Man-Systems Integration Standards
NASA-STD-3000, Volume II
Revision B, July 1995

Foreword

The original document was assembled for NASA by the Boeing Aerospace Company (BAC), Kent Washington, in conjunction with subcontractors Lockheed Missiles and Space Company (LMSC), Sunnyvale, California; Essec Corporation, Huntsville, Alabama; and CAMUS, Inc., Springdale, Arkansas.

A Government/Industry Advisory Group (GIAG), composed of a panel of "experts" and "users", met four times to review the technical content as it was being developed.

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The GIAG user group was composed of invited representatives from all of the prime aerospace contractors, support contractors, NASA centers and Headquarters, other Government agencies and some non-aerospace contractors.

The technical content of these documents has been thoroughly reviewed by the GIAG participants. The data can be used with confidence that all known relevant human engineering requirements applicable to the space environment have been documented and are as technically valid as it is possible to determine. Iterations to NASA-STD-3000 will be developed as physiological and technical knowledge and requirements dictate.

Technical comments from any user are welcome and will be considered for updating the documentation.

The contents of this volume are as follows:

Appendix A
Bibliography

Groups: | 50 - 99 | 100 - 149 | 150 - 199 | 200 - 249 | 250 - 299 | 300 - 349 | 350 - 399 | 400 - 419 |

USER'S GUIDE

This bibliography includes all of the human engineering standards, data books, and technical documents that were reviewed to obtain the human-systems integration design considerations, requirements, and examples given in this document. The references that are cited as source documents for either the text or figures are noted by having an asterisk located after the reference number. Those references that are not so notated were given due consideration but found not to have data appropriate for these standards.

In the following listing, the reference citation is as follows:

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Appendix B
Paragraph References

USER'S GUIDE

This appendix provides references between the requirements in Volume I and the literature that the authors considered whilst developing these requirements. A specific document, paragraph, and/or page number is cited for each paragraph in the standards. Where a paragraph is not listed, no reference documents were applied (e.g., this is the case for introductory paragraphs).

You may investigate specific requirements by examining the lists below to identify the reference numbers corresponding to your requirement. It will then be necessary to look up the reference code in Appendix A's bibliography in order for you to find the full document title and citation.

Section References

Appendix B
Paragraph References for Section 2

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
2.2.1	2	4.6	15
	18	DN lB2, Item 11	
2.2.2	2	4.2	
	130	-	43
	156	N-2	
2.3	351		
2.3.1	2	4.6	15
	18	DN lB2, Item 1 1	
2.3.2	2	4.2	
	2	5.9.1.1	
	37	30302-04,-08	
	130		43
	156	N-2	

Appendix B
Paragraph References for Section 3

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
3.1.2	16	III	78-81
	273		9-15
	275		6&7
3.2.2	16	Chapt VIII	
	275	Chapt 7 & 8	
3.2.3.1	16		1-28, 29
	208		32-133
3.2.3.2	16		II-25, 28
3.2.3.3	16		II-52
3.3.1.3	16		IIII-85
	308		all
	274		121-128
3.3.2.1	16	Vol I	VI-3
3.3.2.2.1	15	2.3.1	2-80
	16		VI-7
3.3.2.2.2	16		VI-9
3.3.2.3.1	15		2-82
	16		VI-5, -6
	16		VI-12-15
	365		
3.3.2.3.2	16		VI-15

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
3.3.3.2.1	16	Vol. I	V-12, 13
	19	2D6	1
3.3.3.2.2	16	Vol I	V-14
	1	2.4	2.4-3, -4
3.3.3.2.3	16		V-14
3.3.3.2.4	16		V-17
3.3.3.2.5	16		V-16
3.3.3.3.1	310		34-52
	16		V-58, 61
	2		145
3.3.3.3.2	2	DN 3Q4	3
3.3.4.2	16	Vol I	I-26
	129		18
3.3.4.3	129		21
	16		I-24
	17		25, 26
3.3.5.2	272		475
3.3.5.3	272		476
3.3.6.3.1	276		81
3.3.6.3.2	276		32-81
3.3.7.3.1.1	16		III-85, 92

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	308		all
3.3.7.3.1.2	276		32-81
3.3.7.3.2.1	320		
3.3.7.3.2.2	16		IV-12, 33
		274	
3.3.7.3.3.1	16		IV-42
3.3.7.3.3.2	276		32-81

