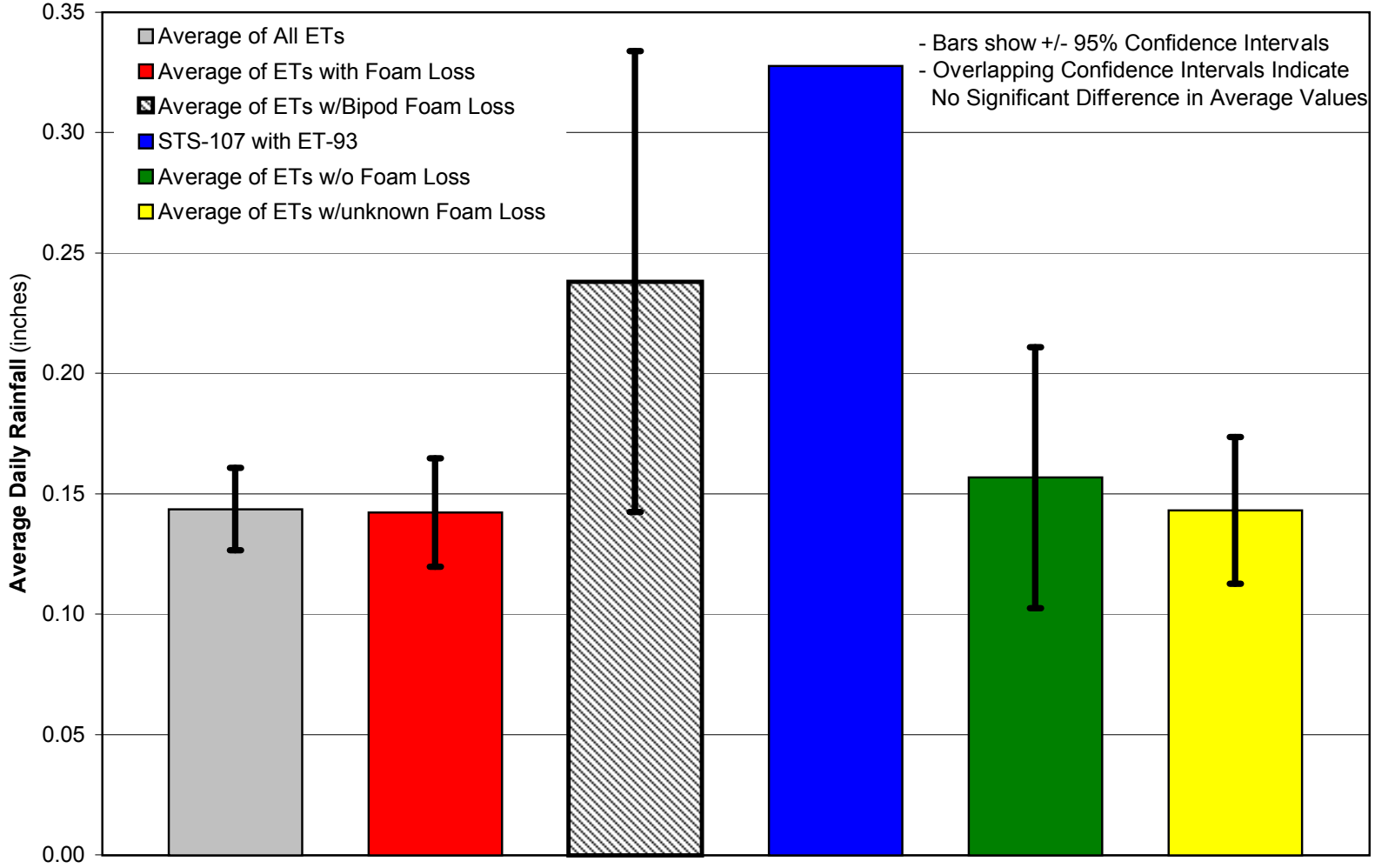
Single-Day Maximum Rainfall During Pre-Launch Period



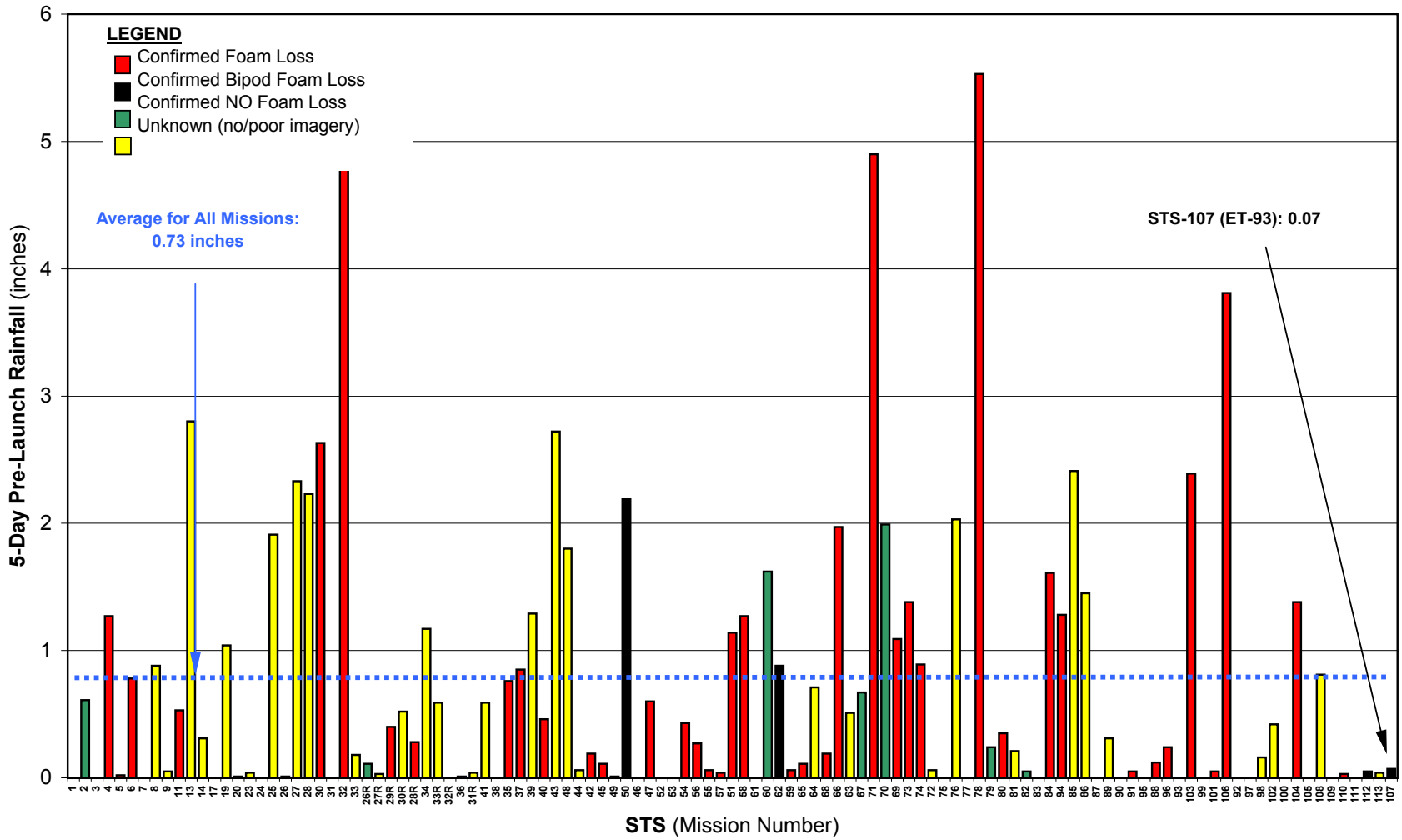
Average Daily Rainfall During Pre-Launch Period



Average Daily Rainfall During Pre-Launch Period



Total Rainfall During 5 Days Before Launch

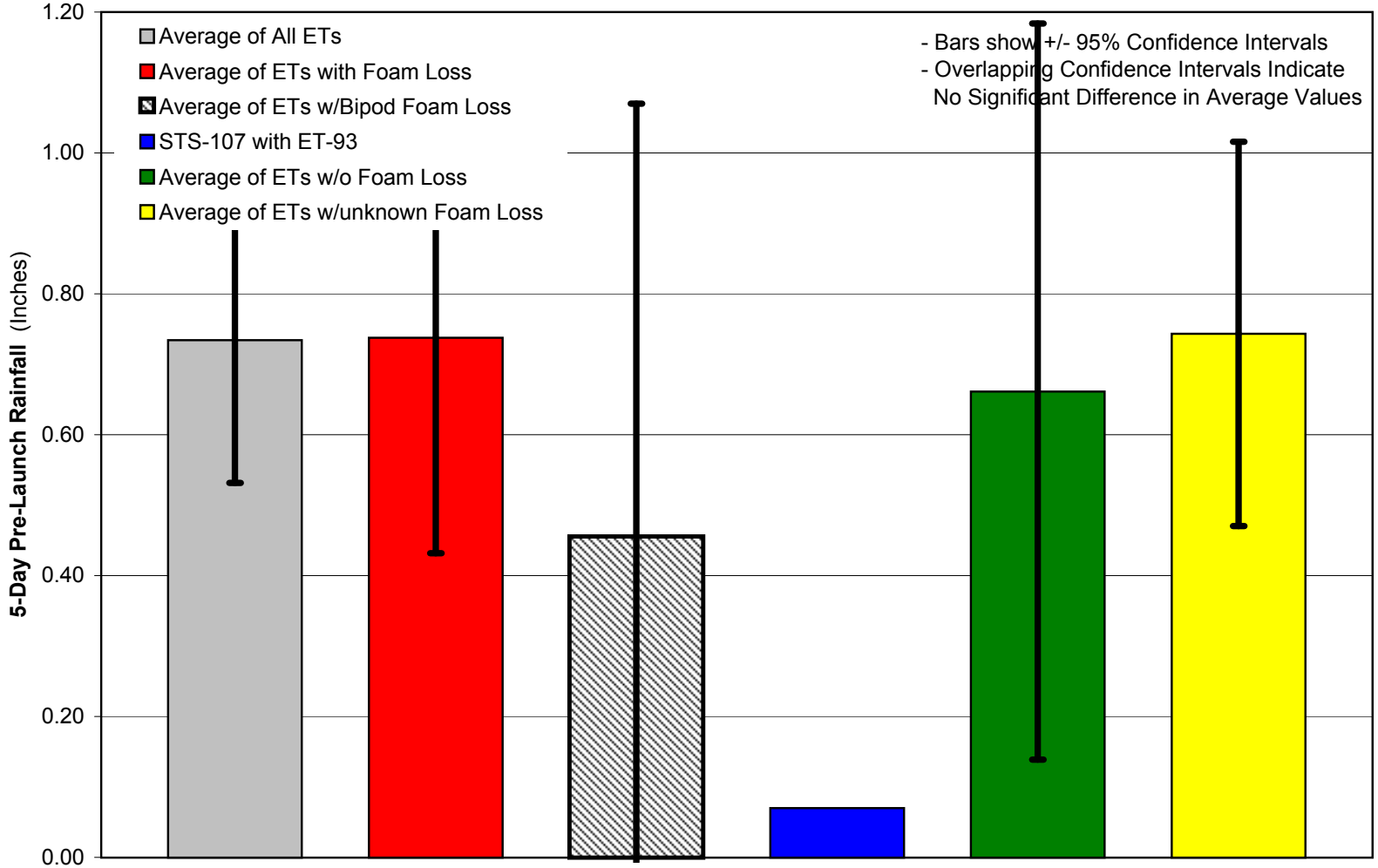


ET & Foam Data Trend

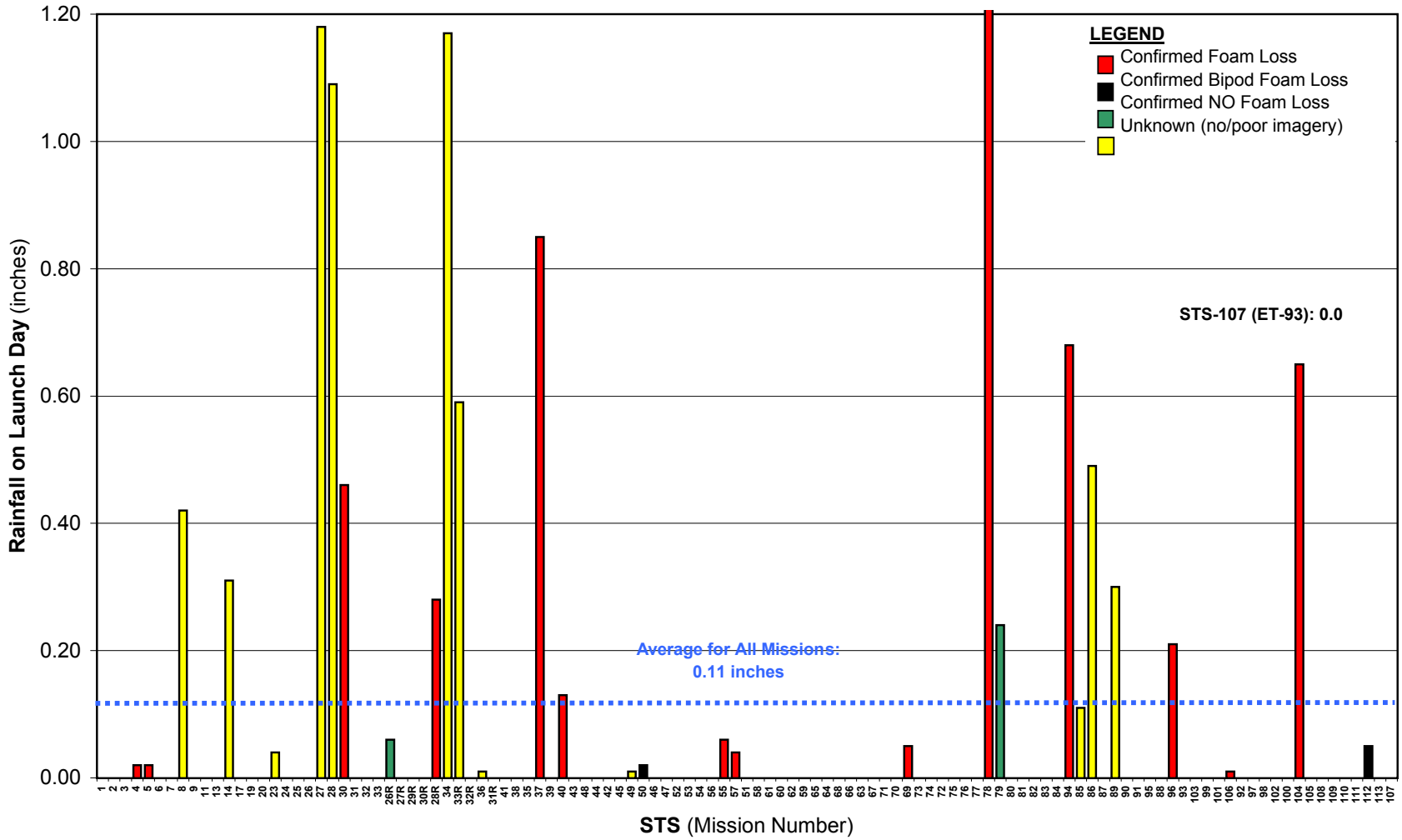
ET & Foam Data Trending.xls

CAB099-0037

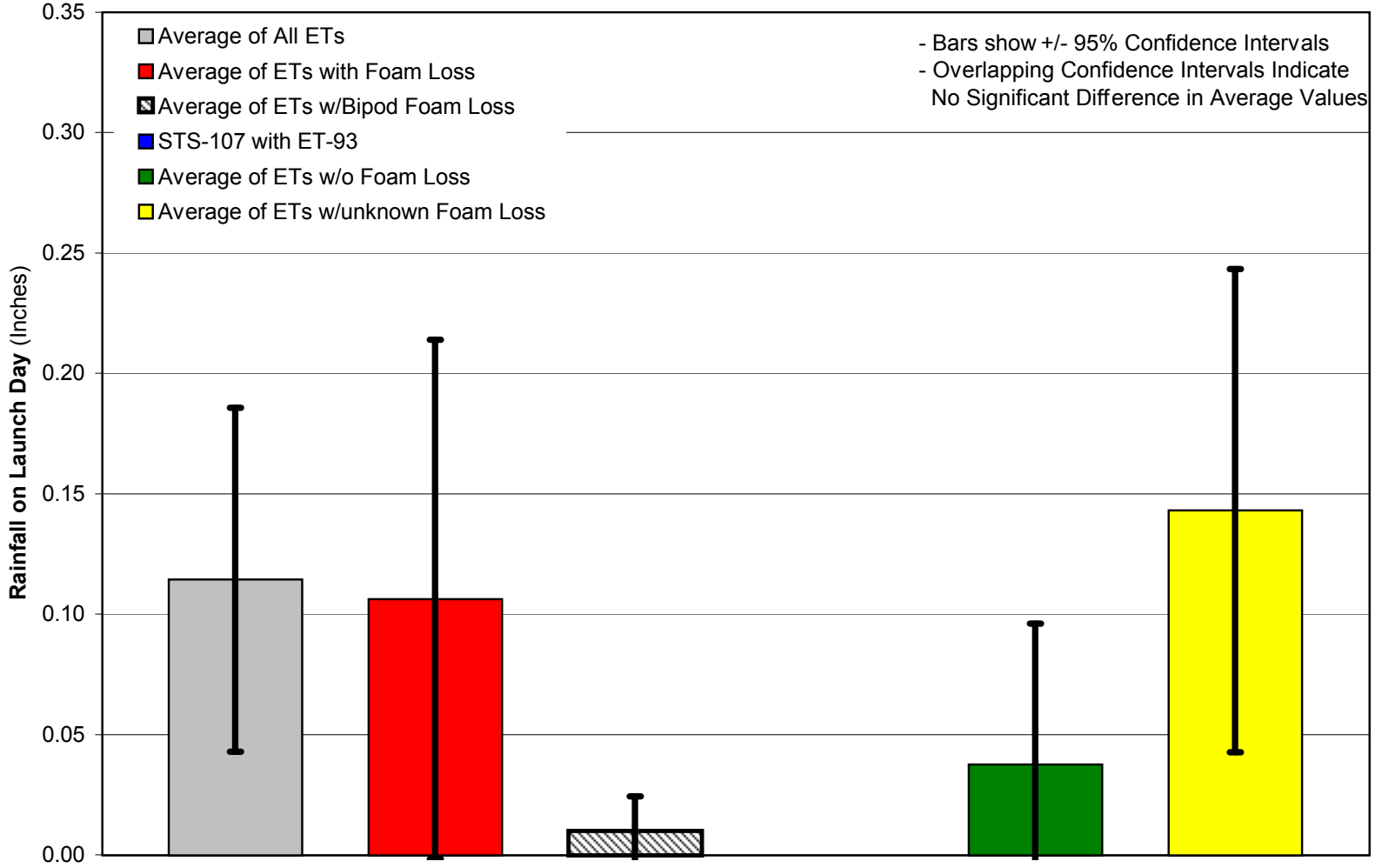
Total Rainfall During 5 Days Before Launch



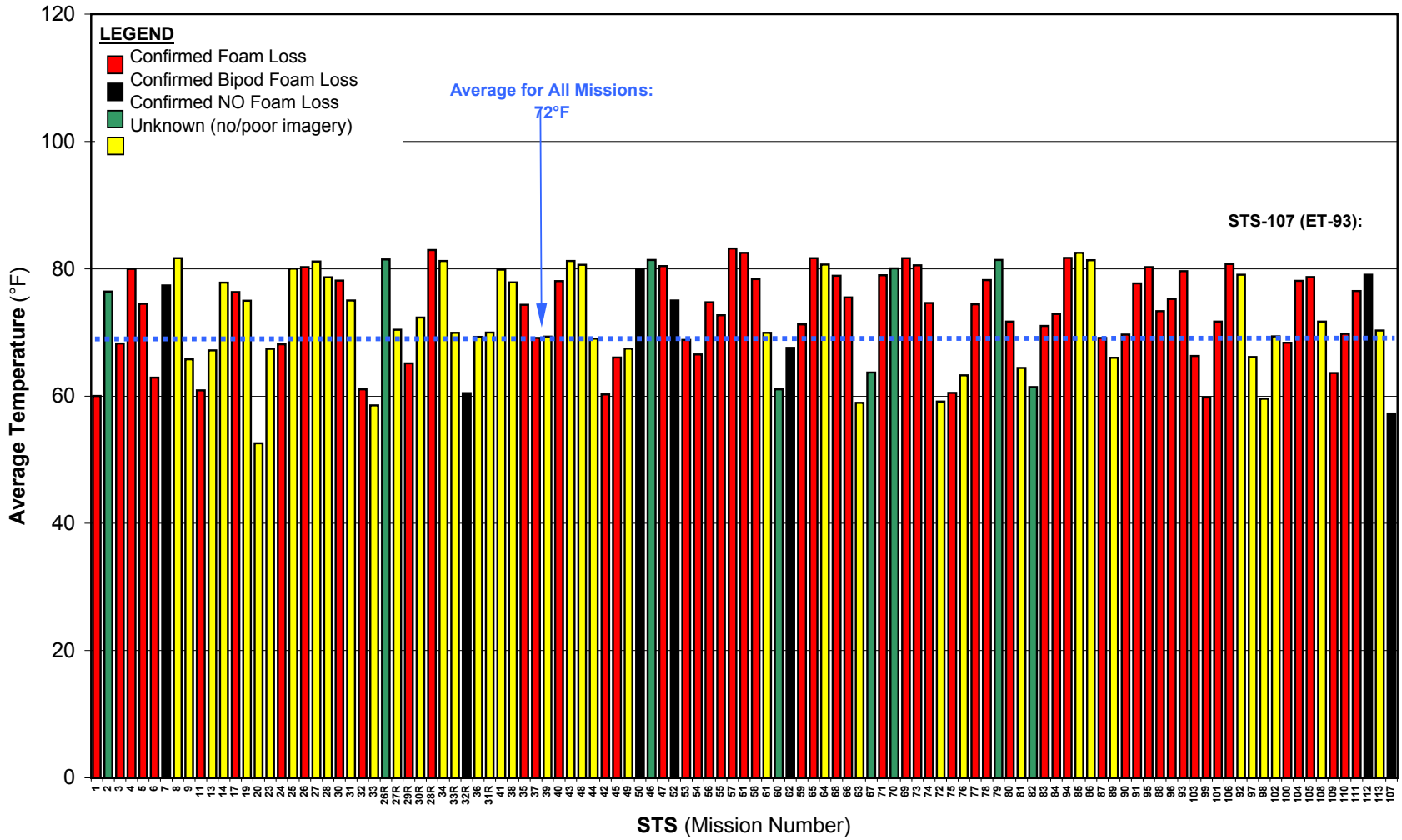
Rainfall On Launch Day



Rainfall on Launch Day



Average Temperature During Pre-Launch Period

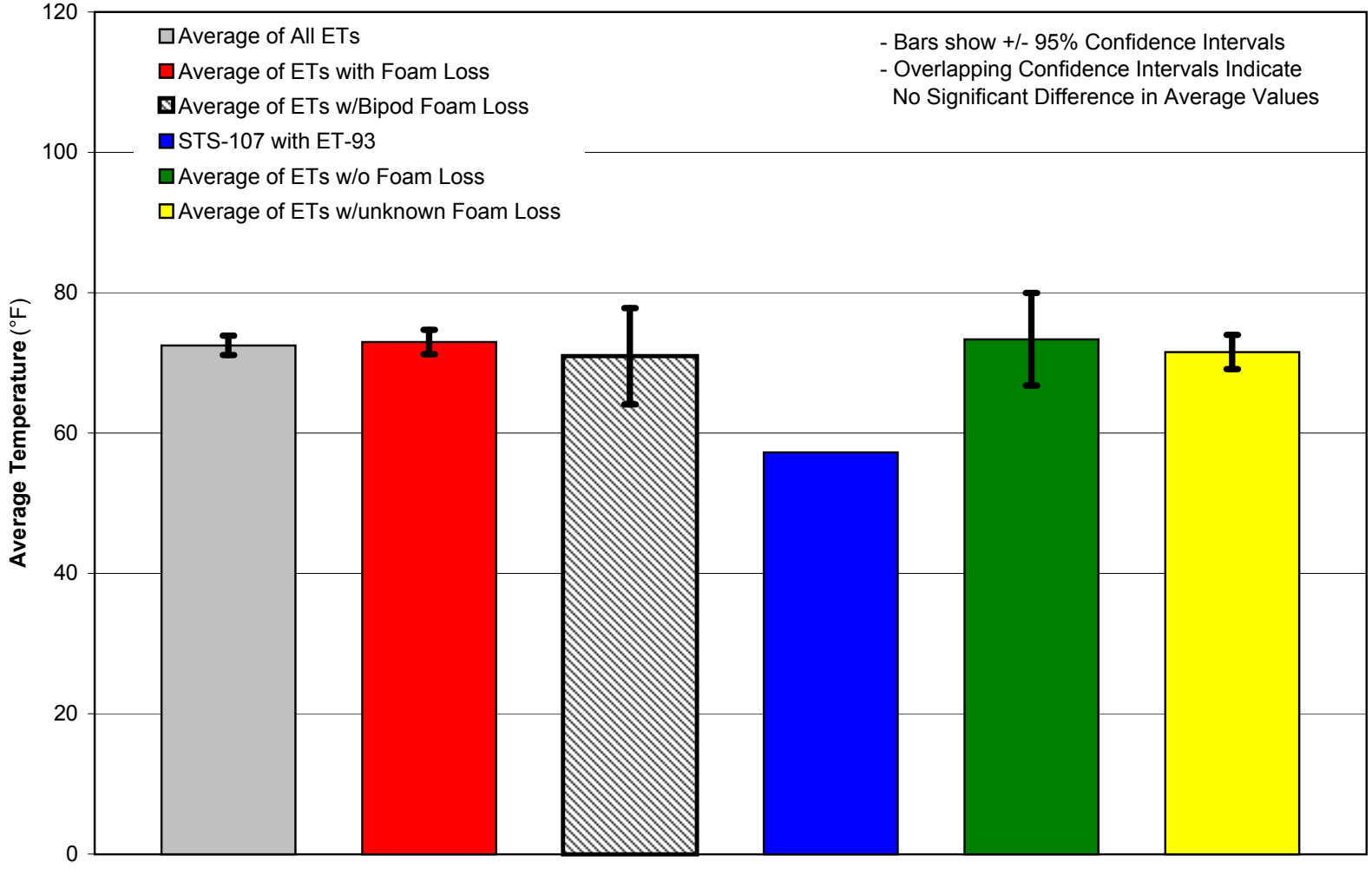


ET & Foam Data Trend

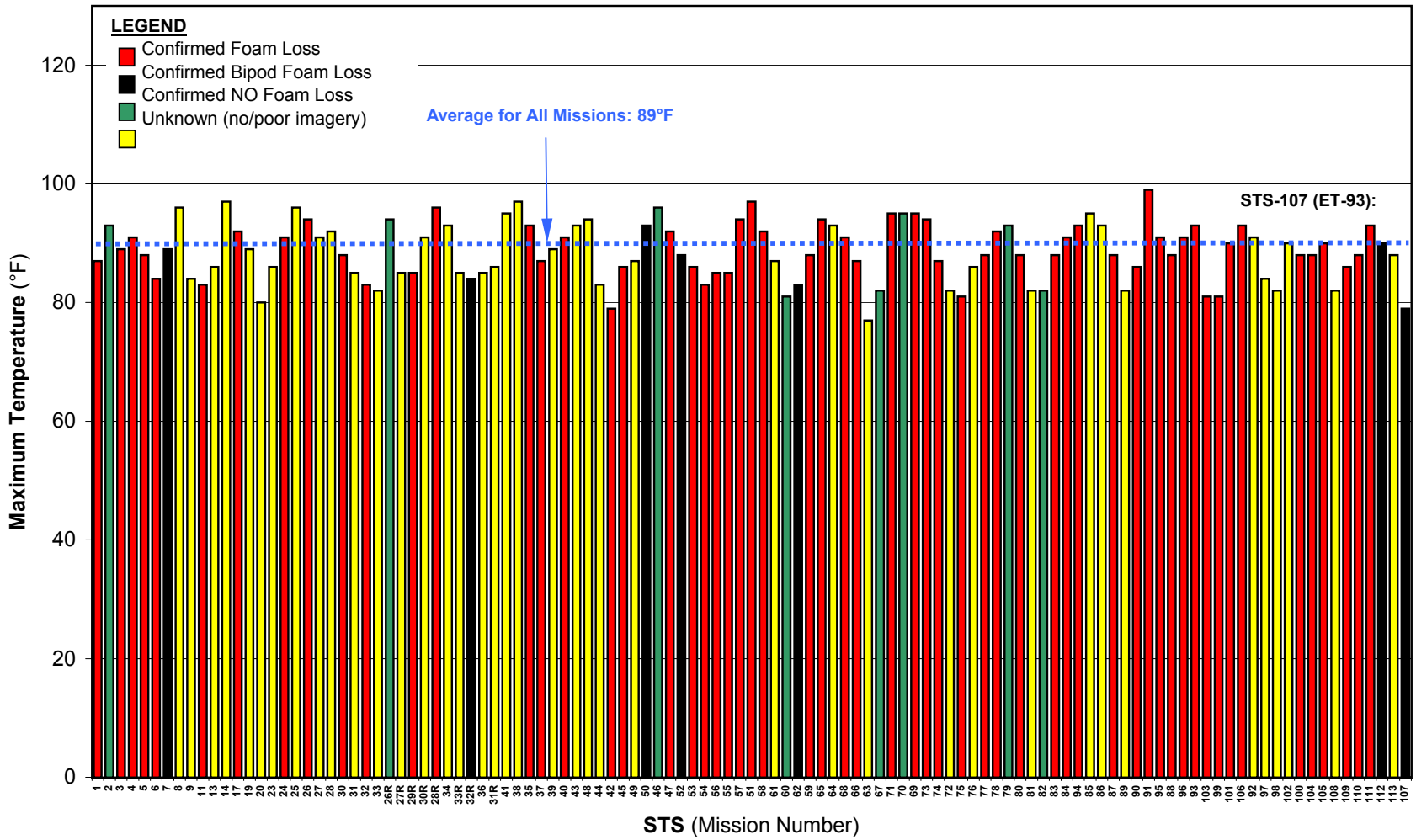
ET & Foam Data Trending.xls

CAB099-0041

Average Temperature During Pre-Launch Period



Maximum Temperature During Pre-Launch Period

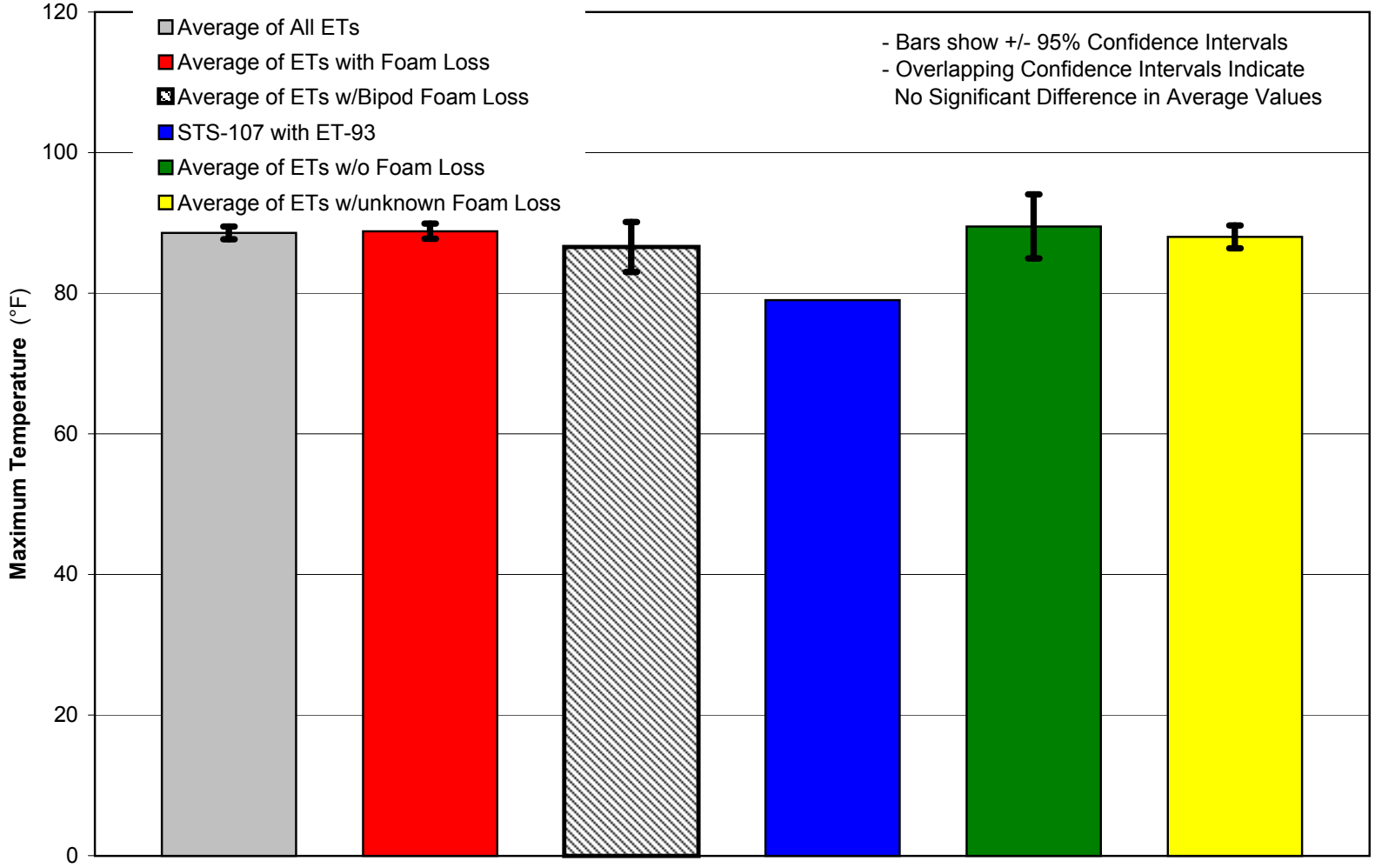


ET & Foam Data Trend

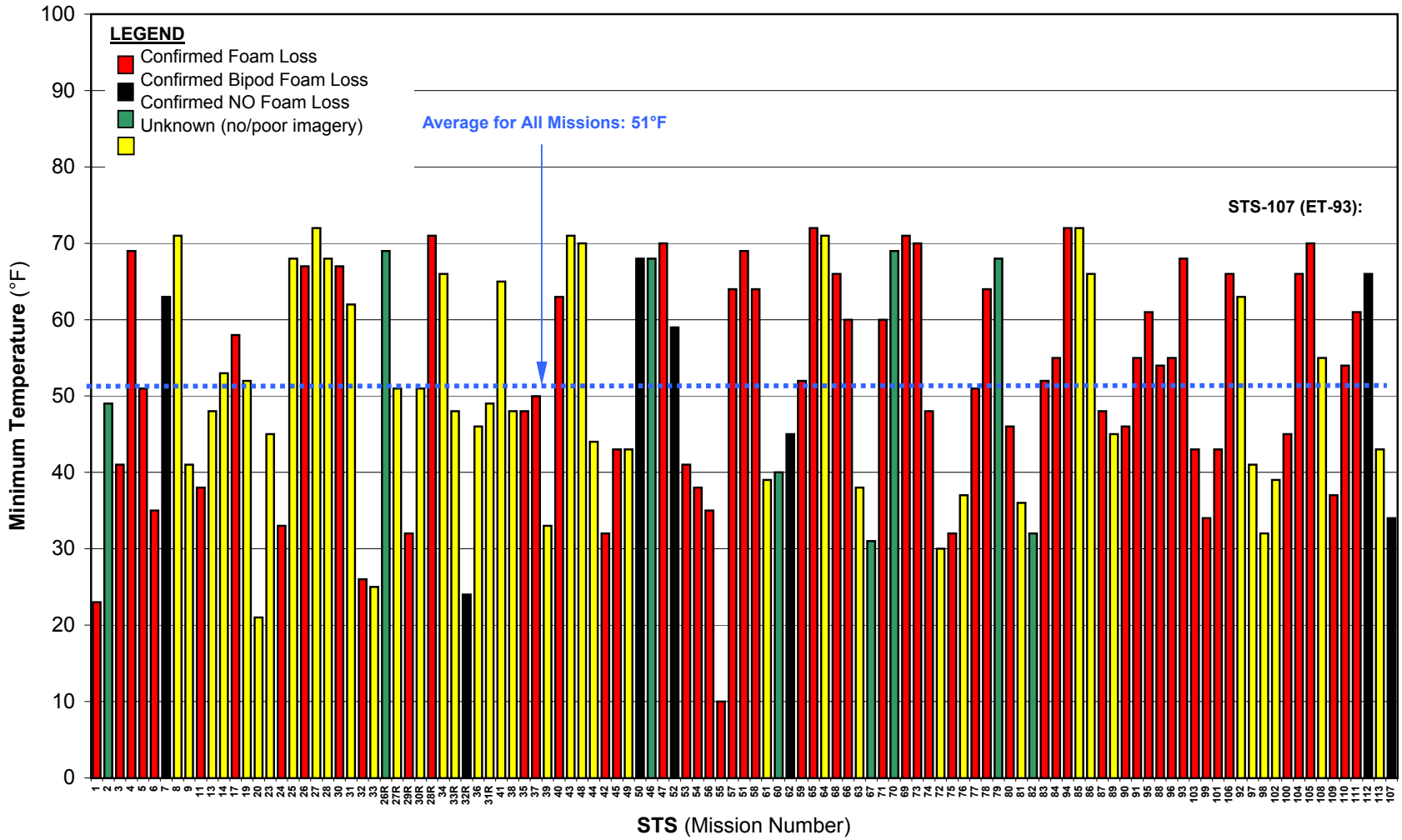
ET & Foam Data Trending.xls

CAB099-0043

Maximum Temperature During Pre-Launch Period



Minimum Temperature During Pre-Launch Period

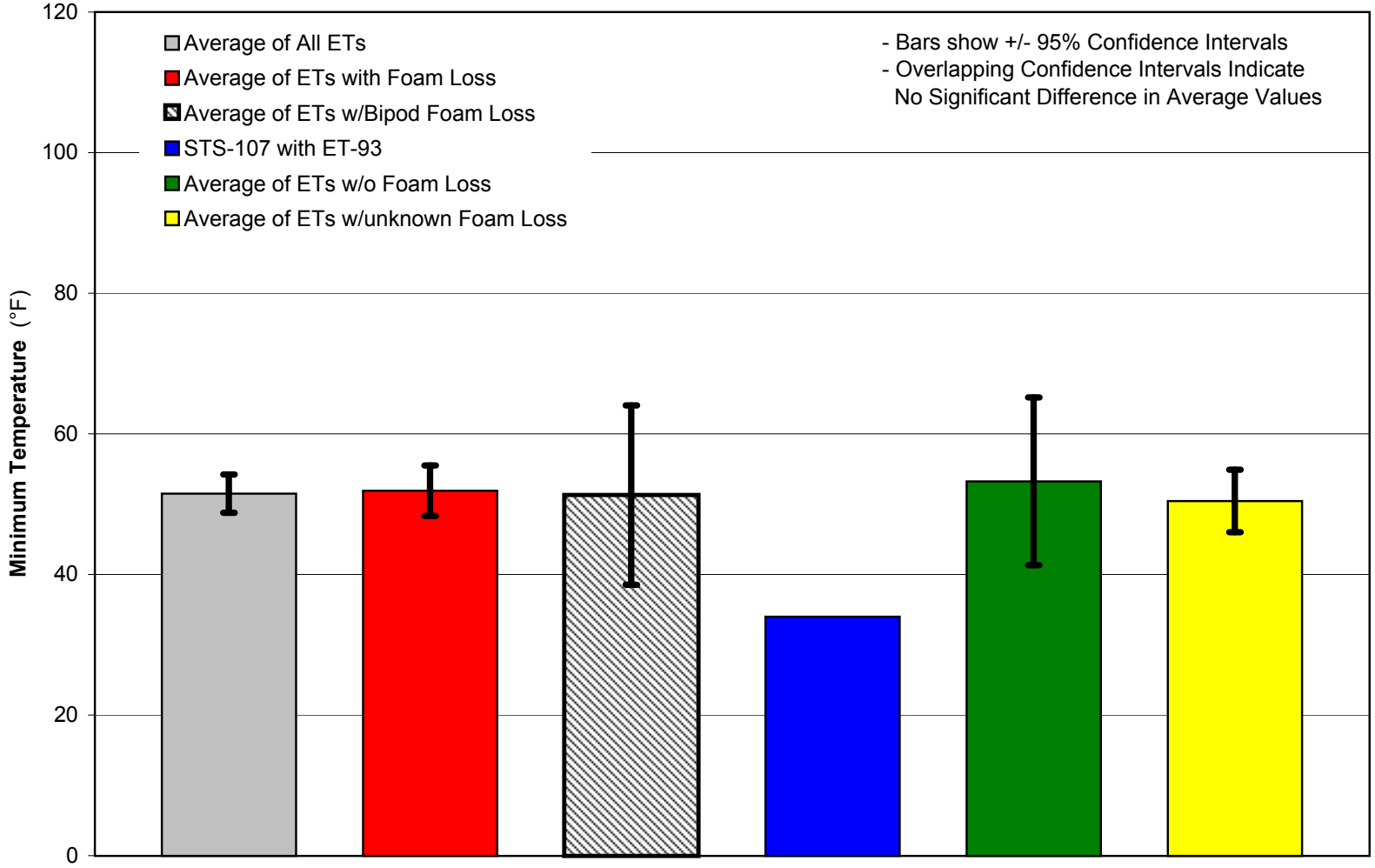


ET & Foam Data Trend

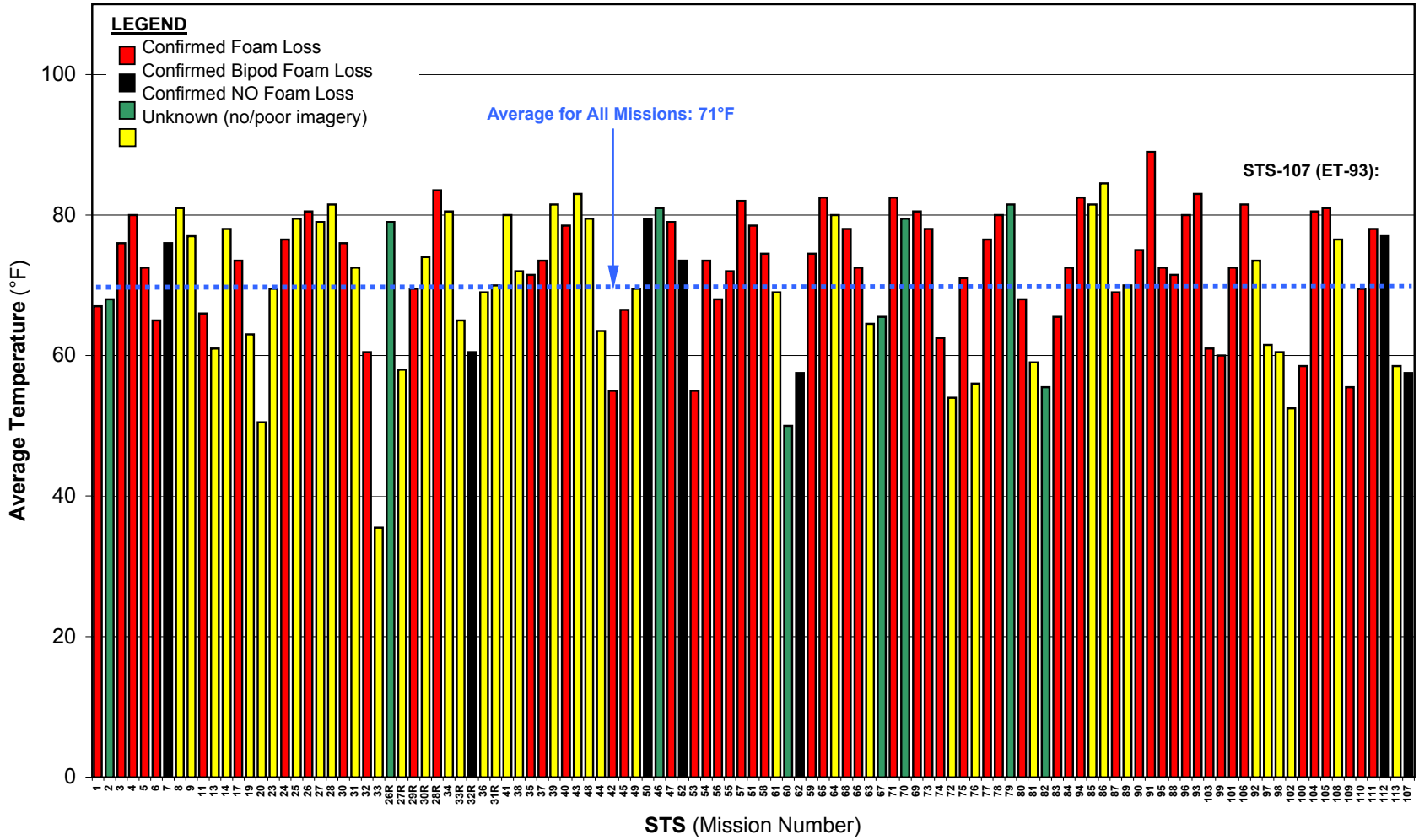
ET & Foam Data Trending.xls

CAB099-0045

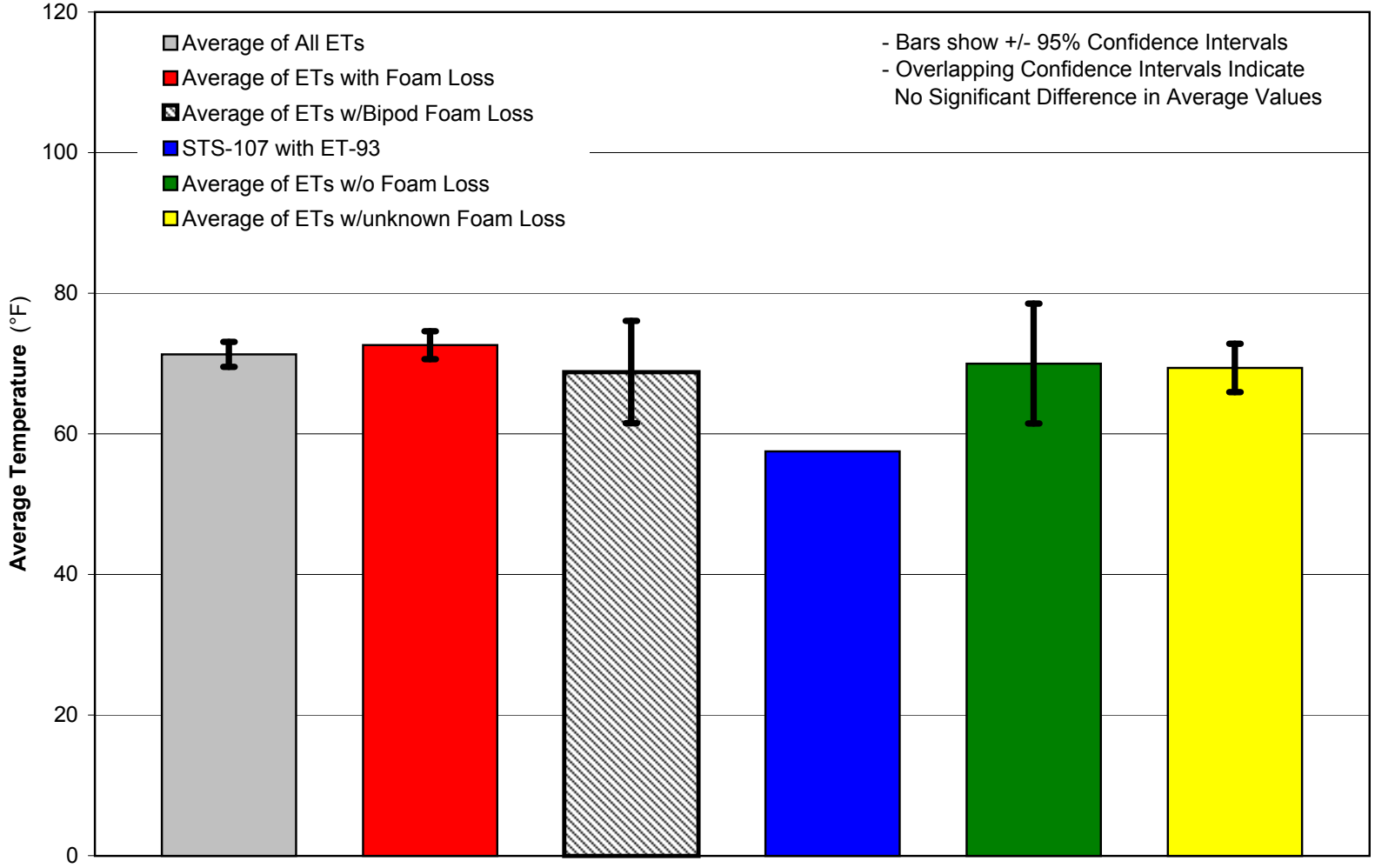
Minimum Temperature During Pre-Launch Period



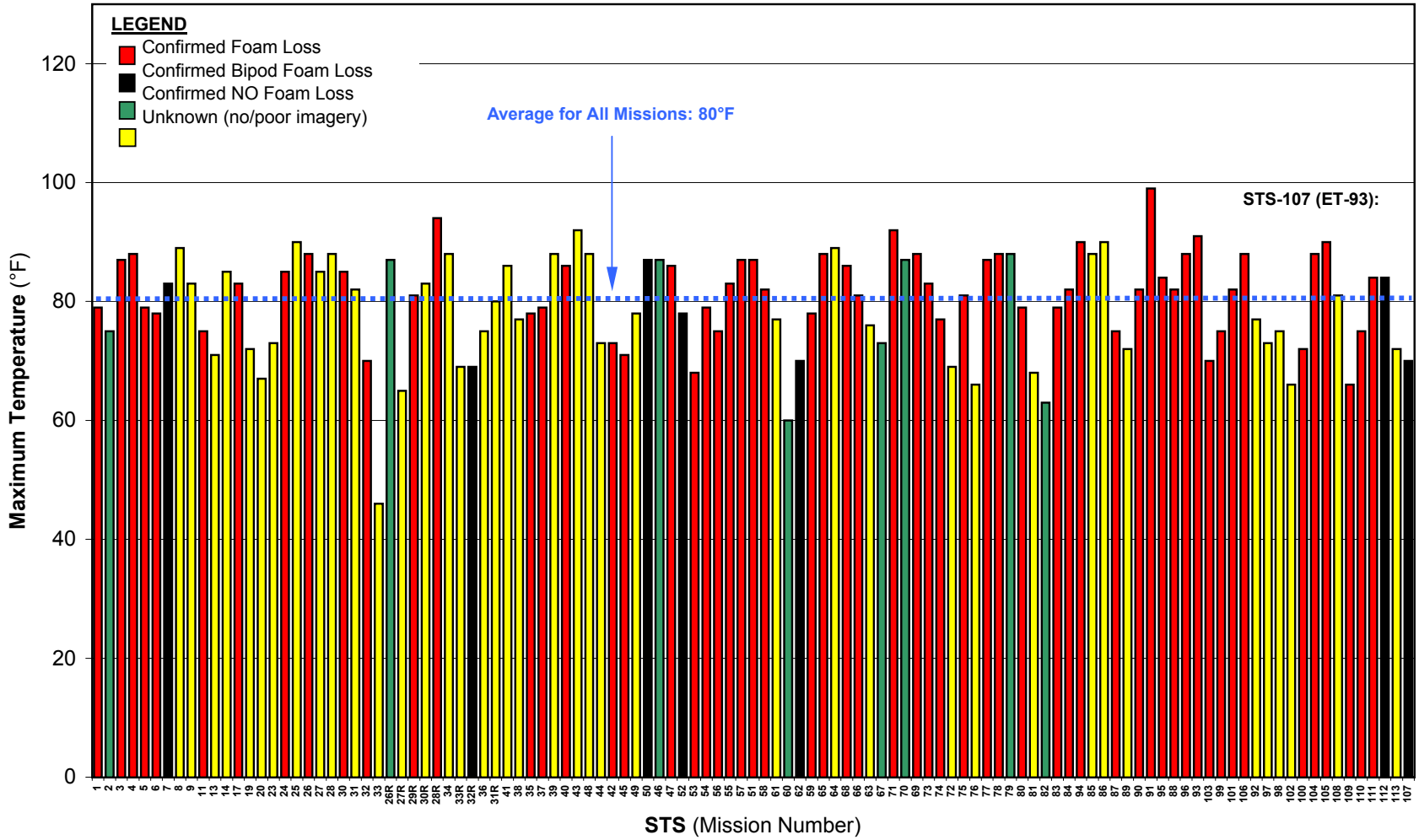
Average Temperature on Launch Day



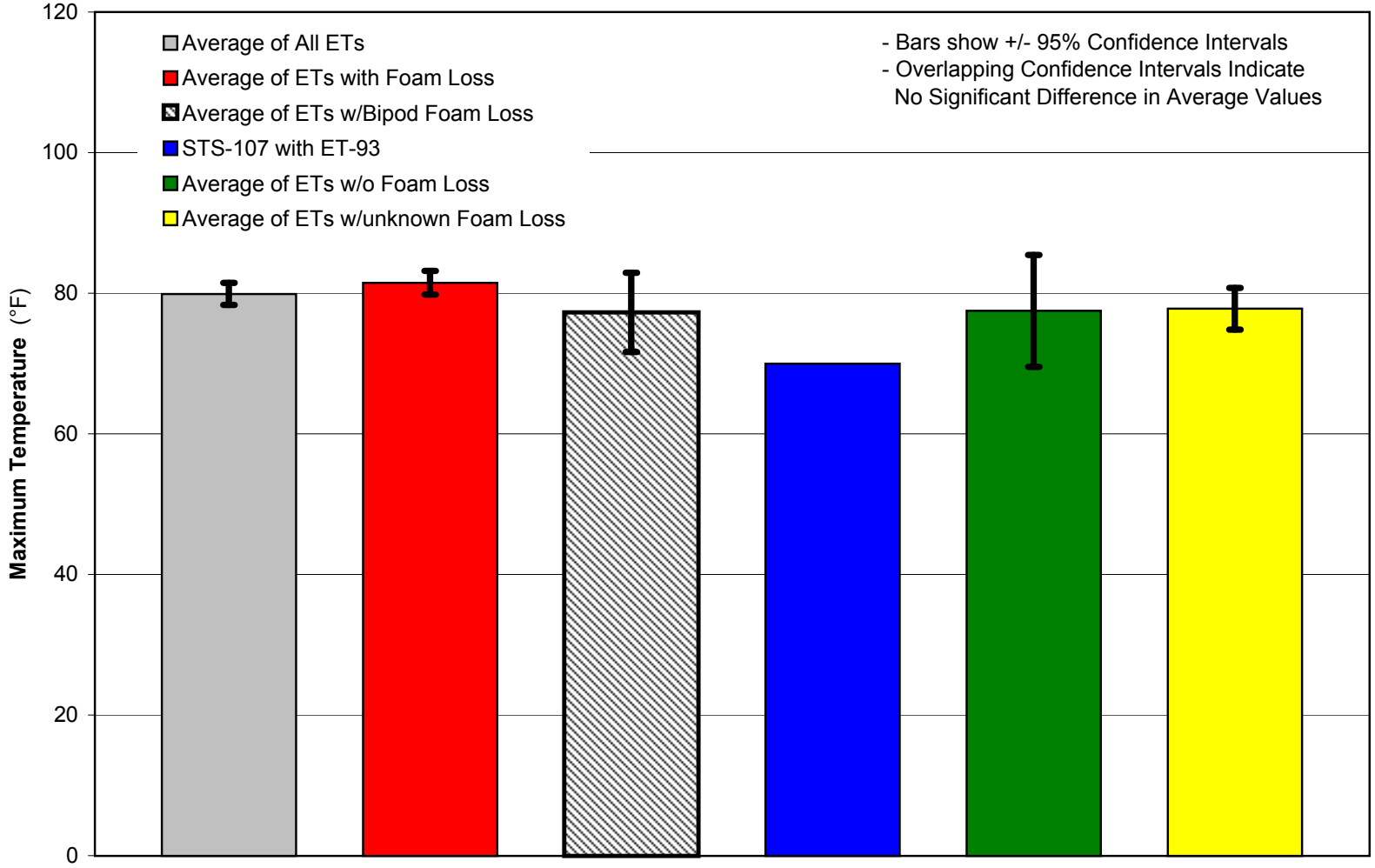
Average Temperature on Launch Day



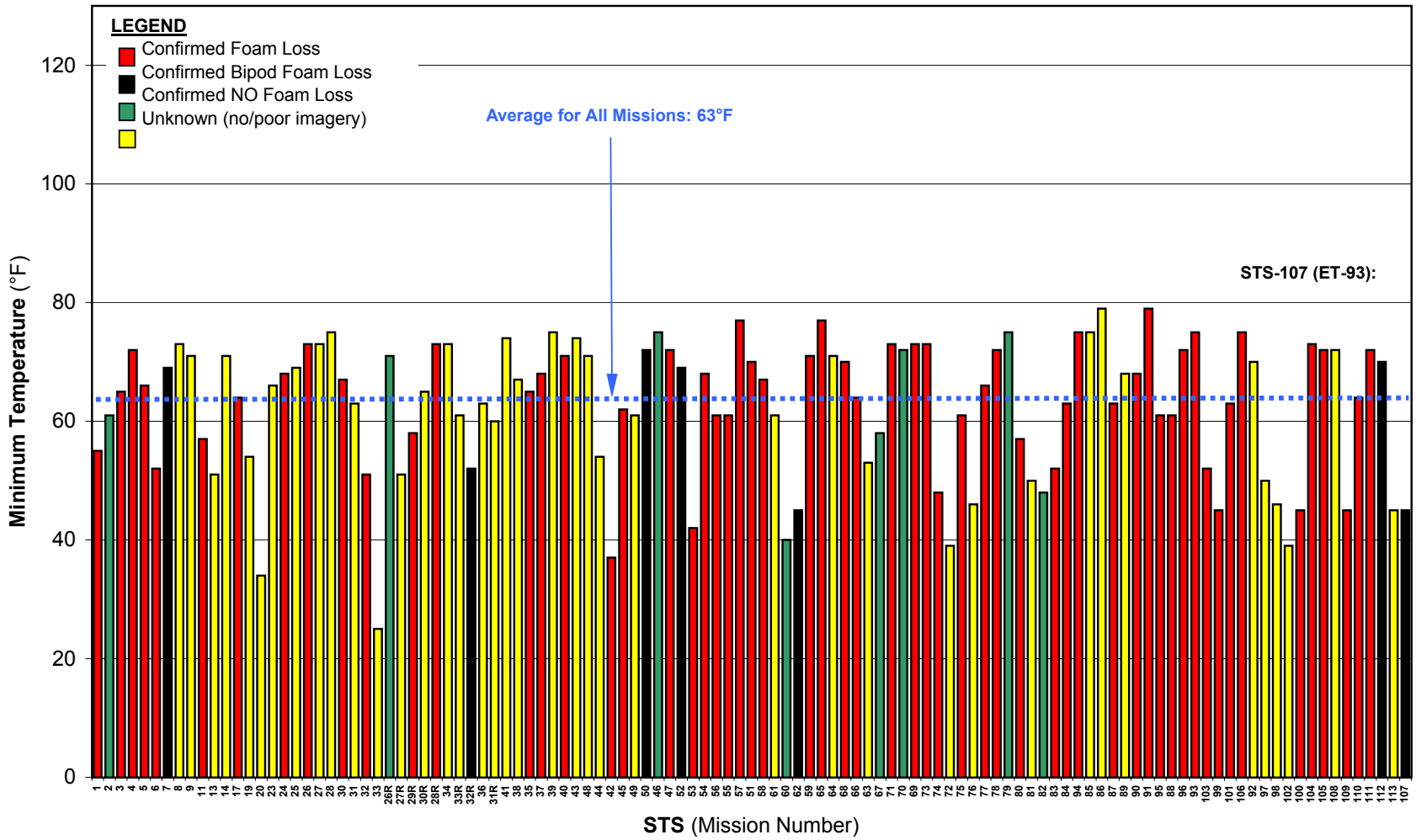
Maximum Temperature on Launch Day



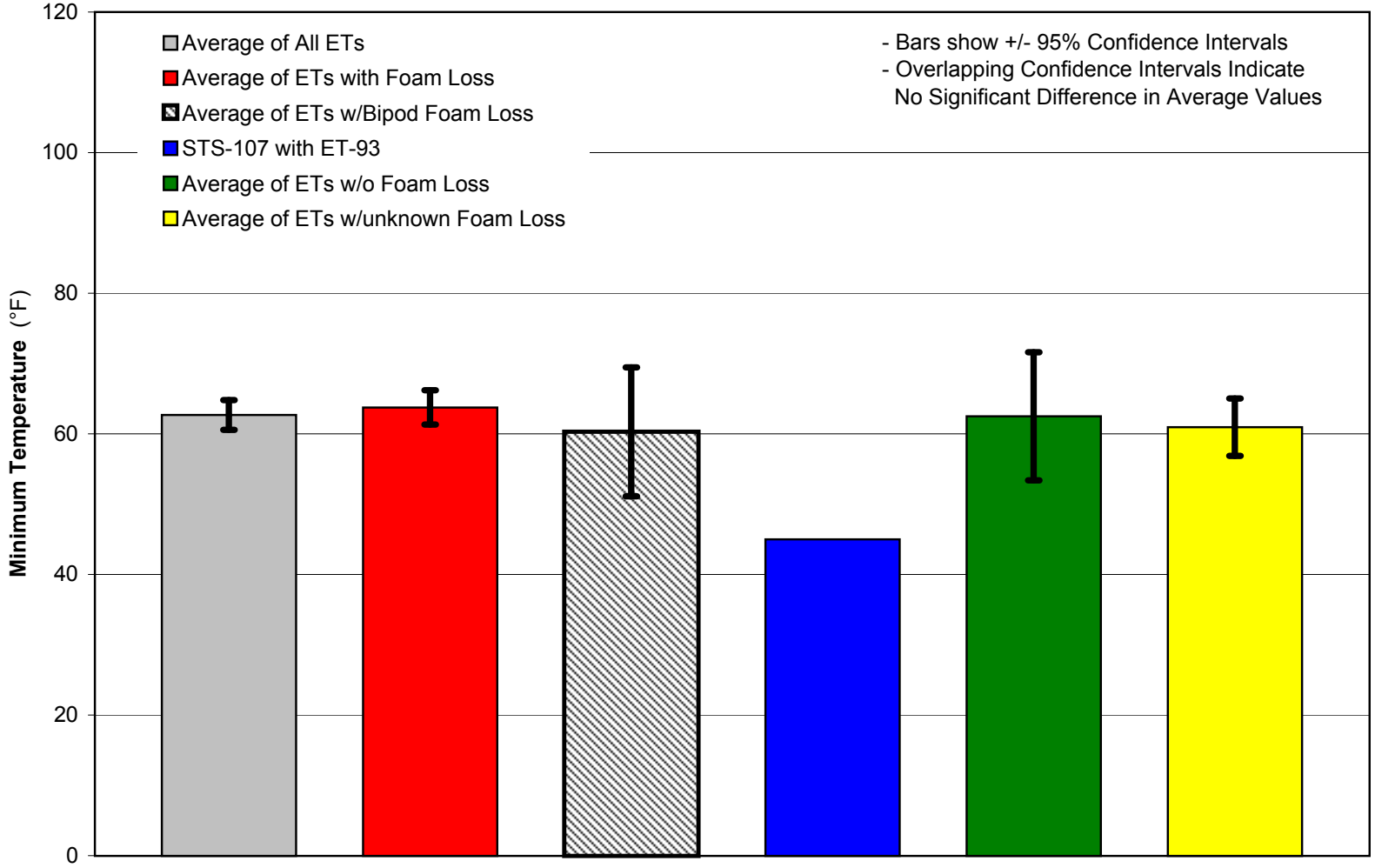
Maximum Temperature on Launch Day



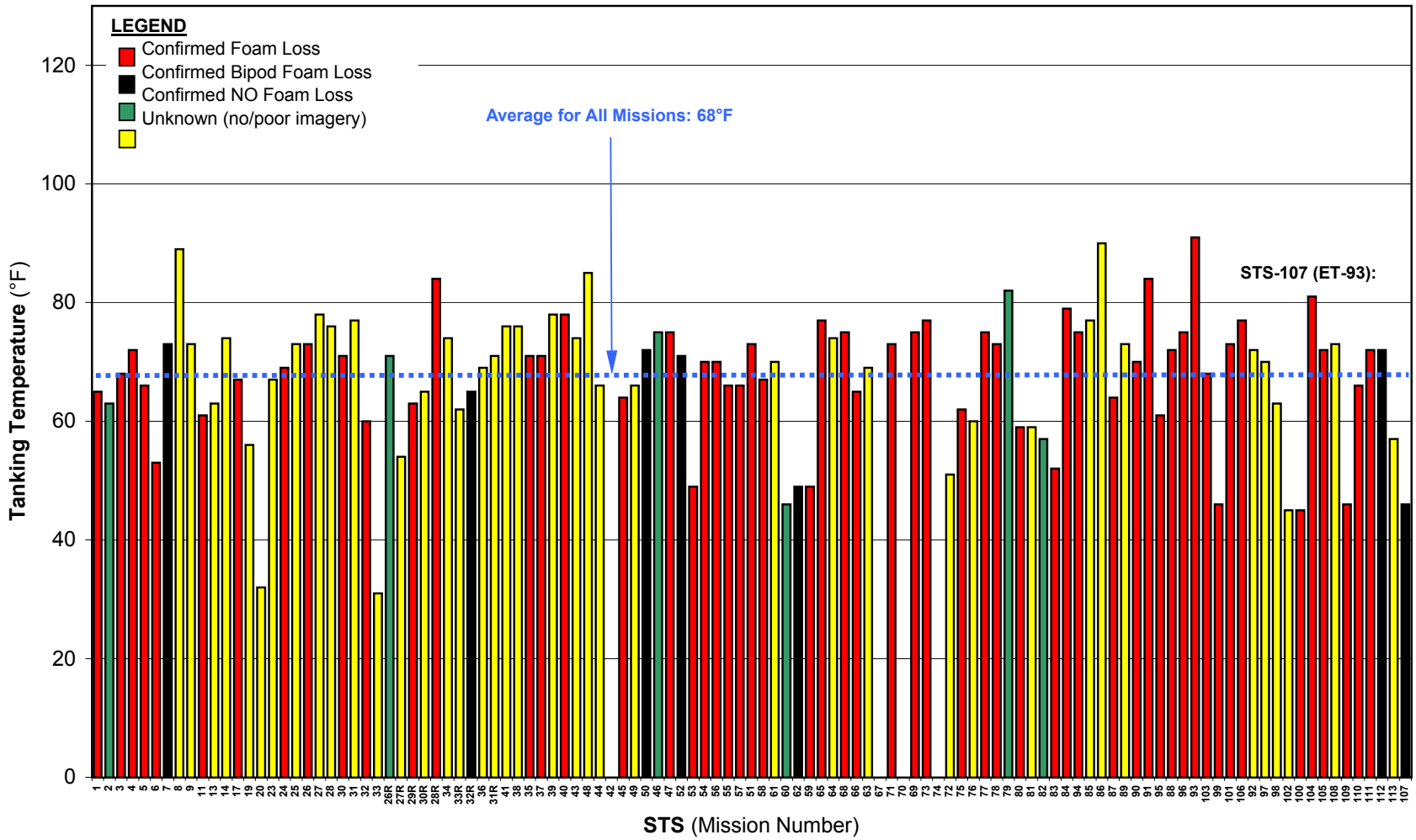
Minumum Temperature on Launch Day



Minimum Temperature on Launch Day



Temperature At Start of Tanking on Launch Day

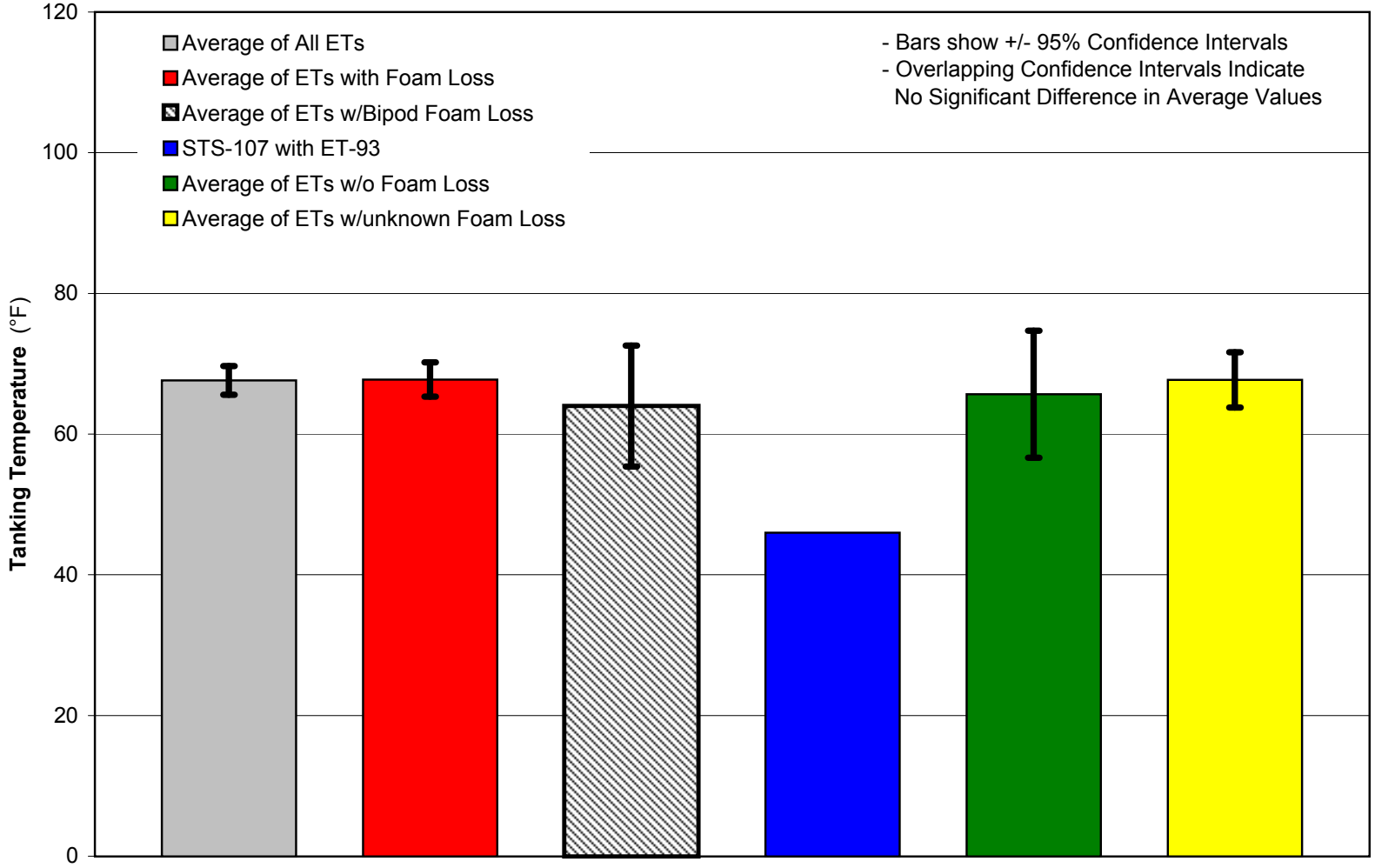


ET & Foam Data Trend

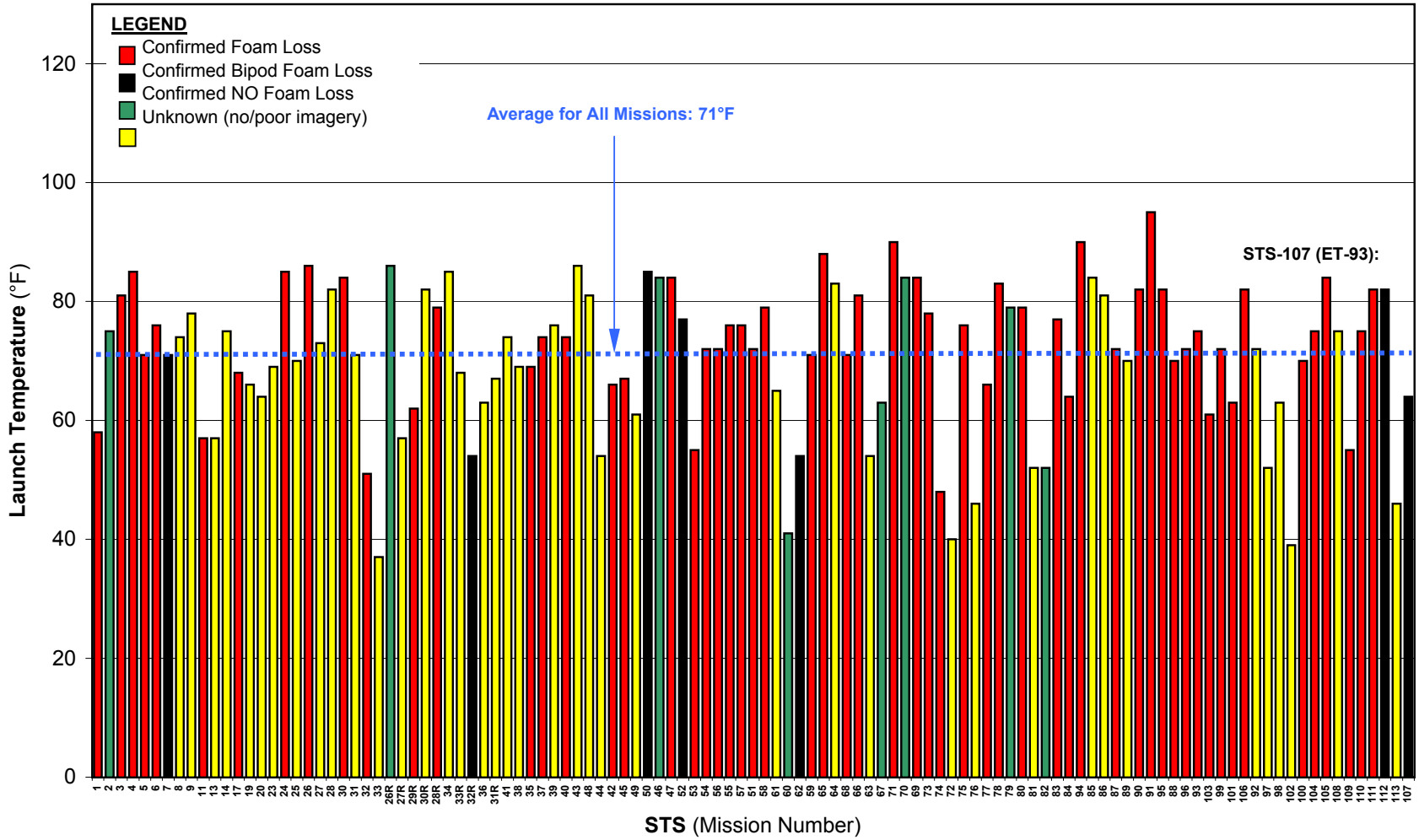
ET & Foam Data Trending.xls

CAB099-0053

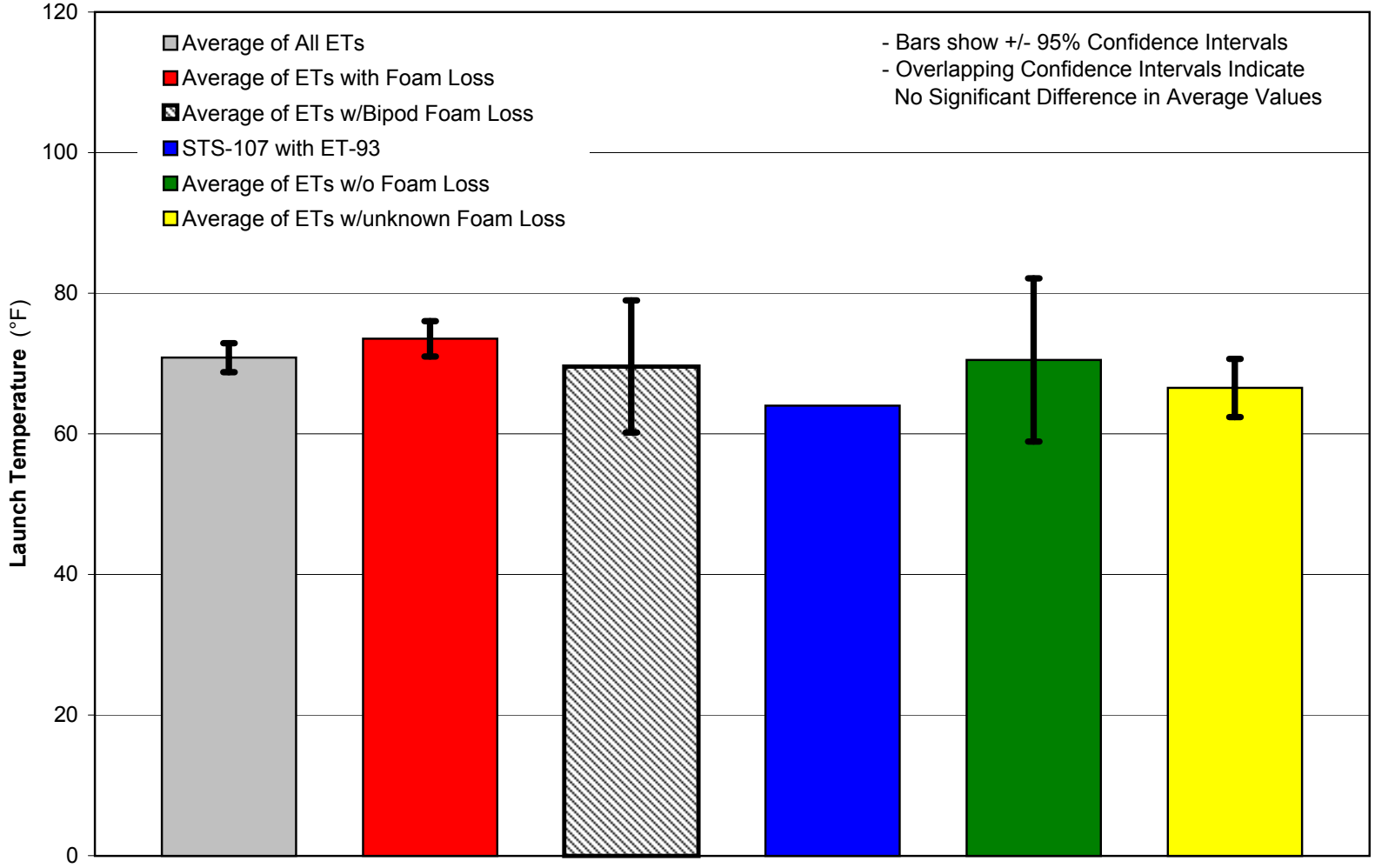
Temperature At Start of Tanking on Launch Day