Appendix B
Paragraph References for Section 4

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
4.2.2	86		38, 52, 53
	6		65
4.3.2.1	86		70
4.3.2.2	86		70-75
4.4.2.1	86		69
4.4.2.2	86		64
4.5.2.1	6	3.2.1.3.3	67
4.5.2.2	86		35, 36, 42
	86		43, 46, 49
	86		50
4.6.2	19		3, 4
4.7.2	19		3
4.8.2	19		3
	86		119121
4.9.2	351		
	86		20
4.9.3	1		2.5-5, -6
	1		2.5-19, -18
	2		113115
	16		VII-50
		307	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
4.10.2	86		118122
	86		125127
	86		128131
	86		138
	351		

Appendix B
Paragraph References for Section 5

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.1.1	6	3.1.5.1	57
	6	5.4	
	21	2 and 3	
	92	Ch. 1	1
5.1.2	21	6Bl-l, 6Bl-6	1-3
	321	Table 2.4-1	
5.1.2.1	198	4.9	27
	92	Ch. 2	
5.1.2.1.1	11		
	111		
	92		56-57
	264	11.1	
	280		132-161
5.1.2.1.2.1	92		59
	280		132-161
5.1.2.1.2.2	92		52-59
5.1.2.1.2.3	92		57
5.1.2.2.1.1	11		10-48
	92		37
5.1.2.2.1.2	11		10-49
5.1.2.2.1.3	11		10-53
	92		45

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.1.2.2.1.4	11		10-71 to ?
5.1.2.2.1.5	11		10-63 to 70
5.1.2.2.1.6	11		10-70, 10-71
5.1.2.2.1.7	92		25-26
	11		12.2-12.11
	280		135-140
	78		1-291
5.1.2.2.1.7.1	92		25-26
	11		12.2-12.11
	280		135-140
	78		1-291
	353	Vol. 57	223-228
	354		
	355		
	356		
	357		
	358		
	359	Vol. 42	518-524
5.1.2.2.1.7.3	111		865, 6
	277		4-5
	78	2	8-36
	24	2	14
	24	4	50
	351		
5.1.2.3.1	349		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.1.2.3.2	349		
5.1.2.3.3	349		
5.1.3.1	37	20101	
	321	2.3	
	323	Table C-4-IX	
	324	Table 2.9	
5.1.3.2	321	2.3	
	323	Table C-4-IX	
	324	Table 2.9	
5.1.3.3	323	C-4	
	321	Table 2.4-1	
	349		
5.1.3.4	349		
5.1.3.4.1	349		
5.1.3.4.2	349		
5.1.3.4.3	349		
5.2.2.1	10		7-90/7-96
	10		7-85
	10		7-173/76
	6		208
	78		2-5
	86		36
	92		400
	92		405-6

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.2.2.2	92		400-404
	10		7-173/6
5.3.1	92	Tables A, B, 6-223	
	78		1-160
5.3.2.1.1	21		1
	198		11
5.3.2.1.2	21		1
	198		11
5.3.2.1.3	198		7-12
5.3.2.2.1	21		1
	78		1-162/163
5.3.2.2.2	92		150-151
5.3.2.2.3	92		49-166
	92		373-379
	92		387-389
	92		553
	7		17-19
	10		7-48
	10		7-64/95
	36		525-527
	86		36-37
5.3.2.3	10		7-56
	78		2-5
	92		601-609

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.3.2.4	407		
	408		
	409		
	417		
	418		
5.3.3.1	78		1-164
	198		13
	415		
	418		
5.3.3.2	78		1-187 to 188
5.3.3.3	198		18
5.4.1	61	1.2	9
	10		9-1
5.4.2.1	101	5.8.3.1	166
	10		9-5
	10		9-9
	198		5
5.4.2.1.1	10		9-5
	214		19, 23
5.4.2.1.2	214		20, 64, 65
5.4.2.1.3	10		9-9
5.4.2.2	214		41
	224		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.4.2.3	92	2	693
5.4.2.3.1	*5*	5.6.3.1.1	273
	15		365
	92		732
	10		9-40
5.4.2.3.2	5	5.6.3, 5.6.3.1.1	273
	4	6.6.7	6.6-16
	8	5	32
	233		359380
5.4.2.3.3	92		729
	223		447531
	278	C3.1.4.1.3	C-18
5.4.2.4	198	1.46	3
5.4.2.4.1	58		iii
5.4.2.4.1.1	58	3.16	10
5.4.2.4.1.1.1	61	1.37, 1.12	11, 9
	58	3.5	6
	281	5.b, 5.e, C.9	1-3, -4, C-2
	37	20502-5	13
	198	4.1.2.1	*5*
5.4.2.4.1.1.2	29	6.3.4	8
	198	1.4.8, 4.1.1, 4.3, 4.5, 4.8	
5.4.2.4.1.2	25	3.1.2	2
5.4.2.4.2	19	6.1	4