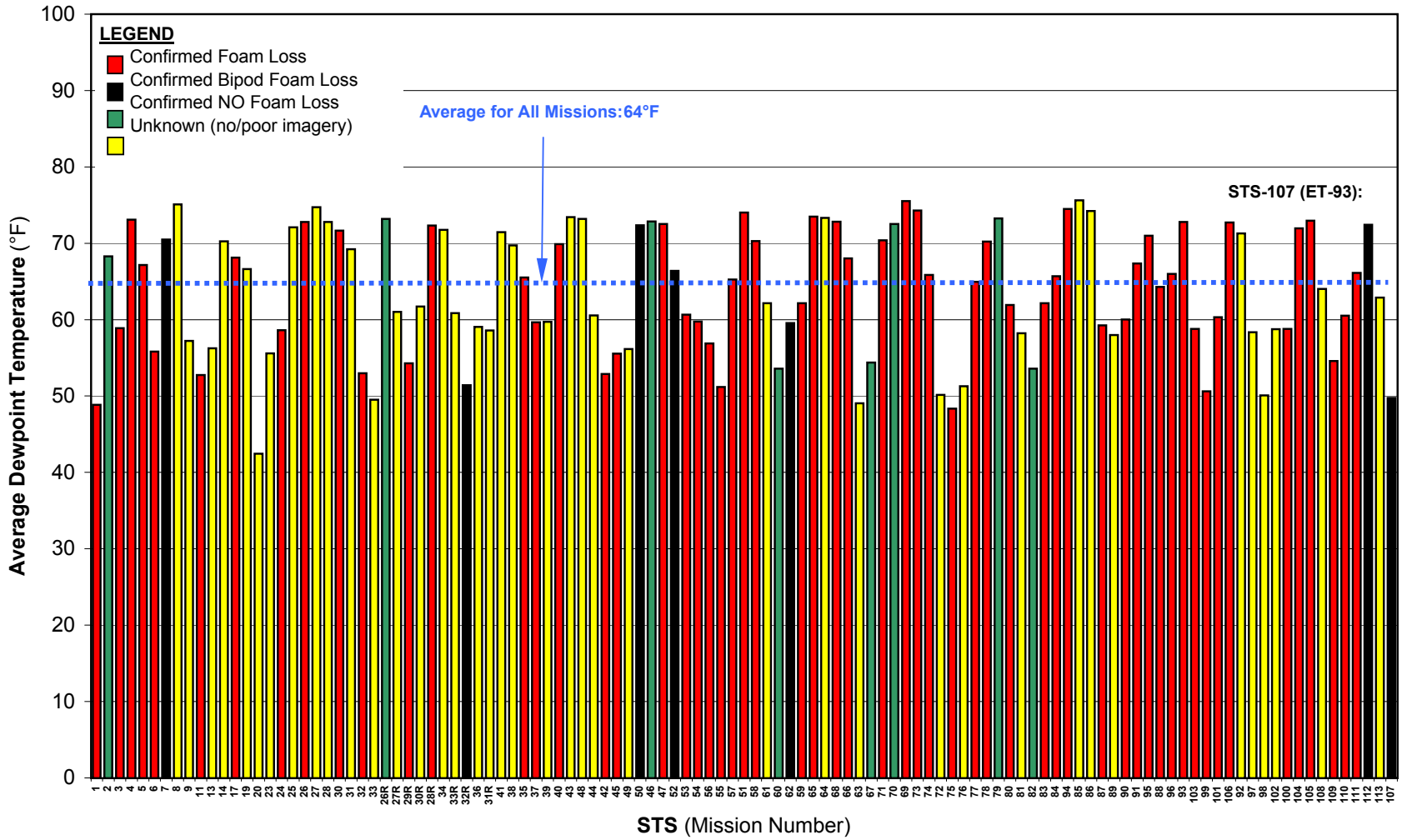
Temperature At Launch



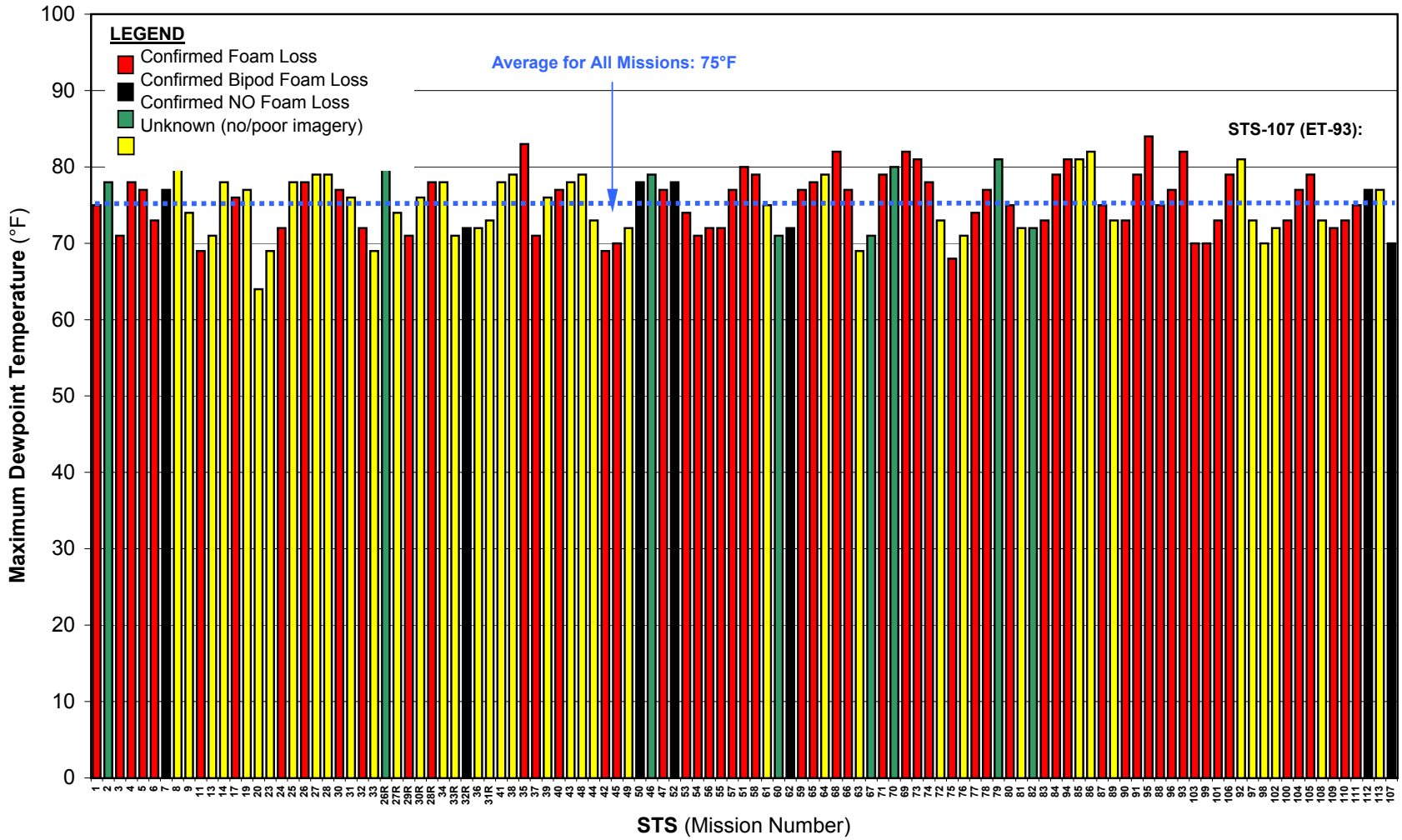
Temperature At Launch



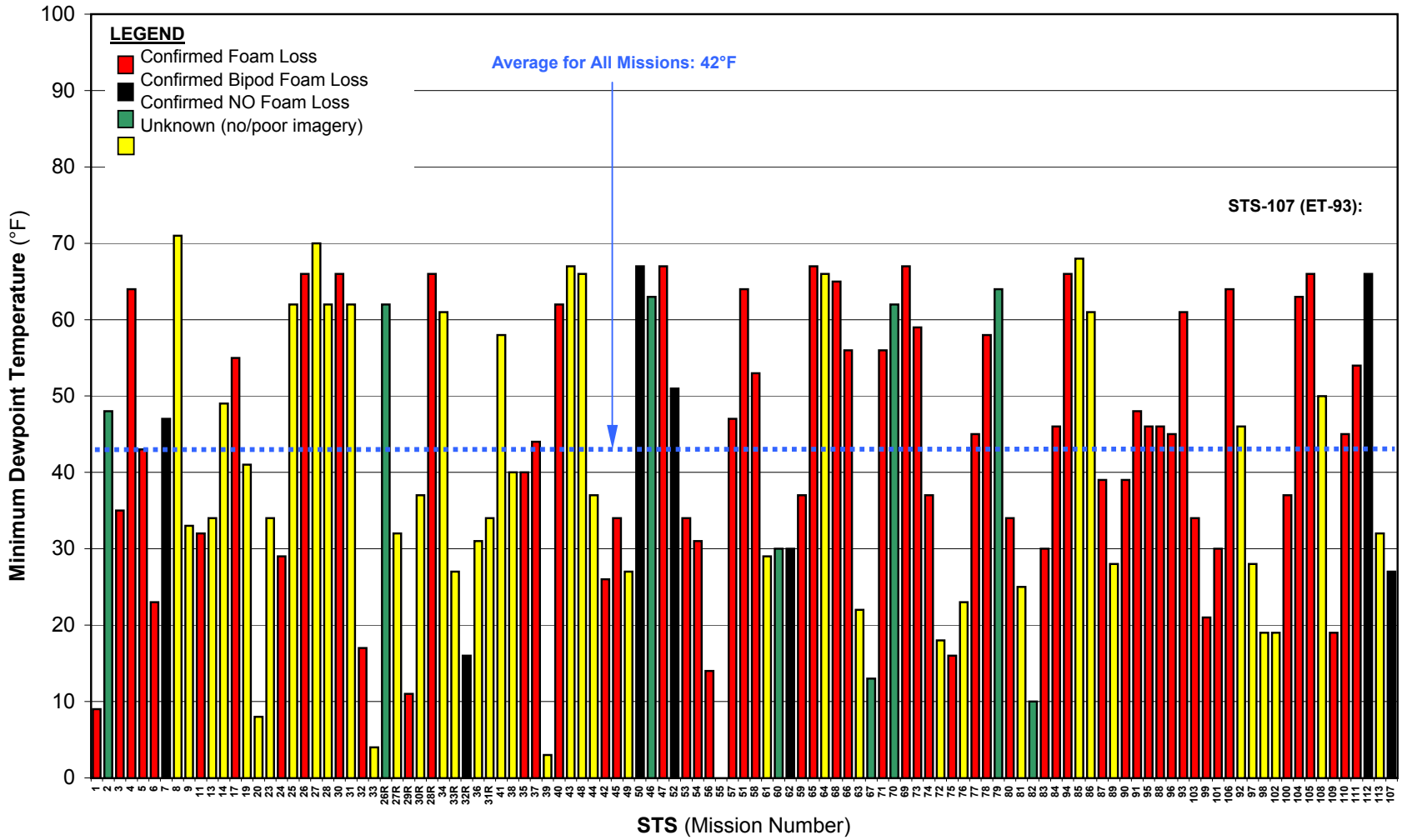
Average Dewpoint Temperature During Pre-Launch Period



Maximum Dewpoint Temperature During Pre-Launch Period



Minimum Dewpoint Temperature During Pre-Launch Period

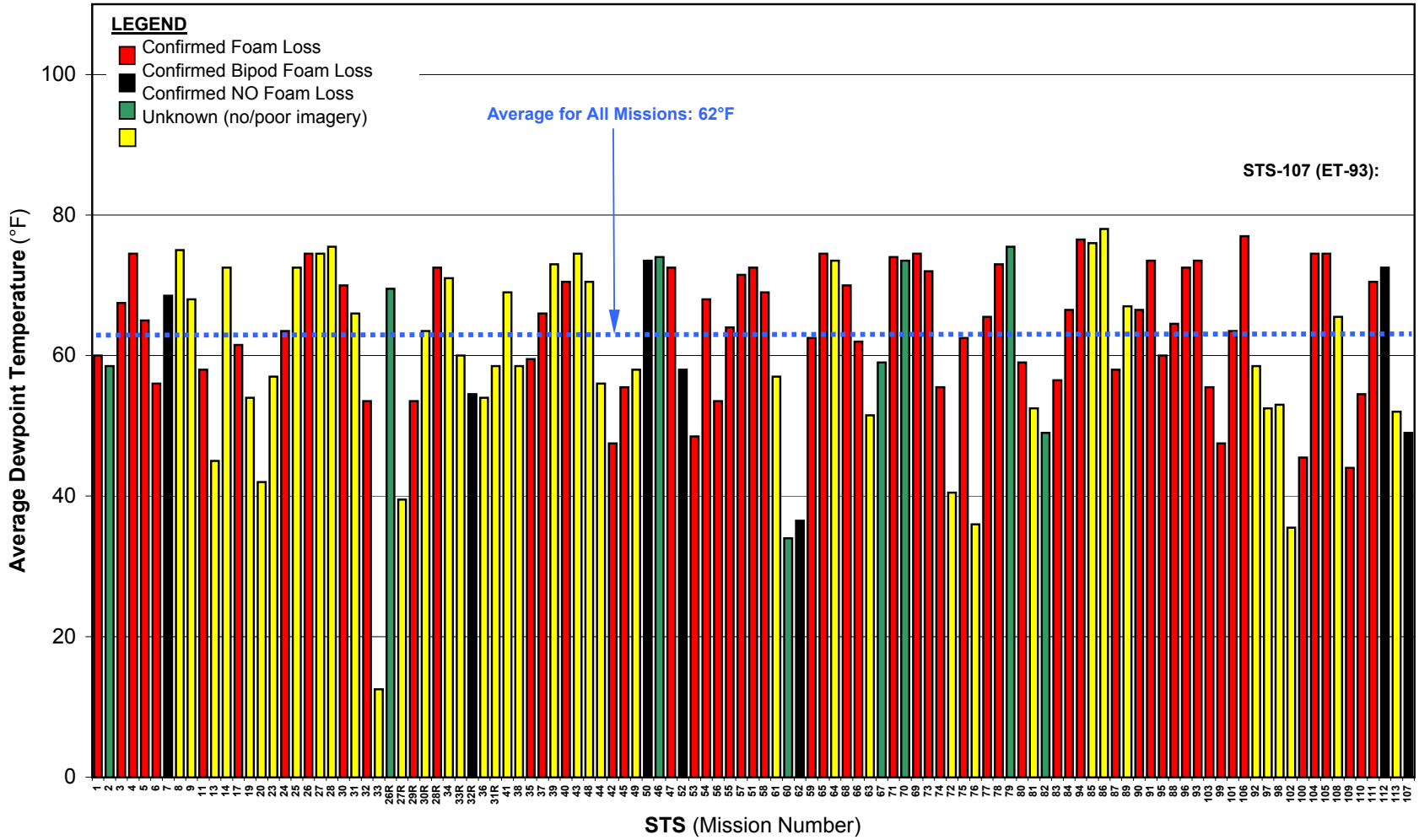


ET & Foam Data Trend

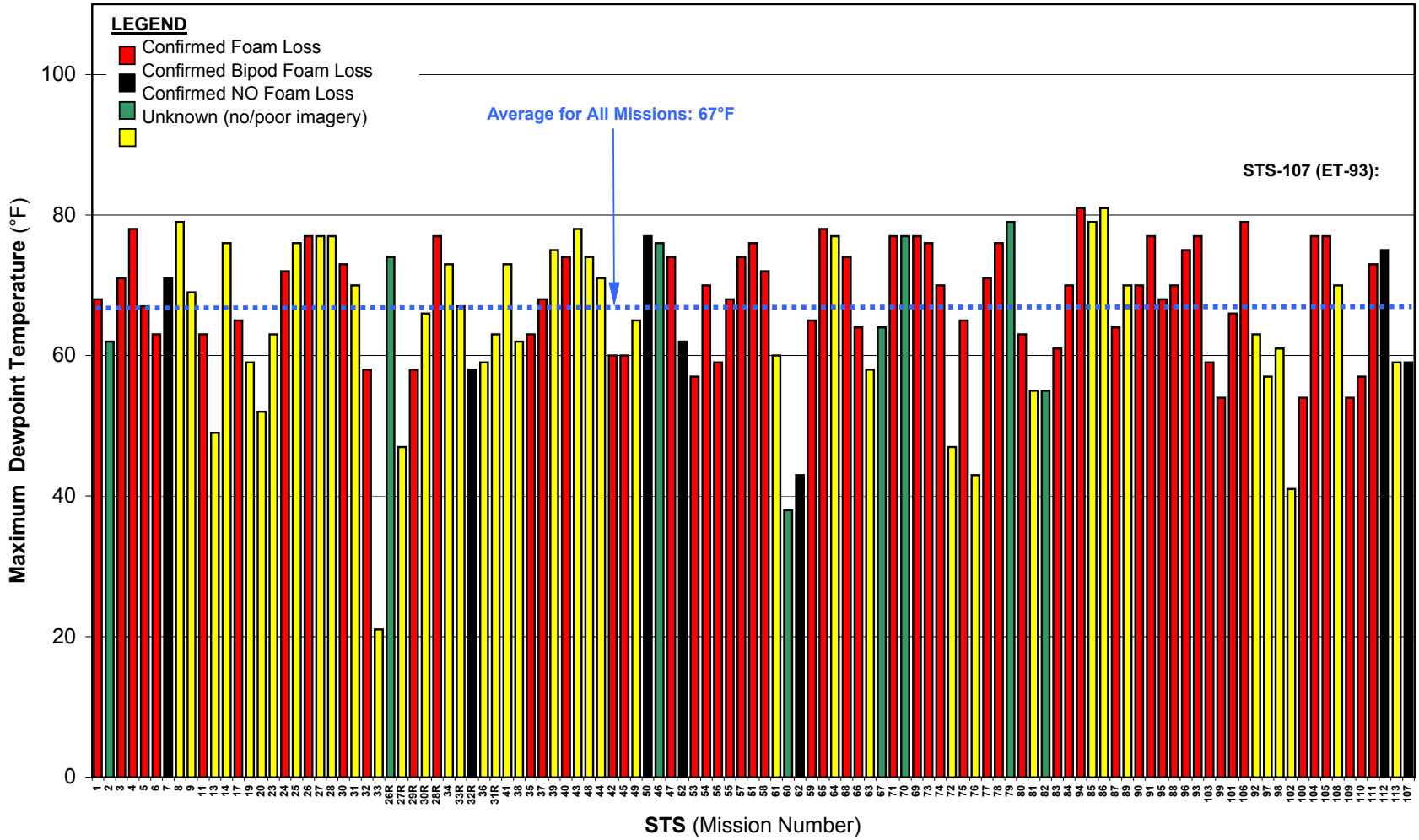
ET & Foam Data Trending.xls

CAB099-0059

Average Dewpoint Temperature on Launch Day



Maximum Dewpoint Temperature on Launch Day

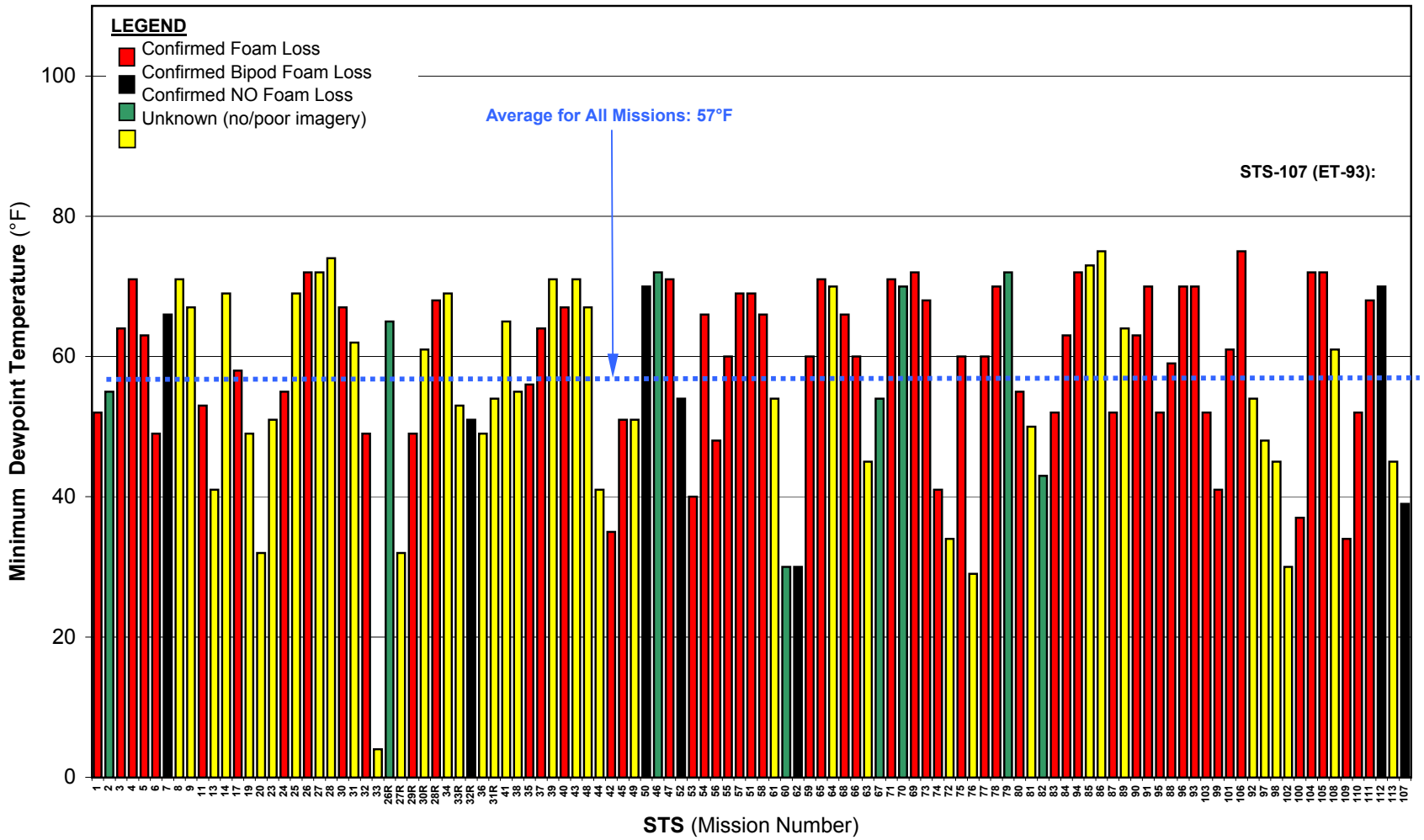


ET & Foam Data Trend

ET & Foam Data Trending.xls

CAB099-0061

Minimum Dewpoint Temperature on Launch Day

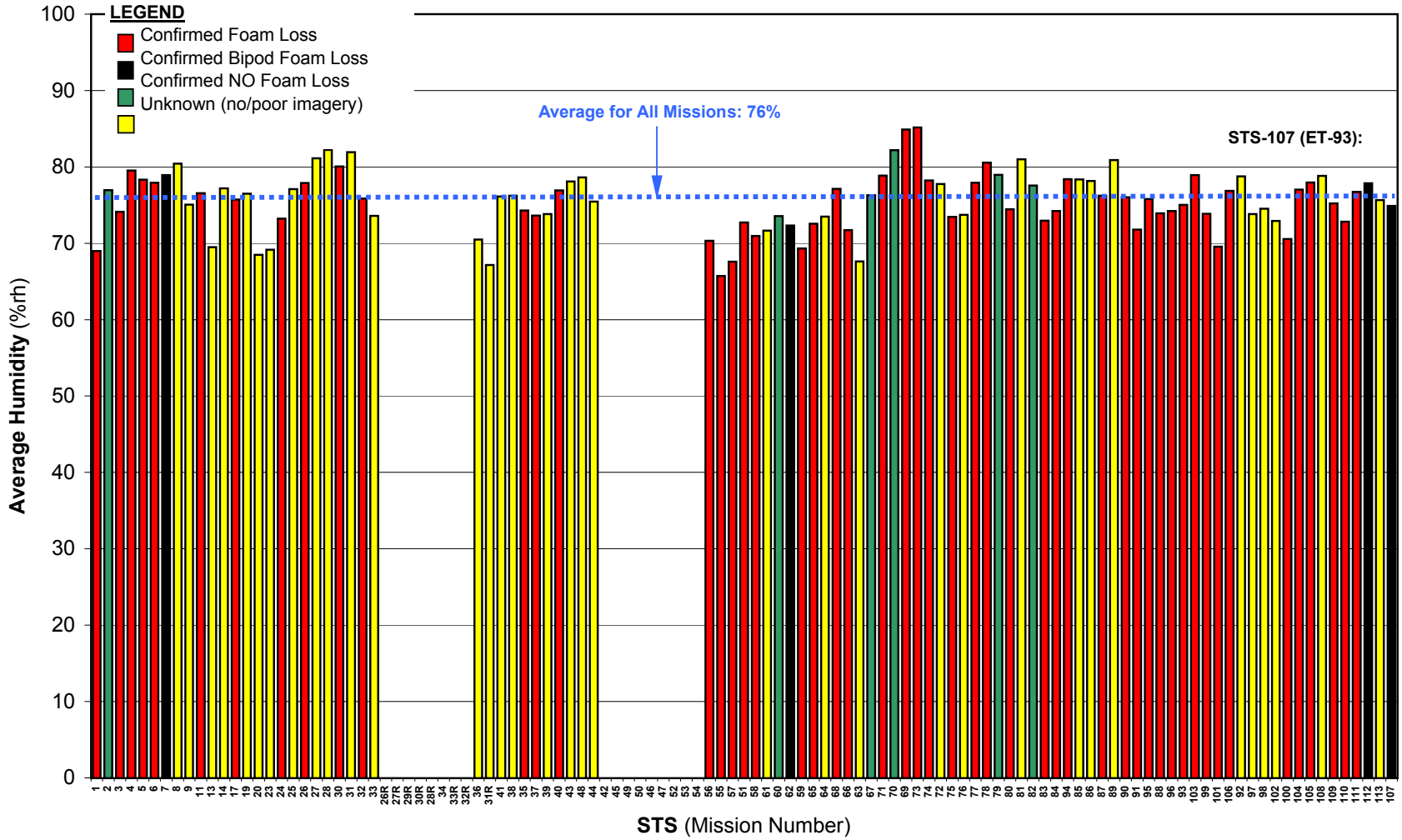


ET & Foam Data Trend

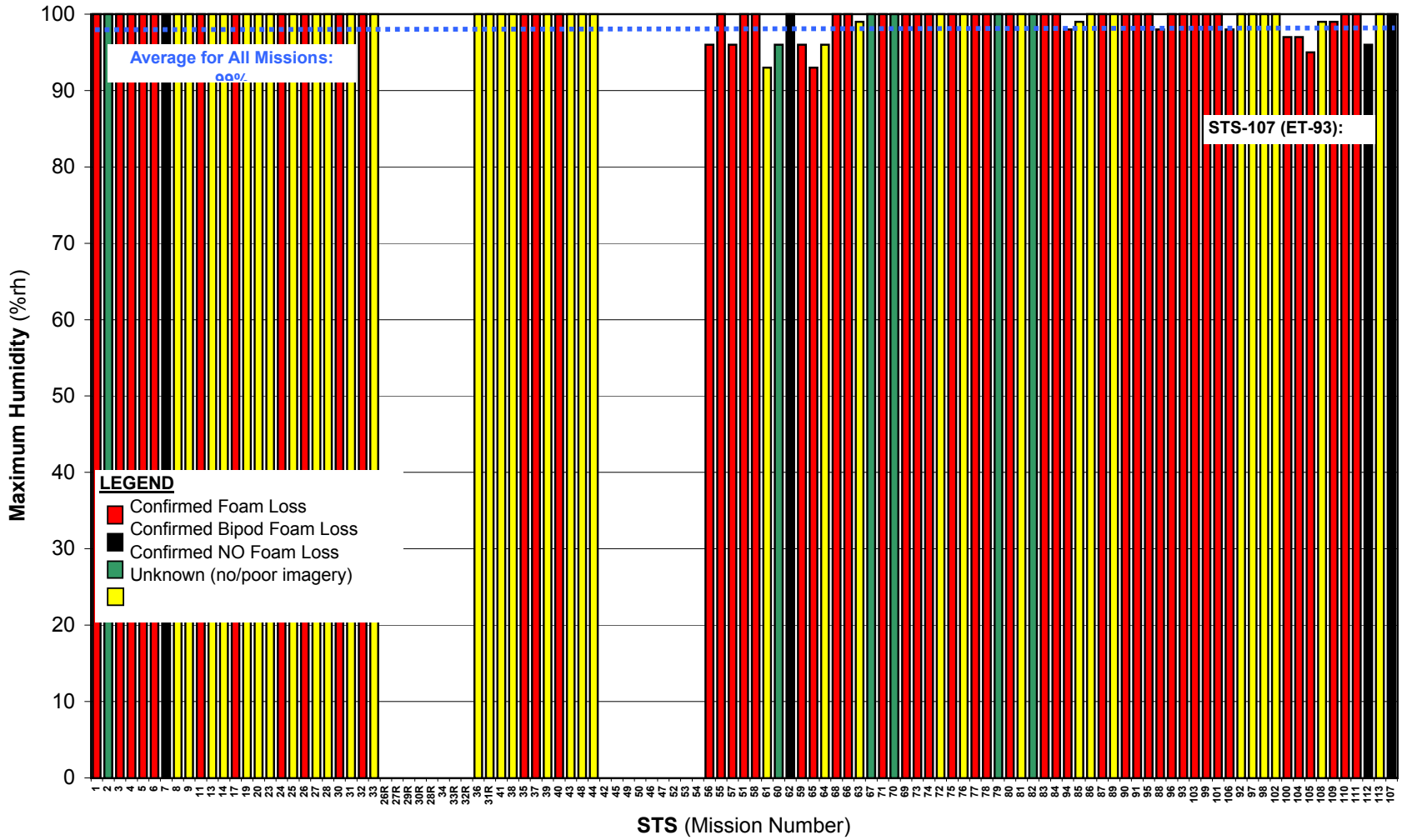
ET & Foam Data Trending.xls

CAB099-0062

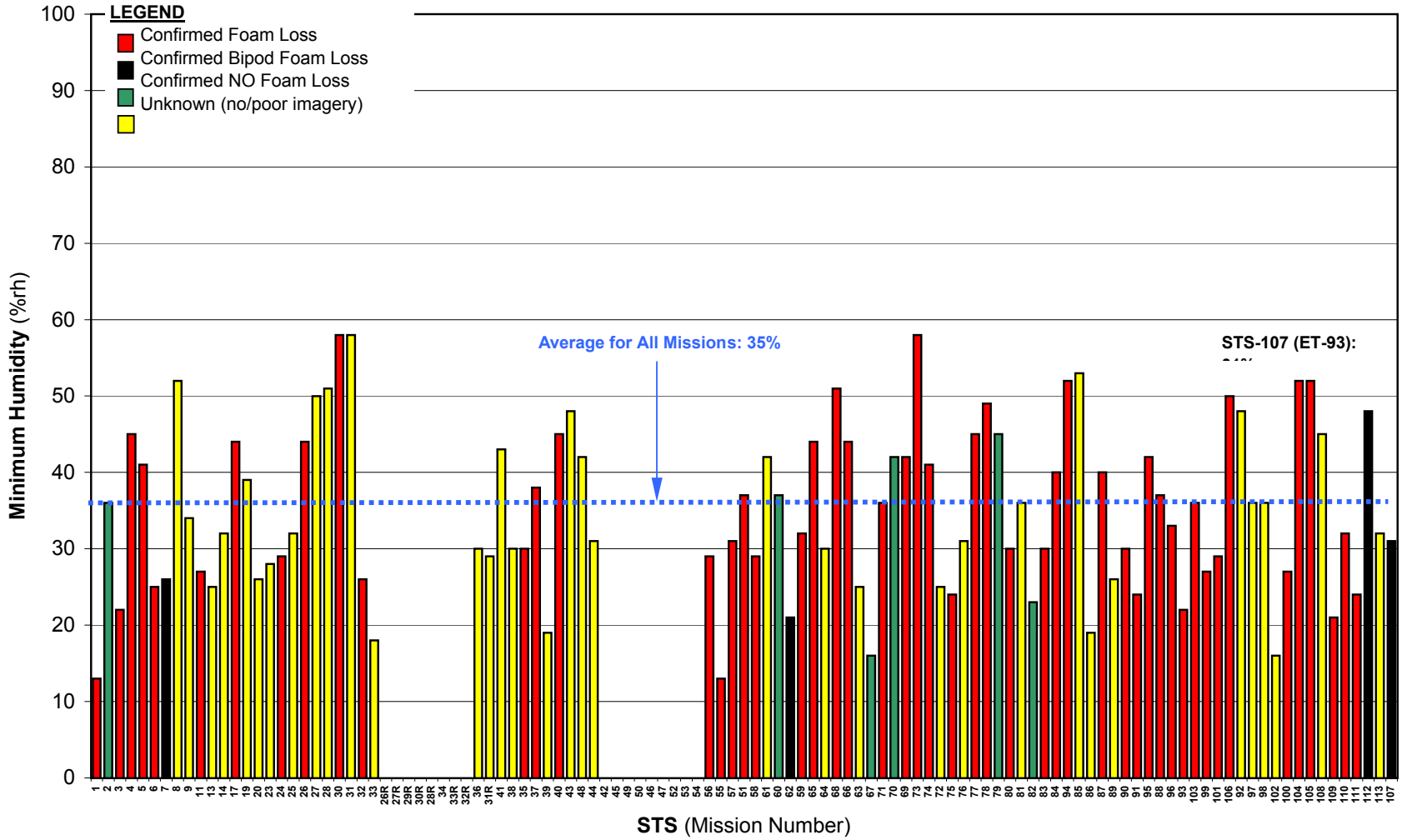
Average Humidity During Pre-Launch Period



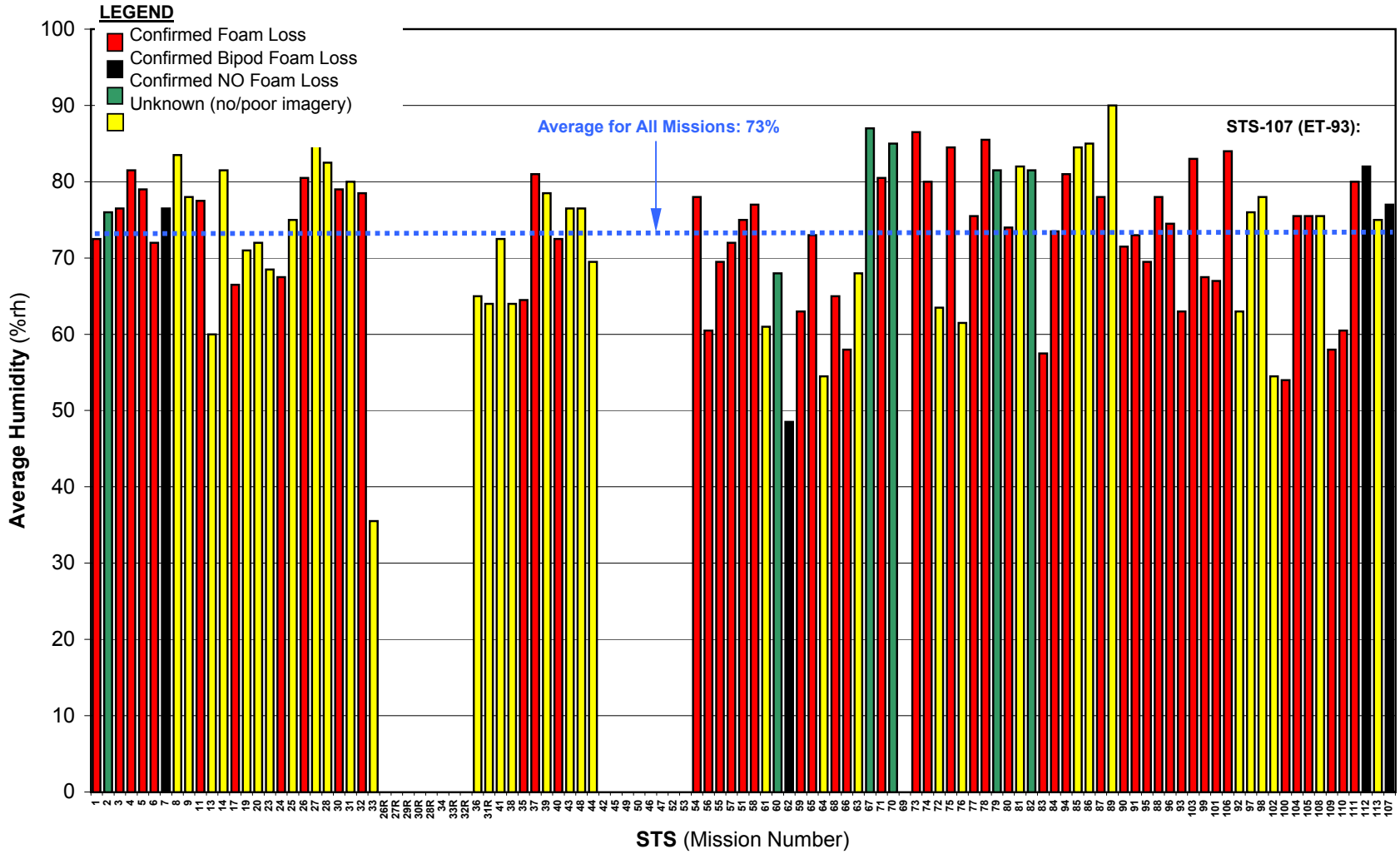
Maximum Humidity During Pre-Launch Period



Minimum Humidity During Pre-Launch Period



Average Humidity on Launch Day

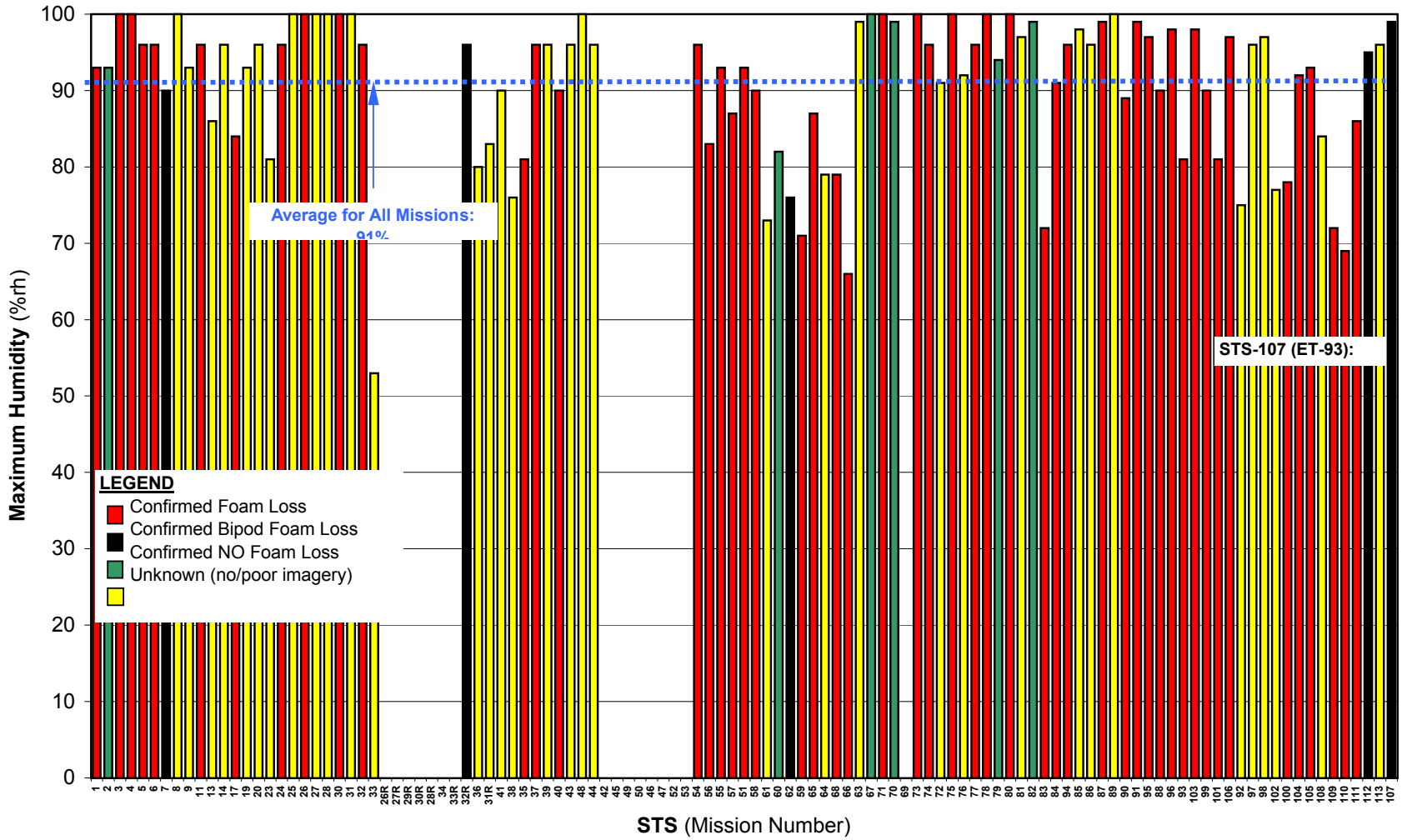


ET & Foam Data Trend

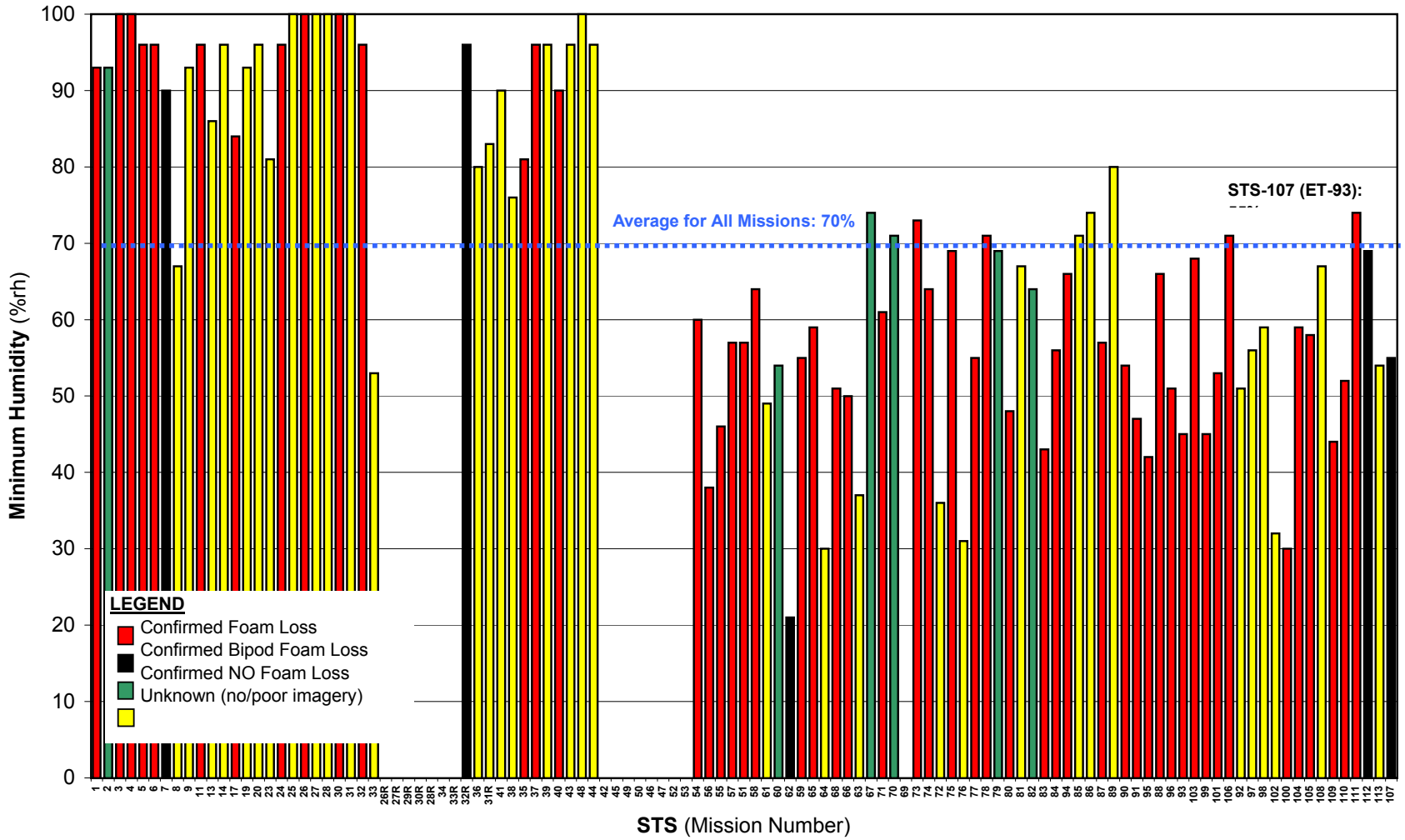
ET & Foam Data Trending.xls

CAB099-0066

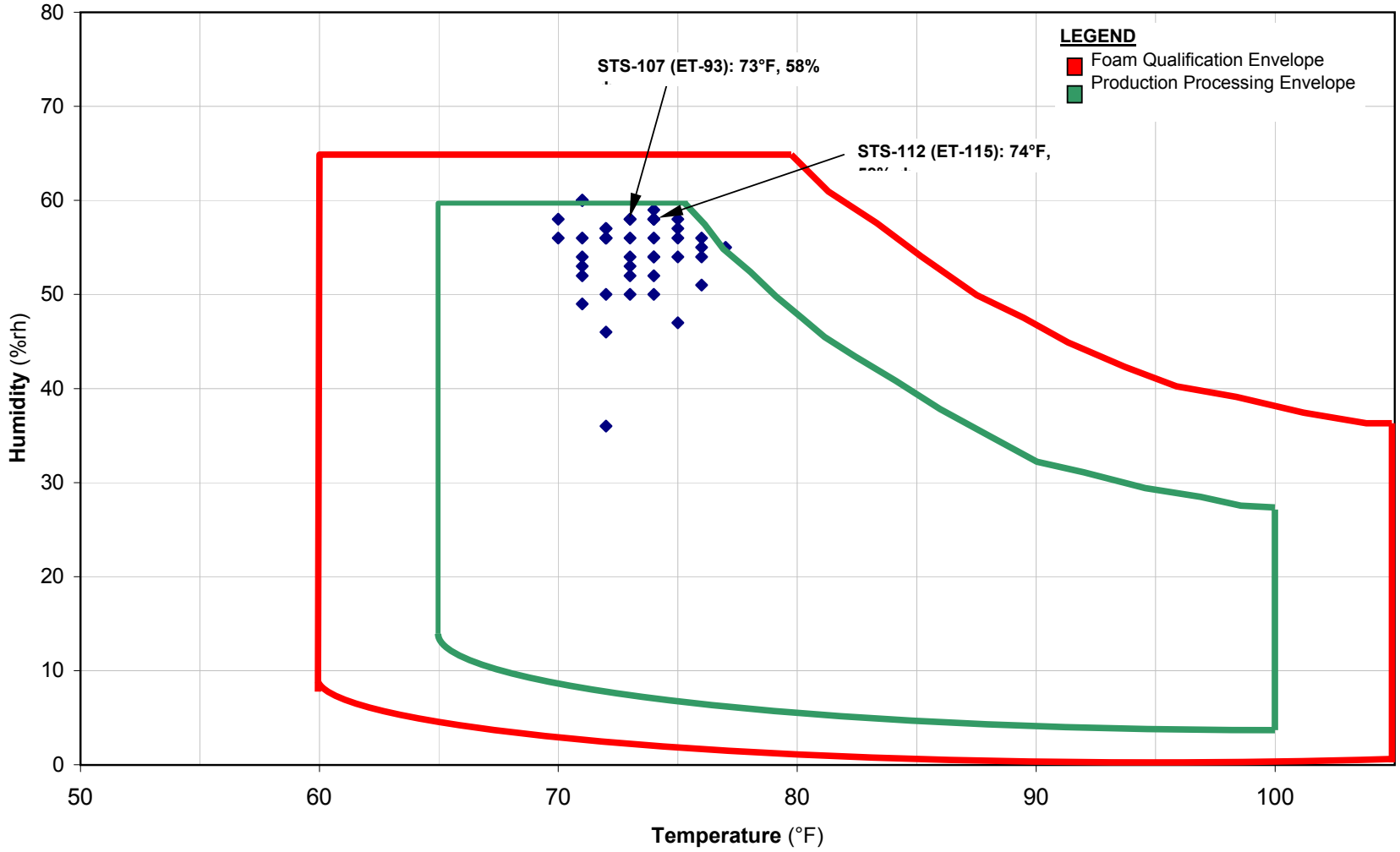
Maximum Humidity on Launch Day



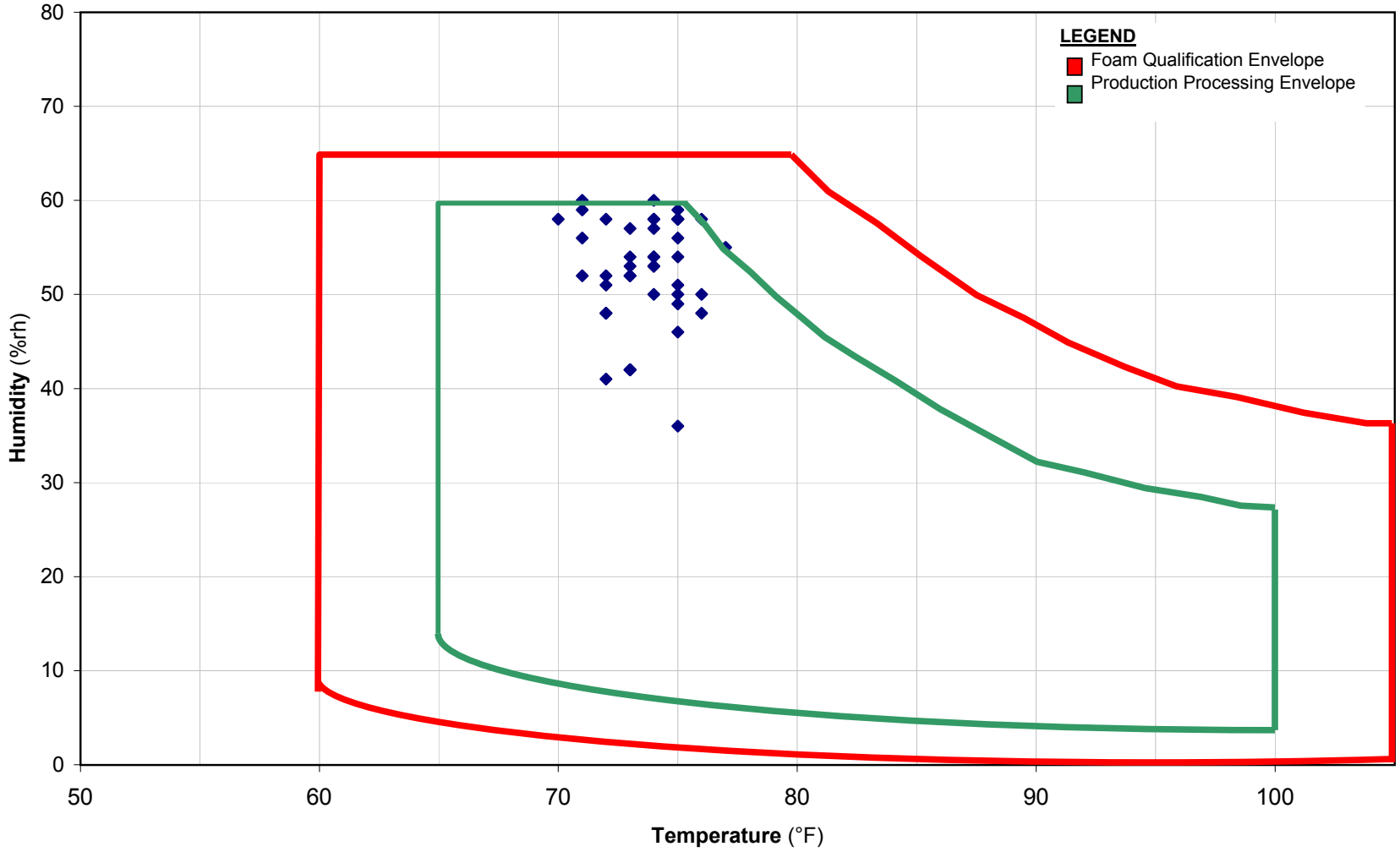
Minimum Humidity on Launch Day



-Y Bipod Manual Spray Conditions
(Cell Temperature & Humidity)



-Y Bipod Manual Spray Conditions
(Cell Temperature & Humidity)



STS-Mission ET Bipod Ramp Imagery and Damage Summary	B1-00173				
History of Foam Damage	OrlandoSentinel		15-Apr-02		
External Tank Foam Loss	B1-00039				
MAF Mission Support Room Log Board	at MAF				
Night Launches:	http://www-pao.ksc.nasa.gov/kscpao/factoids/shfacts.htm				
STS-ET Correlation.xls	Jim Feeley, MAF				
Debris Info STS-32 -35 -42 - 58 Summary.xls	B0-000026				
CAIB Cryoinsulation Report	B1-000121				
Discussions at MSFC (Scotty Sparks & Steve Holmes)	B1-000132				
tanking.xls	B1-000145				
Exposure Data for OVs.xls	B1-000145				
History of External Tank Foam Loss	B0-000026				
Pad_SLF_Mission_Summaries_1981-2003.xls (Rain)	B1-000145				
STS-XXX_L.xls (Climate)	B1-000145				
Production Data	B1-000131				
E-mail from P Munafo 10 July w/loads data, etc.	3 Jul 03 Telecon				

		tanking.xls (from B1-000167)								
STS	Launch	Tanking	Tanking							
		Start Date	Start	Stop	Duration	All Times Eastern				
107	1/16/2003	1/16/2003	219	519	3.00					
113	1/16/2003	1/16/2003	1120	1420	3.00					
112	10/7/2002	10/7/2002	650	950	3.00					
111	6/5/2002	6/5/2002	757	1057	3.00					
110	4/8/2002	4/8/2002	714	1014	3.00					
109	3/1/2002	2/28/2002	2101	1	3.00					
108	12/5/2001	12/5/2001	754	1054	3.00					
105	8/10/2001	8/10/2001	750	1050	3.00					
104	7/12/2001	7/11/2001	2008	2308	3.00					
100	4/19/2001	4/19/2001	545	845	3.00					
102	3/8/2001	3/7/2001	2117	7	2.92					
98	2/7/2001	2/7/2001	916	1216	3.00					
97	11/30/2000	11/30/2000	1310	1610	3.00					
92	10/11/2000	10/11/2000	952	1252	3.00					
106	9/8/2000	9/7/2000	2350	250	3.00					
101	5/19/2000	5/18/2000	2117	17	3.00					
99	2/11/2000	2/11/2000	410	710	3.00					
103	12/19/1999	12/19/1999	1030	1330	3.00					
93	7/23/1999	7/22/1999	1454	1754	3.00					
96	5/27/1999	5/26/1999	2154	54	3.00					
88	12/4/1998	12/3/1998	1810	2110	3.00					
95	10/29/1998	10/29/1998	540	840	3.00					
91	6/2/1998	6/2/1998	914	1214	3.00					
90	4/17/1998	4/17/1998	529	829	3.00					
???	1/22/1998	1/22/1998	1252	1552	3.00					
87	11/19/1997	11/19/1997	626	926	3.00					
86	9/25/1997	9/25/1997	1339	1639	3.00					
85	8/7/1997	8/7/1997	151	521	3.50					
94	7/1/1997	7/1/1997	530	830	3.00					
84	5/15/1997	5/14/1997	1847	2157	3.17					
83	4/4/1997	4/4/1997	540	840	3.00					
82	2/11/1997	2/10/1997	1904	2204	3.00					
81	1/12/1997	1/12/1997	1937	2237	3.00					
80	11/19/1996	11/19/1996	603	903	3.00					
79	9/16/1996	9/15/1996	1933	2243	3.17					
78	6/20/1996	6/20/1996	159	509	3.17					
77	5/19/1996	5/18/1996	2140	50	3.17					
76	3/22/1996	3/21/1996	1752	2102	3.17					
75	2/22/1996	2/22/1996	658	953	2.92					
72	1/11/1996	1/10/1996	1958	2253	2.92					
74	11/13/1995	11/12/1995	2248	48	3.00					
73	10/20/1995	10/20/1995	130	430	3.00					
69	9/7/1995	9/7/1995	249	549	3.00					
70	7/13/1995	7/13/1995	121	421	3.00					
71	6/27/1995	6/27/1995	612	912	3.00					
67	3/2/1995	3/1/1995	1717	2017	3.00					
63	2/3/1995	2/2/1995	1531	1831	3.00					
66	11/3/1994	11/3/1994	336	636	3.00					
68	9/30/1994	9/29/1994	2256	156	3.00					
64	9/9/1994	9/9/1994	810	1110	3.00					
65	7/8/1994	7/8/1994	423	723	3.00					
59	4/9/1994	4/9/1994	2245	145	3.00					
62	3/4/1994	3/4/1994	33	333	3.00					
60	2/3/1994	2/2/1994	2250	150	3.00					
61	12/2/1993	12/1/1993	2007	2307	3.00					
58	10/18/1993	10/18/1993	233	533	3.00					
51	9/12/1993	9/11/1993	2325	225	3.00					
57	6/21/1993	6/21/1993	47	347	3.00					
55	4/26/1993	4/26/1993	230	530	3.00					
56	4/8/1993	4/7/1993	1610	1910	3.00	ESTIMATED				
54	1/13/1993	1/13/1993	32	332	3.00					
53	12/2/1992	12/1/1992	2239	139	3.00					
52	10/22/1992	10/22/1992	256	526	2.50					
47	9/12/1992	9/12/1992	203	503	3.00					
46	7/31/1992	7/31/1992	136	436	3.00					
50	6/25/1992	6/25/1992	347	647	3.00					
49	5/7/1992	5/7/1992	1016	1316	3.00					
45	3/24/1992	3/24/1992	2310	240	3.50					
42	1/22/1992	1/22/1992	33	333	3.00					
44	11/24/1991	11/24/1991	1011	1311	3.00					
48	9/12/1991	9/12/1991	1037	1337	3.00					
43	8/2/1991	8/2/1991	241	541	3.00					

40	6/5/1991	6/4/1991	2340	240	3.00					
39	4/28/1991	4/27/1991	2241	141	3.00					
37	4/5/1991	4/5/1991	58	358	3.00					
35	12/2/1990	12/1/1990	1708	2008	3.00					
38	11/15/1990	11/15/1990	1010	1310	3.00					
41	10/6/1990	10/5/1990	2315	215	3.00					
31	4/24/1990	4/24/1990	11	311	3.00					
36	2/28/1990	2/27/1990	1840	2140	3.00	ESTIMATED FROM A PREVIOUS ATTEMPT				
32	1/9/1990	1/8/1990	2150	50	3.00	ESTIMATED				
33	11/22/1989	11/22/1989	1010	1310	3.00					
34	10/18/1989	10/18/1989	407	707	3.00	ESTIMATED FROM PREVIOUS DAY ATTEMPT				
28	8/8/1989	8/7/1989	2310	210	3.00	ESTIMATED FROM PREVIOUS DAY ATTEMPT				
30	5/4/1989	5/4/1989	528	828	3.00					
29	3/13/1989	3/12/1989	2350	250	3.00	ESTIMATED FROM PREVIOUS DAY ATTEMPT				
27	12/2/1988	12/1/1988	2220	120	3.00	ESTIMATED FROM PREVIOUS DAY ATTEMPT				
26	9/29/1988	9/29/1988	139	439	3.00					
51L	1/28/1986	1/28/1986	418	718	3.00					
61C	1/12/1986	1/11/1986	2235	1035	12.00	ESTIMATED FROM LAUNCH TIME (L-8)				
61B	11/26/1985	11/26/1985	1109	1409	3.00					
61A	10/30/1985	10/30/1985	340	640	3.00					
51J	10/3/1985	10/3/1985	200	500	3.00					
51I	8/27/1985	8/26/1985	2300	200	3.00	ESTIMATED FROM LAUNCH TIME (L-8)				
51F	7/29/1985	7/29/1985	628	928	3.00					
51G	6/17/1985	6/16/1985	2313	213	3.00					
51B	4/29/1985	4/29/1985	340	640	3.00					
51D	4/12/1985	4/12/1985	100	400	3.00	ESTIMATED FROM LAUNCH TIME (L-8)				
51C	1/23/1985	1/23/1985	455	755	3.00					
51A	11/7/1984	11/6/1984	2358	258	3.00					
41G	10/5/1984	10/4/1984	2243	143	3.00					
41D	8/30/1984	8/30/1984	15	315	3.00	ESTIMATED FROM PREVIOUS DAY ATTEMPT				
41C	4/6/1984	4/5/1984	2038	338	5.00					
41B	2/3/1984	2/2/1984	2345	245	5.00					
9	11/28/1983	11/27/1983	2240	540	7.00					
8	8/30/1983	8/29/1983	1800	2100	3.00	ESTIMATED				
7	6/18/1983	6/18/1983	13	313	3.00					
6	4/4/1983	4/4/1983	530	930	4.00	ESTIMATED				
5	11/11/1982	11/10/1982	2330	230	3.00	ESTIMATED				
4	6/27/1982	6/27/1982	300	600	3.00	ESTIMATED				
3	3/22/1982	3/22/1982	200	500	3.00	ESTIMATED				
2	11/12/1981	11/12/1981	200	530	2.50	ESTIMATED FROM LAUNCH TIME (L-8)				
1	4/12/1981	4/11/1981	2330	300	3.50	ESTIMATED				

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
107	093	102	01/16/03	Yes	No	Day	***Columbia Accident*** Crew downlink video views -Y/-Z side of ET - No visual observations	N	N	Ground base films note most likely loss of -Y bipod ramp at 81 seconds MET	No loss of TPS noted	No loss of TPS noted
113	116	105	11/24/02	No	No	Night	Due to dark conditions no useable ET imagery was obtained	N	N	No data obtained	No data obtained	No data obtained
112	115	104	10/07/02	No	Yes	Day	N/A	Y	Y	Portion (approximately 12"x7") of the -Y Bipod Ramp TPS is missing exposing the bipod spindle	1 divot (3" dia) in LH2 tank flange near the -Y jack-pad closeout with exposed primed substrate 1 divots (2.5"x1.5") in LH2 tank flange just forward of the +Y jack pad closeout	No loss of TPS noted
111	113	105	06/05/02	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	3 divots (1.5" dia) in LH2 tank flange near the +Y jack-pad closeout 1 divot (1.5" dia) at the +Y bipod ramp-to-LH2 tank interface	No loss of TPS noted
110	114	104	04/08/02	Yes	Yes	Day	ET intertank, LO2 tank, and the ET nose cone were not imaged Shadows from the late afternoon limited the 35mm umbilical camera views in the +Y direction of the ET LO2 feedline. The +Y ET Thrust Panel was not imaged 16mm umbilical camera film with the 10 mm lens (FL-101) was out of focus	Y	Y	No loss of TPS noted	2 divots (approximately 5" x 5") between the bipod. One of the divots encompasses a significant portion of the +Y Jack Pad closeout	No loss of TPS noted
109	112	102	03/01/02	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	3 divots between bipod ramps (one small and two 6" dia) 2 smal divots (3" dia) +Y of LH2 PAL Ramp near thrust panel	No loss of TPS noted
108	111	105	12/05/01	No	No	Night	No data obtained	N	N	No data obtained	No data obtained	No data obtained
105	110	103	08/10/01	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	Small divots observed between the bipod struts	No loss of TPS noted
104	109	104	07/12/01	Yes	Yes	Day	Large areas of the +Z not visible	Y	Y	No loss of TPS noted	1 small divot in the LH2 tank flange at +Y 1 small divot between bipod struts	No loss of TPS noted
100	108	105	04/19/01	Yes	Yes	Day	All images were in clear focus, field of view and the lighting was excellent	Y	Y	No loss of TPS noted	2 divots (4" dia and 10" dia) between the bipod struts near centerline 1 divot (4"-6" dia) in the LH2 tank flange closeout -Y/+Z quadrant	No loss of TPS noted
102	107	103	03/08/01	Yes	Yes	Day	Lighting was excellent for areas to the +Y side of the LO2 feedline, the -Y side of the ET was in deep shadow 16 mm umbilical cameras not flown on this mission	N	N	No apparent loss of TPS noted - Area in deep shadow	No loss of TPS noted	No loss of TPS noted
098	106	104	02/07/01	No	No	Night	Due to dark conditions no useable ET imagery was obtained	N	N	No data obtained	No data obtained	No data obtained
097	105	105	11/30/00	No	No	Night	Crew photos too distant to determine ET foam loss 35mm imagery too dark and 16mm umbilical cameras disabled	N	N	No data obtained	No data obtained	No data obtained
092	104	103	10/11/00	No	No	Night	Due to dark conditions no useable ET imagery was obtained	N	N	No data obtained	No data obtained	No data obtained
106	103	104	09/08/00	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	Numerous divots occurred in the LH2 tank flange closeout 3 divots (4"-6" dia) in LH2 tank flange closeout between the LO2 feedline and +Y thrust panel with exposed primed substrate in two of the divots 3 divots (4"-6" dia) in LH2 tank flange closeout between the bipod struts Possible divot in LH2 tank flange closeout under pressline	No loss of TPS noted
101	102	104	05/19/00	Yes	Yes	Day	SRB Mounted Cameras installed to observe NCFI popcorning phenomenon - 228 popcorn-type (small shallow) divots in Intertank thrust panel foam First ET will fully implemented thrust panel foam venting - Venting thrust panel foam reduced the size of the foam divots	Y	Y	No loss of TPS noted	Possible divot in the LH2 tank flange closeout on centerline (seen in crew photos only)	No loss of TPS noted
099	092	105	02/11/00	No	Yes	Day/Night	Good frontal lighting on the ET after the Orbiter shadow moved away Implemented partial venting of thrust panel foam	Y	Y	No loss of TPS noted	1 divot (18"X6") +Y side of the LH2 tank cable tray. The divot extended from the LH2 tank-to-intertank flange closeout into the intertank net spray foam 1 divot (7"x5") in the LH2 tank flange closeout on centerline between the bipod struts with exposed primed substrate 2 divots (6"-7"dia) divots in the LH2 tank flange closeout in the -Y/+Z quadrant outboard of the -Y bipod ramp	No loss of TPS noted
103	101	103	12/20/99	No	No	Night	SRB Mounted Cameras installed to observe NCFI popcorning phenomenon - 78 popcorn-type (small shallow) divots in Intertank thrust panel foam Implemented partial venting of thrust panel foam	N	N	No data obtained	No data obtained	No data obtained
093	099	102	07/23/99	No	No	Night/Day	Crew photos too distant to determine ET foam loss SRB Mounted Cameras installed to observe NCFI popcorning phenomenon - 210 popcorn-type (small shallow) divots in Intertank thrust panel foam	N	N	No data obtained	No data obtained	No data obtained
096	100	103	05/27/99	Yes	No	Day	SRB Mounted Cameras installed to observe NCFI popcorning phenomenon - 449 popcorn-type (small shallow) divots in Intertank thrust panel foam	Y	Y	No loss of TPS noted	Two small light spots (possible divots) were detected in the LH2 tank flange closeout between the bipod struts	Small divots (2 or 3) in the foward ogive (pencil sharpener area) that exceed the typically observed normal ablation. "Popcorn" type divots close to the +Z axis in an area from the nose cone aft to approximately XT-480.

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	3
One shallow TPS divot was observed on the LH2 tank near the ice/frost ramp at station Sta-1857. The area is shallow and approximately 5-inches long by 3-inches wide.	No loss of TPS noted	No loss of TPS noted	Flange closeout	1
1 divot (6"x2") near the GO2 pressline ramp at Sta 897 with exposedprimed substrate. This area is not sanded or vented	No loss of TPS noted	No loss of TPS noted	Flange closeout	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	1 small divot (3" dia) with foam still partially attached on the +Y thrust strut near the aft /inboard side 1 divot (8" dia) with foam still partially attached on the +Y thrust strut near the forward flange	No	1
No data obtained	No data obtained	No data obtained	N/A	2
No loss of TPS noted	1 divot near the base of the LO2 feedline support bracket closeout at station Sta 1377 1 divot (2"x6") observed near the Sta 1270 location	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	1 divot(4" dia) was noted just aft of the +Y bipod spindle housing closeout	1 divot (6"x 4") was seen on the +Y longeron TPS closeout, near the thrust strut joint to the longeron	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	2
4 shallow divots were located on stringer head 1 divot (8"Lx2"W) just forward of the flange closeout and almost on centerline with the bipod 2 small divots on stringer head TPS forward of the +Y bipod housing closeout in the intertank acreage	2 shallow divots (2" dia) approximately 12 inches aft of the flange closeout/bipod	1 small divot on the +Y thrust strut knuckle (appeared to be the result of a debris impact) 1 divot in the leading edge of the Sta 1787 ice/frost ramp (may have taken some acreage NCFI as well	Flange closeout	2
Intertank thrust panel popcorning (See notes)	No loss of TPS noted	Possible divot in +Y longeron closeout 1 divot (4"x2") in the forward surface outboard edge of the +Y vertical strut cable tray closeout 7 divots, possibly caused by ice debris impacts, in the +Y thrust strut TPS near the flange/knuckle	No	4
1 divot (approximately 18"L) at the +Y thrust panel to stringer interface just forward of the LH2 tank-to-intertank flange	No loss of TPS noted	3 divots on the pressline ice/frost ramp upper closeout at Sta 1722	Flange closeout	2
Intertank thrust panel popcorning (See notes)	No data obtained	No data obtained	N/A	2
Intertank thrust panel popcorning (See notes)	No data obtained	No data obtained	N/A	3
Intertank thrust panel popcorning (See notes) Light spots, possible small divots, were visible in the intertank +Z stringers forward of the bipod	No loss of TPS noted	No loss of TPS noted	No	1

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
088	097	105	12/04/98	Yes	No	Night/Day	No usable umbilical imagery ere available due to the dark conditions Crew phots provided views of the aft dome, aft hardpoint, LH2 tank acreage, LO2 tank acreage, portions of the intertank and the nose cone.	Y	Y	No loss of TPS noted	10" divot in LH2 tank flange closeout extending into -Y thrust panel acreage	No loss of TPS noted
095	098	103	10/29/98	Yes	Yes	Day	SRB Mounted Cameras installed to observe NCFI popcorning phenomenon - 152 popcorn-type (small shallow) divots in Intertank thrust panel foam	Y	Y	No loss of TPS noted	2 divots (7" dia) between bipod 1 divot near +Y bipod flange	No loss of TPS noted
091	096	103	06/02/98	Yes	Yes	Day	First flight of umbilical well cameras on OV103	Y	Y	No loss of TPS noted	6" divot between bipod struts in LH2 tank flange closeout Two divots (4 to 6 diameter) in -Y/+Z quadrant of LH2 tank flange closeout 10" divot in LH2 tank flange closeout near -Y thrust panel	No loss of TPS noted
090	091	102	04/17/98	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	One 6" dia divot in LH2 tank flange closeout at centerline Three divots in -Y/+Z quadrant (2 divots approximately 4 - 6" dia and one divot 10" dia, with exposed primed substrate) of LH2 tank flange closeout One divot (3" dia) in +Y/+Z quadrant of LH2 tank flange closeout	No loss of TPS noted
089	090	105	01/22/98	No	No	Night	No data obtained	N	N	No data obtained	No data obtained	No data obtained
087	089	102	11/19/97	Yes	Yes	Day	IFA-87-T001, Intertank thrust panel foam popcorning phenomenon associated with NCFI	Y	Y	No loss of TPS noted	8" divot outboard of LO2 feedline in LH2 tank flange closeout	No loss of TPS noted
086	088	105	09/25/97	No	No	Night	No data obtained	N	N	No data obtained	No data obtained	No data obtained
085	087	105	08/07/97	Yes	No	Day	No loss of TPS noted (+Z / -Y side visible)	Y	N	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
094	086	102	07/01/97	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
084	085	104	05/15/97	Yes	No	Night	No umbilical cameras installed on OV104 ET separation not visible due to darkness until later when the ET crossed the terminator line	Y	Y	No loss of TPS noted	1 divot (6" dia) in LH2 tank flange closeout between bipod struts	No loss of TPS noted
083	084	102	04/04/97	Yes	Yes	Day	35 mm film jammed Good data from 16mm Handhelds back lighting by sun	Y	Y	No loss of TPS noted	5 divots (approximately 9 to 11" dia) in LH2 tank flange closeout at -Y/+Z quadrant outboard of -Y bipod 3 divots (6 to 7" dia) in LH2 tank flange closeout between bipod struts	No loss of TPS noted
082	081	103	02/11/97	Yes	No	Night	No umbilical cameras instaled on OV103 Good image of +Y axis No loss of TPS noted	Y	Y	No apparent loss of TPS noted	No loss of TPS noted	No loss of TPS noted
081	083	104	01/12/97	Yes	No	Night	Good images of -Z / +Y axis	N	N	No apparent loss of TPS noted	Six divots in LH2 tank flange closeout +Y axis (aft of thrust panel)	No loss of TPS noted
080	080	102	11/19/96	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
079	082	104	09/16/96	Yes	No	Night	Crew photos taken after ET cross terminator line (long range views) No loss of TPS noted	Y	Y	No loss of TPS noted - Cannot verify fwd ramp due to angle	No loss of TPS noted	No loss of TPS noted
078	079	102	06/20/96	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	4 divots in LH2 tank flange closeout - 1 in +Y/+Z quadrant - 2 in -Y/+Z quadrant - 1 adjacent to -Y jack pad closeout	No loss of TPS noted
077	078	105	05/19/96	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
076	077	104	03/22/96	No	No	Night	No ET sep imagery - SRB sep only	N	N	No data obtained	No data obtained	No data obtained
075	076	102	02/22/96	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	4 divots in LH2 tank flange closeout ranging from 6 to 12" dia (1 at -Y/+Z and 3 at +Y/+Z)	5" dia divot just below flange closeout +Y side
072	075	105	01/11/96	Yes	Yes	Night	Data obtained from 16mm umbilical or 35mm crew photos	N	N	No apparent loss of TPS noted - Bipods in shadow	No loss of TPS noted	No loss of TPS noted

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
Several divots (2"-3") could be discerned in thrust panel TPS to the -Z side of the EB fitting and forward of the fitting	No loss of TPS noted	No loss of TPS noted	No	2
Intertank thrust panel popcorning (See notes) 1 divot (7" long) near +Z aero vent 10 small divots on stringers forward of the bipod 11 divots (3"-7" dia) on +Y thrust panel forward of EB	1 divot (6" dia) between LO2 feedline and cable tray near Sta 1860 2 divots (3" dia) just forward of the crossbeam	No loss of TPS noted	No	1
Several (20 -25) small shallow divots were detected in the -Y thrust panel acreage	Small divot just aft of -Y bipod ramp in LH2 acreage	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	Small divots in -Y and +Y thrust struts	10" dia divot in flange	1
No data obtained	No data obtained	No data obtained	N/A	1
Numerous divots forward and aft of EB fitting on +Y and -Y thrust panel	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
7 small shallow divots on Intertank stringer heads forward of the forward of the bipod	22 divots (2"-3" dia) concentrated forward of aft crossbeam 1 divot (16"x10") between pressline and LO2 feedline at Sta 1528 1 divot (14"x2") outboard of Sta 1593 ice/frost ramp 1 divot (5" dia) adjacent to Sta 1623 LO2 feedline bracket with possible primer showing 1 divot (6"x4") between the pressline and LO2 feedline at Sta 1722	1 divot (6"x6") in -Y bipod jack pad closeout with substrate exposed 1 divot (4"x2") in leading edge of ice/frost ramp at Sta 1657	Jack pad closeout	1
3 shallow divots in stringer heads near LO2 PAL ramp 10 shallow divots forward of bipod 8 shallow divots around -Y bipod	No loss of TPS noted	Jack pads - Two shallow divots extending to upper barrel acreage	No	1
No loss of TPS noted	No loss of TPS noted	2 divots (approximately 3" dia) on -Y thrust strut - One on flange closeout and one just aft of flange	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
1 divot forward of -Y bipod ramp approximately 10" long and possibly showing substrate 2 divots (approximately 4" long) between bipod struts just forward of the flange closeout. One of the divotswith exposed primed substrate 1 divot (15" long) forward of the LO2 feedline fairing near Sta 930 with exposed primed substrate	1 divot (6" dia) in -Y/+Z quadrant	4 shallow divots (approximately 2"-3") on +Y vertical strut outboard surface 1 divot (5" dia) on -Y vertical strut	Intertank acreage	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
30 small shallow divots in stringer valleys around -Y bipod 10 small shallow divots around +Y bipod ramp	4 shallow divots in LH2 acreage just below -Y bipod	Missing portion of ice/frost ramp at Sta 760 Part of +Y jack pad (4" x '4") with primed substrate exposed 1 divot (4"x2") in forward, inboard corner of ice/frost ramp at Sta 1464 1 divot (12"x4"x1") on -Y thrust strut flange	Jack pad closeout	1
No data obtained	No data obtained	No data obtained	N/A	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
074	074	104	11/12/95	No	Yes	Day	16mm/10 lens did not run	Y	Y	No loss of TPS noted	3" dia divot in LH2 tank flange closeout in +Y/+Z quadrant adjacent to PAL ramp	No loss of TPS noted
073	073	102	10/20/95	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
069	072	105	09/07/95	No	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
070	071	103	07/13/95	Yes	No	Day	Good images of +Z and -Z	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
071	070	104	06/27/95	No	Yes	Day	No handheld photography	Y	Y	No loss of TPS noted	1 shallow divot aft of -Y bipod closeout	No loss of TPS noted
067	069	105	03/03/95	Yes	No	Night	View of +Z with handhelds No apparent loss of TPS noted	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
063	068	103	02/03/95	No	No	Night	No umbilical cameras installed on OV103 No data obtained	N	N	No data obtained	No data obtained	No data obtained
066	067	104	11/03/94	Yes	Yes	Day	First flight of umbilical well cameras on OV104	Y	Y	No loss of TPS noted	1 divot (5" dia) in -Y/+Z quadrant of LH2 tank flange 1 divot (7" dia) adjacent to -Y bipod in the LH2 tank flange 1 divot (5") +Y of the PAL ramp in the LH2 tank flange	1 divot (4") near LO2 presline at Sta 514 1 divot (9") near LO2 pressline at Sta 676
068	065	105	09/30/94	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	1 divot (6" dia) on +Y side of LO2 feedline in the LH2 tank flange	No loss of TPS noted
064	066	103	09/09/94	No	No	Sunset	No umbilical cameras installed OV103 No view of +Z side from crew photos	N	N	No data obtained	No data obtained	No data obtained
065	064	102	07/08/94	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	2 divots (6" - 8" dia) in the LH2 tank flange outboard of PAL ramp with exposed primed substrate	No loss of TPS noted
059	063	105	04/09/94	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	6 divots (ranging from 6" - 10" dia) in the LH2 tank flange - 2 divots outboard of LO2 feedline - 3 divots between -Y bipod and -Y thrust panel - 1 divot at the -Y bipod spindle outboard bondline	No loss of TPS noted
062	062	102	03/04/94	Yes	Yes	Day	N/A	Y	Y	1 small shallow divot (3"x1") near the aft face of the box section of the ramp	No loss of TPS noted	No loss of TPS noted
060	061	103	02/03/94	Yes	No	Day	No umbilical cameras installed OV103	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
061	060	105	12/02/93	Yes	No	Night	18 handheld images 36 min after sep	N	N	No apparent loss of TPS noted	No loss of TPS noted	No loss of TPS noted
058	057	102	10/18/93	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	1 divot (19" dia) outboard of -Y bipod in the LH2 tank flange	No loss of TPS noted
051	059	103	09/12/93	Yes	No	Day	No umbilical cameras installed OV103 Orbiter damaged during payload deployment	Y	Y	No loss of TPS noted	1 divot (8" dia) outboard of -Y bipod closeout in the LH2 tank flange	No loss of TPS noted
057	058	105	06/21/93	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	7 small divots between bipod (size not reported) 1 divot near LO2 feedline (size not reported) 2 divots at +Y, aft of EB fitting (size not reported) 1 divot (approximately 10" dia) at -Y, aft of EB fitting (size not reported)	No loss of TPS noted
055	056	102	04/26/93	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	1 divot at -Y thrust panel (size not reported) in LH2 tank flange	No loss of TPS noted
056	054	103	04/08/93	Yes	No	Dawn	No umbilical cameras installed OV103	Y	Y	No loss of TPS noted	1 divot (16"-24") at +Y thrust panel in LH2 tank flange	No loss of TPS noted
054	051	105	01/03/93	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	3 divots on -Y/+Z quadrant (size not reported) in LH2 tank flange	No loss of TPS noted
053	049	103	12/02/92	Yes	No	Day	No umbilical cameras installed OV103	Y	Y	No loss of TPS noted	3 divots in +Y/+Z quadrant (size not reported) in LH2 tank flange 1 divot in -Y/+Z quadrant (size not reported) in LH2 tank flange	No loss of TPS noted
052	055	102	10/22/92	Yes	Yes	Day	N/A	Y	Y	Lower outboard corner (8" X 4") of -Y bipod ramp missing	No loss of TPS noted	No loss of TPS noted
047	045	105	09/12/92	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	4 divots (6"-8" dia) at +Z corner of +Y thrust panel in LH2 tank flange 2 divots (8" dia) at +Z corner of -Y thrust panel in LH2 tank flange 1 divot (10"-12" dia) in -Y/+Z quadrant in LH2 tank flange 1 divot (6"-8" dia) just forward of -Y jack pad closeout in LH2 tank flange	No loss of TPS noted
046	048	104	07/31/92	Yes	No	Day	No umbilical cameras installed OV104 Crew photos showed limited views at ET sep + 12 min - No loss of TPS noted	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
050	050	102	06/25/92	Yes	Yes	Day	N/A	Y	Y	Large portion (26" x 10") of -Y bipod ramp missing	No loss of TPS noted	No loss of TPS noted
049	043	105	05/07/92	No	No	Day	No data obtained	N	N	No data obtained	No data obtained	No data obtained

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	8" x 6" divot on -Y longeron to vertical strut / cable tray attach point came off shortly after ET sep	No	5
No loss of TPS noted	Numerous shallow "popcorn" type divots forward of crossbeam on LH2 tank	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
8 stringer head divots 2 forward of bipod at Sta 1080 1 forward of bipod on centerline at Sta 960 1 forward of LO2 feedline at Sta 860 1 forward/outboard of -Y bipod at Sta 1080 3 between LO2 feedline and EB-2 at Sta 1080	5" dia divot just inboard of LO2 feedline at Sta 1377 5" dia divot between LO2 feedline and presline at Sta 1377 (substrate exposed)	No loss of TPS noted	Divot between feedline and pressline	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	1
3 divots on Intertank stringer heads 1 divot (14" dia) forward of the -Y bipod 1 divot (17"x3.5") at centerline with exposed primed substrate 1 divot (24" x 3.5") with exposed primed substrate	1 shallow divot aft of bipod	No loss of TPS noted	Divots on stringer heads	1
1 divot (12"x4") on stringer head at Sta 1050, -Y of centerline with exposed primed substrate	1 divot (5" dia) aft of flange closeout between -Y thrust panel and -Y bipod	No loss of TPS noted	Intertank acreage	2
No data obtained	No data obtained	No data obtained	N/A	1
3 shallow divots in stringer valleys just forward of +Y bipod	1 divot (6" dia) aft of flange between +Y bipod and LO2 feedline	Small divot in pressline ramp at Sta 1152 Small divot in pressline ramp at Sta 1787	Flange closeout	1
No loss of TPS noted	1 divot (8" dia) aft of -Y bipod with substrate exposed 1 divot (6" dia) on -Y axis just below flange Numerous (greater than usual) small divots just forward of the ET/Orb crossbeam	No loss of TPS noted	8" divot in LH2 acreage	2
1 divot (14" x 4") on stringer head forward of -Y bipod ramp Numerous (approximately 35) small divots in vicinity of bipod	1 divot (5.5" dia) between +Y bipod and LO2 feedline	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
1 divot (28" x 4.6") on Intertank centerline with exposed primed substrate 4 small divots forward of +Y bipod	No loss of TPS noted	Portions of both jack pad closeouts were missing with exposed primed substrate	Intertank acreage Jack pad closeouts	3
No loss of TPS noted	1 divot (8" dia) just aft of flange between bipod	1 divot (10"-12") in -Y longeron closeout Missing foam on +Y thrust strut flange closeout	No	4
Numerous (approximately 70) small divots on stringer heads forward of bipod 1 divot (6" dia) on -Y thrust panel 9 divots (6" - 8" dia) +Z of -Y thrust panel	No loss of TPS noted	1 divot (6"-8" dia) on -Y longeron 1 divot on +Y thrust strut flange with exposed primed substrate	+Y thrust strut flange	2
No loss of TPS noted	4 divots just aft of flange closeout (smallest divot = 4.7")	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
2 divots (8" x 4") between bipod just forward of flange 1 divot (8" x 3") on stringer head in -Y/+Z quadrant	3 divots (4"-6" dia) just aft of flange - 1 divot below +Y bipod spindle - 1 divot below -Y bipod ramp - 1 divot below -Y thrust panel	+Y jack pad closeout missing	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
Several (20) small divots on stringer heads forward of bipod	1 divot (5" dia) between ET centerline and LO2 feedline at Sta 1399 with exposed primed substrate	-Y jack pad closeout partially missing	LH2 tank divot	1
1 divot (8") just above flange at -Y 1 divot (14"-16") just forward of bipod	1 divot (4" x 6") aft of LH2 PAL ramp adjacent to cable tray 1 divot (4"-6") just aft of -Y bipod spindle	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	1 divot (7" dia) near inboard base of Sta 1377 feedline bracket	+Y jack pad closeout (6" dia) and portion of adjacent material missing	No	1
No data obtained	No data obtained	No data obtained	N/A	2