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.4.2.4.2.2	19	1.2	1
5.4.2.4.3	278	I.D.	4
5.4.3	198	1.1, 1.2	1
5.4.3.1	198	4.1	5
	58	3.4	6
	37	20501-1, -2, -3	
	351		
5.4.3.2	198	1.46	3
5.4.3.2.1.1	281	5.b, 5.e, c.9	1-3, 1-4, C2
	37	20502-5	13
	198	4.1.2.1	5
5.4.3.2.1.2	198	4.1.3	8
	37	20502-03	
5.4.3.2.1.3	90	-	1, 3
	5	5.6.3.1.1.1	273
5.4.3.2.1.4	223	-	10
	37	20502-04	-
	58	Fig. 5	10
5.4.3.2.1.5	37	20503-07	
	283	8.2.2	198
5.4.3.2.1.6	37	20503-08	
	281	5.e	1-3

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.4.3.2.2.1	19	AFSC DH 1-3	1
	198	4.1.2.1	5
	37	20502-06	
	4	6.6.7	6.6-16
	2	5.8.3.4.3	173
5.4.3.2.2.2	19	1.4	3, 10
5.4.3.2.3.1	198	4.1.2.1	5
	278	C.3.1.4.1.3	6.6-16
	37	20504-0lb	
5.4.3.2.3.2	90	-	1
	37	20502-03	
5.4.3.2.3.3	223	-	442
	37	20503-05	
5.4.3.2.3.4	37	20504-01, a & d	
	278	C.3.1.4.1.3	C-18
5.4.3.2.4	58	5.13, 5.14	21
5.4.4	37	20501-01, -02	
	214		70
5.4.4.1	214		87
5.4.4.2	214	-	71, 79
5.4.4.3	281	8	1-5 to 1-7
	214		24
	10	Fig. 9-52	9-80

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.5.1	10	-	8-1
5.5.2	10	-	8-1
	182	4	4.106
5.5.2.1	182	4	4.1
5.5.2.1.1	92	-	304
	6	-	110
5.5.2.1.2	6	5.8.2	211
5.5.2.1.3	92	-	304
	6	5.8.3	211
5.5.2.3	92	-	342
	10	-	8-16
5.5.2.3.1	10		8-6
5.5.2.3.2	182	4.1, 4.0	4.109
5.5.2.3.3	182	4.0, 4.1	4.100,
			4.125
			4.129
			4.127
	5	5.6.2.2.2(d)	264
5.5.2.4.1	101	3.1	2
5.5.2.4.2	101	2.1, 2.2 and 2.2, 3/Add	
5.5.2.4.3	29	-	297

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	101	4	4
5.5.2.4.4	101	4.4.1	5
	101	4.4.2	6
	101	4.4.3	6
5.5.3	37	22001-1	
	198	4.2.1	8
	92	2.3	304
5.5.3.1	278	C.3.1.4.3	C-19
5.5.3.2.1	101	2	2/add.2-
	320		
	327		
	351		
5.5.3.2.2	101	2.2	3/Add
5.5.3.2.3	101	2.3	3/Add
	-	-	2-82
5.5.3.2.4	101	2.1.1	2 (Add
5.5.3.3.1	101	4.1.2	4
	2	5.8.4.1.1.1	173
	198	4.2.2.4	11
5.5.3.3.2	101	4.1.1	4
	2	5.8.4.1.1.2	173
5.5.3.3.3	2	5.8.4.1.2	173177

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.5.3.3.4	101	4.4	5, 6
5.5.4.1	295	2.7.1	10-11
	92	-	304
5.5.4.3	296	-	37
	10	-	8-13, -14,
	-	-	91
5.7.2.1.1	6		205
5.7.2.1.2	92		424-429
	179		41-48
	210		295-96
	213		69-81
	284		321-342
	361		412
	328		123-140
5.7.2.1.2.1	411		
5.7.2.1.2.3	411		
	412		
	413		
5.7.2.1.3.1	9		3-27
	19	3.4	
	92		421-23
	416		
5.7.2.1.3.2	163	-	151-160
	164	-	115-120
	285	-	121-130

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.7.2.1.3.3	9	-	3-49 - 3-62
	328	-	123 - 140
	362	-	153 - 160
	365	-	633 - 640
	411		
5.7.2.1.3.4	189		1-57
5.7.2.1.4	37	202M02	
	92		430-435
	286		173-175
	287		1-3
	288		545-576
	367		1-10
	328		123-140
5.7.2.1.5	414		
5.7.2.2.1	206	-	103
	285	-	121-130
	328	-	123-140
	419		
5.7.2.2.2	37	202M201-04	
	42		App. II, 94f
	360		1-29
5.7.2.2.3	37	202M201	
	42	App. II	94-96
5.7.2.2.4	37	202M201-4	
	42	App II	94-96

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	289	-	61-85
5.7.3.1.1	297	-	-
	299		41-44
	300	-	1329-62
5.7.3.1.2	37	203M0l	
	301	-	6-7
	289	Vol. II, App. D117	145-57
5.7.3.1.3	4	-	6.8-1--11
	298	-	1-24
	302	-	1329-1362
	303	-	341-359
	304	-	331-340
	368		1879-81
	369		1873-80
5.7.3.1.4	37	203M0l	
		209	
		289	Vol. III, App.
5.7.3.2.1	298		1-24
		302	
		303	
		304	
		305	
			306
			410
5.7.3.2.2	37	203M01	
	289	Vol. III, App. 46-50	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.8.1	92	Ch. 3	
	5	4.8	
	6	5.1	
	9	Ch. 6	
5.8.2	198	4.7	23
		198	4.7.1
		21	Ch. 2
		92	Ch. 3
		5	4.8
		6	5.1
		9	Ch. 6
		19	4
			332
5.8.2.1	198	4.7.1	23
	19	4	3
5.8.2.2	92		66
	19	7	4
5.8.2.2.1	9	6	6-1
5.8.2.2.2	19	2.3	1.2
5.8.2.2.2.1	332		
	333		
	334		
5.8.2.2.3	19	2	1
5.8.2.2.4	19	3	2

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
5.8.2.2.5	1	3.1.3	3.1-2
	4	7.4.1	7.4-1
	15	11.6	211
5.8.3.1	198	4.7	23
	21	Ch. 2	
	37	20101	
	42	B-31	81
5.8.3.2	37	20101	
	21	Ch. 2	
	198	4.7	23
	198	4.7.1	23
5.9.2	92	Chap. 19	881-913
	351		
5.9.3	92	Chap. 19	892-906

Appendix B
Paragraph References for Section 6

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
6.1	21	3N	
	42	Appendices	
6.2.2	2	5.13.1	225
	21	DN 2Cl, para 1, 2	
	6	8.1	34
	15	19.1	423-5
6.2.3	2	4.8	15
	5	4.7	15
	2	4.5	15
6.3.2	90	142	
	100	4.2.12	4-26
6.3.3	1	6.3.5	3.5-10
	37	10401-01, -02	
	2	5.13.5.4	
	15	19.3	431
	90	142	
	277	M/S-6	6-6
6.4.2	15	19.2.1	425-426
	9	Sec. 5	
6.4.2.2	403		28
6.4.2.2.1	403		39
6.4.2.4	394		210
	399		310

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
6.4.3	2	5.13.7.1	
	5	5.7.3.2.4	
	5	5.8.10.3	
	5	5.8.14.10	
	22	1	
	37	20601-06	
	42	B-2, DG-EPG-097	
	90	131	
	155	6.1.1	
	277	E-9, E-13	5-9, 5-13
	9	Sec. 5	
	392		310
6.4.3.1	395		113
	394		213
6.4.3.1.1	392		113
6.4.3.12	394		15
	392		15
6.4.3.14	392		115
	394		115
	394		215
6.4.3.15	392		115
	394		115
6.4.3.15.1	394		115
6.4.3.16	394		135
6.4.3.18.1.1	394		117

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	399		117
6.4.3.18.1.2	394		117
	399		117
6.4.3.18.2	394		17, 19
	399		19
6.4.3.18.2.1	394		19
	399		19
6.4.3.18.2.2	394		19
	399		19
6.4.3.18.2.3	399		19
	401		19
	394		19
6.4.3.18.2.4	399		19
	401		19
	304		19
6.5.2	1	3.5.1.4	3.5-4
6.5.3	1	3.5.1.4	3.5-4
	4	6.8.4	
	42	App.B, No.B-31	
	37	20601-05	
6.6.1	1	3.5.2	
	21	DN3N2	
6.6.2	21	DN3N2	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
6.6.3	1	3.5.2	3.5-5 & 6