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
045	044	104	03/24/92	Yes	No	Day	No umbilical cameras installed OV104	Y	N	No loss of TPS noted	4 divots on -Y side 6 divots on +Y side	No loss of TPS noted
042	052	103	01/22/92	Yes	No	Day	No umbilical cameras installed OV103	Y	N	No loss of TPS noted	2 divots (8"-12") in the -Y/+Z quadrant just forward of the flange	No loss of TPS noted
044	053	104	11/24/91	No	No	Night	No data obtained	N	N	No data obtained	No data obtained	No data obtained
048	042	103	09/12/91	No	No	Day	No umbilical cameras installed OV103	N	N	No data obtained	No data obtained	No data obtained
043	047	104	08/02/91	Yes	No	Day	No umbilical cameras installed OV104 Poor quality photo of -Y only - No apparent loss of TPS	Y	N	No loss of TPS noted	No apparent loss of TPS noted	No apparent loss of TPS noted
040	041	102	06/05/91	Yes	Yes	Day	Umbilical photos of +Z and handheld photos of -Y	Y	Y	No loss of TPS noted	1 divot (6"-8" dia) in LH2 tank flange below +Y ET/SRB fitting	No loss of TPS noted
039	046	103	04/28/91	Yes	No	Day	No umbilical cameras installed OV103	N	N	No apparent loss of TPS noted	No loss of TPS noted	No loss of TPS noted
037	037	104	04/05/91	Yes	No	Day	No umbilical cameras installed OV104 No view of +Z	N	N	No apparent loss of TPS noted	2 divots (12"-14" dia) at -Y	No loss of TPS noted
035	035	102	12/02/90	Yes	No	Night	Umbilical cameras failed to operate	Y	N	No loss of TPS noted	12 divots on +Z, 6 of the divots had major dimension of 8"-10"	No loss of TPS noted
038	040	104	11/19/90	No	No	Night	No umbilical cameras installed OV104 No data obtained	N	N	No data obtained	No data obtained	No data obtained
041	039	103	10/06/90	Yes	No	Day	No umbilical cameras installed OV103 No loss of TPS noted	N	N	No apparent loss of TPS noted - Too distant to discern details	No loss of TPS noted	No loss of TPS noted
31R	034	103	04/24/90	No	No	Day	No umbilical cameras installed OV103 No data obtained	N	N	No data obtained	No data obtained	No data obtained
036	033	104	02/28/90	No	No	Night	No umbilical cameras installed OV103 No data obtained	N	N	No data obtained	No data obtained	No data obtained
032R	032	102	01/09/90	No	Yes	Day	N/A	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
33R	038	103	11/22/89	No	No	Night	No data obtained No umbilical cameras installed OV103	N	N	No data obtained	No data obtained	No data obtained
034	027	104	10/18/89	No	No	Day	No umbilical cameras installed OV104 Poor quality photo of -Y only	Y	N	No data obtained	No data obtained	No data obtained
028R	031	102	08/08/89	Yes	Yes	Day	N/A	Y	Y	No loss of TPS noted	1 divot (4"x8") in LH2 tank flange closeout outboard of PAL ramp	No loss of TPS noted
030R	029	104	05/04/89	No	No	Day	No umbilical cameras installed OV104 No data obtained	N	N	No data obtained	No data obtained	No data obtained
029R	036	103	03/13/89	Yes	No	Day	No umbilical cameras installed OV103	Y	Y	No loss of TPS noted	Divots (12"-20" dia) at +Y/+Z Numerous smaller divots in LO2 and LH2 flanges	No loss of TPS noted
027R	023	104	12/02/88	No	No	Day	No umbilical cameras installed OV104 No data obtained	N	N	No data obtained	No data obtained	No data obtained
026R	028	103	09/29/88	Yes	No	Day	No umbilical cameras installed OV103 Crew photos are poor quality	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
033 51L	026	99	01/28/86	No	No	Day	***Challenger Accident*** No data obtained	N	N	No data obtained	No data obtained	No data obtained
032 61C	030	102	01/12/86	No	Yes	Day	16mm umbilical cameras only No crew photos located at KSC	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
031 61B	022	104	11/26/85	No	No	Night	No umbilical cameras installed OV104 No data obtained	N	N	No data obtained	No data obtained	No data obtained
030 61A	024	99	10/30/85	No	Yes	Day	35mm umbilical cameras only No crew photos located at KSC	Y	Y	No loss of TPS noted	Divot approximately 2 inches in dia. located in the flange closeout between the bipod ramps. Divot approximately 2 inches in dia. Located in the flange closeout +Y of the feedline.	No loss of TPS noted
028 51J	025	104	10/03/85	Yes	No	Day	No umbilical cameras installed OV104 Crew photos showed only -Y side, +Y side too distant to detect foam loss	N	N	No data obtained	No data obtained	No data obtained
027 51I	021	103	08/27/85	No	No	Day	No umbilical cameras installed OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	1
No apparent loss of TPS noted	No apparent loss of TPS noted	No apparent loss of TPS noted	No	3
No foam loss noted	No foam loss noted	No foam loss noted	No	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	4
No loss of TPS noted	1 divot just aft of -Y bipod	No loss of TPS noted	No	6
No data obtained	No data obtained	No data obtained	N/A	1
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	2
No data obtained	No data obtained	No data obtained	N/A	3
5 divots just forward of the flange closeout - 2 divots (12"-14" dia) - 1 divot (14" dia) on centerline extending to flange - 1 divot (6" dia) just aft of flange outboard of -Y bipod ramp 1 divot (28" dia) surrounding part of the forward part of the -Y bipod ramp	2 divots near centerline at Sta 1250 and 1320	1 divot in +Y jack pad closeout with exposed primed substrate	Jack pad closeout	2
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	2
1 divot (23" x 15") in the two-tone area just forward of the +Y bipod ramp	No loss of TPS noted	5 small divots noted on +Y thrust strut flange closeout 1 divot in ice/frost ramp at Sta 1270	No	1
No data obtained	No data obtained	No data obtained	N/A	2
4 divots (6"-12" dia) at -Y thrust panel	1 divot (6" dia) on +Y longeron	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	2
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	5
No data obtained	No data obtained	No data obtained	N/A	2
1 divot (15"x20") in two-tone foam just forward of the -Y bipod ramp 1 divot (30"x12") in two-tone foam between bipod struts	No loss of TPS noted	1 divot (7"x3") in LH2 cable-tray clamshell closeout	No	5
No data obtained	No data obtained	No data obtained	N/A	1
No loss of TPS noted	No loss of TPS noted	1 divot (4" dia) in +Z surface of Sta 1115 feedline flange closeout	No	1
No data obtained	No data obtained	No data obtained	N/A	2
No data obtained	No data obtained	No data obtained	N/A	3

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
026 51F	019	99	07/29/85	No	Yes	Day	35mm umbilical cameras only Unable to locate crew photos at KSC	Y	Y	No loss of TPS noted	The -Y jack pad closeout is missing. This area is approximately 5 inches by 5 inches with substrate exposed. This area is located within the flange closeout between the bipod ramps.	No loss of TPS noted
025 51G	020	103	06/17/85	No	No	Day	No umbilical cameras installed on OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
024 51B	017	99	04/29/85	No	Yes	Day	35mm umbilical cameras only - Sun angle washed out view of ET making it hard to detect foam loss Unable to locate crew photos at KSC	Y	N	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
023 51D	018	103	04/12/85	No	No	Day	No umbilical cameras installed on OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
020 51C	014	103	01/24/85	No	No	Day	No umbilical cameras installed on OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
019 51A	016	103	11/08/84	No	No	Day	No umbilical cameras installed on OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
017 41G	015	99	10/05/84	No	Yes	Day	35mm umbilical cameras only Unable to locate crew photos at KSC	Y	Y	No loss of TPS noted	No data obtained	No data obtained
014 41D	013	103	08/30/84	No	No	Day	No umbilical cameras installed on OV103 Unable to locate crew photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
013 41C	012	99	04/06/84	No	No	Day	Unable to locate crew or umbilical photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
011 41B	010	99	02/03/84	No	Yes	Day	35mm umbilical cameras only Unable to locate crew photos at KSC	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
009 041A	011	102	11/28/83	No	No	Day	Unable to locate crew or umbilical photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
008	009	99	08/30/83	No	No	Night	Unable to locate crew or umbilical photos at KSC No imagery available (per J. Disler/ JSC)	N	N	No data obtained	No data obtained	No data obtained
007	006	99	06/18/83	No	Yes	Day	35mm umbilical cameras only Unable to locate crew photos at KSC	Y	Y	Portion (approximately 18"x12") of the -Y Bipod Ramp TPS is missing. Spindle is not exposed	1 divot (4"dia) outboard of the cable tray in the flange closeout	No loss of TPS noted
006	008	99	04/04/83	No	Yes	Day	35mm umbilical cameras only Unable to locate crew photos at KSC	Y	Y	No loss of TPS noted	1 divot (10" x 4") located +Y of the LO2 feedline extending into the Intertank acreage TPS 1 divot (3" dia) in the flange closeout between the bipod ramps.	No loss of TPS noted
005	005	102	11/11/82	No	Yes	Day	GH2 pressline on -Y side	Y	Y	No loss of TPS noted	4 divots (2" to 6" dia) outboard of LH2 PAL ramp 1 divot (approximately 7" dia) between bipod	No loss of TPS noted
004	004	102	06/27/82	No	Yes	Day	GH2 pressline on -Y side Sun angle (backlighting) washed out view of ET above Sta 1623	Y	Y	No loss of TPS noted	3 divots (approximately 6" dia) just outboard of PAL ramp 1 divot (approximately 4" dia) between LO2 feedline and pressline	No loss of TPS noted
003	003	102	03/22/82	No	Yes	Day	GH2 pressline on -Y side	Y	Y	No loss of TPS noted	4 divots (ranging 4" to 8") at +Z 1 divot (approximately 6" x 12") outboard of +Y cable tray - Included portion of LH2 L7tank acreage foam 3 small divots (approximately 3" dia) on +Y/+Z quadrant	No loss of TPS noted

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
13 divots (7"-30" dia) in two-tone foam forward of the bipod struts 1 divot (3" dia) located in the intertank acreage TPS +Y axis just forward of the flange closeout 1 divot (16" dia) located just forward of the +Y bipod ramp 3 divots (10" dia) located in the intertank thrust panel 2-tone foam near the +Y EB fitting	No loss of TPS noted	Small divots (< 1 inch dia.) on LO2 feedline flange closeouts +Z surface 1 divot (8"x5") on the +Z surface of Sta 1856 feedline flange closeout with exposed primed substrate 1 divot (6" dia) located on the +Z surface of Sta 1609 feedline flange closeout	Sta 1856 feedline flange	2
No data obtained	No data obtained	No data obtained	N/A	1
9 divots (10" dia) located in the intertank two-tone foam just forward of the bipod struts	2 divots (3"-4" dia) located in the LH2 +Z axis acreage TPS just aft of the flange closeout	No loss of TPS noted	No	1
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	1
No data obtained	No data obtained	No data obtained	N/A	2
1 divot (5" dia) located in the intertank two-tone foam forward and between the bipod struts 1 divot (18"-20" dia) located in the 2-tone foam forward of the +Y bipod ramp	1 divot (3" dia) in the LH2 acreage +Z axis at Sta 1623 - Appears to be in plug-pull repair area	1 divot (6" dia) on the LO2 feedline flange at Sta 1870 with exposed primed substrate	Sta 1870 feedline flange	1
No data obtained	No data obtained	No data obtained	N/A	4
No data obtained	No data obtained	No data obtained	N/A	1
1 divot (10" dia) located in the intertank two-tone foam area just forward and inboard of the +Y bipod ramp	1 divot (2" dia) located in the LH2 acreage TPS 12 inches below the +Y bipod ramp	-Y jack pad closeout is missing Area is approximately 5" x 5" with substrate exposed	Jack pad closeout	1
No data obtained	No data obtained	No data obtained	N/A	2
No data obtained	No data obtained	No data obtained	N/A	1
Numerous (approximately 25) shallow divots (less than 4" dia) located in the intertank acreage TPS +Z axis just forward of the bipod struts	Numerous (approximately 40) divots (less than 2" dia) located in the upper LH2 acreage TPS +Z axis between Sta 1129 and Sta 1200	Divots in ice/frost ramps ranging from 4" dia up to most of the upper ramp closeouts missing at Stations 1916, 1851, 1787, 1722, 1657, 1528, and 1464. Most of these areas of missing foam exposed cable tray SLA sidewall substrate	Ice/frost ramps	1
No loss of TPS noted	1 divot (3"dia) located outboard of LO2 feedline in acreage TPS at Sta 1610	1 divot (5" dia) in LO2 feedline flange closeout at Sta 1958 with exposed substrate 1 divot (3" dia) in LO2 feedline flange closeout at Sta 1856 1 divot(2" dia) in LO2 feedline flange closeout at Sta 1609	Sta 1958 LO2 feedline flange	3
3 divots (1" to 2") just forward of +Y bipod ramp 3 divots (1" dia) forward of bipod	1 divot (2" dia) between pressline and feedline near Sta 1800 Numerous (30) divots (ranging 2"W x 2 to 10"L) just aft of +Z flange Numerous divots along entire length of GH2 pressline	Missing upper portion of GH2 pressline ice/frost ramp at Sta 1430	No	2
3 divots (2" to 3" dia) forward of bipod	1 divot (3" dia) just forward of longeron Numerous small divots (approximately 40) between pressline and feedling along entire length of LH2 tank Several (7 -9) divots (2" -3" dia) in acreage just aft of +Z flange	4 divots (3" to 4" dia) in LH2 PAL ramp along the entire length 1 divot (15"L x 8"W) on LH2 PAL ramp with 1 divot (20"L x 8"W) on forward end of LH2 PAL ramp with exposed SLA and exposed primed substrate	LH2 PAL ramp	2
3 divots (2" to 3" dia) forward of bipod	Numerous (35) divots (ranging 2" to 6" dia) between flange and Sta 1377	No loss of TPS noted	No	2

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
002	002	102	11/12/81	No	Yes	Day	GH2 pressline on -Y side Foam loss divots are difficult to detect due to white paint No loss of TPS ntoed	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
001	001	102	04/12/81	No	Yes	Day	GH2 pressline on -Y side Foam loss divots are difficult to detect due to white paint	Y	Y	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No	2
No loss of TPS noted	1 divot (16"x12") in LH2 acreage near Sta 1851adjacent to GH2 pressline 1 divot (15"x10") located in LH2 acreage near Sta 1721adjacent to GH2 pressline 1 divot (5" dia) with what appears to be exposed primed substrate located at approximately Sta 2068, aft of the GH2 Pressline run.	No loss of TPS noted	LH2 acreage	6

No imagery of the +Z axis +/-90 degrees available

No loss of TPS noted

								View				
STS	**ET**	**Vehicle**	**Launch Date**	**Useable ET Crew Photos**	**Useable ET Umbilical Well Photos**	**Day/ Night**	**Notes**	**-Y**	**+Y**	**Bipod Ramp**	**Flange**	**LO2 Tank**
			Total Flight History									
							External Tank			**Bipod Ramp**	**Flange**	**LO2 Tank**
			# of flights with usable imagery				79	72		79	79	79
			# of flights with no loss of TPS noted				14			74	30	76
			# of flights with known loss				65			6	49	3
							82%			8%	62%	4%

Acreage				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	**# of Tankings**
Note: Thrust panel popcorning not considered				
Intertank	**LH2 Tank**	**Components**	**Substrate Exposed**	
79	79	79	79	
44	45	49	55	
35	34	30	24	
44%	43%	38%	30%	

LWT	ET	STS	MLP/PAD	ORBITER	DD250	SRB MATE	ORB MATE	ROLLOUT	TANK/FRF**	LAUNCH	MISSION	Contingency SIM	# of Launches
1 (SWT)	1	1	1/A	Columbia	6/29/1979	11/3/1980	11/24/1980	12/29/1980	1/22/81 Tanking	4/12/1981	1		113
									02/20/81 FRF				
2 (SWT)	2	2	1/A	Columbia	2/27/1981	6/30/1981	8/10/1981	8/31/1981	09/14/81 Tanking	11/12/1981	2		112
3 (SWT)	3	3	1/A	Columbia	9/28/1981	1/4/1982	2/3/1982	2/16/1982	02/26/82 Tanking	3/22/1982	3		111
4 (SWT)	4	4	1/A	Columbia	1/17/1982	4/17/1982	5/19/1982	5/26/1982	06/02/82 Tanking	6/27/1982	4		110
5 (SWT)	5	5	1/A	Columbia	5/26/1982	8/19/1982	9/10/1982	9/21/1982	09/28/82 Tanking	11/11/1982	5		109
1	8	6	2/A	Challenger	9/8/1982	10/21/1982	11/23/1982	11/30/1982	12/18/82 FRF	4/4/1983	6		108
									01/25/83 FRF				
6 (SWT)	6	7	1/A	Challenger	7/26/1982	3/2/1983	5/24/1983	5/26/1983	None	6/18/1983	7		107
2	9	8	2/A	Challenger	1/12/1983	6/23/1983	7/26/1983	8/2/1983	None	8/30/1983	8		106
4	11	9	1/A	Columbia	5/6/1983	8/24/1983	9/24/1983	1) 09/28/83	10/11/83 Tanking	11/28/1983	9		105
							ROLLBACK?	2) 11/08/83					
-----	-----	10	-----	-----	-----	-----	-----	-----	-----	Cancelled			
3	10	11/41B	2/A	Challenger	3/1/1983	1/3/1984	1/8/1984	1/12/1984	None	2/3/1984	10		104
-----	-----	12	-----	-----	-----	-----	-----	-----	-----	Cancelled			
5	12	13/41C	1/A	Challenger	7/22/1983	2/28/1984	3/15/1984	3/19/1984	None	4/6/1984	11		103
6	13	14/41D	2/A	Discovery	9/13/1983	4/9/1984	1) 05/14/84	1) 05/19/84	06/02/84 FRF	8/30/1984	12		102
						ROLLBACK?	2) 08/04/84	2) 08/09/84					
-----	-----	15	-----	-----	-----	-----	-----	-----	-----	Cancelled			
8	15	17/41G	1/A	Challenger	12/15/1983	6/19/1984	9/10/1984	9/13/1984	None	10/5/1984	13		101
		18	-----	-----	-----	-----	-----	-----	-----	Cancelled			
9	16	19/51A	2/A	Discovery	1/27/1984	10/2/1984	10/19/1984	10/23/1984	None	11/8/1984	14		100
7	14	20/51C	1/A	Discovery	11/3/1983	10/30/1984	12/23/1984	1/5/1985	None	1/24/1985	15		99
-----	-----	21	-----	-----	-----	-----	-----	-----	-----	Cancelled			
10	17	22/51E	2/A	Challenger	3/16/1984	1/9/1985	2/12/1985	2/15/1985	None	Cancelled			
16	23	OV	---	Enterprise	9/24/1984	2/1/1985		Stack-On-Pad	(Inert) 01/23-24/85	(Destack) 03/08/85			
11	18	23/51D	1/A	Discovery	4/24/1984	2/14/1985	3/23/1985	3/28/1985	None	4/12/1985	16		98
10	17	24/51B	2/A	Challenger	3/16/1984	1/9/1985	4/11/1985	4/15/1985	None	4/29/1985	17		97
13	20	25/51G	1/A	Discovery	7/5/1984	5/2/1985	5/29/1985	6/4/1985	None	6/17/1985	18		96
12	19	26/51F	2/A	Challenger	5/24/1984	5/31/1985	6/26/1985	6/29/1985	None	7/29/1985	19		95
14	21	27/51I	1/A	Discovery	7/25/1984	7/2/1985	7/30/1985	8/6/1985	None	8/27/1985	20		94
18	25	28/51J	2/A	Atlantis	12/20/1984	8/9/1985	8/13/1985	8/30/1985	09/12/85 FRF	10/3/1985	21		93
17	24	30/61A	1/A	Challenger	11/16/1984	9/30/1985	10/12/1985	10/16/1985	None	10/30/1985	22		92
15	22	31/61B	2/A	Atlantis	8/24/1984	10/22/1985	11/8/1985	11/12/1985	None	11/26/1985	23		91
23	30	32/61C	1/A	Columbia	6/18/1985	11/14/1985	11/22/1985	12/2/1985	None	1/12/1986	24		90
19	26	33/51L	2/B	Challenger	3/15/1985	12/10/1985	12/17/1985	12/22/1985	None	1/28/1986	25		89
										(In-Flight Failure)			
21	28	26R	2/B	Discovery	4/16/1985	6/10/1988	6/24/1988	7/4/1988	08/01/88 Tanking	09/29/88	26		88
									08/10/88 FRF				
16	23	27R	1/B	Atlantis	9/24/1984	9/21/1988	10/24/1988	11/2/1988	None	12/2/1988	27		87
29	36	29R	1/B	Discovery	12/10/1985	12/15/1988	1/25/1989	2/3/1989	None	3/13/1989	28		86
22	29	30R	1/B	Atlantis	5/15/1985	3/2/1989	3/11/1989	3/22/1989	None	5/4/1989	29		85
24	31	28R	2/B	Columbia	7/16/1985	5/22/1989	7/4/1989	7/15/1989	None	8/8/1989	30		84
20	27	34	1/B	Atlantis	1/29/1985	7/29/1989	8/21/1989	8/29/1989	None	10/18/1989	31		83
31	38	33R	2/B	Discovery	4/15/1986	9/2/1989	10/5/1989	10/27/1989	None	11/22/1989	32		82
25	32	32R	3/A	Columbia	8/14/1985	11/1/1989	11/21/1989	11/28/1989	None	1/9/1990	33		81
26	33	36	1/A	Atlantis	10/15/1985	12/22/1989	1/19/1990	1/25/1990	None	2/28/1990	34		80
27	34	31R	2/B	Discovery	9/23/1985	2/23/1990	3/6/1990	3/16/1990	None	4/24/1990	35		79
32	39	41	2/B	Discovery	4/15/1986	8/1/1990	8/27/1990	9/5/1990	None	10/6/1990	36		78
33	40	38	1/A	Atlantis	6/20/1986	9/12/1990	10/3/1990	10/12/1990	10/24/1990	11/15/1990	37		77
28	35	35	3/B	Columbia	11/8/1985	3/22/1990	8/2/1990	10/13/1990	10/30/1990	12/2/1990	38		76
30	37	37	1/B	Atlantis	1/15/1986	2/4/1991	3/8/1991	3/15/1991	None	4/5/1991	39		75
39	46	39	2/A	Discovery	9/9/1987	12/18/1990	3/25/1991	4/4/1991	None	4/28/1991	40		74
34	41	40	3/B	Columbia	7/25/1986	4/17/1991	4/25/1991	5/2/1991	None	6/5/1991	41		73
40	47	43	1/A	Atlantis	12/18/1987	6/3/1991	6/19/1991	6/25/1991	None	8/2/1991	42		72
35	42	48	3/A	Discovery	9/9/1986	7/24/1991	8/1/1991	8/12/1991	None	9/12/1991	43		71
46	53	44	1/A	Atlantis	7/31/1989	9/26/1991	10/18/1991	10/23/1991	None	11/24/1991	44		70
45	52	42	3/A	Discovery	5/3/1989	11/4/1991	12/13/1991	12/19/1991	None	1/22/1992	45		69
37	44	45	1/A	Atlantis	3/11/1987	1/22/1992	2/13/1992	2/20/1992	None	3/24/1992	46		68
36	43	49	2/B	Endeavour	11/10/1986	2/17/1992	3/7/1992	3/13/1992	4/6/1992	5/7/1992	47		67
43	50	50	3/A	Columbia	10/31/1988	4/9/1992	5/29/1992	6/3/1992	None	6/25/1992	48		66
41	48	46	1/B	Atlantis	4/22/1988	5/15/1992	6/5/1992	6/11/1992	None	7/31/1992	49		65
38	45	47	2/B	Endeavour	6/8/1987	7/13/1992	8/20/1992	8/25/1992	None	9/12/1992	50		64
48	55	52	3/B	Columbia	2/1/1990	9/9/1992	9/20/1992	9/26/1992	None	10/22/1992	51		63
42	49	53	1/A	Discovery	8/8/1988	10/13/1992	11/3/1992	11/8/1992	None	12/2/1992	52		62
44	51	54	2/B	Endeavour	2/3/1989	11/5/1992	11/23/1992	12/3/1992	None	1/13/1993	53		61
47	54	56	1/B	Discovery	10/30/1989	2/10/1993	3/2/1993	3/15/1993	None	4/8/1993	54		60
49	56	55	/A	Columbia	5/10/1990	1/12/1993	2/2/1993	2/7/1993	None	4/26/1993	55		59
51	58	57	2/B	Endeavour	10/16/1990	3/8/1993	3/25/1993	4/28/1993	None	6/21/1993	56		58
52	59	51	/B	Discovery	3/27/1991	6/2/1993	6/18/1993	6/25/1993	None	9/12/1993	57		57
50	57	58	/B	Columbia	7/26/1990	7/21/1993	8/12/1993	9/16/1993	None	10/18/1993	58		56
53	60	61	/B	Endeavour	6/27/1991	10/6/1993	10/21/1993	10/28/1993	None	12/2/1993	59		55
54	61	60	/B	Discovery	10/15/1991	11/29/1993	1/5/1994	1/10/1994	None	2/3/1994	60		54
55	62	62	1/B	Columbia	1/21/1992	1/20/1994	2/3/1994	2/10/1994	None	3/4/1994	61		53
56	63	59	2/A	Endeavour	4/2/1992	2/23/1994	3/14/1994	3/19/1994	None	4/9/1994	62		52
57	64	65	3/A	Columbia	7/20/1992	5/3/1994	6/9/1994	6/15/1994	None	7/8/1994	63		51
59	66	64	2/B	Discovery	1/26/1993	7/27/1994	8/11/1994	8/18/1994	None	9/9/1994	64		50
58	65	68	1/A	Endeavour	11/2/1992	6/16/1994	7/21/1994	7/27/1994	None				49
							ROLLBACK?	9/13/1994		9/30/1994	65		
60	67	66	3/B	Atlantis	5/17/1993	9/14/1994	10/4/1994	10/10/1994	None	11/3/1994	66		48
61	68	63	2/B	Discovery	8/6/1993	11/8/1994	1/5/1995	1/10/1995	None	2/3/1995	67		47
62	69	67	1/A	Endeavour	11/3/1993	12/13/1994	2/3/1995	2/8/1995	None	3/2/1995	68		46
63	70	71	B	Atlantis	2/17/1994	3/15/1995	4/20/1995	4/26/1995	None	6/26/1995	69		45
64	71	70	B	Discovery	5/4/1994	4/13/1995	5/3/1995	5/11/1995	(Rollback)	----------			
								6/14/1995		7/13/1995	70		44
65	72	69	1/A	Endeavour	7/1/1994	5/31/1995	6/28/1995	7/6/1995	(Rollback)	----------			
								8/7/1995		9/7/1995	71		43
66	73	73	B	Columbia	10/4/1994	8/5/1995	8/21/1995	8/28/1995	None	10/20/1995	72		42
67	74	74	2/A	Atlantis	11/17/1994	9/11/1995	10/3/1995	10/11/1995	None	11/12/1995	73		41
68	75	72	1/B	Endeavour	2/3/1995	11/9/1995	12/1/1995	12/6/1995	None	1/11/1995	74		40
69	76	75	3/B	Columbia	3/29/1995	1/8/1996	1/24/1996	1/29/1996	None	2/22/1996	75		39
70	77	76	2/B	Atlantis	5/24/1995	2/5/1996	2/20/1996	2/28/1996	None	3/22/1996	76		38
71	78	77	1/B	Endeavour	7/17/1995	3/21/1996	4/8/1996	4/16/1996	None	5/19/1996	77		37
72	79	78	3/B	Columbia	9/13/1995	5/3/1996	5/21/1996	5/29/1996	None	6/20/1996	78		36
73	80	79	2/A	Atlantis	11/17/1995	6/6/1996	6/24/1996	7/1/1996	None	Demate			
75	82	79	/A	Atlantis	3/12/1996	8/5/1996	8/13/1996	8/20/1996	None	9/16/1996	79		35
73	80	80	/A	Columbia	11/17/1995	9/26/1996	10/10/1996	10/16/1996	None	11/19/1996	80		34
76	83	81	/A	Atlantis	4/25/1996	11/14/1996	12/4/1996	12/10/1996	None	1/12/1997	81		33
74	81	82	1/A	Discovery	1/18/1996	12/9/1996	1/11/1997	1/17/1997	None	2/11/1997	82		32
77	84	83	3/A	Columbia	6/17/1996	1/30/1997	3/5/1997	3/11/1997	None	4/4/1997	83		31
78	85	84	2/A	Atlantis	8/7/1996	3/24/1997	4/20/1997	4/24/1997	None	5/15/1997	84		30
79	86	94	1/A	Columbia	10/8/1996	5/12/1997	6/4/1997	6/11/1997	None	7/1/1997	85		29
80	87	85	3/A	Discovery	12/4/1996	6/20/1997	7/7/1997	7/14/1997	None	8/7/1997	86		28
81	88	86	2/A	Atlantis	1/17/1997	7/24/1997	8/11/1997	8/18/1997	None	9/25/1997	87		27
82	89	87	1B	Columbia	6/26/1997	9/25/1997	10/24/1997	10/29/1997	None	11/19/1997	88		26
83	90	89	3A	Endeavour	8/8/1997	11/11/1997	12/12/1997	12/19/1997	None	1/22/1998	89		25
84	91	90		Columbia	11/14/1997	2/26/1998	3/16/1998	3/23/1998	None	4/17/1998	90		24
89	96	91		Discovery	1/12/1998	3/26/1998	4/27/1998	5/2/1998	5/18/1998	6/2/1998	91		23
91	98	95		Discovery	6/4/1998	8/25/1998	9/14/1998	9/21/1998	None	10/29/1998	92		22
90	97	88		Endeavour	3/30/1998	9/22/1998	10/12/1998	10/19/1998	None	12/4/1998	93		21
93	100	96	2B	Discovery	11/25/1998	3/16/1999	4/15/1999	4/21/1999	(Rollback)	----------			
"	"	"	"	"	"	"	"	5/20/1999	None	5/27/1999	94		20
92	99	93		Columbia	7/28/1999	12/1/1999	6/2/1999	6/7/1999	None	7/23/1999	95		19
94	101	103	B	Discovery	11/25/1999	8/26/1999	11/2/1999	11/13/1999	None	12/19/1999	96		18
85	92	99	A	Endeavour	4/19/1999	6/29/1999	12/2/1999	12/13/1999	None	2/11/2000	97		17
95	102	101	A	Atlantis	2/1/1999	2/3/2000	3/13/2000	3/25/2000	None	5/19/2000	98		16
96	103	106	B	Atlantis	6/22/1999	4/4/2000	8/7/2000	8/14/2000	None	9/8/2000	99		15
97	104	92	A	Discovery	6/1/1999	7/6/2000	8/30/2000	9/11/2000	None	10/9/2000	100		14
98	105	97	B	Endeavour	7/16/1999	9/27/2000	10/25/2000	10/31/2000	None	11/30/2000	101		13
99	106	98	A	Atlantis	12/17/1999	11/13/2000	12/4/2000	1/3/2001	(Rollback)	----------			
"	"	"	"	"	"	"	"		None	2/7/2001	102		12
100	107	102	B	Discovery	12/9/1999	1/10/2001	2/2/2001	2/12/2001	None	3/8/2001	103		11
101	108	100	A	Endeavour	2/10/2000	2/26/2001	3/17/2001	3/22/2001	None	4/19/2001	104		10
102	109	104	B	Atlantis	5/3/2000	4/16/2001	5/29/2001	6/21/2001	None	7/12/2001	105		9
103	110	105	A	Discovery	7/26/2000	5/24/2001	6/13/2001	7/2/2001	None	8/10/2001	106		8
104	111	108	B	Endeavour	3/22/2001	9/26/2001	10/24/2001	10/31/2001	None	12/5/2001	107		7
105	112	109	A	Columbia	3/8/2001	11/27/2001	1/16/2002	1/23/2002	None	3/1/2002	108		6
107	114	110		Atlantis	6/18/2001	1/21/2002	3/6/2002	3/12/2002	None	4/8/2002	109		5
106	113	111		Endeavour	4/30/2001	2/28/2002	4/22/2002	4/29/2002	None	6/5/2002	110		4
108	115	112	B	Atlantis	9/26/2001	6/25/2002	9/4/2002	9/10/2002	None	10/7/2002	111		3
109	116	113		Endeavour	11/28/2001	9/11/2002	9/30/2002	10/12/2002	MMT SIM 11/1/02	11/23/2002	112		2
86	93	107	A	Columbia	11/2/2000	5/8/2002	6/24/2002	*	*	*	*		

LWT	ET	STS	MLP/PAD	ORBITER	DD250	SRB MATE	ORB MATE	ROLLOUT	TANK/FRF**	LAUNCH	MISSION	Contingency SIM	# of Launches
					Demate	8/28/2002	*	*	*	*			
						11/4/2002	11/20/2002	12/9/2002	None	1/16/2003	113		1
										(Re-entry Failure)			
Upcoming Flights													
110	117	114	B	Atlantis	2/6/2002	1/7/2003	1/29/2003						
						Demate	*3/11/2003*	*TBD*	*None*	*TBD*	*114*		
111	118	115	B	Endeavour		*TBD*	*TBD*	*TBD*	*None*	*TBD*	*115*		
112	119	116	B	Atlantis		*TBD*	*TBD*	*TBD*		*TBD*			

** Reflects 1) tanking tests to fill ET to various levels in support of some test objective, 2) Flight Readiness Firings in support of similar objectives, & 3) some info relative to rollback etc that have nothing to do with either tanking or firing

DATES IN RED ARE SUBJECT TO CHANGE

Mission	Bipod Ramp Visible		Damage to Ramp Visible		Other Damage Near ET Bipod	Camera Views of ET Bipod Ramps			Comments
	Left (-Y)	Right (+Y)	Left (-Y)	Right (+Y)		16 mm Umbilical	35 mm Umbilical	Handheld	
STS-26	No	No	No	No		No	No	Yes	
STS-27	No	No	No	No		No	No	Yes	
STS-28	Yes	Yes	No	No	Divot	Yes	Yes	Yes	Large divot immediately forward of +Y bipod ramp
STS-29	Yes	Yes	No	No	Divots	No	No	No	Divots on LH2 tank/intertank closeout flange
STS-30	No	No	No	No		No	No	No	
STS-31	No	No	No	No		No	No	No	
STS-32	Yes	Yes	No	No	Divot	Yes	Yes	No	Divot on intertank forward of -Y bipod ramp
STS-33	No	No	No	No		No	No	No	
STS-34	Yes	No	No	No		No	No	Yes	
STS-35	No	No	No	No		No	No	No	
STS-36	No	No	No	No		No	No	No	
STS-37	No	No	No	No		No	No	No	
STS-38	No	No	No	No		No	No	No	
STS-39	No	No	No	No		No	No	No	
STS-40	Yes	Yes	No	No		Yes	No	No	
STS-41	No	No	No	No		No	No	Yes	
STS-42	Yes	No	No	No	Two divots	No	No	Yes	Divots on intertank near -Y bipod ramp
STS-43	Yes	No	No	No		No	No	Yes	
STS-44	No	No	No	No		No	No	No	
STS-45	No	No	No	No	Divots	No	No	Yes	Divots on LH2/intertank closeout flange in -Y direction from -Y bipod ramp
STS-46	No	No	No	No		No	No	No	
STS-47	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divots on LH2/intertank closeout flange underneath bipod
STS-48	No	No	No	No		No	No	No	
STS-49	No	No	No	No		No	No	No	
STS-50	Yes	Yes	**Yes**	No		Yes	Yes	Yes	26x10 inch divot on -Y bipod ramp
STS-51	Yes	Yes	No	No	Divots	No	No	Yes	Divot on LH2/Intertank closeout flange adjacent to -Y bipod ramp
STS-52	Yes	Yes	**Yes**	No		Yes	Yes	Yes	Foam missing on left corner of -Y bipod ramp. -Y jack pad closeout missing
STS-53	Yes	Yes	No	No	Divots	No	No	Yes	Two divots on LH2/Intertank closeout flange near -Y bipod ramp
STS-54	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divots on closeout under bipod. Right bipod jack pad closeout missing.
STS-55	Yes	Yes	No	No	Divots	No	No	Yes	TPS divots near bipod. +Y bipod jack pad closeout missing
STS-56	No	No	No	No		No	No	Yes	IFA for divots on -Z side of ET
STS-57	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Small Intertank TPS divots forward of bipod
STS-58	Yes	Yes	No	No	Divots	Yes	Yes	Yes	TPS divots near bipod. Both bipod jack pad closeouts missing
STS-59	Yes	Yes	No	No	Divots	Yes	Yes	Yes	28 inch intertank stringer head divot forward of bipod
STS-60	Yes	Yes	No	No		No	No	Yes	
STS-61	Yes	No	No	No		No	No	No	
STS-62	Yes	Yes	No	No	Intertank Divot	Yes	Yes	Yes	14 inch intertank stringer head divot forward of -Y bipod ramp. TPS divots
STS-63	No	No	No	No		No	No	No	
STS-64	No	No	No	No		No	No	No	
STS-65	Yes	Yes	No	No	Divots	Yes	Yes	Yes	6 inch divot near +Y bipod ramp
STS-66	Yes	Yes	No	No	Divots	Yes	Yes	Yes	14 inch intertank stringer head divot forward of -Y bipod ramp
STS-67	Yes	Yes	No	No		No	No	Yes	
STS-68	Yes	Yes	No	No	Divot	Yes	Yes	Yes	10 inch divot on intertank stringer head forward of bipod
STS-69	Yes	Yes	No	No		Yes	No	No	
STS-70	Yes	Yes	No	No		No	No	Yes	
STS-71	Yes	Yes	No	No	Divots	Yes	No	Yes	24 inch intertank stringer head divot forward of bipod
STS-72	Yes	Yes	No	No		Yes	No	No	
STS-73	Yes	Yes	No	No		Yes	Yes	Yes	
STS-74	Yes	Yes	No	No		Yes	Yes	No	
STS-75	Yes	Yes	No	No		Yes	Yes	No	
STS-76	No	No	No	No		No	No	No	
STS-77	Yes	Yes	No	No		Yes	Yes	Yes	Portion of +Y jack pad closeout missing. Multiple, small TPS divots
STS-78	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divot on intertank closeout flange between bipod legs
STS-79	No	No	No	No		No	No	No	
STS-80	Yes	Yes	No	No	Divots	Yes	Yes	Yes	10 inch divot on stringer head forward of bipod. Two divots under bipod
STS-81	No	No	No	No		No	No	No	
STS-82	No	No	No	No		No	No	No	
STS-83	Yes	Yes	No	No	Divots	Yes	No	Yes	3 divots between bipod legs. 5 divots on flange in -Y direction from bipod
STS-84	Yes	Yes	No	No	Divots	Yes	Yes	Yes	3 divots between bipod legs (largest 9 inches). Few divots forward of bipod
STS-85	No	No	No	No		No	No	Yes	
STS-86	No	No	No	No		No	No	No	
STS-87	Yes	Yes	No	No		Yes	Yes	Yes	
STS-88	No	No	No	No		No	No	Yes	
STS-89	No	No	No	No		No	No	No	
STS-90	Yes	Yes	No	No		Yes	Yes	Yes	
STS-91	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Small divot on LH2 tank TPS aft of -Y bipod. 1 divot under bipod
STS-92	No	No	No	No		No	No	No	
STS-93	No	No	No	No		No	No	Yes	
STS-94	Yes	Yes	No	No	Divot	Yes	Yes	Yes	6 inch piece of foam missing from -Y jack pad closeout
STS-95	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divots on closeout flange under bipod.
STS-96	Yes	Yes	No	No		Yes	Yes	Yes	
STS-97	Yes	No	No	No		No	No	Yes	
STS-98	No	No	No	No		No	No	No	
STS-99	Yes	Yes	No	No	Divot	Yes	Yes	Yes	Divot on closeout flange under bipod
STS-100	Yes	Yes	No	No	Divot	Yes	Yes	Yes	Divot on closeout flange under bipod
STS-101	Yes	Yes	No	No	Divot	Yes	Yes	Yes	Divot on closeout flange under bipod
STS-102	Yes	Yes	No	No		No	Yes	Yes	
STS-103	No	No	No	No		No	No	No	
STS-104	Yes	Yes	No	No	Divot	No	No	Yes	Divot on closeout flange under bipod
STS-105	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divot on closeout flange under bipod
STS-106	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divot on closeout flange under bipod
STS-107	No	No	No	No		No	No	Yes	Downlink video only
STS-108	No	No	No	No		No	No	No	
STS-109	Yes	Yes	No	No	Divots	Yes	Yes	Yes	5 divots in bipod area
STS-110	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divots on closeout between bipod legs
STS-111	Yes	Yes	No	No	Divots	Yes	Yes	Yes	Divots on closeout between bipod legs
STS-112	Yes	Yes	**Yes**	No	Divots	Yes	Yes	Yes	Left bipod ramp partially missing
STS-113	No	No	No	No		No	No	No	