Appendix B
Paragraph References for Section 7

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
7.2.2.2.1	309		64
7.2.2.2.2	309		
	107		4-3
7.2.2.2.3	309		
7.2.2.3.1	309		
	320		
7.2.2.3.2.1	278		
7.2.2.3.2.2	278	C-2-2	C-21
7.2.2.3.2.3	37	21108	
7.2.2.4	309		23, 24
	406		
7.2.3.2	208		265
7.2.3.3.2.1	37	20701	
	86		31, 32
	208		267268
	320		
7.2.3.3.2.2	37	20701	
	86		31, 32
	208		267268
	320		
	341		
7.2.3.3.3	37	20701	
	86		31, 32
	208		267268
	320		
7.2.3.4.2	37	20701	
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
7.2.3.4.3	37	20701	
	320		
7.2.4.2	11		16-80
	86		123
	208		162
	256		i
7.2.4.3	250		
	317	3.1.2.1.5	152
7.2.5.2	86		65
7.2.5.3.1	37	21005	
	250		
7.2.5.3.2	250		
7.2.5.3.3	250		
7.2.5.3.4	250		
7.2.5.3.5	250		
7.2.5.3.6	278		C-21 to -23
7.2.6.2	208		135148
	208		240-260
7.2.7.2.1	351		
7.2.7.2.2	320		
7.2.7.3.1.1	349		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
7.2.7.3.1.2	349		
7.2.7.3.1.3	349		
7.2.7.3.2	320		
7.2.7.3.2.1	349		
7.2.7.3.2.2	349		
7.2.7.3.2.3	349		
7.2.7.3.2.4	349		
7.2.7.3.2.5	320		
7.3.2.1	229		5
	320		
7.3.2.3	208		246-252
	320		
7.3.3.1	229		4, 5
7.3.3.2	320		
7.3.3.3	320		
7.3.3.4	320		

Appendix B
Paragraph References for Section 8

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.2.2.2	37		10104
8.2.2.3	107	Chapt. 2	
8.2.2.4	4	7.1.1	7.1-1
8.3.2.2	319		all
8.3.3.1	37	10107	
8.3.3.2	37	10107	
	204	DG-OPS-176	99
8.4.1	1	3.2.1	3.2-1
8.4.2	86		62
	7		40
8.4.3	1	3.2.1	3.2-1
	107	2.1.2	
8.4.4	1	3.2	3.2-1, 2
	107	J	106
8.5.2.1	320		
8.5.3.1	320		
8.5.3.2	250		
8.5.3.3	199		17, 18
	277	G-37	4-37
8.5.3.4	1	4.8.4.4	4.8-10
	37	10206	
	201	4.0e	13
8.6.2	315		i

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.6.2.1	78		2-39
8.6.2.2	315		41-44
	134		4-35
8.6.2.3	315		91-95
	320		
	310		all
8.6.2.4	315		130-132
8.6.4.1	130		10
	155		3-4
8.6.4.2	155	3.1.2	3-4
8.6.4.3	155	3.1.2	3-3
8.7.2.1	107	2.1.1	2-2
	250		
8.7.2.2	115		6
8.7.2.3	89	5.3.2	26
8.7.3.1	37	10201	
	37	10203	
	107.1	2.1.1	2-2
8.7.3.2	37	10203	
	37	10201	
	107	2.1.1	2-2
8.7.3.3	37	10203	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.7.3.4	37	10205	
	42	Bll	80
	42	DG-INT-004	87
	42	DG-INT-027	89
8.8.2	*5*	5.5.2.6.3	220
	37	10204	
	250		
	111		303
8.8.3.1	250		
	320		
	115	3.1.2	3-9
8.8.3.2	*5*	5.5.2.6.3	220
	37	10204	
	1	3.2.2.2	3.2-3
8.8.3.3	1	3.3.4	3.3-4
	1	3.2.2.2	3.2-3
	1	3.2.2.3	3.2-5
	37	10202	
	37	10204	
	42	B-31	81
	42	DG-INT-021	88
	107	2.2	2-3
8.8.3.4	44		
8.9.2.1	1	3.3.2	3.3-2
	200	3.1.4.6	4
	124		23