PRELIMINARY

ET TPS Foam Loss

STS	ET	Vehicle	Launch Date	Useable ET Crew Photos	Useable ET Umbilical Well Photos	Day/ Night	Notes	Photo Catalogued	Bipod Ramp	Flange	Acreage: LO2 Tank	Acreage: Intertank	Acreage: LH2 Tank
033 51L	026	99	01/28/86	No	No	Day	Challenger accident		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
032 61C	030	102	01/12/86	No crew photos found	16mm only	Day			No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	Divot in I/T 2-tone foam just forward of the -Y bipod ramp. The divot measured approximately 15 inches by 20 inches. Divot in intertank 2-tone foam between bipods. The divot measures 30 inches by 12 inches.	No loss of TPS noted
031 61B	022	104	11/26/85	No	No	Night	No data obtained		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
030 61A	024	99	10/30/85	No crew photos found	35mm only	Day			No loss of TPS noted	Divot approximately 2 inches in dia. located in the flange closeout between the bipod ramps. Divot approximately 2 inches in dia. Located in the flange closeout +Y of the feedline.	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
028 51J	025	104	10/03/85	Yes	No umbilical photos found	Day	-Y visible +Y side too distant to detect foam loss		No loss of TPS noted	No data obtained	No data obtained	No data obtained	No data obtained
027 51I	021	103	08/27/85	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
026 51F	019	99	07/29/85	No crew photos found	35mm only	Day			No loss of TPS noted	The -Y jack pad closeout is missing. This area is approximately 5 inches by 5 inches with substrate exposed. This area is located within the flange closeout between the bipod ramps.	No loss of TPS noted	Thirteen large divots in intertank 2-tone foam ranging form 7 inches to 30 inches in dia. located forward of the bipods. Divot approximately 3 inches in dia. located in the intertank acreage TPS +Y axis just forward of the flange closeout. Divot appro	No loss of TPS noted
025 51G	020	103	06/17/85	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
024 51B	017	99	04/29/85	No crew photos found	35mm only	Day	Sun angle washed out view of ET making it hard to detect foam loss.	√	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	Nine large divots (10 inches in dia.) located in the intertank 2-tone foam just forward of the bipods.	Two divots approximately 3-4 inches in dia. Located in the LH2 +Z axis acreage TPS just aft of the flange closeout.
023 51D	018	103	04/12/85	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
020 51C	014	103	01/24/85	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
019 51A	016	103	11/08/84	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
017 41G	015	99	10/05/84	No crew photos found	35mm only	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	Divot approximately 5 inches in dia. located in the intertank 2-tone foam forward and between the bipods. Divot approximately 18-20 inches in dia. located in the 2-tone foam forward of the +Y bipod ramp.	Divot in the LH2 acreage +Z axis at Sta 1623. The divot appears to be loss of 3 inch dia. plug pull repair area.
014 41D	013	103	08/30/84	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
013 41C	012	99	04/06/84	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
011 41B	010	99	02/03/84	No crew photos found	35mm only	Day			No loss of TPS noted	The -Y jack pad closeout is missing. This area is approximately 5 inches by 5 inches with substrate exposed. This area is located within the flange closeout between the bipod ramps.	No loss of TPS noted	Divot approximately 10 inches in dia. located in the intertank 2-tone foam area just forward and inboard of the +Y bipod ramp.	Divot approximately 2 inches in dia. located in the LH2 acreage TPS 12 inches below the +Y bipod ramp.
009 041A	011	102	11/28/83	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
008	009	99	08/30/83	No crew photos found	No umbilical photos found	Day	No crew or umbilical photos located at KSC.		No data obtained	No data obtained	No data obtained	No data obtained	No data obtained
007	006	99	06/18/83	No crew photos found	35 mm only	Day		√	A portion of the -Y Bipod Ramp TPS is missing. The area is approximately 18" x 12". The bipod spindle is not exposed.	One small divot approximately 4 inches in dia. Located outboard of the cable tray in the flange closeout.	No loss of TPS noted	Approximately 25 shallow divots all less than 4 inches in dia. located in the intertank acreage TPS +Z axis just forward of the bipods	Approximately 40 divots all less than 2 inches in dia. located in the upper LH2 acreage TPS +Z axis between Sta 1129 and Sta 1200.
006	008	99	04/04/83	No crew photos found	35mm only	Day			No loss of TPS noted	Divot (10" x 4") located in flange closeout and extending into the Intertank acreage TPS. The divot is located +Y of the LO2 feedline. Small shallow 3 inch dia. Divot located in the flange closeout between the bipod ramps.	No loss of TPS noted	No loss of TPS noted	Small divot approximately 3 inches in dia. Located outboard of LO2 feedline in acreage TPS at Sta 1610
005	005	102	11/11/82	No crew photos found	Yes	Day	GH2 pressline on -Y side		No loss of TPS noted	4 divots (2" to 6" dia) outboard of LH2 PAL ramp 1 divot (approximately 7" dia) between bipod	No loss of TPS noted	3 divots (1" to 2") just forward of +Y bipod ramp 3 divots (1" dia) forward of bipod	1 divot (2" dia) between pressline and feedline near Sta 1800 Numerous (30) divots (ranging 2"W x 2 to 10"L) just aft of +Z flange Numerous divots along entire length of GH2 pressline
004	004	102	06/27/82	No crew photos found	Yes	Day	GH2 pressline on -Y side Sun angle (backlighting) washed out view of ET above Sta 1623		No loss of TPS noted	3 divots (approximately 6" dia) just outboard of PAL ramp 1 divot (approximately 4" dia) between LO2 feedline and pressline	No loss of TPS noted	3 divots (2" to 3" dia) forward of bipod	1 divot (3" dia) just forward of longeron Numerous small divots (approximately 40) between pressline and feedling along entire length of LH2 tank Several (7 -9) divots (2" -3" dia) in acreage just aft of +Z flange

Components	Substrate Exposed
No data obtained	N/A
Divot 7 inch by 3 inch in LH2 cable-tray clamshell closeout.	No
No data obtained	
Divot approximately 4 inches in dia. In +Z surface of Sta 115 feedline flange closeout.	No
No data obtained	N/A
No data obtained	N/A
Small divots (< 1 inch dia.) on LO2 feedline flange closeouts +Z surface. Divot 8 inches long by 5 inches wide with substrate exposed located on the +Z surface of Sta 1856 feedline flange closeout. Divot approximately 6 inches in dia. located on the +Z	Yes
No data obtained	N/A
No loss of TPS noted	No
No data obtained	N/A
No data obtained	N/A
No data obtained	N/A
Divot approximately 6 inches in dia. with substrate exposed located in LO2 feedline at Sta 1870.	Yes
No data obtained	N/A
No data obtained	N/A
No loss of TPS noted	Yes
No data obtained	N/A
No data obtained	N/A
Divots in ice/frost ramps ranging from 4 inches in dia. To most of the upper ramp closeouts missing at Sta 1916, Sta 1851, Sta 1787, Sta 1722, Sta 1657, Sta 1528, Sta 1464. Most of these areas of missing foam exposed cable tray SLA sidewall substrate.	Yes
Divot in LO2 feedline flange closeout at Sta 1958 with exposed substrate. Divot is approximately 5 inches in dia. Divot in LO2 feedline flange closeout at Sta 1856. Divot is approximately 3 inches in dia. Divot in LO2 feedline flange closeout at Sta 1	Yes
Missing upper portion of GH2 pressline ice/frost ramp at Sta 1430	No
4 divots (3" to 4" dia) in LH2 PAL ramp along the entire length 1 divot (15"L x 8"W) on LH2 PAL ramp 1 divot (20"L x 8"W) on forward end of LH2 PAL ramp	No

003	003	102	03/22/82	No crew photos found	Yes	Day	GH2 pressline on -Y side		No loss of TPS noted	4 divots (ranging 4" to 8") at +Z 1 divot (approximately 6" x 12") outboard of +Y cable tray - Included portion of LH2 L7tank acreage foam 3 small divots (approximately 3" dia) on +Y/+Z quadrant	No loss of TPS noted	3 divots (2" to 3" dia) forward of bipod	Numerous (35) divots (ranging 2" to 6" dia) between flange and Sta 1377
002	002	102	11/12/81	No crew photos found	Yes	Day	GH2 pressline on -Y side Foam loss divots are difficult to detect due to white paint.		No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted
001	001	102	04/12/81	No crew photos found	Yes 16mm only	Day	GH2 pressline on -Y side Foam loss divots are difficult to detect due to white paint		No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	No loss of TPS noted	Divot approximately 16 inch by 12 inch (occurred after ET Sep.) in LH2 acreage near Sta 1851adjacent to Pressline. Divot approximately 15 inch by 10 inch located in LH2 acreage near Sta 1721adjacent to Pressline. 5 inch dia. Divot with what appears

No loss of TPS noted	N/A
No loss of TPS noted	No
No loss of TPS noted	Yes

Launch Year	Mission	Rollover	Rollout	Rollback	TCDT	Launch	Land	Ferry Complete	Vehicle	OV	Pad	Dates of Exposure		Days on Pad	OV Exposure Dates		OV Exposure Days	
												Start	End					
2003																		
	STS-107	20-Nov-02	9-Dec-02			16-Jan-03	1-Feb-03		Columbia	OV-102	39A	9-Dec-02	16-Jan-03	39	1-Feb-03			
2002																		
	STS-113	30-Sep-02	12-Oct-02			23-Nov-02	7-Dec-02		Endeavour	OV-105	39A	12-Oct-02	23-Nov-02	43				
	STS-112	4-Sep-02	10-Sep-02			7-Oct-02	18-Oct-02		Atlantis	OV-104	39B	10-Sep-02	7-Oct-02	28				
	STS-111	22-Apr-02	28-Apr-02		17-May-02	5-Jun-02	19-Jun-02	29-Jun-02	Endeavour	OV-105	39A	28-Apr-02	5-Jun-02	39	19-Jun-02	29-Jun-02		
	STS-110	6-Mar-02	12-Mar-02		19-Mar-02	8-Apr-02	19-Apr-02		Atlantis	OV-104	39B	12-Mar-02	8-Apr-02	28				
	STS-109	16-Jan-02	28-Jan-02		9-Feb-01	1-Mar-02	12-Mar-02		Columbia	OV-102	39A	28-Jan-02	1-Mar-02	33				
2001																		
	STS-108	24-Oct-01	31-Oct-01		9-Nov-01	5-Dec-01	17-Dec-01		Endeavour	OV-105	39B	31-Oct-01	5-Dec-01	36				
	STS-105	13-Jun-01	2-Jul-01		23-Jul-01	10-Aug-01	22-Aug-01		Discovery	OV-103	39A	2-Jul-01	10-Aug-01	40				
	STS-104	29-May-01	21-Jun-01		29-Jun-01	12-Jul-01	24-Jul-01		Atlantis	OV-104	39B	21-Jun-01	12-Jul-01	22				
	STS-100	17-Mar-01	22-Mar-01		30-Mar-01	19-Apr-01	1-May-01		Endeavour	OV-105	39A	22-Mar-01	19-Apr-01	29				
	STS-102	1-Feb-01	12-Feb-01		14-Feb-01	8-Mar-01	21-Mar-01		Discovery	OV-103	39B	12-Feb-01	8-Mar-01	25				
	STS-98	4-Dec-00	3-Jan-01	19-Jan-01	6-Jan-01	7-Feb-01	20-Feb-01	? Yes	Atlantis	OV-104	39A	3-Jan-01	19-Jan-01	17	20-Feb-01	? Yes		
	STS-98		26-Jan-01			7-Feb-01	20-Feb-01		Atlantis	OV-104	39A	26-Jan-01	7-Feb-01	13				
2000																		
	STS-97	25-Oct-00	31-Oct-00		7-Nov-00	30-Nov-00	11-Dec-00		Endeavour	OV-105	39B	31-Oct-00	30-Nov-00	31				
	STS-92	24-Aug-00	11-Sep-00			11-Oct-00	24-Oct-00		Discovery	OV-103	39A	11-Sep-00	11-Oct-00	31				
	STS-106	7-Aug-00	13-Aug-00		18-Aug-00	8-Sep-00	20-Sep-00		Atlantis	OV-104	39B	13-Aug-00	8-Sep-00	27				
	STS-101	17-Mar-00	25-Mar-00		7-Apr-00	19-May-00	29-May-00		Atlantis	OV-104	39A	25-Mar-00	19-May-00	56				
	STS-99	2-Dec-99	13-Dec-99		14-Dec-99	11-Feb-00	22-Feb-00		Endeavour	OV-105	39A	13-Dec-99	11-Feb-00	61				
1999																		
	STS-103	4-Nov-99	13-Nov-99		17-Nov-99	19-Dec-99	28-Dec-99		Discovery	OV-103	39B	13-Nov-99	19-Dec-99	37				
	STS-93	2-Jun-99	7-Jun-99		24-Jun-99	23-Jul-99	27-Jul-99		Columbia	OV-102	39B	7-Jun-99	23-Jul-99	47				
	STS-96	12-Apr-99	23-Apr-99	8-May-99		27-May-99			Discovery	OV-103	39B	23-Apr-99	8-May-99	16				
	STS-96		20-May-99			27-May-99	6-Jun-99		Discovery	OV-103	39B	20-May-99	27-May-99	8				
1998																		
	STS-91	27-Apr-98	2-May-98		7-May-98	2-Jun-98	12-Jun-98		Discovery	OV-103	39A	2-May-98	2-Jun-98	32				
	STS-90	17-Mar-98	23-Mar-98		31-Mar-98	17-Apr-98	10-May-98		Columbia	OV-102	39B	23-Mar-98	17-Apr-98	26				
	STS-89	12-Dec-97	19-Dec-97		10-Jan-98	22-Jan-98	31-Jan-98		Endeavour	OV-105	39A	19-Dec-97	22-Jan-98	35				
	STS-95	14-Sep-98	21-Sep-98			29-Oct-98	7-Nov-98		Discovery	OV-103	39B	21-Sep-98	29-Oct-98	39				
	STS-88	15-Oct-98	21-Oct-98			4-Dec-98	15-Dec-98		Endeavour	OV-105	39A	21-Oct-98	4-Dec-98	45				
1997																		
	STS-87	24-Oct-97	29-Oct-97			19-Nov-97	5-Dec-97		Columbia	OV-102	39B	29-Oct-97	19-Nov-97	22				
	STS-86	11-Aug-97	18-Aug-97			25-Sep-97	6-Oct-97		Atlantis	OV-104	39A	18-Aug-97	25-Sep-97	39				
	STS-85	7-Jul-97	14-Jul-97		22-Jul-97	7-Aug-97	19-Aug-97		Discovery	OV-103	39A	14-Jul-97	7-Aug-97	25				
	STS-94	4-Jun-97	11-Jun-97			1-Jul-97	17-Jul-97		Columbia	OV-102	39A	11-Jun-97	1-Jul-97	21				
	STS-84	19-Apr-97	24-Apr-97		28-Apr-97	15-May-97	24-May-97		Atlantis	OV-104	39A	24-Apr-97	15-May-97	22				
	STS-83	5-Mar-97	11-Mar-97		13-Mar-97	4-Apr-97	8-Apr-97		Columbia	OV-102	39A	11-Mar-97	4-Apr-97	25				
	STS-82	11-Jan-97	17-Jan-97		22-Jan-97	11-Feb-97	21-Feb-97		Discovery	OV-103	39A	17-Jan-97	11-Feb-97	26				
	STS-81	5-Dec-96	10-Dec-96		17-Dec-96	12-Jan-97	22-Jan-97		Atlantis	OV-104	39B	10-Dec-96	12-Jan-97	34				
1996																		
	STS-80	9-Oct-96	16-Oct-96		22-Oct-96	19-Nov-96	7-Dec-96		Columbia	OV-102	39B	16-Oct-96	19-Nov-96	35				
	STS-79	24-Jun-96	1-Jul-96	10-Jul-96	27-Aug-96	16-Sep-96	26-Sep-96		Atlantis	OV-104	39A	1-Jul-96	10-Jul-96	10				
	STS-79	13-Aug-96	20-Aug-96	4-Sep-96		16-Sep-96			Atlantis	OV-104		20-Aug-96	4-Sep-96	16				
	STS-79		5-Sep-96			16-Sep-96			Atlantis	OV-104		5-Sep-96	16-Sep-96	12				
	STS-78	20-May-96	30-May-96		4-Jun-96	20-Jun-96	7-Jul-96		Columbia	OV-102	39B	30-May-96	20-Jun-96	22				
	STS-77	9-Apr-96	16-Apr-96		23-Apr-96	19-May-96	29-May-96		Endeavour	OV-105	39B	16-Apr-96	19-May-96	34				
	STS-76	19-Feb-96	28-Feb-96		5-Mar-96	22-Mar-96	31-Mar-96	12-Apr-96	Atlantis	OV-104	39B	28-Feb-96	22-Mar-96	24	31-Mar-96	12-Apr-96		
	STS-75	23-Jan-96	29-Jan-96			22-Feb-96	9-Mar-96		Columbia	OV-102	39B	29-Jan-96	22-Feb-96	25				
	STS-72	30-Nov-95	6-Dec-95			11-Jan-96	20-Jan-96		Endeavour	OV-105	39B	6-Dec-95	11-Jan-96	37				
1995																		
	STS-74	3-Oct-95	12-Oct-95		17-Oct-95	12-Nov-95	20-Nov-95		Atlantis	OV-104	39A	12-Oct-95	12-Nov-95	32				
	STS-73	21-Aug-95	28-Aug-95		11-Sep-95	20-Oct-95	5-Nov-95		Columbia	OV-102	39B	28-Aug-95	20-Oct-95	54	5-Nov-95			
	STS-69	28-Jun-95	5-Jul-95	1-Aug-95		7-Sep-95			Endeavour	OV-105	39A	5-Jul-95	1-Aug-95	28				
	STS-69		8-Aug-95			7-Sep-95	18-Sep-95		Endeavour	OV-105	39A	8-Aug-95	7-Sep-95	31				
	STS-70	3-May-95	11-May-95	8-Jun-95		13-Jul-95			Discovery	OV-103	39B	11-May-95	8-Jun-95	29				
	STS-70		15-Jun-95			13-Jul-95	22-Jul-95		Discovery	OV-103	39B	15-Jun-95	13-Jul-95	29				
	STS-71	20-Apr-95	26-Apr-95			27-Jun-95	7-Jul-95		Atlantis	OV-104	39A	26-Apr-95	27-Jun-95	63				
	STS-67	3-Feb-95	8-Feb-95		14-Feb-95	2-Mar-95	18-Mar-95		Endeavour	OV-105	39A	8-Feb-95	2-Mar-95	23				
	STS-63	5-Jan-95	10-Jan-95		17-Jan-95	3-Feb-95	11-Feb-95		Discovery	OV-103	39B	10-Jan-95	3-Feb-95	25				
1994																		
	STS-66	3-Oct-94	9-Oct-94			3-Nov-94	14-Nov-94	? Yes	Atlantis	OV-104	39B	9-Oct-94	3-Nov-94	26	14-Nov-94	? Yes		
	STS-68	21-Jul-94	27-Jul-94	24-Aug-94	13-Sep-94	30-Sep-94	11-Oct-94		Endeavour	OV-105	39A	27-Jul-94	24-Aug-94	29				
	STS-68		13-Sep-94			30-Sep-94			Endeavour	OV-105	39A	13-Sep-94	30-Sep-94	18				
	STS-64	11-Aug-94	19-Aug-94			9-Sep-94	20 Spe 94		Discovery	OV-103	39B	19-Aug-94	9-Sep-94	22				
	STS-65	8-Jun-94	15-Jun-94			8-Jul-94	23-Jul-94		Columbia	OV-102	39A	15-Jun-94	8-Jul-94	24				
	STS-59	14-Mar-94	19-Mar-94			9-Apr-94	20-Apr-94	2-May-94	Endeavour	OV-105	39A	19-Mar-94	9-Apr-94	22	20-Apr-94	2-May-94		
	STS-62	3-Feb-94	10-Feb-94			4-Mar-94	18-Mar-94		Columbia	OV-102	39B	10-Feb-94	4-Mar-94	23				
	STS-60	4-Jan-94	10-Jan-94			3-Feb-94	11-Feb-94		Discovery	OV-103	39A	10-Jan-94	3-Feb-94	25				
1993																		
	STS-56	2-Mar-93	15-Mar-93			8-Apr-93	17-Apr-93		Discovery	OV-103	39B	15-Mar-93	8-Apr-93	25				
	STS-61	21-Oct-93	28-Oct-93			2-Dec-93	13-Dec-93		Endeavour	OV-105	39B	28-Oct-93	2-Dec-93	36				
	STS-58	11-Aug-93	17-Sep-93			18-Oct-93	1-Nov-93	9-Nov-93	Columbia	OV-102	39B	17-Sep-93	18-Oct-93	32	1-Nov-93	9-Nov-93		
	STS-51	18-Jun-93	26-Jun-93			12-Sep-93	22-Sep-93		Discovery	OV-103	39B	26-Jun-93	12-Sep-93	79				
	STS-57	24-Mar-93	28-Apr-93			21-Jun-93	1-Jul-93		Endeavour	OV-105	39B	28-Apr-93	21-Jun-93	55				
	STS-55	2-Feb-93	8-Feb-93			26-Apr-93	6-May-93	14-May-93	Columbia	OV-102	39A	8-Feb-93	26-Apr-93	78	6-May-93	14-May-93		
	STS-54	23-Nov-92	3-Dec-92			13-Jan-93	19-Jan-93		Endeavour	OV-105	39B	3-Dec-92	13-Jan-93	42				
1992																		
	STS-53	3-Nov-92	8-Nov-92			2-Dec-92	9-Dec-92	18-Dec-92	Discovery	OV-103	39A	8-Nov-92	2-Dec-92	25	9-Dec-92	18-Dec-92		
	STS-52	20-Sep-92	26-Sep-92			22-Oct-92	1-Nov-92		Columbia	OV-102	39B	26-Sep-92	22-Oct-92	27				
	STS-47	17-Aug-92	25-Aug-92			12-Sep-92	20-Sep-92		Endeavour	OV-105	39B	25-Aug-92	12-Sep-92	19				
	STS-46	4-Jun-92	11-Jun-92			31-Jul-92	8-Aug-92		Atlantis	OV-104	39B	11-Jun-92	31-Jul-92	51				
	STS-50	29-May-92	3-Jun-92			25-Jun-92	9-Jul-92		Columbia	OV-102	39A	3-Jun-92	25-Jun-92	23				
	STS-49	7-Mar-92	13-Mar-92			7-May-92	16-May-92	30-May-92	Endeavour	OV-105	39B	13-Mar-92	7-May-92	56	16-May-92	30-May-92		
	STS-45	13-Feb-92	19-Feb-92			24-Mar-92	2-Apr-92		Atlantis	OV-104	39A	19-Feb-92	24-Mar-92	35				
	STS-42	12-Dec-91	19-Dec-91			22-Jan-92	30-Jan-92	16-Feb-92	Discovery	OV-103	39A	19-Dec-91	22-Jan-92	35	30-Jan-92	16-Feb-92	1.23	4.4
1991																		
	STS-44	18-Oct-91	23-Oct-91			24-Nov-91	1-Dec-91	8-Dec-91	Atlantis	OV-104	39A	23-Oct-91	24-Nov-91	33	1-Dec-91	8-Dec-91		
	STS-48	25-Jul-91	12-Aug-91			12-Sep-91	18-Sep-91	26-Sep-91	Discovery	OV-103	39A	12-Aug-91	12-Sep-91	32	18-Sep-91	26-Sep-91		
	STS-43	19-Jun-91	25-Jun-91			2-Aug-91	11-Aug-91		Atlantis	OV-104	39A	25-Jun-91	2-Aug-91	39				
	STS-40	26-Apr-91	2-May-91			5-Jun-91	14-Jun-91	21-Jun-91	Columbia	OV-102	39B	2-May-91	5-Jun-91	35	14-Jun-91	21-Jun-91		
	STS-39	9-Feb-91	15-Feb-91	7-Mar-91		28-Apr-91	6-May-91		Discovery	OV-103	39A	15-Feb-91	7-Mar-91	21				
	STS-39	25-Mar-91	1-Apr-91			28-Apr-91			Discovery	OV-103	39A	1-Apr-91	28-Apr-91	28				
	STS-37	8-Mar-91	15-Mar-91			5-Apr-91	11-Apr-91	18-Apr-91	Atlantis	OV-104	39B	15-Mar-91	5-Apr-91	22	11-Apr-91	18-Apr-91		
1990																		
	STS-35	16-Apr-90	22-Apr-90	12-Jun-90		2-Dec-90	10-Dec-90		Columbia	OV-102	39B	22-Apr-90	12-Jun-90	52				
	STS-35	2-Aug-90	9-Aug-90	9-Oct-90		2-Dec-90			Columbia	OV-102	39B	9-Aug-90	9-Oct-90	62				
	STS-35		14-Oct-90			2-Dec-90			Columbia	OV-102	39B	14-Oct-90	2-Dec-90	50				
	STS-38	8-Jun-90	18-Jun-90	9-Aug-90		15-Nov-90	20-Nov-90		Atlantis	OV-104	39A	18-Jun-90	9-Aug-90	53				
	STS-38	2-Oct-90	12-Oct-90			15-Nov-90			Atlantis	OV-104	39A	12-Oct-90	15-Nov-90	35				
	STS-41	27-Aug-90	4-Sep-90			6-Oct-90	10-Oct-90	16-Oct-90	Discovery	OV-103	39B	4-Sep-90	6-Oct-90	33	10-Oct-90	16-Oct-90		
	STS-31	5-Mar-90	15-Mar-90			24-Apr-90	29-Apr-90	7-May-90	Discovery	OV-103	39B	15-Mar-90	24-Apr-90	41	29-Apr-90	7-May-90		
	STS-36	19-Jan-90	25-Jan-90			28-Feb-90	4-Mar-90	13-Mar-90	Atlantis	OV-104	39A	25-Jan-90	28-Feb-90	35	4-Mar-90	13-Mar-90		
	STS-32	16-Oct-89	28-Nov-89			9-Jan-90	20-Jan-90	26-Jan-90	Columbia	OV-102	39A	28-Nov-89	9-Jan-90	43	20-Jan-90	26-Jan-90		
1989																		
	STS-33	5-Oct-89	27-Oct-89			22-Nov-89	27-Nov-89	4-Dec-89	Discovery	OV-103	39B	27-Oct-89	22-Nov-89	27	27-Nov-89	4-Dec-89		
	STS-34	21-Aug-89	29-Aug-89			18-Oct-89	23-Oct-89	29-Oct-89	Atlantis	OV-104	39B	29-Aug-89	18-Oct-89	51	23-Oct-89	29-Oct-89		
	STS-28	3-Jul-89	14-Jul-89			8-Aug-89	13-Aug-89	21-Aug-89	Columbia	OV-102	39B	14-Jul-89	8-Aug-89	26	13-Aug-89	21-Aug-89		
	STS-29	23-Jan-89	3-Feb-89			13-Mar-89	18-Mar-89	24-Mar-89	Discovery	OV-103	39B	3-Feb-89	13-Mar-89	39	18-Mar-89	24-Mar-89		
	STS-30	11-Mar-89	22-Mar-89			4-May-89	8-May-89	15-May-89	Atlantis	OV-104	39B	22-Mar-89	4-May-89	44	8-May-89	15-May-89		
1988																		
	STS-27	22-Oct-88	2-Nov-88			2-Dec-88	6-Dec-88	13-Dec-88	Atlantis	OV-104	39B	2-Nov-88	2-Dec-88	31	6-Dec-88	13-Dec-88		
	STS-26	21-Jun-88	4-Jul-88			29-Sep-88	30-Oct-88	8-Oct-88	Discovery	OV-103	39B	4-Jul-88	29-Sep-88	88	30-Oct-88	8-Oct-88		
1987																		
	No Shuttle Flights																	
1986																		
	51-L	16-Dec-85	22-Dec-85			28-Jan-86			Challenger	OV-099	39B	22-Dec-85	28-Jan-86	38				
	61-C	22-Nov-85	2-Dec-85			12-Jan-86	18-Jan-86	23-Jan-86	Columbia	OV-102	39A	2-Dec-85	12-Jan-86	42	18-Jan-86	23-Jan-86		
1985																		
	61-B	7-Nov-85	12-Nov-85			26-Nov-85	5-Dec-85	7-Dec-85	Atlantis	OV-104	39A	12-Nov-85	26-Nov-85	15	5-Dec-85	7-Dec-85		
	61-A	12-Oct-85	16-Oct-85			30-Oct-85	6-Nov-85	11-Nov-85	Challenger	OV-099	39A	16-Oct-85	30-Oct-85	15	6-Nov-85	11-Nov-85	1.16	
	51-J	12-Aug-85	30-Aug-85			3-Oct-85	7-Oct-85	11-Oct-85	Atlantis	OV-104	39A	30-Aug-85	3-Oct-85	35	7-Oct-85	11-Oct-85		
	51-I	30-Jul-85	6-Aug-85			27-Aug-85	3-Sep-85	8-Sep-85	Discovery	OV-103	39A	6-Aug-85	27-Aug-85	22	3-Sep-85	8-Sep-85		
	51-F	24-Jun-85	29-Jun-85			29-Jul-85	6-Aug-85	11-Aug-85	Challenger	OV-099	39A	29-Jun-85	29-Jul-85	31	6-Aug-85	11-Aug-85		

	51-G	29-May-85	4-Jun-85			17-Jun-85	24-Jun-85	28-Jun-85	Discovery	OV-103	39A	4-Jun-85	17-Jun-85	14	24-Jun-85	28-Jun-85		
	51-B	10-Feb-85	15-Feb-85	4-Mar-85		29-Apr-85	6-May-85	11-May-85	Challenger	OV-099	39A	15-Feb-85	4-Mar-85	18	6-May-85	11-May-85		
	51-B	10-Apr-85	15-Apr-85			29-Apr-85			Challenger	OV-099	39A	15-Apr-85	29-Apr-85	15				
	51-D	23-Mar-85	28-Mar-85			12-Apr-85	19-Apr-85		Discovery	OV-103	39A	28-Mar-85	12-Apr-85	16				
	51-C	21-Dec-84	5-Jan-85			24-Jan-85	27-Jan-85		Discovery	OV-103	39A	5-Jan-85	24-Jan-85	20				
1984																		
	51-A	18-Oct-84	23-Oct-84			8-Nov-84	16-Nov-84	?Yes	Discovery	OV-103	39A	23-Oct-84	8-Nov-84	17	16-Nov-84	?Yes	4.42	
	41-G	8-Sep-84	13-Sep-84			5-Oct-84	13-Oct-84	? Yes	Challenger	OV-099	39A	13-Sep-84	5-Oct-84	23	13-Oct-84	? Yes		
	41-D	12-May-84	19-May-84	14-Jul-84		30-Aug-84	5-Sep-84	10-Sep-84	Discovery	OV-103	39A	19-May-84	14-Jul-84	57	5-Sep-84	10-Sep-84		
	41-D	1-Aug-84	9-Aug-84			30-Aug-84			Discovery	OV-103	39A	9-Aug-84	30-Aug-84	22				
	41-C	14-Mar-84	19-Mar-84			6-Apr-84	13-Apr-84	18-Apr-84	Challenger	OV-099	39A	19-Mar-84	6-Apr-84	19	13-Apr-84	18-Apr-84		
	41-B	6-Jan-84	12-Jan-84			3-Feb-84	11-Feb-84		Challenger	OV-099	39A	12-Jan-84	3-Feb-84	23				
1983																		
	STS-9	24-Sep-83	28-Sep-83	19-Oct-83		28-Nov-83	8-Dec-83	15-Dec-83	Columbia	OV-102	39A	28-Sep-83	19-Oct-83	22	8-Dec-83	15-Dec-83		
	STS-9	3-Nov-83	8-Nov-83			28-Nov-83			Columbia	OV-102	39A	8-Nov-83	28-Nov-83	21				
	STS-8	26-Jul-83	2-Aug-83			30-Aug-83	5-Sep-83	9-Sep-83	Challenger	OV-099	39A	2-Aug-83	30-Aug-83	29	5-Sep-83	9-Sep-83		
	STS-7	21-May-83	26-May-83			18-Jun-83	24-Jun-83	29-Jun-83	Challenger	OV-099	39A	26-May-83	18-Jun-83	24	24-Jun-83	29-Jun-83		
	STS-6	23-Nov-82	30-Nov-82			4-Apr-83	9-Apr-83		Challenger	OV-099	39A	30-Nov-82	4-Apr-83	126				
1982																		
	STS-5	9-Sep-82	21-Sep-82			11-Nov-82	16-Nov-82	22-Nov-82	Columbia	OV-102	39A	21-Sep-82	11-Nov-82	52	16-Nov-82	22-Nov-82		
	STS-4	19-May-82	26-May-82			27-Jun-82	4-Jul-82	15-Jul-82	Columbia	OV-102	39A	26-May-82	27-Jun-82	33	4-Jul-82	15-Jul-82		
	STS-3	3-Feb-82	16-Feb-82			22-Mar-82	30-Mar-82	6-Apr-82	Columbia	OV-102	39A	16-Feb-82	22-Mar-82	35	30-Mar-82	6-Apr-82		
1981																		
	STS-2	10-Aug-81	31-Aug-81			12-Nov-81	14-Nov-81	25-Nov-81	Columbia	OV-102	39A	31-Aug-81	12-Nov-81	74	14-Nov-81	25-Nov-81		
	STS-1	24-Nov-80	29-Dec-80			12-Apr-81	14-Apr-81	28-Apr-81	Columbia	OV-102	39A	29-Dec-80	12-Apr-81	105	14-Apr-81	28-Apr-81		
														4316				
														Days	**Days**			
													Columbia	1208	1208			
													Discovery	1050	1050			
													Atlantis	948	948			
													Endeavour	749	749			
													Challenger	361	361			
													Total Days	4316	4316			

Mission	Vehicle	Reference	Comments
STS-32	OV-103 Discovery	Debris Damage Assessment	The majority of debris damage was located on the lower surface, which was attributed to ice debris released from the umbilical area during ET separation. This umbilical ice debris was seen in the ET separation films and phots taken by cameras mounted in the OV-102 umbilical wells. These films also showed a loss of TPS from the ET intertank near the bipod. The largest piece of material lost was approximately 24" x 18". Loss of TPS from this area was the source of considerable debris damage for earlier flights and probably was a contributor to the lower surface damage for STS-32. "Jagged" steel particles of this type (from the frangible nuts) represent a potentially catostrophic source of damage to the vehicle, although the transport mechanism and risk are very uncertain due to the liftoff environment.
STS-35	OV-102 Columbia	Debris Damage Assessment	one of the damage sites, on the lower surface of the bodyflap, exhibited significant thermal erosion (app.. 3/4 inch in depth and melting adjacent tiles coating material. The largest lower surface damage site was located on the right hand wing chine, affected four tiles, but had a maximum depth of only 1/4 inch. This damage may be a result of impact from ET TPS debris. Photos of the separated ET, taken by the flight crew, indicate a loss of foam TPS at the juncture of the intertank and LH2 tank. This item was documented as an in-flight anomaly and is under investigation.
STS-35	OV-102 Columbia		ET TPS debris classified as IFA (35-T-001)
STS-35	OV-102 Columbia	Debris Damage Assessment	one of the damage sites, on the lower surface of the bodyflap, exhibited significant thermal erosion (app.. 3/4 inch in depth and melting adjacent tiles coating material. The largest lower surface damage site was located on the right hand wing chine, affected four tiles, but had a maximum depth of only 1/4 inch. This damage may be a result of impact from ET TPS debris. Photos of the separated ET, taken by the flight crew, indicate a loss of foam TPS at the juncture of the intertank and LH2 tank. This item was documented as an in-flight anomaly and is under investigation.
STS-42	OV-103 Discovery	Debris Damage Assessment	The majority of the hits occurred on the Orbiter lower surface which had a total of 159 hits. 38 of the lower surface hits had a major dimension of one inch or greater and 14 of the lower surface hits had a major dimension of 3 inches or greater. The large shallow hits on the wing glove lower surfaces were not typical. Analysis concluded that loss of ET intertank foam is the probable source of increased debris damage. An IFA was documented. STS-42 and STS-44 were the first two flights using the two gun spray process on the intertank. It is also the second flight (behind STS-44_ without intertank vent holes.
STS-58	OV-102 Columbia	Debris Damage Assessment	Photos of the separated ET taken using the cameras located in the Orbiter umbilical well showed a significant loss of TPS from the ET intertank. The jack pad closeout material was missing as was a strip of foam material from an intertank stringer. The loss of jack pad closeout material has occurred previously but the amount of material missing from the stringer (down to the primer) is unusual. Both of these conditions were documented as an inflight anomaly (IFA STS-58-T-1).

Mission	Pad	Days.Exposed	Total	DailyMax	DailyAvg
STS-100	39A	29	1.920	1.710	0.066
STS-101	39A	56	2.231	0.710	0.040
STS-102	39B	25	0.840	0.370	0.034
STS-103	39B	37	5.130	1.720	0.139
STS-104	39B	22	2.520	0.600	0.115
STS-105	39A	40	5.060	1.400	0.127
STS-106	39B	27	6.880	5.580	0.255
STS-107	39A	39	12.780	5.880	0.328
STS-108	39B	36	10.240	3.650	0.284
STS-109	39A	33	4.210	2.040	0.128
STS-110	39B	28	1.190	1.080	0.043
STS-111	39A	39	1.850	0.630	0.047
STS-112	39B	28	0.550	0.310	0.020
STS-113	39A	43	3.460	1.640	0.080
STS-42	39A	24	2.974	2.600	0.124
STS-44	39A	33	0.750	0.370	0.023
STS-45	39A	35	2.750	1.240	0.079
STS-46	39B	51	11.450	2.920	0.225
STS-47	39B	19	1.420	0.700	0.075
STS-48	39A	32	4.050	2.010	0.127
STS-49	39B	56	4.570	1.600	0.082
STS-50	39A	23	6.140	2.650	0.267
STS-51	39B	79	12.440	2.500	0.157
STS-52	39B	27	6.350	2.950	0.235
STS-53	39A	25	4.060	2.180	0.162
STS-54	39B	42	3.050	1.120	0.073
STS-55	39A	78	8.085	2.510	0.104
STS-56	39B	25	2.020	0.700	0.081
STS-57	39B	55	1.210	0.500	0.022
STS-58	39B	32	3.980	1.250	0.124
STS-59	39A	22	2.040	1.650	0.093
STS-60	39A	25	3.720	1.400	0.149
STS-61	39A/B	36	1.000	0.400	0.028
STS-62	39B	24	9.700	6.350	0.404
STS-63	39B	25	3.030	2.250	0.121
STS-64	39B	22	3.380	1.340	0.154
STS-65	39A	24	3.920	3.070	0.163
STS-66	39B	26	4.960	1.500	0.191
STS-67	39A	23	1.860	1.350	0.081
STS-68	39A	47	10.470	3.000	0.223
STS-69	39A	59	20.470	5.650	0.347
STS-70	39B	58	11.460	5.600	0.198
STS-71	39A	63	11.330	3.200	0.180
STS-72	39B	37	7.035	3.800	0.190
STS-73	39B	54	15.750	2.750	0.292
STS-74	39A	32	5.360	2.600	0.168
STS-75	39B	25	1.870	1.750	0.075
STS-76	39B	24	8.740	4.000	0.364
STS-77	39B	34	1.270	1.240	0.037
STS-78	39B	22	5.770	2.400	0.262
STS-79	39A	38	9.370	3.350	0.247
STS-80	39B	35	0.910	0.360	0.026
STS-81	39B	34	0.410	0.300	0.012
STS-82	39A	26	0.200	0.180	0.008
STS-83	39A	25	2.465	0.970	0.099
STS-84	39A	22	2.975	1.230	0.135
STS-85	39A	25	3.515	1.400	0.141
STS-86	39A	39	7.015	1.400	0.180
STS-87	39B	22	3.500	1.500	0.159
STS-88	39A	45	5.010	2.370	0.111
STS-89	39A	35	3.545	1.570	0.101
STS-90	39B	26	0.150	0.110	0.006
STS-91	39A	32	0.520	0.250	0.016
STS-92	39A	31	7.582	3.590	0.245
STS-93	39B	47	6.900	3.060	0.147
STS-94	39A	21	4.995	1.250	0.238
STS-95	39B	39	2.740	0.520	0.070
STS-96	39B	24	2.060	0.910	0.086
STS-97	39B	31	1.150	0.990	0.037
STS-98	39A	30	0.800	0.160	0.027
STS-99	39A	61	6.003	1.760	0.098
STS-1	39A	105	5.9961	2.220472	0.057105362
STS-2	39A	74	13.11	2.110236	0.177165354
STS-3	39A	35	2.9567	1.448819	0.08447694
STS-4	39A	33	8.0157	2.389764	0.242901456
STS-5	39A	52	4.0197	1.11811	0.077301635
STS-6	39A	126	18.996	1.889764	0.150762405
STS-7	39A	24	6.9685	1.779528	0.290354331
STS-8	39A	29	4.8543	1.531496	0.167390714
STS-9	39A	43	5.3701	1.031496	0.124885552
STS-41-B	39A	23	2.1142	0.531496	0.091920575
STS-41-C	39A	19	3.6496	2.149606	0.192084542
STS-41-D	39A	79	15.945	2.759843	0.201833948
STS-41-G	39A	23	3.3701	1.96063	0.146525163
STS-51-A	39A	17	4.252	2.46063	0.250115794
STS-51-C	39A	20	0.0945	0.070866	0.004724409
STS-51-D	39A	16	0.4016	0.318898	0.025098425
STS-51-B	39A	33	0.122	0.090551	0.003698401
STS-51-G	39A	14	3.0315	1.031496	0.216535433
STS-51-F	39A	31	5.2441	1.098425	0.169164338
STS-51-I	39A	22	7.4724	1.181102	0.339656407
STS-51-J	39A	35	9.9252	2.129921	0.283577053
STS-61-A	39A	15	3.1181	1.468504	0.207874016
STS-61-B	39A	15	0.1929	0.110236	0.012860892
STS-61-C	39A	42	9.5315	4.141732	0.226940382
STS-51-L	39B	38	7.1811	4.141732	0.188976378
STS-26	39B	88	14.98	2.889764	0.170230852
STS-27	39B	24	4.311	3.279528	0.179625984
STS-28	39B	26	4.3268	1.610236	0.166414294
STS-29	39B	39	3.378	1.11811	0.086614173
STS-30	39B	44	2.7756	0.791339	0.063081603
STS-31	39B	41	2.4803	0.968504	0.060495487
STS-32	39A	43	5.2874	1.38189	0.122962827
STS-33	39B	27	2.2205	1.019685	0.08223972
STS-34	39B	51	13.886	5.468504	0.272271113
STS-35	39A/B	164	20.516	4.350394	0.125096025
STS-36	39A	35	4.4921	1.610236	0.128346457
STS-37	39B	22	8.2795	3.740157	0.376342162
STS-38	39A	88	16.843	4.350394	0.191392269
STS-39	39A	49	6.9843	1.531496	0.142535754
STS-40	39B	35	6.4803	2.098425	0.185151856
STS-41	39B	33	2.2559	0.838583	0.068360773
STS-43	39A	39	11.728	1.330709	0.300726832

	Production				-Y Bipod Ramp (Hand Spray)								-Y Bipod Spindle Face (Hand Spray)								-Y Bipod Beneath S.F. (Hand Spray)								+Y Bipod Ramp (Hand Spray)								+Y B	
ET	Start Date	Completion Date	Ship Date	Days in Storage Before Shipment	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)
61	01/09/89	10/15/91	07/23/93	647				06/27/91	Thu	1520	BN		76	76	55	06/05/91	Wed	1445	BR		75	75	58	06/14/91	Fri	1030	BN					07/16/91	Tue	1150	BR		76	76
61	Additional Data As Noted By Partial Respray																																					
62	04/28/89	01/16/92	10/01/93	624				09/17/91	Tue	2300	AP		75	75	50	09/03/91	Tue	2330	AR		75	75	58	09/07/91	Sat	130	AP					09/25/91	Wed	2150	AP		78	78
63	06/24/89	04/19/92	11/11/93	571				11/17/91	Sun	1125	BR		71	71	46	11/27/01	Tue	1240	BR		77	77	50	12/11/91	Wed	1035	BR					01/15/92	Wed	1500	BR		75	75
64	09/25/89	07/13/92	01/08/94	544				04/07/92	Tue	2125	AT		75	75	58	03/18/92	Wed	2100	BJ		78	78	48	03/26/92	Thu	1845	BJ					04/14/92	Tue	845	BR		75	75
65	11/25/89	10/21/92	02/24/94	491				06/30/92	Tue	640	BR		2	72	57	06/11/02	Tue	1445	BR		74	74	57	06/23/92	Tue	1100	BN					07/02/92	Thu	700	BR		72	72
65	Additional Data As Noted By Partial Respray																																					
66	01/28/90	01/20/93	05/12/94	477				09/17/92	Thu	2045	AP		75	75	58	09/03/92	Thu	1815	AR		76	76	56	09/09/92	Wed	2230	AR					09/30/92	Wed	2040	AP		76	76
67	04/15/90	04/16/93	06/08/94	418				01/06/93	Wed	1110	BR		74	74	56	12/10/92	Thu	1345	BR		74	74	58	12/23/92	Wed	1442	BR					01/21/93	Thu	1510	BR		74	74
68	06/25/90	07/27/93	07/21/94	359				04/23/93	Fri	1350	AP		75	75	58	03/02/93	Tue	1230	AR		73	73	52	03/10/93	Wed	1445	AR					04/15/93	Thu	1330	AP		74	74
69	08/25/90	10/26/93	09/15/94	324				06/25/93	Fri	1315	BU		74	74	56	06/03/93	Thu	1240	BR		74	74	60	06/14/93	Mon	1500	BR					07/15/93	Thu	1110	BU		74	74
70	01/20/91	01/21/94	11/10/94	293				09/25/93	Sat	2150	BE		75	75	56	09/13/93	Mon	2255	BD		76	76	56	09/16/93	Thu	2330	BD					10/14/93	Thu	1330	AL		74	74
71	04/25/91	04/11/94	12/09/94	242	72	72	50	01/06/94	Thu	2130	AT		73	73	48	12/04/93	Sat	2230	BJ		74	74	38	12/17/93	Fri	100	AT		75	75	36	01/20/94	Thu	115	AT		73	73
72	09/28/91	06/02/94	03/09/95	280	71	71	60	03/01/94	Tue	1350	BR		74	74	54	02/10/64	Mon	1100	BN		70	70	56	02/18/94	Fri	1500	BN		72	72	48	03/17/94	Thu	1345	BR		70	70
73	01/04/92	08/12/94	04/06/95	237	75	75	54	04/22/94	Fri	2115	AT		74	74	58	04/05/94	Tue	300	CY		74	74	64	04/15/94	Fri	100	BJ		76	76	58	05/17/94	Tue	2205	AT		74	74
74	05/17/92	10/14/94	06/01/95	230	76	76	56	06/24/94	Fri	1050	BN		74	74	60	06/15/94	Wed	1000	BE		73	73	60	06/17/94	Fri	950	BD		73	73	57	07/19/94	Tue	1100	BR		73	73
75	07/10/92	01/13/95	07/13/95	181	76	76	51	08/31/64	Mon	1000	AP		77	77	56	08/15/94	Mon	1340	AR		78	78	52	08/17/94	Wed	1710	AR		76	76	50	09/21/94	Wed	940	AP		77	77
76	09/10/92	02/10/95	08/10/95	181	75	75	47	10/21/94	Fri	100	AT		72	72	54	10/06/94	Thu	150	BJ		72	72	64	10/08/94	Sat	2250	BJ		75	75	50	11/09/94	Wed	1050	BR		72	72
77	11/05/92	04/04/95	10/19/95	198	71	71	54	12/08/94	Thu	1440			70	70	54	11/29/94	Tue	640	BR		74	74	40	12/02/94	Fri	610	BR		71	71	59	01/09/95	Mon	1500			70	70
77	Additional Data As Noted By Partial Respray																																					
78	04/05/93	05/25/95	12/07/95	196	71	71	53	02/17/95	Fri	1250	AP		75	75	36	01/31/95	Tue	1030	AP		70	70	29	02/08/95	Wed	530	AP		73	73	54	03/14/95	Tue	1000	AP		73	73
78	Additional Data As Noted By Partial Respray																																					
79	06/09/93	07/17/95	01/11/96	178	70	70	58	04/22/95	Sat	1305	BR		73	73	48	03/03/95	Fri	2120	H		73	73	48	04/14/95	Fri	1700	H		70	70	58	04/22/95	Sat	1330	BR		74	74
80	08/18/93	09/05/95	03/21/96	198	73	73	58	06/10/95	Sat	1050	BU		75	75	53	05/18/95	Thu	115	H		74	74	56	05/30/95	Tue	2100	H		74	74	54	06/16/95	Fri	300	CI		76	76
81	10/20/93	10/23/95	04/11/96	171	72	72	56	07/25/95	Tue	2250	AT		78	78	59	07/11/95	Tue	2240	CR		75	75	59	07/15/95	Sat	1850	CR		75	75	56	07/29/95	Sat	2250	CI		75	75
82	12/20/93	12/13/95	04/25/96	134	76	76	54	09/19/95	Tue	1445	CZ		71	71	60	08/31/95	Thu	1405	CZ		76	76	60	09/06/95	Wed	1330	CZ		74	74	58	09/26/95	Tue	1000	CZ		73	73
83	02/12/94	02/19/96	09/18/96	212	72	72	57	11/10/95	Fri	2210	BW		73	73	50	10/09/95	Mon	2100	H		74	73	50	10/25/95	Wed	1800	H		73	73	52	11/17/95	Fri	2120	AT		73	73
84	03/25/94	04/22/96	11/07/96	199	71	71	56	01/18/96	Thu	1110	BN		73	73	42	12/19/96	Thu	1300	BN		68	68	38	01/03/96	Wed	1325	BN		73	73	42	02/02/96	Fri	1400	R	BR	73	73
85	05/08/94	06/20/96	10/03/96	105	72	72	57	03/15/96	Fri	2130			75	75	50	03/06/96	Wed	2145	DF		72	72	44	03/08/96	Fri	2150	DF		73	73	42	04/03/96	Wed	2125	CY		73	73
85	Additional Data As Noted By Partial Respray																																					
86	06/07/94	08/22/96	01/09/97	140	71	71	49	05/17/96	Fri	800	AX		72	71	48	04/30/96	Tue	1400	AX		72	72	49	05/07/96	Tue	1300	DE		71	72	41	05/30/96	Thu	1350	AX		72	71
87	07/21/94	11/04/96	03/27/97	143	76	76	55	07/23/96	Tue	1855	CY		74	74	64	07/08/96	Mon	2130	CY		76	76	54	07/12/96	Fri	1915	CY		75	75	51	08/23/96	Fri	1415	R	AX	75	75
88	08/25/94	01/09/97	04/24/97	105	71	71	52	10/23/96	Wed	1440	BD		71	71	60	09/18/96	Wed	1000	AR		72	72	52	10/16/96	Wed	1030	AR		71	71	52	10/23/96	Wed	1440	AR		70	70
89	10/04/94	06/24/97	07/10/97	16	73	73	54	04/11/97	Fri	1410	BR		74	74	54	03/28/97	Fri	1310	BR		74	74	56	04/02/97	Wed	1500	BR		75	75	49	05/01/97	Thu	1415	BR		73	73
89	Additional Data As Noted By NCD																																					
90	11/29/94	08/05/97	08/21/97	16	74	74	50	06/07/97	Sat	1230	CG		73	73	57	05/29/97	Thu	1055	CI		73	73	58	06/03/97	Tue	1830	CI		75	75	58	06/17/97	Tue	1330	CI		72	72
91	06/20/95	11/14/97	12/04/97	20	77	77	55	09/17/97	Wed	230	AB		76	76	56	09/03/97	Wed	255	BD	HD	75	75	52	09/08/97	Mon	420	BD	HD	73	73	42	10/07/97	Tue	230	AB		76	76
92	04/28/97	04/19/99	04/23/99	4	74	74	52	02/26/99	Fri	1120	BD	HD	72	72	46	02/18/99	Thu	1030	BD	HD	74	74	48	02/21/99	Sun	1050	BD	HD	72	72	51	03/05/99	Fri	950	BD		72	72
93	06/11/99	11/01/00	12/14/00	43	73	73	58	09/01/00	Fri	1045	BN	BR	73	73	58	08/21/00	Mon	1510	BN		72	72	60	08/25/00	Fri	1015	BN		74	74	58	09/14/00	Thu	1310	BR	BN	73	73
94	08/28/99	01/10/01	Still at MAF		74	74	56	10/26/00	Thu	1000	BD	HD	73	73	50	10/09/00	Mon	1305	BD	HD	74	74	54	10/17/00	Tue	1110	BD	HD	72	72	51	11/10/00	Fri	1730	BD	HD	73	73
95	NOT BUILT																																					
96	06/28/95	01/09/98	01/29/98	20	72	72	56	11/29/97	Sat	1120	BN	BR	72	72	50	11/19/97	Wed	1455	BR		74	74	56	11/22/977	/22/9	1500	BN		72	72	48	12/08/97	Mon	1410	BR		72	72
97	12/12/95	03/27/98	04/02/98	6	72	72	46	02/18/98	Wed	1330	AO		73	73	42	02/07/98	Sat	200	BE		73	73	48	02/09/98	Mon	1325	AO		72	72	52	02/28/98	Sat	1350	BR		73	73
98	02/16/96	05/27/98	06/12/98	16	73	73	56	04/18/98	Sat	1345	BD		73	73	61	04/02/98	Thu	2030	DF		74	74	44	04/05/98	Sun	2245	DF		74	74	50	04/25/98	Sat	1100	BD		73	73
99	05/02/96	07/28/98	08/07/98	10	74	74	59	06/10/98	Wed	245	BD		74	74	56	05/24/98	Sun	1705	AR		73	73	60	05/28/98	Thu	855	AR		75	75	58	06/19/98	Fri	245	BD		74	74
100	09/20/96	10/16/98	12/13/98	58	74	74	58	08/06/98	Thu	1200			75	75	58	07/17/98	Fri	1340	BN		75	75	60	07/22/98	Wed	1515	BN		74	84	56	08/11/98	Tue	1320	BD		75	75
101	01/06/97	11/30/98	01/15/99	46	71	71	60	10/07/98	Wed	235	CI		74	74	57	09/18/98	Fri	200	M		74	74	54	09/24/98	Thu	200	M		73	73	53	10/10/98	Sat	1430	BD		72	72
102	03/26/97	01/29/99	04/02/99	63	75	75	58	12/01/98	Tue	2200	AT		77	77	56	11/20/98	Fri	1710	J		74	74	52	11/23/98	Mon	2310	J		75	75	59	12/20/98	Sun	2210	BW		77	77
102	Additional Data As Noted By Partial Respray 1																																					
102	Additional Data As Noted By Partial Respray 2																																					
103	06/10/97	06/22/99	09/22/99	92	74	74	54	05/10/99	Mon	235	BU		74	74	56	04/27/99	Tue	2145	S		75	75	46	04/30/99	Fri	2305	J		74	74	54	05/10/99	Mon	245	BL		74	74
104	09/15/97	05/29/99	06/10/99	12	73	73	52	04/02/99	Fri	720	BD		73	73	53	03/28/99	Sun	20	M		74	74	54	03/31/99	Wed	852	R		73	73	52	04/20/99	Tue	740	AR		72	72
105	10/28/97	07/16/99	08/05/99	20	75	75	57	06/08/99	Tue	115	BU		70	70	60	05/26/99	Wed	1230	CG		71	71	61	05/31/99	Mon	40	T		75	75	58	06/16/99	Wed	1330	BD		70	70
106	02/15/98	12/14/99	02/24/00	72	72	72	56	10/08/99	Fri	1405	BN		73	73	56	09/28/99	Tue	1450	BR		71	71	54	10/01/99	Fri	1500	BN		72	72	58	10/14/99	Thu	1030	BR		73	73
107	03/08/98	10/10/99	03/16/00	158	75	75	56	09/07/99	Tue	2315	BW		76	76	56	08/21/99	Sat	2105	O		78	78	56	08/27/99	Fri	2200	O		74	74	57	09/09/99	Thu	2340	BW		78	78
108	05/29/98	02/07/00	07/13/00	157	73	73	50	12/14/99	Tue	2230	BW		71	71	56	11/30/99	Tue	45	T		71	71	56	12/07/99	Tue	500	T		75	75	54	12/17/99	Fri	2310	BW		71	71
109	07/22/98	05/02/00	10/20/00	171	74	74	54	03/02/00	Thu	2245	L		74	74	56	02/16/00	Wed	1040	DF		72	72	45	02/21/00	Mon	1330	DF		76	76	48	03/21/00	Tue	2200	AT	BW	76	76
110	08/25/98	07/14/00	11/02/00	111	74	74	56	05/05/00	Fri	2140	F	BD	72	72	55	04/25/00	Tue	1945	A	BD	73	73	56	05/01/00	Mon	2130	D	Q	77	77	55	05/23/00	Tue	2145	F	BD	73	73
111	12/06/98	09/22/00	03/22/01	181	74	74	58	07/20/00	Thu	530	M		73	73	52	06/27/00	Tue	500	M		76	76	58	07/11/00	Tue	720	H		74	74	60	08/01/00	Tue	2230	L		75	75
112	04/26/99	03/06/01	05/03/01	58	72	72	36	01/20/01	Sat	1100	B	BN	74	74	42	01/12/01	Fri	1450	BN		76	76	58	01/15/01	Mon	1050	BN		71	71	56	01/30/01	Tue	1040	BR	BN	74	74
113	10/05/99	04/27/01	05/17/01	20	70	70	56	03/12/01	Mon	2130	BW		74	74	54	02/20/01	Tue	2050	L		75	75	46	02/23/01	Fri	1410	L		75	75	46	03/18/01	Sun	1350	BD	HD	74	74
114	11/03/99	06/15/01	08/30/01	76	73	73	53	05/07/01	Mon	830	BR	BN	74	74	56	05/01/01	Tue	1250	BN		74	74	54	05/03/01	Thu	1320	AY		74	74	53	05/13/01	Sun	1030	BN		74	74
115	01/24/00	09/24/01	12/14/01	81	74	74	58	07/13/01	Fri	2200	AB		76	76	55	06/15/01	Fri	430	H	C	76	76	55	06/21/01	Thu	530	H	E	74	74	53	07/26/01	Thu	945	BR		76	76
116	02/27/00	11/26/01	01/13/02	48	71	71	60	10/10/01	Wed	1425	BR		72	72	56	09/18/01	Tue	1435	BR		72	72	61	09/21/01	Fri	1315	BR		71	71	60	10/10/01	Wed	1425	BR		72	72
117	03/22/00	01/31/02	04/18/02	77	74	74	46	11/16/01	Fri	1020	BN		74	74	48	11/05/01	Mon	2130	BD		74	74	49	11/09/01	Fri	30	BW		73	73	52	12/05/01	Wed	1030	BQ	BN	74	74
118	04/19/00	04/05/02	06/27/02	83	74	74	54	01/25/02	Fri	2200	M		72	72	54	01/17/02	Thu	1840	M		74	74	58	01/20/02	Sun	1700	M		73	73	50	03/19/02	Tue	635	BU		72	72
119	05/30/00	05/21/02	10/24/02	156	73	73	58	03/20/02	Wed	200	AB		71	71	44	03/06/02	Wed	440	H		72	72	58	03/12/02	Tue	515	H		71	71	52	03/22/02	Fri	230	AB		71	71
120	06/26/00	07/16/02			74	74	58	05/08/02	Wed	1130	AX		72	72	60	04/22/02	Mon	1430	BE		74	74	58	04/29/02	Mon	1235	BE		75	75	58	05/27/02	Mon	1030	BE		72	72
121	07/26/00	09/04/02			75	75	58	06/20/02	Thu	1445	BU		75	75	64	06/09/02	Sun	1700	BR		73	73	54	06/15/02	Sat	1500	BR		73	73	50	07/13/02	Sat	1110	BR	BN	75	75

ipod Spindle Face (Hand Spray)						+Y Bipod Beneath S.F. (Hand Spray)								Aft Half of LH/IT Flange Closeout (Hand Spray)										FwdHalf of LH/IT Flange Closeout (Hand Spray)									Intertank Acrea									
Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Substrate Temp at Upper Flange - 1 (°F)	Substrate Temp at Upper Flange - 2 (°F)	Substrate Temp at Upper Flange - 3 (°F)	Substrate Temp at Upper Flange - 4 (°F)	Substrate Temp at Lower Flange - 1 (°F)	Substrate Temp at Lower Flange - 2 (°F)	Substrate Temp at Lower Flange - 3 (°F)	Substrate Temp at Lower Flange - 4 (°F)	Cell Temp (°F)	Cell Humidity (%rh)
55	06/05/91	Wed	1440	BR		74	74	61	07/09/91	Tue	1115	BN					10/24/90	Wed	2135	CE							11/06/90	Tue	2040	CE			130								102	15
52	08/29/91	Thu	2300	AR		75	75	50	09/03/91	Tue	2310	AP					01/04/91	Fri	1300	BB							01/15/91	Tue	1200	AH			126							128	100	14
36	12/05/91	Thu	1330	BN		76	76	51	12/12/91	Thu	1030	BR					05/15/91	Wed	1530	AN							05/31/91	Fri	1250	BX			128								98	16
58	03/18/92	Wed	2100	BJ		78	78	46	03/27/92	Fri	2045	AT		82	76	54	08/01/91	Thu	1700	AN				74	74	46	08/16/91	Fri	2300	AW			132								102	14
57	06/11/92	Thu	1435	BR		75	75	54	06/30/92	Tue	1045	BA		74	74	46	12/12/91	Thu	1630	AQ				74	74	34	01/10/92	Fri	1230	BB			125								102	10
52	08/17/92	Mon	2300	AR		75	75	54	08/20/92	Thu	2035	AP		73	72	56	05/20/92	Wed	1315	BB				77	73	56	06/16/92	Tue	1053	BB			129								98	15
56	12/10/92	Thu	1330	BR		74	74	58	12/23/92	Wed	1438	BR		77	75	58	08/19/92	Wed	1445	BX				76	75	56	09/01/92	Tue	1130	BB			126								109	22
51	03/01/93	Mon	1445	AR		74	74	50	03/12/93	Fri	1500	AR		85	85	23	11/06/92	Fri	1930	BZ				72	72	50	11/17/92	Tue	1210	AH			130			145				131	104	10
56	06/03/93	Thu	1233	BR		73	73	54	06/17/93	Thu	1440	BR		71	71	40	02/12/93	Fri	1450	AH				75	75	46	02/26/93	Fri	1115	BX			127								104	12
57	09/20/93	Mon	1300	BD		75	75	57	09/22/93	Wed	1225	BD		75	77	51	05/25/93	Tue	1100	AN				78	74	54	06/04/93	Fri	1355	AN			130								102	20
60	12/03/93	Fri	2200	BJ		74	74	44	12/18/93	Sat	2045	AT		79	74	54	08/13/93	Fri	1215	BB				77	75	48	08/24/93	Tue	1340	BX			126								97	10
50	02/11/94	Fri	1030	BN		72	72	55	03/02/94	Wed	1330	BN		75	73	57	10/13/93	Wed	1025	BO				77	76	40	10/28/93	Thu	1130	BO			126								102	10
58	04/05/94	Tue	119	CY		74	74	64	04/15/94	Fri	110	BJ		73	77	36	01/11/94	Tue	730	BX				73	74	30	01/21/94	Fri	1350	BO			132								104	10
60	06/14/94	Tue	1320	BD		73	73	60	06/17/94	Fri	940	BD		72	72	38	03/03/94	Thu	1415	BX				72	76	42	03/15/94	Tue	1400	CF			126								98	20
62	08/15/94	Mon	2250	AR		77	77	56	08/24/94	Wed	1300	AR		75	68	56	04/20/94	Wed	1410	BO				73	73	46	04/29/94	Fri	1415	BB			126								97	21
54	10/06/94	Thu	210	BJ		72	72	64	10/08/94	Sat	2300	BJ		76	77	56	07/12/95	Wed	1100	BO				74	74	52	07/19/94	Tue	1345	BO			130								100	9
54	11/28/94	Mon	635	RBR		74	74	40	12/02/94	Fri	600	BR		74	74	46	09/09/94	Fri	1430	CK				74	74	54	09/15/94	Thu	1400	BO			132								100	18
36	02/01/95	Wed	820	AP		71	71	31	02/09/95	Thu	1300	AP		74	75	42	11/01/94	Tue	1550	AE				76	57	52	11/09/94	Wed	1415	BX			125								101	18
52	03/27/95	Mon	2250	H		74	74	52	04/14/95	Fri	1700	H		72	77	32	01/03/95	Tue	1435	BX				74	74	52	01/16/95	Mon	2115	CK			125								96	19
46	05/19/95	Fri	2240	BY		73	73	59	05/26/95	Fri	2315	BY		74	76	34	02/22/95	Wed	1105	BX				73	76	36	03/03/95	Fri	1640	BX			125				125				100	20
54	06/28/95	Wed	2320	CR		78	78	54	07/07/95	Fri	1800	CR		75	75	50	04/08/95	Sat	1145	BX				75	75	54	04/20/95	Thu	710	BX			127				125				97	21
54	09/11/95	Mon	1300	AP		71	71	60	09/14/95	Thu	1300	CZ		75	75	54	05/31/95	Wed	1055	BX				74	74	54	06/08/95	Thu	1345	BX			131				127				99	19
50	10/06/95	Fri	2230	H		73	73	49	10/17/95	Tue	2300	H		77	74	54	07/14/95	Fri	1430	BO				73	72	58	07/21/95	Fri	1345	BO			130				139				100	20
42	12/19/95	Tue	1300	R2BR		73	73	33	01/09/96	Tue	1335	BR		74	74	52	09/18/95	Mon	1500	BX				73	73	52	09/26/95	Tue	1440	BX			126				131				98	24
44	02/29/96	Thu	2030	CY		73	73	46	03/04/96	Mon	2245	CY		73	73	46	11/14/95	Tue	1345	BX				75	75	52	11/28/95	Tue	1340	BX			127				139				100	18
48	04/30/96	Tue	1400	AX		72	72	49	05/07/96	Tue	1300	DE		73	74F	46	01/31/96	Wed	1800	CF				76	78	48	02/08/96	Thu	1345	BX			125				134				99	19
69	07/09/96	Tue	1100	BD		72	72	48	07/11/96	Thu	1455	BD		74	75	35	04/10/96	Wed	1410	BX				74	75	46	04/18/96	Thu	1930	BX			128				135				100	20
57	09/25/96	Wed	1235	AR		71	71	56	10/10/96	Thu	830	AR		75	75	54	06/17/96	Mon	1505	BX				82	79	52	06/27/96	Thu	1430	BX			130				126				105	19
52	03/25/97	Tue	1330	BR		74	74	56	04/02/97	Wed	1500	BR		75	75	56	01/05/97	Sun	1500	BX				95	95	22	01/09/97	Thu	1440	BX			131				129				105	10
54	05/29/97	Thu	1730	CI		73	73	56	06/04/97	Wed	1500	CI		78	77	53	03/17/97	Mon	1430	DA				76	76	50	03/21/97	Fri	1410				136				128				96	19
56	09/03/97	Wed	250	BD		76	76	54	09/09/97	Tue	230	BD		76	78	56	07/26/97	Sat	1230	DA				76	76	54	07/30/97	Wed	1615	BX			126				137				102	16
46	02/18/99	Thu	1030	R		74	74	48	02/21/99	Sun	1100	R		78	79	42	01/16/99	Sat	1125	BX				78	78	52	01/20/99	Wed	1935	DA			125				125				100	21
58	08/21/00	Mon	1510	BR		72	72	60	08/25/00	Fri	1015	BR		74	74	54	06/15/00	Thu	1150	BX				76	76	54	06/25/00	Sun	1440	BX			130				129				105	19
48	10/09/00	Mon	1030	BD	HD	74	74	52	10/18/00	Wed	1030	BD	HD	77	77	51	07/31/00	Mon	1530	IC	IC			74	73	50	08/09/00	Wed	1500	IX	IC		127				131				98	21
46	11/18/97	Tue	1445	BR		71	71	57	12/01/97	Mon	1350	BR		74	74	42	10/22/97	Wed	1450	AH	BX			78	72	59	10/26/97	Sun	820	AH			138				127				92	20
42	02/06/98	Fri	1355	AO		73	73	39	02/08/98	Sun	1430	AO		74	77	35	01/11/98	Sun	1225	CD				76	76	46	01/15/98	Thu	1350	BX			135				130				103	8
60	03/31/98	Tue	2030	DF		73	73	53	04/07/98	Tue	2150	DF		74	73	58	03/05/98	Thu	2230	CK				74	74	36	03/09/98	Mon	810	BX			134				125				102	16
56	05/24/98	Sun	1700	AR		73	73	60	05/28/98	Thu	850	AR		78	78	52	04/16/98	Thu	1410	BO	BX			76	76	46	04/20/98	Mon	1630	BX			126				127				101	22
58	07/17/98	Fri	1340	BR		75	75	60	07/22/98	Wed	1515	BR		74	74	46	06/04/98	Thu	1800	DA				80	80	40	06/11/98	Thu	805	CD			125				129				102	20
60	10/01/98	Thu	1430	BD		72	72	56	10/04/98	Sun	1225	BD		75	75	56	08/02/98	Sun	2045	BX				75	75	54	08/07/98	Fri	2045	BX			125				128				102	18
56	11/20/98	Fri	1715	DF		72	72	52	11/22/98	Sun	2030	DF		76	80	46	10/26/98	Mon	1520	DA				80	80	50	10/31/98	Sat	1450	BX			126				126				103	17
56	04/27/99	Tue	2145	J		75	75	50	04/30/99	Fri	100	S		78	78	48	02/06/99	Sat	1900	BX				78	79	52	02/09/99	Tue	2200	BX			125				127				105	18
52	03/26/99	Fri	450	M		73	73	53	04/06/99	Tue	1450	R		74	76	30	02/23/99	Tue	540	BX				71	73	39	03/03/99	Wed	1350	BO			123				125				197	23
60	05/26/99	Wed	1230	CG		71	71	60	06/01/99	Tue	630	T		75	72	53	05/02/99	Sun	2315	CX				76	76	54	05/06/99	Thu	1400	AS			125							130	100	23
56	09/28/99	Tue	1450	BR		72	72	55	10/04/99	Mon	1300	BR		75	75	58	08/19/99	Thu	2348	CL	CX			76	76	56	08/23/99	Mon	600	DA	BX		128				125				105	15
56	08/19/99	Thu	1845	L		77	77	58	08/24/99	Tue	1900	L		78	78	52	07/30/99	Fri	1410	BX				77	77	54	08/02/99	Mon	1445	BX			126				127				103	12
56	11/30/99	Tue	45	T		71	71	56	12/07/99	Tue	500	T		77	79	47	10/31/99	Sun	1410	AS				76	76	48	11/05/99	Fri	635	BX			125				125				104	19
54	02/17/00	Thu	950	DF		75	75	50	02/23/00	Wed	850	DF		75	75	49	01/05/00	Wed	1415	GF	GF			74	75	48	01/09/00	Sun	830	DA	GF		126				125				105	15
57	04/24/00	Mon	1830	A	L	73	73	56	05/01/00	Mon	2130	D	Q	74	74	52	02/26/00	Sat	940	BX				73	75	50	03/03/00	Fri	1205	DA			125				125				101	18
57	06/28/00	Wed	600	H		76	76	58	07/11/00	Tue	715	H		76	76	44	04/26/00	Wed	1050	BX				74	74	56	05/05/00	Fri	545	BX			126				125				105	17
42	01/12/01	Fri	1445	BR	A	76	76	58	01/15/01	Mon	1400	BR		76	78	49	12/14/00	Thu	700	DA				80	80	40	12/17/00	Sun	1650	BX			126				127				103	20
54	02/20/01	Tue	1820	J		73	73	56	02/22/01	Thu	2300	J		73	73	32	01/22/01	Mon	1130	AS	AH	GZ	CK	78	79	44	01/28/01	Sun	630	DA	GF		128				126				102	5
56	05/01/01	Tue	1250	BR		74	74	54	05/04/01	Fri	810	BR		78	78	50	04/11/01	Wed	1400	CK	GF			78	78	52	04/17/01	Tue	550	DA	GF		127				125				105	17
55	06/15/01	Fri	430	H	C	76	76	55	06/21/01	Thu	525	H	E	75	75	48	05/15/01	Tue	1400	DA				74	76	46	05/19/01	Sat	845	DA			127	127	128	130	126	126	126	127	101	20
56	09/18/01	Tue	1435	BR		72	72	61	09/21/01	Fri	1315	BR		75	76	52	07/13/01	Fri	1400	DA	GF	IC	BX	75	76	53	07/24/01	Tue	1355	BX	DA	IC	127				133				98	22
48	11/05/01	Mon	2130	BD		74	74	49	11/09/01	Fri	30	BW		72	72	56	10/02/01	Tue	700	DA				76	76	55	10/06/01	Sat	1230	DA	AQ		131	129	127	134	125	128	127	127	98	22
54	01/17/02	Thu	1840	M		74	74	58	01/20/02	Sun	1700	M		76	76	48	12/22/01	Sat	1100	BX				78	78	38	12/27/01	Thu	1745	BX			131	128	126	126	125	125	126	126	94	24
44	03/06/02	Wed	440	H		72	72	58	03/12/02	Tue	510	H		76	78	45	09/22/02	Sun	1510	DA				75	75	40	01/26/02	Sat	2320	CX			132	132	128	128	125	126	125	126	104	13
60	04/22/02	Mon	1020	AX		75	75	58	04/30/02	Tue	1300	AX		74	74	54	03/09/02	Sat	1115	BX				70	74	48	03/16/02	Sat	235	AS			128	130	125	129	127	126	127	127	105	10
64	06/09/02	Sun	1700	BR		74	74	58		Sat		BR		74	71	55	04/18/02	Thu	1450	BX				73	75	48	04/26/02	Fri	1410	DA			127	129	128	129	125	125	125	125	103	18

ge (Machine Spray)									LO2 Tank Acreage (Machine Spray)													LH2 Barrel Acreage (Machine Spray)														
Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	Personnel	St380 Substrate Temp (°F)	St800 Substrate Temp (°F)	St840 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel	St2058 Substrate Temp (°F)	St1129 Substrate Temp (°F)	Cell Temp (°F)	Cell Humidity (%rh)	Complete Date	Complete Day	Complete Time	Personnel	Personnel	Personnel	Personnel	Personnel			Sprayer Codes Used for "Personnel" Column
03/16/90	Fri	1821	AE	HW	IU	HJ			149	127	126	100	12	07/09/90	Mon	2127	V					130	146	101	20	07/05/90	Thu	1603		HB	GH	HL				A
																						125	127	99	21	08/16/90	Thu	142		HG	HF	FA				B
06/04/90	Mon	1418	DG						144	127	129	104	8	09/26/90	Wed	1552	BM					126	154	100	15	09/26/90	Wed	1408	CO							C
08/17/90	Fri	1921	AS						154	132	130	99	10	03/08/91	Fri	1058	CJ	HX	IT	JA		126	142	99	19	12/14/90	Fri	1557	AJ	HB	FE	GH	JA			D
10/31/90	Wed	1056	CA						141	127	125	94	18	05/09/91	Thu	1549	AE					127	152	99	15	05/07/91	Tue	1430	CB							E
12/07/90	Fri	1739		HJ	GC	HX			155	127	128	97	11	07/25/91	Thu	1722		HX	IT	GI		100	106	100	22	08/06/91	Tue	1655		HB	GD	FE				F
									137			99	15	08/27/91	Tue	1729		HX	IT	GI																G
06/13/91	Thu	1426	Z	IJ	HC	JC	JA		155	127	128	101	17	10/03/91	Thu	1515	X	IJ	GC	HA	GS	127	129	103	7	01/17/92	Fri	1549	V	FE	GD	HW				H
09/06/91	Fri	1916		EW	GS	DX	EC		145	127	133	100	15	05/15/92	Fri	1655		DD	HY	EC	GT	125	132	103	11	04/29/92	Wed	2217	GS	HW	HB	FE	GL			I
12/18/91	Wed	1305	BK						147	127	127	103	16	08/18/92	Tue	1420	BS					128	148	103	20	08/06/92	Thu	2250	V							J
02/14/92	Fri	1416	AI	IJ	GC	EC	GS		159	128	130	97	18	11/18/92	Wed	1415	AZ	DD	GC	IX	EC	127	145	103	17	10/09/92	Fri	1516	DH	IL	HE	IX	FE			K
07/09/92	Thu	1143		HX	IT	JB	GS		137	130	126	130	10	03/24/93	Wed	1138		HW	GD	IX	JB	126	131	99	23	12/15/92	Tue	2134		HB	FE	GX	IX			L
12/02/92	Wed	1405	DK						128	131	128	98	24	05/07/93	Fri	2258	DM					125	135	103	14	04/23/93	Fri	1606	DJ							M
03/11/93	Thu	2313	AU	HW	JB	FF			157	127	135	98	18	07/30/93	Fri	1958	AZ	HW	GD			132	150	105	17	07/13/93	Tue	1345	BX	HX	FE	IE	GT			N
04/05/93	Mon	1915		HI	IT	JB	HO		157	127	128	102	15	10/05/93	Tue	1559		II	HL	HY	GS	125	153	103	19	09/23/93	Thu	1435		HX	DX	FE	GS			O
06/16/93	Wed	1149	DJ	GV	II	IT	EC		139	125	130	101	13	01/10/94	Mon	1522	GS	JB	II	HW	FQ	126	151	98	20	11/19/93	Fri	1520	DK	HX	FE	HY				P
10/21/93	Thu	1957	AA						135	125	131	98	10	02/11/94	Fri	1630	BP					125	142	101	14	01/14/94	Fri	1053	CB							R
02/02/94	Wed	1340	CM	JB	II	FF	HO		154	126	126	104	17	05/13/94	Fri	1508	BS	II	GD	HO	HW	125	134	102	11	03/12/94	Sat	1520								S
03/26/94	Sat	1322	V						153	126	125	102	20	06/24/94	Fri	1853	BS					125	140	103	22	05/28/94	Sat	1910	AW							T
										140		93	21	07/09/94	Sat	1601	CT																			V
05/05/94	Thu	1555	BS	JB	HW	FQ	HO		155	128	130	93	11	07/29/94	Fri	1435	CM	IM	FF	HO	GK	127	149	104	16	07/19/94	Tue	1307	CB	HX	HQ	FE	GT			X
									146	137	131	92	18	08/06/94	Sat	1721	CT	IM	FF	HO	GK	125	139	101	24	08/05/94	Fri	1603	DO							Y
06/17/94	Fri	1331		HL	HI	FQ	GS		139	126	129	100	14	09/28/94	Wed	1226		IM	FQ	GT		126	139	102	20	09/16/94	Fri	1515		HQ	FE	ET				Z
09/10/94	Sat	621	CC	FZ	HI	FQ	GT		147	125	126	97	12	12/02/94	Fri	1323	V	HW	GD	HO		128	135	105	19	11/03/94	Thu	1827	AG	FE	GB	DX	ET			AA
11/05/94	Sat	857		HW	GD	HO			145	125	126	104	14	02/14/95	Tue	1610	V	JC	FQ	HO		129	140	102	13	01/19/95	Thu	1348		EE	II	FS	HO			AB
12/15/94	Thu	2223	AM	GJ	IM	FQ	ET		149	126	134	104	15	03/31/95	Fri	1325	BS	HI	FW			123	140	102	19	03/30/95	Thu	830	DJ	GP	II	HV	GS			AD
01/31/95	Tue	1420	BV	JC	HW	FQ	HO		146	125	127	105	18	05/09/95	Tue	1537	AB	HI	GD	HO		132	141	105	19	05/19/95	Fri	726	AW	DZ	II	HY	HO			AE
04/22/95	Sat	0632	DM	GJ	HI	GD			153	127	133	100	18	07/21/95	Fri	1915	CT	DD	FW	FZ		126	127	101	22	07/07/95	Fri	1457	DB	DZ	II	HY				AF
06/10/95	Sat	730		JB	HI	FW	GV		145	126	130	100	23	09/12/95	Tue	0410 .		FZ	DD	GD	HO	125	131	88	25	09/23/95	Sat	1703		DZ	II	GE	HO			AG
											133	99	21	**Partial Respray**				FZ	DD	GD	HO															AH
06/23/95	Fri	932		HI	FW	ET			137	126	130	104	16	11/14/95	Tue	1148		HW	GD	HO		127	133	99	19	11/17/95	Fri	2250		DZ	HB	GE	HO			AI
08/22/95	Tue	1325	CH						141	126	127	105	11	01/13/96	Sat	1819	BV	FZ	HW	GD	HO	129	155	97	25	01/26/96	Fri	2058	Y	DZ	IF	FD	HO			AJ
12/05/95	Tue	1416		FZ	DD	FW	EI		152	126	128	105	10	03/22/96	Fri	2121		FZ	HW	GD	HO	126	134	100	22	04/28/96	Sun	0913		DZ	IF	FW	HO			AK
12/21/95	Thu	1510		FN	DD	FO	ET		147	130	127	102	20	05/21/96	Tue	2322	AD	FZ	DD	GD	IX	127	136	96	25	11/13/96	Wed	600		EE	II	HU	IX			AL
									134			95	22	06/10/96	Mon	1553	V	FZ	DD	GD	IX	125	127	94	14	11/13/96	Wed	600		DZ	GR	FS	HO			AM
03/14/96	Thu	1407	CH						149	128	127	101	10	09/29/96	Sun	1158	CH					127	134	95	10	12/21/96	Sat	1034	AF							AN
05/23/96	Thu	1338	BS	HI	FF	HO			150	125	127	105	8	02/07/97	Fri	1148	CN	FC	HI	GH	BS	129	141	95	24	06/03/97	Tue	2232	GB	EE	II	HZ	HP			AO
09/15/98	Tue	1227		HT	GH	GY			157	128	142	99	20	12/02/98	Wed	359		GJ	FZ	JD	HF	126	134	98	21	12/03/98	Thu	1226		DZ	II	HY	EY			AP
08/16/99	Mon	2001	CT	GJ	DD	GA	EY		150	125	127	92	26	03/04/00	Sat	729	DN	IF	IM	EZ	EI	127	141	99	17	04/26/00	Wed	1851	CW	DZ	DD	HY	EI			AQ
11/10/99	Wed	1215		GN	EU	EZ	EY		155	126	125	103	18	05/07/00	Sun	318		EX	IM	EZ	EI	130	154	96	17	06/07/00	Wed	2123		DZ	HI	HZ	EI			AR
																																				AS
10/02/96	Wed	2219	CA						142	130	132	102	19	08/18/97	Mon	1202	DI					130	146	100F	21	09/19/97	Fri	1724		FE	HX	FD	HT			AT
12/07/96	Sat	1305	CH						154	127	128	102	19	12/04/97	Thu	1511	DM					128	147	99	22	12/04/97	Thu	2125		DZ	IF	IK	GW			AU
01/22/97	Wed	1638		FZ	HI	FO	IX		140	126	126	104	18	02/04/98	Wed	638		FB	HX	GH	GW	126	131	99	20	01/29/98	Thu	1210		DZ	HX	FQ	EI			AW
08/19/97	Tue	655		IH	DD	DX	HK		158	131	132	103	9	03/13/98	Fri	1317		HR	IM	FW	EI	125	150	102	12	03/03/98	Tue	1932		DZ	HH	FW	GW			AX
10/07/97	Tue	1457		GJ	IM	GD	HP		126	130	149	100	20	04/26/98	Sun	657		GJ	DD	JD	EI	126	148	94	23	05/01/98	Fri	1315		DZ	FL	HY	EI			AY
10/31/97	Fri	1521	DM	HI	GD	FF			156	125	132	103	19	06/28/98	Sun	1313	BC	GJ	IF	GH	GW	127	153	99	23	06/22/98	Mon	1459	AF	EE	DD	HY	GW			AZ
12/22/97	Mon	1956		GJ	IM	FQ	EI		143	125	125	103	18	09/17/98	Thu	145	CA	HN	IF	JD	EI	127	142	98	23	09/13/98	Sun	1410		EU	II	HY	GW			BA
																						133	137	99	23	09/14/98	Mon	1137	DJ	DZ	II	HY	GW			BB
																						127	131	101	21	09/19/03	Fri	1353	DJ	DZ	II	HY	GW			BC
04/14/98	Tue	127		GJ	IM	FW	EI		141	125	128	104	17	10/14/98	Wed	1345		GJ	IM	GD	HQ	126	145	102	19	11/24/98	Tue	1830		DZ	II	HY	EY			BF
06/08/98	Mon	142	**ABORT Spray 1: Pressure**						160	128	131	105	17	01/20/99	Wed	124		GM	DD	GD	FF	126	140	100	22	01/19/99	Tue	1415		DZ	II	HY	FF			BJ
08/23/98	Sun	1523	BC	**I/T Moved:Cell H**			G		156	126	136	105	12	03/10/99	Wed	1529	AN					126	143	103	19	04/04/99	Sun	2146		EE	HB	GE	EI			BK
11/22/98	Sun	1544		IF	HF				159	125	131	100	72	07/21/99	Wed	1418		GJ	FZ	EZ	EY	126	140	196	22	05/13/99	Thu	0		DZ	HI	GE	EI			BL
12/23/98	Wed	504	AK	GJ	IF	JD			130	126	126	105	19	06/30/99	Wed	2036	P	GJ	FL	FI		143	127	103	19	07/01/99	Thu	2200	CP	DZ	II	HY	DT			BM
03/14/99	Sun	1247	AV	IF	FQ	EI	BT		144	125	127	100	17	09/12/99	Sun	630	CN	GJ	EU	EZ	EY	142	125	105	18	10/07/99	Thu	1708	CS	DZ	DD	HY	EY			BN
04/21/99	Wed	1441		HM	IF	EZ	EI		150	128	128	101	21	10/03/99	Sun	811		FY	HX	HM	EY	126	143	106	16	12/02/99	Thu	536		DZ	HH	GW				BO
06/07/99	Mon	1948		FZ	EZ	EY	EN		152	130	125	104	20	12/04/99	Sat	314	N	GJ	IF	GD	GW	126	143	104	19	01/22/00	Sat	1201		EV	HH	DX	EI			BP
07/07/99	Wed	2105	CT	FN	IF	EZ	FF		148	125	128	105	15	01/16/00	Sun	702	N	GJ	EU	GW		126	144	105	19	03/15/00	Wed	1518	DB	EE	DD	GU	EI			BQ
12/16/99	Thu	1213		FG	IF	GD	EI		154	128	125	105	19	08/11/00	Fri	520		HR	FL	HM	IY	128	143	90	23	11/24/00	Fri	2228		EE	II	HY	EI			BR
04/04/00	Tue	1606		GJ	IF	GD	EI		146	125	127	105	15	09/07/00	Thu	1624		GJ	IG	EZ	EI	129	143	100	18	12/13/00	Wed	2252		IB	DD	HY	EI			BS
05/15/00	Mon	1527		GJ	IM	EZ			151	125	129	105	16	10/30/00	Mon	1451		HR	DD	JD	EI	143	126	94	20	03/14/01	Wed	1126		IB	II	GD	FF			BT
06/29/00	Thu	319		GM	IM	GE	EI		156	130	135	101	15	12/22/00	Fri	1457		IF	FW	EI		129	156	89	22	04/20/01	Fri	1538		FR	DD	HY	EI			BU
01/24/00	Mon	1722		EN	FL	EZ	EI		154	127	135F	99	11	03/26/01	Mon	156	CQ	IV	HM	EI	AK	133	160	102	17	06/01/01	Fri	1441		DZ	II	DX	HF			BV
08/09/00	Wed	1606	AV	AW	EN	IF	EZ	CH	160	128	131	95	18	05/20/01	Sun	1354	GJ	DD	GL	EI		129	149	97	20	11/29/01	Thu	1136	CS	EE	II	DX	DJ			BW
10/18/00	Wed	1555			EC	FL	GD	EI	150	125	127	104	16	07/27/01	Fri	422	EN	IF	FW	EI		127	150	89	18	11/26/01	Mon	356		DZ	II	GA	EI			BX
12/09/00	Sat	1542	BT		EC	IM	GH		158	125	135	103	17	10/12/01	Fri	126	GJ	FZ	FD	EI		132	147	95	22	12/16/01	Sun	1228	CU	EE	DD	DX				BY
03/16/01	Fri	2229			HR	DD	GH		155	125	128	97	23	12/07/01	Fri	2229	GJ	IF	GH	EI		130	153	99	13	02/01/02	Fri	2244		DZ	DD	GA				BZ
04/23/01	Mon	1448	BT		EC	IF	ID		157	130	135	100	11	02/24/02	Sun	345	AV	GJ	EU	ID		128	153	98	19	03/13/02	Wed	438	AK	EV	DD	DV	EI			CA
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Summary of Mass Properties for Flights That Lost ET Bi-Pod TPS