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.9.2.2	16		V-14
	37	10206	
	89		25
	107	3.8	3-3
	200	3.2.2.1	6
	200	3.2.4.6, 3.2.4.8	
8.9.3.1	1	3.3.2	3.3-1
	37	10206	
	200	3.1.2.1	3
	200	3.1.4.6.1.1	5
	200	3.1.4.6.1.2	5
	200	3.1.4.6.2	5
8.9.3.2	1	4.2	4.2-1
	37	10206	
8.10.2	111		301-303
8.10.3.1	15	9.5	157
	47	DG-INT-001	87
	47	DG-INT-003	87
	47	DG-INT-004	87
	47	DG-INT-026	88
	47	DG-INT-173	99
	47	DG-INT-027	89
8.10.3.2	1	4.3.5	4.3-2
	1	4.3.5.3	4.3-3
	6	4.2.3.3	145
	47	DC-MSE-064	91
	37	10705	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.10.3.3	277	M/S-4	6-4
8.10.3.4	1	4.3.1	4.3-1
	1	4.3.2	4.3-1
	11		16-36
8.10.3.5	250		
8.11.2.1	37	10705	
	322		
8.11.2.2	322		
	323		
8.11.3	37	10705	
	323		
8.12.2.2	86		67
	37	10301, 10302,	1
8.12.2.3	37	10301	
	351		
8.12.2.4	37	10400	
8.12.3	37	10301, 10302,	1
8.13.2	351		
8.13.2.1	4		7.3-4
	86		68
	351		
	19	DN2C3, 3.1.2	8

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	9		2-27
8.13.2.2	19	DN2C3, 3.1.2	8
	9		2-27
	15	11.10.8	225
	351		
8.13.2.3	15		3-19
	19	DN2C3, 1.4	3
	19	DN2C3, 1.5	3
	351		
8.13.2.4	351		
8.13.2.5	351		
8.13.2.7	351		
8.13.3.1	351		
8.13.3.2.1	1	3.4.2	3.4-1
	4	8.13.3.2	7.3-6
	5	5.6.1.3	252
	8		44
	9		2-109
	37	20402	3.4-1
	351		
8.13.3.2.2	1	3.4.3	3.4-1
	4	3.2.12	3.2-5
	5	5.6.1.6.2	255
	8	3	39
	250		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
8.13.3.3	4	3.2.7.2	3.2-35
	4	3.2.7.1	3.2-33
	9	1	2-77
	19	8	3.1.2
	37	20403	
8.13.3.4	4	3.2.10	3.2-42
	4	6.8.8	6.8-16
	37	10106	
	37	20401	
	37	20403	
	42	D-8	83
	199	7.2.1	16
	250		
	155	2.4.1	2-14
	155	2.4.2.1	2-14
	155	2.4.2.3	2-17

Appendix B
Paragraph References for Section 9

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.2.2.1.1	1	4.9.6	4.9-13
9.2.2.2.1	1		4.9-13
	2	5.8.2	166
9.2.2.2.2	37	40102	
9.2.2.2.3	37	40102	
9.2.2.2.4	195	6.8	11-13
9.2.3.1	1		4.9-6
9.2.3.2.1	1		4.9-9
9.2.3.2.2	2		24
	2	5.1.2.3.3	19
9.2.3.2.3	2	5.1.2.3	18, 19
	2	5.2.1.4.7, 5.2.26	
	2	5.1.2.1.1.1	17
	193	3.1.6.2	8
	1		4.9-6
9.2.3.2.4	2		17
	2	5.1.2.1.1.2	18
	2	5.2.1.4.8, 5.2.26	
	2	5.4.1.3.3	64
	19	2D6	1
9.2.3.2.5	2	5.1.2.1.1.4	18
	193	3.1.6.4	8
9.2.3.2.6	2	5.2.2.1.8	29
9.2.3.2.7	2	5.1.2.3.8	19
9.2.3.2.8	194	3.1.3.1	4
	2	5.4.1.2	63
	2	5.4.1.3.5	64
	2	5.1.3	19, 20
	2	5.1.1.1	17
9.2.3.2.9	2	5.1.4	21

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.2.3.2.10	2	5.1.1.3	17
9.2.4.2.1	37	40102	
9.2.4.2.2	193	3.1.9.1	41
	193	3.5.6	34
	2	5.2.1.4.1.2	26
	37	40102	
9.2.4.2.3	200	3.2.4.5	7
	37	40102	
	1	4.9.8	4.9-16
9.2.5.1.1	323		5102
9.2.5.1.2	322		81102104
	323		5, 7
9.2.5.2.1	37	21503	
	345	Sec 4 Pt 3	2.2.4.2
	345	Sec 4 Pt 3	2.2.4.3
	345	Sec 4 Pt 3	2.2.4.27
	345	Sec 4 Pt 3	2.7.2.8
	345	Sec 4 Pt 3	2.3.5.6
9.2.5.2.2	345	Sec 4 Pt 3	2.2.4.4
	345	Sec 4 Pt 3	2.3.3.18
	345	Sec 4 Pt 3	2.2.4.14
	345	Sec 4 Pt 3	2.3.1.5
	345	Sec 4 Pt 3	2.2.4.2
	345	Sec 4 Pt 3	2.2.4.3
	345	Sec 4 Pt 3	2.2.4.28
	345	Sec 4 Pt 3	2.7.2.8
	345	Sec 4 Pt 3	2.3.5.6
	345	3.2.X.1.6.5	
	345	3.2.X.1.6.3	
9.2.5.2.2	345	3.2.X.1.6.1	
	345	3.2.X.1.6.6	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
	37	10107, 10403, 2	
	37	21201, 20103, 3	
	37	2, 020, 121, 503	
9.3.2.1	2		71-110
9.3.2.2	279		8-6 to 8-9
9.3.3.1	2	5.4.1.1	63
	194	3.1.1	3
	1		4.9-1
	2	5.4.4	112
	2	5.4.5	116
9.3.3.2	1		4.9-8, 10
	194	3.1.11	8
	194	3.1.10.5	9
9.3.3.3.1	2	5.4.2.2	76
	194	3.2.1	9
9.3.3.3.2	2	5.4.2.1.3.3	75
	194	3.2.2	10
9.3.3.3.3	194	3.2.4.2	15
9.3.3.3.4	2	5.4.2.2.4	82
9.3.3.3.5	2	5.4.2.2.5	84
9.3.3.3.6	2	5.4.3.2.1	102
9.3.3.3.7	1	4.9.4.3.4	4.9-11, 12
	2	5.4.3.1.4.4	92
	194	3.3.3.2	20
9.3.3.3.8	2		88
	157		358
	194	3.3.1	15
9.3.3.3.9	2	5.4.3.1.2	87
9.3.3.3.10	2	5.4.3.2.8	110
9.3.3.3.11	2	5.4.3.1.6	95
9.3.3.3.12	2	5.4.3.1.8	99

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.3.3.3.13	194	3.3.2	18
9.3.3.3.14	2	5.4.3.1.7	97
9.3.3.3.15	2	5.4.3.1.5	95
9.3.3.3.16	2	5.4.3.1.9	101
9.3.3.3.17	2	5.4.2.1.2	72
9.3.3.4.1	279	1-Aug	8-1
	2		91
9.3.3.4.2	279	8-2.2	8-5
9.3.3.4.3	279	8-2.4	8-6
9.3.3.4.4	279	8-2.5	8-7
9.3.3.4.5	279	8-2.6	8-8
9.3.3.4.6	279	8-2.7	8-9
9.3.3.4.7	279	8-2.8	8-9
9.3.3.4.8	351		
9.3.3.5	2		58, 59
9.3.3.6	2		60, 61
9.3.4	1		C-9 to C-21

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.4.2.1	2		23
	193		3
9.4.2.3.1.1	2		23, 29
9.4.2.3.1.2	2		29
9.4.2.3.1.3	2		24
9.4.2.3.1.4	2		24
9.4.2.3.1.5	1		4.9-2
9.4.2.3.2	2		23, 24, 28
	193		7, 8, 17
9.4.2.3.3.1	2		29, 30
	193		8
9.4.2.3.3.2	2		45, 47
9.4.2.3.3.3	2		31
	193		19
9.4.2.3.3.4	2		
	2		
	193		11
9.4.2.3.3.5	193		15
9.4.2.3.3.6	1		
	2		
	193		31