						Orbiter Liftoff Mass Properties				Integrated Vehicle Liftoff Mass Properties			
	Flight	Orbiter Vehicle	Dry Orbiter & SSMEs	Cargo & Crew	Orbiter Consumables	Orbiter Gross Liftoff Weight	Orbiter Xcg*	Orbiter Ycg*	Orbiter Zcg*	Integrated Veh Gross Liftoff Weight	Shuttle Xcg	Shuttle Ycg	Shuttle Zcg
	FLIGHTS WITH KNOWN FOAM LOSS												
7	STS-7	OV-099	169044	41134	39448	249626	1122.0	-0.8	381.1	4486449	1416.8	0.0	418.6
32	STS-32	OV-102	179735	31735	44593	256063	1131.3	-0.8	381.3	4519487	1413.2	0.2	418.9
50	STS-50	OV-102	180784	38315	38596	257695	1105.5	-0.5	378.7	4520103	1412.0	0.2	418.8
52	STS-52	OV-102	181201	32341	36828	250370	1109.5	-0.3	377.5	4514565	1411.4	0.1	418.2
62	STS-62	OV-102	181475	36350	38754	256579	1107.4	-0.6	379.2	4519801	1412.0	0.2	418.7
112	STS-112	OV-104	177322	44073	44417	265812	1109.8	-0.2	383.0	4521314	1412.8	0.3	419.7
107	STS-107	OV-102	182487	42493	40101	265081	1104.7	-0.5	378.5	4526034	1412.6	0.2	419.3
	OTHER FLIGHTS												
100	STS-100	OV-105	175924	45379	43965	265268	1108.2	-0.5	381.9	4522246	1412.7	0.2	419.5
101	STS-101	OV-104	176456	42344	43728	262528	1110.8	-0.2	380.6	4519455	1412.6	0.2	419.3
102	STS-102	OV-103	176415	43794	44588	264797	1114.3	-0.2	382.4	4521809	1413.1	0.2	419.5
103	STS-103	OV-103	176346	27159	44654	248159	1114.3	-0.1	381.3	4506419	1411.7	0.2	418.4
104	STS-104	OV-104	176559	41468	44925	262952	1110.9	0.1	381.8	4520159	1412.8	0.3	419.4
105	STS-105	OV-103	176545	43423	42509	262477	1113.0	-0.6	382.3	4518170	1412.8	0.2	419.4
106	STS-106	OV-104	176466	41981	43606	262053	1110.9	0.0	380.6	4519178	1412.6	0.2	419.3
108	STS-108	OV-105	176072	44241	44605	264918	1111.7	-0.3	382.8	4519872	1412.9	0.2	419.6
109	STS-109	OV-102	181579	34459	44627	260665	1113.8	-0.8	381.0	4515646	1412.6	0.2	419.2
110	STS-110	OV-104	177273	42766	44724	264763	1110.2	-0.8	381.8	4520964	1413.0	0.2	419.5
111	STS-111	OV-105	176970	42362	44715	264047	1112.2	-0.5	383.0	4518077	1412.9	0.2	419.5
113	STS-113	OV-105	177030	44430	44514	265974	1109.6	-0.2	383.2	4521249	1412.9	0.2	419.7
26	STS-26	OV-103	171978	51180	31459	254617	1118.1	0.3	380.6	4522407	1412.5	0.2	418.7
29	STS-29	OV-103	172149	52640	31446	256235	1116.3	0.6	380.8	4522277	1412.5	0.3	418.8
30	STS-30	OV-104	172098	52878	36380	261356	1123.4	0.5	382.6	4527426	1413.4	0.3	419.3
31	STS-31	OV-103	172036	34236	42892	249164	1114.8	-0.5	384.2	4514688	1411.8	0.2	418.6
34	STS-34	OV-104	172329	53721	31565	257615	1114.1	0.4	380.7	4523573	1412.5	0.2	418.9
35	STS-35	OV-102	178847	38800	38864	256511	1106.5	-0.5	378.1	4521514	1412.1	0.2	418.7
37	STS-37	OV-104	172272	46082	37404	255758	1116.7	-0.3	381.7	4519945	1412.4	0.2	418.8
39	STS-39	OV-103	172883	33052	41401	247336	1111.1	0.0	382.5	4513048	1411.2	0.3	418.3
40	STS-40	OV-102	180375	39117	32429	251921	1100.2	-0.1	376.4	4519792	1411.4	0.2	418.3
39	STS-41	OV-103	172562	55036	31903	259501	1115.2	-0.1	381.4	4527138	1412.9	0.2	419.0
41	STS-41B	OV-099	169166	37743	43496	250405	1124.4	0.2	381.4	4505048	1412.3	0.3	418.5
41	STS-41C	OV-099	169433	42040	42931	254404	1113.5	0.2	383.4	4509231	1412.4	0.2	418.9
41	STS-41D	OV-103	169944	51483	42194	263621	1118.5	-0.2	382.8	4519789	1411.2	0.4	419.5
41	STS-41G	OV-099	170667	27994	43882	242543	1119.1	-0.1	381.6	4497865	1417.1	0.2	418.0
42	STS-42	OV-103	172707	37890	32859	243456	1104.8	-0.1	378.3	4507474	1410.6	0.2	417.8
41	STS-43	OV-104	172179	54799	32369	259347	1113.9	-0.2	380.4	4523118	1412.6	0.2	419.0
40	STS-44	OV-104	172322	52859	34670	259851	1116.2	0.0	381.0	4522576	1412.7	0.3	419.1
39	STS-45	OV-104	172140	25963	35547	233650	1113.1	-0.3	377.6	4496035	1409.8	0.2	417.2
46	STS-46	OV-104	171994	40185	43852	256031	1113.7	-0.4	382.4	4516789	1411.9	0.2	418.9
47	STS-47	OV-105	172859	38812	32897	244568	1104.1	-0.4	379.2	4506804	1410.5	0.3	417.9
48	STS-48	OV-103	172770	26978	40306	240054	1125.5	-0.9	381.9	4502671	1411.2	0.2	417.8
49	STS-49	OV-105	172749	44886	38698	256333	1119.6	-0.3	383.9	4519154	1412.4	0.2	419.0
5	STS-5	OV-102	172566	35902	37957	246425	1116.7	0.2	379.6	4488857	1416.7	0.3	418.3
51	STS-51	OV-103	173664	52473	35341	261478	1116.5	-0.6	381.6	4523125	1412.8	0.2	419.2
51	STS-51A	OV-103	169711	49661	43980	263352	1120.9	0.0	382.6	4524849	1413.3	0.2	419.4
51	STS-51B	OV-099	170953	35422	40879	247254	1114.5	-0.2	381.4	4501978	1411.3	0.3	418.3
51	STS-51D	OV-103	169481	40610	40318	250409	1126.0	-0.2	381.7	4506364	1412.2	0.2	418.6
51	STS-51F	OV-099	170948	38742	43043	252733	1111.5	-0.5	381.8	4514313	1412.2	0.2	418.7
51	STS-51G	OV-103	169802	49042	37532	256376	1109.8	0.2	379.6	4514774	1412.5	0.3	418.8
51	STS-51I	OV-103	169919	48781	43354	262054	1120.6	0.2	382.4	4519949	1413.3	0.3	419.4
51	STS-51L	OV-099	172162	57545	38929	268636	1119.0	-0.3	384.0	4529681	1413.0	0.2	419.9
53	STS-53	OV-103	173438	33943	36516	243897	1112.4	0.1	380.7	4506587	1410.7	0.2	418.0
54	STS-54	OV-105	173073	54495	31844	259412	1116.2	0.3	381.3	4522840	1412.6	0.2	419.0
55	STS-55	OV-102	180891	39484	35093	255468	1101.5	-0.7	377.5	4519000	1411.5	0.3	418.6
56	STS-56	OV-103	173563	27278	36412	237253	1109.5	-0.3	379.3	4501920	1410.1	0.2	417.5
57	STS-57	OV-105	173363	35196	44144	252703	1112.7	-0.1	383.0	4518566	1412.0	0.2	418.7
58	STS-58	OV-102	181268	38442	36393	256103	1103.4	-0.4	378.1	4517138	1411.5	0.2	418.6
59	STS-59	OV-105	173853	40423	32573	246849	1098.8	-0.5	378.7	4511411	1410.7	0.2	418.1
6	STS-6	OV-099	168736	51032	37219	256987	1127.6	0.4	382.8	4490778	1416.6	0.3	419.1
60	STS-60	OV-103	173781	35012	37143	245936	1104.4	-0.8	380.1	4509010	1410.7	0.2	418.1
61	STS-61	OV-105	173685	32016	44577	250278	1113.5	-0.1	381.7	4511794	1411.4	0.2	418.5
61	STS-61A	OV-099	171084	36388	36279	243751	1108.4	-0.3	380.1	4505113	1410.0	0.2	418.0
61	STS-61B	OV-104	170127	53027	38290	261444	1110.3	0.0	379.3	4515538	1412.6	0.2	419.2
61	STS-61C	OV-102	176549	37894	40480	254923	1111.2	0.9	380.6	4511561	1411.0	0.3	418.8
60	STS-63	OV-103	173605	31156	42864	247625	1111.6	-0.3	382.4	4511630	1411.4	0.2	418.3
64	STS-64	OV-103	173579	32194	35661	241434	1105.6	-0.6	379.5	4503921	1410.4	0.2	417.8
65	STS-65	OV-102	181576	39732	37991	259299	1104.8	-0.4	378.8	4523441	1412.2	0.2	418.9
66	STS-66	OV-104	173051	30635	40552	244238	1112.0	-0.1	379.4	4508715	1411.1	0.2	417.9
65	STS-67	OV-105	174223	34923	47349	256495	1117.1	-0.1	381.5	4520187	1412.4	0.2	418.9
64	STS-68	OV-105	173891	40911	32601	247403	1099.3	-0.5	378.5	4510613	1410.7	0.2	418.1
69	STS-69	OV-105	173869	37782	44733	256384	1112.9	-0.1	383.3	4519114	1412.3	0.2	419.0
70	STS-70	OV-103	173728	52140	32716	258584	1120.6	0.0	380.9	4521772	1412.9	0.2	419.0
71	STS-71	OV-104	173189	33963	41936	249088	1110.0	-0.1	380.1	4511586	1411.3	0.2	418.3
72	STS-72	OV-105	174465	27771	44775	247011	1117.7	-0.1	381.7	4514647	1411.9	0.2	418.2
73	STS-73	OV-102	182071	39838	35418	257327	1101.6	-0.5	377.1	4521581	1411.8	0.2	418.7
74	STS-74	OV-104	173255	30086	44925	248266	1112.5	-0.5	381.6	4512395	1411.5	0.2	418.3
75	STS-75	OV-102	181514	38894	41083	261491	1106.2	-0.4	379.9	4526493	1412.7	0.2	419.1
76	STS-76	OV-104	173405	31342	41473	246220	1110.1	-0.1	379.9	4509631	1411.2	0.2	418.1
77	STS-77	OV-105	174484	40955	39314	254753	1106.5	-0.2	380.5	4519162	1411.8	0.1	418.7
78	STS-78	OV-102	182433	37873	36189	256495	1102.6	-0.4	377.3	4517477	1411.4	0.2	418.6
79	STS-79	OV-104	173550	34533	41357	249440	1109.6	0.0	379.8	4510469	1411.3	0.3	418.3
8	STS-8	OV-099	168832	34008	39953	242793	1124.7	0.2	382.0	4495896	1412.6	0.3	418.0
80	STS-80	OV-102	181558	37388	42871	261817	1106.1	-0.5	381.1	4524735	1412.4	0.2	419.2
81	STS-81	OV-104	174043	34669	41455	250167	1110.5	0.1	379.7	4511011	1411.6	0.2	418.4
82	STS-82	OV-103	175820	31998	44168	251986	1112.1	0.1	381.5	4513855	1411.8	0.2	418.6
83	STS-83	OV-102	181532	40462	37973	259967	1101.6	-0.2	378.0	4521509	1411.9	0.1	418.9
84	STS-84	OV-104	173265	34927	41432	249624	1109.0	0.0	379.7	4509832	1411.2	0.2	418.4
85	STS-85	OV-103	175865	37478	36758	250101	1104.4	-0.1	379.8	4512125	1411.0	0.3	418.4
86	STS-86	OV-104	173505	36730	41560	251795	1109.7	0.1	379.7	4512024	1411.5	0.3	418.5
87	STS-87	OV-102	182091	40630	38973	261694	1104.1	-0.3	378.5	4521900	1412.1	0.2	419.1
86	STS-88	OV-105	175329	44497	44200	264026	1111.2	-1.1	383.3	4518489	1412.8	0.2	419.6
89	STS-89	OV-105	175377	34880	40326	250583	1112.7	-0.2	380.3	4511879	1411.6	0.2	418.5
9	STS-9	OV-102	176231	36402	35180	247813	1109.7	-0.1	378.9	4506789	1411.8	0.2	418.2
90	STS-90	OV-102	181658	41983	38629	262270	1103.9	-0.3	378.0	4523683	1412.4	0.2	419.1
89	STS-91	OV-103	175951	42272	41750	259973	1109.0	-0.9	381.3	4514649	1412.1	0.1	419.2
92	STS-92	OV-103	176407	42236	44445	263088	1114.8	-0.3	382.3	4520549	1413.0	0.2	419.4
91	STS-93	OV-102	180714	57441	32232	270387	1120.6	0.0	380.8	4524972	1413.9	0.2	419.8
94	STS-94	OV-102	181842	40448	37989	260279	1102.1	-0.3	378.2	4519333	1411.6	0.2	419.0
93	STS-95	OV-103	176161	45134	44560	265855	1110.3	-0.5	382.2	4520191	1412.9	0.2	419.6
96	STS-96	OV-103	176287	40748	44777	261812	1112.3	-0.7	381.3	4514231	1412.2	0.2	419.3
97	STS-97	OV-105	175852	48974	41744	266570	1107.2	-0.5	383.4	4524795	1412.9	0.2	419.7

98	STS-98	OV-104	176461	45336	42330	264127	1110.3	-0.5	382.6	4519380	1412.7	0.2	419.5
99	STS-99	OV-105	175882	41818	39039	256739	1104.7	0.2	381.4	4520450	1412.1	0.3	418.9
27	STS-27	DOD											
28	STS-28	DOD											
33	STS-33	DOD											
36	STS-36	DOD											
38	STS-38	DOD											
51	STS-51C	DOD											
51	STS-51J	DOD											
			Note: * Conversion from Orbiter to Shuttle coordinate system:										
				Shuttle Xcg = Orbiter Xcg + 741 inches									

STS	Total Wind Speed, fps (per altitude, ft)						IP Wind Speed, fps (per altitude, ft)						OP Wind Speed, fps (per altitude, ft)					
	0	10k	20k	30k	40k	50k	0	10k	20k	30k	40k	50k	0	10k	20k	30k	40k	50k
1	6	32	11	40	56	82	3.000	31.761	-10.998	-39.976	-52.949	-71.719	5.196	3.900	0.192	-1.396	-18.232	-39.754
2	25	33	45	110	129	113	-4.341	10.198	-20.430	-67.723	-100.252	-106.185	-24.620	-31.385	-40.095	-86.681	-81.182	-38.648
3	5	31	66	76	106	93	4.830	-28.536	-66.000	-73.410	-102.388	-89.397	-1.294	-12.113	0.000	-19.670	-27.435	-25.634
4	10	15	28	10	11	27	5.000	-13.908	-26.915	-9.925	-6.923	-26.590	8.660	5.619	7.718	1.219	-8.549	-4.689
5	16	8	30	58	142	78	16.000	-0.697	-6.237	-15.987	-57.757	-21.500	0.000	-7.970	-29.344	-55.753	-129.723	-74.978
6	13	15	50	93	107	112	11.258	-14.672	-48.515	-91.587	-106.935	-111.386	-6.500	3.119	12.096	-16.149	3.734	11.707
7	1	12	17	39	63	32	0.500	4.689	-16.959	-38.620	-42.966	-31.878	-0.866	-11.046	-1.186	5.428	-46.075	-2.789
8	6	8	5	14	28	12	-5.890	-4.702	-1.710	1.706	22.362	8.336	-1.145	-6.472	4.698	-13.896	-16.851	8.632
9	19	45	55	77	71	77	-15.564	-44.829	-54.866	-69.786	-50.205	-63.836	10.898	-3.922	-3.837	-32.542	-50.205	-43.058
41b	0	19	55	104	111	72	0.000	-12.958	-53.989	-97.092	-105.567	-71.989	0.000	13.896	-10.494	-37.270	-34.301	-1.257
41c	15	59	62	142	170	106	-11.657	-56.112	-61.764	-136.499	-162.572	-105.419	-9.440	-18.232	-5.404	-39.140	-49.703	-11.080
41d	1	15	12	31	42	20	0.946	-14.918	-11.535	-29.799	-41.770	-5.513	0.326	-1.568	-3.308	-8.545	4.390	19.225
41g	3	9	13	21	75	27	1.888	2.025	-4.659	-12.343	-3.925	13.906	2.331	8.769	-12.137	-16.989	-74.897	-23.144
51a	10	44	45	118	90	76	3.256	-3.069	-40.784	-116.207	-80.891	-74.052	-9.455	-43.893	-19.018	-20.490	-39.453	-17.096
51c	15	79	111	154	162	151	-11.147	-78.808	-110.578	-152.501	-154.071	-150.425	10.037	-5.511	-9.674	21.433	50.061	13.161
51d	17	25	37	62	128	83	12.830	9.768	-36.949	-51.400	-100.865	-55.538	11.153	23.013	-1.936	-34.670	-78.805	-61.681
51b	13	41	38	44	62	61	9.508	5.706	-7.251	4.599	-17.090	16.814	-8.866	-40.601	-37.302	-43.759	-59.598	-58.637
51g	5	20	20	29	51	48	-4.728	-16.180	-6.511	-22.537	-11.473	-41.569	1.628	11.756	-18.910	-18.250	-49.693	-24.000
51f	10	16	13	17	42	38	9.877	3.327	7.456	12.229	8.014	28.240	1.564	-15.650	-10.649	-11.809	-41.228	-25.427
51i	15	35	26	17	24	24	15.000	30.903	22.286	10.231	19.660	19.660	0.000	16.432	13.391	13.577	13.766	13.766
51j	17	6	7	7	11	19	-8.756	-3.090	-1.693	6.619	-7.360	5.555	14.572	5.143	6.792	2.279	-8.175	-18.170
61a	17	43	70	55	63	56	7.185	-31.955	-29.583	-24.969	-42.966	-33.702	15.407	28.773	63.442	49.005	46.075	44.724
61b	3	5	20	11	45	61	2.121	-3.597	-14.387	-9.011	-44.938	-60.073	2.121	3.473	-13.893	-6.309	-2.355	-10.593
61c	10	9	58	172	221	129	-6.428	3.945	-55.161	-170.718	-219.353	-127.412	-7.660	-8.089	17.923	20.962	26.933	20.180
51L	17	72	97	110	153	136	-13.926	-65.254	-87.912	-102.694	-153.000	-134.326	-9.751	-30.429	-40.994	-39.420	0.000	-21.275
26	10	22	12	24	25	35	8.660	21.148	11.780	23.967	-13.980	-30.001	-5.000	6.064	2.290	-1.256	-20.726	-18.026
27	22	46	69	146	174	142	4.198	31.954	-24.727	-108.499	-150.688	-96.844	-21.596	-33.090	-64.417	-97.693	-87.000	-103.852
29	16	10	56	57	81	81	-14.127	-3.420	-43.520	-39.596	-68.692	-80.003	7.512	-9.397	-35.242	-41.002	-42.923	-12.671
30	11	2	45	61	138	123	8.175	-1.486	-44.562	-60.991	-134.463	-116.299	7.360	-1.338	6.263	1.065	31.043	40.045
28	10	21	25	16	9	16	-6.293	-16.989	-17.366	-10.285	-8.912	7.014	-7.771	12.343	-17.983	-12.257	-1.253	-14.381
34	13	19	29	50	41	48	-7.456	-18.070	-25.364	-49.970	-39.412	-44.184	10.649	5.871	14.059	1.745	-11.301	-18.755
33	16	24	64	78	108	103	-7.512	-18.113	-54.275	-64.665	-90.576	-99.940	14.127	15.745	33.915	43.617	58.821	24.918
32	4	57	97	118	140	137	-2.571	-47.804	-83.145	-105.139	-137.428	-120.964	-3.064	31.044	49.959	53.571	26.713	64.318
36	11	17	28	67	166	75	5.333	12.633	-20.478	-9.325	-70.155	-28.096	9.621	11.375	-19.096	-66.348	-150.447	-69.539
31	11	15	10	78	77	69	11.000	14.616	1.392	-62.294	-70.343	-57.204	0.000	-3.374	-9.903	-46.942	-31.319	-38.584
41	23	27	14	41	82	63	23.000	24.470	-9.548	-30.469	-72.402	-59.201	0.000	-11.411	-10.239	-27.434	-38.497	-21.547
38	28	4	14	52	130	75	27.847	-1.236	-13.641	-48.546	-127.159	-73.361	-2.927	3.804	-3.149	-18.635	-27.029	-15.593
35	21	10	20	93	139	80	20.987	-8.192	-19.805	-88.936	-137.647	-76.901	-0.733	5.736	-2.783	-27.191	-19.345	-22.051
37	18	8	42	84	127	113	17.303	-4.000	-41.994	-83.540	-124.225	-111.900	-4.961	6.928	0.733	-8.780	-26.405	15.727
39	12	11	45	61	97	85	-2.290	-9.621	-40.446	-60.916	-96.277	-84.948	11.780	5.333	-19.727	-3.192	-11.821	-2.966
40	6	31	26	3	10	32	-5.942	-22.300	-17.397	0.726	8.660	-13.016	0.835	-21.534	-19.322	-2.911	-5.000	-29.233
43	16	26	19	56	63	30	2.778	-16.007	5.555	52.949	60.247	28.532	15.757	20.488	18.170	-18.232	-18.419	-9.271
48	12	18	27	49	78	49	9.830	17.303	26.934	48.397	72.320	44.041	6.883	-4.961	1.883	7.665	29.219	21.480
44	8	51	61	109	122	79	-6.857	-49.485	-58.335	-98.788	-117.274	-69.095	-4.120	12.338	17.835	46.065	33.628	38.300
42	10	27	47	81	97	75	9.998	-26.590	-41.499	-73.997	-49.959	-35.210	-0.175	4.689	-22.065	-32.946	-83.145	-66.221
45	23	35	86	157	176	154	17.619	-9.647	-50.550	-80.861	-93.266	-92.680	-14.784	-33.644	-69.575	-134.575	-149.256	-122.990
49	13	69	147	143	131	87	-8.004	-57.868	-127.306	-118.552	-107.309	-58.214	-10.244	37.580	73.500	79.965	75.139	64.654
50	22	31	25	67	106	60	10.666	-18.221	-22.658	-64.717	-86.830	-59.553	19.242	25.080	10.565	17.341	60.799	-7.312
46	10	8	12	31	67	28	-7.660	-7.608	8.776	-27.371	19.589	21.132	-6.428	2.472	8.184	14.554	64.072	18.370
47	16	17	6	4	7	19	15.939	16.873	-3.355	-3.999	4.684	-3.299	1.394	-2.072	-4.974	0.070	5.202	-18.711
52	27	31	24	82	139	69	20.065	14.074	16.368	-65.488	-121.572	-55.106	-18.067	-27.621	-17.552	-49.349	-67.389	-41.525
53	10	80	91	109	107	77	-9.976	-23.390	-63.214	-35.487	-72.974	-34.957	0.698	-76.504	-65.460	-103.062	-78.255	-68.607
54	9	8	57	78	87	69	0.000	-7.995	-44.917	-68.220	-80.665	-60.349	9.000	-0.279	35.093	37.815	32.591	33.452
56	16	9	22	33	91	119	14.381	-2.177	0.000	10.198	12.665	-71.616	7.014	-8.733	-22.000	-31.385	-90.114	-95.038
55	16	20	36	65	73	87	-13.856	-19.563	-35.912	-63.580	-67.684	-78.849	8.000	-4.158	-2.511	-13.514	-27.346	-36.768
57	10	8	24	64	110	52	9.998	7.064	19.660	46.807	51.642	49.455	0.175	3.756	-13.766	-43.648	-97.124	-16.069
51	6	23	12	28	55	48	-5.481	-20.493	-9.456	-26.630	-44.496	-47.934	-2.440	10.442	-7.388	8.652	32.328	-2.512
58	10	2	7	23	22	28	-2.756	0.450	-1.812	-17.874	-18.858	-27.847	-9.613	1.949	6.761	-14.474	-11.331	2.927
61	11	19	38	47	90	69	10.337	-4.597	-33.552	-34.928	-61.380	-63.035	-3.762	-18.436	-17.840	-31.449	-65.822	-28.065
60	15	46	114	131	161	141	2.347	-25.053	-86.037	-61.501	-82.921	-70.500	-14.815	-38.579	-74.791	-115.666	-138.004	-122.110
62	16	47	82	127	139	120	-11.702	-32.054	-56.962	-84.980	-108.023	-93.258	-10.912	-34.374	-58.986	-94.379	-87.476	-75.518
59	32	21	37	84	133	116	15.514	20.796	-17.938	-52.863	-98.838	-73.001	27.988	2.923	-32.361	-65.280	-88.994	-90.149
65	15	29	31	34	44	28	14.772	24.858	25.080	30.294	40.196	27.847	2.605	14.936	18.221	15.436	17.896	-2.927
64	12	3	5	34	64	38	3.708	-2.158	-4.938	-31.524	-56.509	-31.503	11.413	2.084	0.782	-12.737	-30.046	-21.249
68	3	9	23	57	94	120	2.544	6.792	21.325	-20.427	-70.943	-86.321	1.590	5.905	8.616	-53.214	-61.670	-83.359
66	16	5	8	6	13	49	14.381	4.988	-7.795	5.481	12.053	5.122	7.014	-0.349	-1.800	2.440	4.870	-48.732
63	10	51	98	174	184	110	-9.613	-14.057	-33.518	-127.256	-136.739	-88.992	-2.756	-49.024	-92.090	-118.668	-123.120	-64.656
67	8	51	56	99	136	87	-6.928	-44.167	-52.623	-83.028	-130.732	-85.402	-4.000	25.500	19.153	53.919	37.487	16.600
71	13	38	11	30	81	65	9.192	-13.618	-3.581	-8.269	-12.671	-23.294	9.192	-35.476	-10.401	-28.838	-80.003	-60.683
70	5	2	16	26	25	14	3.886	-1.854	5.734	8.465	1.744	12.887	-3.147	0.749	14.937	24.583	24.939	-5.470
69	11	37	43	64	68	26	-5.500	-11.434	-11.129	-8.907	-35.023	-13.778	9.526	35.189	41.535	63.377	58.287	22.049
73	9	17	15	73	86	41	-0.314	-9.751	-14.419	-59.058	-63.910	-30.943	-8.995	-13.926	4.135	-42.908	-57.545	-26.898
74	19	54	72	82	110	76	2.316	-38.844	-37.083	-60.938	-91.194	-29.696	-18.858	-37.512	-61.716	-54.869	-61.511	-69.958
72	5	32	59	95	124	98	-4.330	-31.180	-57.711	-92.178	-120.317	-97.270	-2.500	-7.198	12.267	-22.983	-29.998	-11.943
75	9	23	51	97	143	56	7.872	-22.996	-31.399	-63.638	-29.731	-35.996	-4.363	-0.401	-40.189	-73.207	-139.875	-42.898
76	11	65	98	119	177	149	-0.767	-33.477	-56.210	-88.434	-154.808	-124.962	-10.973	-55.716	-80.277	-79.627	-85.811	-81.151
77	5	14	6	76	119	44	-4.891	7.000	-5.481	-74.604	-119.000	-43.038	1.040	12.124	2.440	-14.501	0.000	-9.148
78	6	24	25	19	29	16	1.854	-21.571	-14.695	-17.077	-27.251	-8.947	-5.706	-10.521	-20.225	-8.329	-9.919	-13.265
79	15	17	23	30	42	34	-5.376	-16.907	3.994	0.524	5.119	8.800	14.004	-1.777	-22.651	-29.995	-41.687	-32.841
80	13	43	67	96	129	128	-12.803	-39.282	-63.350	-59.104	-72.136	-121.026	-2.257	-17.490	-21.813	-75.649	-106.946	-41.673
81	13	57	95	136	175	149	3.583	-46.114	-81.431	-126.097	-155.926	-129.038	-12.496	-33.504	-48.929	-50.947	-79.448	-74.500
82	6	62	115	139	159	122	-3.857	-61.991	-114.143	-134.871	-154.925	-116.029	-4.596	1.082	-14.015	33.627	35.767	37.700
83	11	6	48	68	80	76	9.526	-4.528	-43.503	-32.967	-55.573	-68.879	5.500	-3.936	-20.286	-59.474	-57.547	-32.119
84	5	25	65	100	186	137	0.523	-19.429	-53.245	-79.864	-138.225	-100.195	-4.973	-15.733	-37.282	-60.182	-124.458	-93.434
94	15	20	21	14	25	23	5.130	-12.586	-19.605	-10.071	8.139	-1.604	-14.095	-15.543	-7.526	-9.725	-23.638	-22.944
85	8	20	19	17	1	22	2.867	-17.143	-14.555	12.433	-0.982	-21.879	-7.469	-10.301	-12.213	-11.594	0.191	2.300
86	3	34	46	43	30	38	-2.719	-33.979	-42.343	-37.967	-11.722	0.000	-1.268	1.187	-17.974	-20.187	-27.615	-38.000
87	21	66	88	97	166	160	3.647	-65.508	-86.663	-96.941	-153.913	-155.899	-20.681	8.043	-15.281	-3.385	62.185	35.992
89	16	20	49	49	105	118	-4.141	-19.406	-48.970	-40.138	-82.741	-97.826	15.455	-4.838	-1.710	-28.105	-64.644	-65.985
90	16	19	32	105	170	116	0.558	-13.667	-23.019	-55.642	-109.274	-77.619	15.990	-13.199	-22.229	-89.045	-130.228	-86.205
91	10	10	39	75	96	92	-4.226	5.878	-8.109	10.438	11.699	31.466	-9.063	-8.090	-38.148	-74.270	-95.284	-86.452
95	11	9	35	35	78	89	3.762	-8.835	-29.353	-32.675	-77.988	-86.356	-10.337	-1.717	-19.062	-12.543	1.361	-21.531
88	5	16	27	37	43	35	2.868	-10.069	12.676	34.542	28.211	14.792	4.096	12.434	23.840	-13.260	-32.453	-31.721
96	3	39	42	83	103	66	-2.121	-28.523	-31.698	-66.287	-80.046	-45.847	-2.121	-26.598	-27.554	-49.951	-64.820	-47.476
93	5	16	24	43	73	39	-4.924	14.937	22.553	33.884	65.612	31.947	-0.868	-5.734	-8.208	-26.473	-32.001	-22.369
103	5	27	48	114	140	117	-3.214	-26.504	-43.142	-111.509	-117.414	-105.159	-3.830	5.152	21.042	23.702	76.249	51.289
99	11	36	81	97	148	100	-5.665	-30.192	-50.975	-51.402	-43.271	-55.919	9.429	-19.607	-62.949	-82.261	-141.533	-82.904
101	5	49	27	55	88	94	2.868	42.856	26.984	2.878	-27.194	24.329	4.096	23.756	0.942	-54.925	-83.693	-90.797
106	8	12	12	18	51	31	6.553	11.984	11.644	13.377	49.262	30.924	-4.589	0.628	-2.903	-12.044	-13.200	-2.162
92	20	8	43	101	109	97	19.924	4.815	-12.572	-64.922	-79.718	-36.337	1.743	6.389	-41.121	-77.370	-74.338	-89.937
97	5	23	27	75	141	73	0.436	-3.994	2.822	-65.596	-131.635	-52.512	-4.981	-22.651	-26.852	-36.361	-50.530	-50.710
98	1	12	23	43	71	76	0.966	1.046	-13.192	-29.326	-42.729	-51.832	-0.259	-11.954	-18.840	-31.448	-56.703	-55.583
102	6	45	94	137	182	133	-0.523	-6.263	-41.207	-70.560	-112.050	-87.256	-5.977	-44.562	-84.487	-117.432	-143.418	-100.376
100	15	25	39	70	64	65	12.287	-12.120	-1.361	-8.531	1.117	-26.438	8.604	-21.865	-38.976	-69.478	-63.990	-59.380
104	8	31	17	9	31	19	-7.970	-29.944	-14.572	4.769	30.205	18.070	-0.697	-8.023	-8.756	-7.632	-6.973	-5.871
105	11	4	6	11	38	7	7.778	0.763	-0.314	-9.011	-37.907	6.578	7.778	-3.927	-5.992	-6.309	-2.651	-2.394
108	16	32	33	51	8	23	14.501	22.627	4.593	5.331	4.474	15.390	6.762	22.627	32.679	50.721	-6.632	-17.092
109	21	16	65	113	186	129	20.681	4.141	-64.753	-111.283	-169.919	-124.604	-3.647	15.455	5.665	19.622	75.653	33.388
110	23	32	20	29	58	105	-2.005	-10.418	-14.863	-20.145	-23.591	-70.259	22.912	30.257	13.383	-20.861	-52.986	-78.030
111	8	23	0	13	25	33	2.071	13.192	0.000	-10.777	-19.151	19.860	7.727	18.840	0.000	-7.270	-16.070	-26.355
112	13	18	23	50	46	21	9.192	8.450	15.390	19.537	5.606	-4.007	-9.192	-15.893	-17.092	-46.025	-45.657	-20.614
113	3	14	25	110	129	99	-0.776	-6.356	-18.868	-100.490	-122.686	-88.210	-2.898	-12.474	-16.401	-44.741	-39.863	-44.945
107	6	38	94	122	179	161	5.298	-36.705	-89.893	-112.302	-158.048	-148.201	2.817	-9.835	-27.483	-47.669	-84.035	-62.908