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.4.2.3.3.7	193		14, 15
9.4.2.3.3.8	2		
9.4.2.3.3.-9	2		
	193		34, 35, 37
	193		38, 39, 40
	279		9-1, 9-2
	279		9-4, 9-5
9.4.2.3.3.10	2		44
	279		9-7
9.4.3.3.1	2		51
9.4.3.3.2	2		51
9.4.3.3.3	2		53, 54
9.4.3.3.4	193		28
9.4.4.3.1	326		18-20
9.4.4.3.2	326		15, 16, 21
	326		22-24
9.4.4.3.3	1		3.5-0
	2		23, 24
	37	40102	
	193		17, 22
	193		23, 25
9.4.4.3.4.1	2		54
	279		53
9.4.4.3.4.2	279		57, 58
9.4.4.3.4.3	279		56, 57

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
9.5.2	279		3-11, 4-2
	279		5-5
9.5.3.1.1	1	4.8.4	4.8-5
	37	10303	
9.5.3.1.2	1	4.8	4.8-1
	37	10303	
	195	6	2
	195	6.2	7
9.5.3.1.3	1	4.8.1	4.8-1
	195	6.1	3-4
9.5.3.1.4	195	6.7	10
9.5.3.1.5	195	7.0, 8.0	15
9.5.3.1.6	1	4.8.4.1	4.8-5
	195	6.1.5	6
9.5.3.1.7	1	4.8.4.4	4.8-8
9.5.3.1.8	1	4.8.4.2	4.8-6
9.5.3.1.9	1	4.8.4.3	4.8-7
9.5.3.1.10	1	4.8.4.6, 4.8.4.4.8-10	
9.5.3.1.11	1	4.8.4.5	4.8-10
	37	10303	
9.5.3.1.12	195	6.1.1	3
9.5.3.1.13	1	4.8.4.9	4.8-11
	195	6.1.3	6
9.5.3.1.14.1	1	4.8.2	4.8-2
	195	6.2.1	7
9.5.3.1.14.2	195	6.5	9
9.5.3.1.14.3	1	4.8.2	4.8-2
9.5.3.1.14.4	195	6.4	9
9.5.3.1.14.5	1	4.8.2	4.8-3
	195	6.1.4	6
9.5.3.1.14.6	2	5.5.5.14	121

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
	195	6.3	9
9.5.3.1.14.7	195	6.6.2	10
9.5.3.1.14.8	195	6.6.3	10
9.5.3.1.14.9	195	6.6	9
9.5.3.1.14.10	1	4.8.2	4.8-2
	195	6.6.1	10
9.5.3.2	2	5.15.3.3.1 -.6244	
	2	5.2.2.1.19	31
	1	4.8.3.2	4.8-4
	2	5.4.1.4.5.4	68
	193	3.1.10.2	11
	194	3.1.7.2-3.1.7.6	
	194	3.1.7.5.1	6
	195	6.8.2 - 6.8.4	13-14
9.6.2	2		244,245
	279		3-1, 3-2
9.6.3.1	2		239,240
	279		3-3
9.6.3.2.1	2		242,243
	2		244
9.6.3.2.2	2		243-244
9.6.3.2.3	279		3-13, 3-14
9.6.3.2.4	2		245246
	279		3-4
9.6.3.2.5	351		
9.6.3.3.1	2		247a, 247b
9.6.3.3.2	2		247e
	37	3, 030, 840, 209	
9.6.3.3.3	2		247b, 247c
	279		3-10
9.6.3.3.4	2		247b, 247e

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No.
	2		247f
9.6.3.3.5	2		247g, 247h
9.6.3.3.6	2		247f, 247g
9.6.3.3.7	2		247f, 247g
9.6.3.3.8	2		247d, 247e
9.6.3.3.9	2		247f, 247g

Appendix B
Paragraph References for Section 10

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.2.2	86		65
	156		43
	232		1
	316		49
10.2.3.1	21	DN6AI, 3n	2
	37	2, 100, 121, 003	
	107	7.2	7-2
	278	C.2.2.4.3	C-6
10.2.3.2	37	1, 010, 621, 002	
	107	7.2	7-2
	276	C.2.2.4.3	2-6
10.2.3.3	250		
10.2.3.4	37	21004	
	250		
10.2.3.5	37	21004	
	107	7.3	7-2
10.3.1	92		915
10.3.2	19	DN3Kl	1
	37	21001	
	92		915917
	92		920
	278	C.2.2.4.2.1, 2C-5, C-6	
	155	3.7.4	
	344	Chapt 9, 10	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	339		
10.3.3.1	19	DNK3	2
	92		915
	107	7.1	
	312		820
	313		894
	155	3.7.4	
10.3.3.2	250		
10.3.4	312		821822
10.4.3	37	1, 010, 620, 701	
	107	2.6.3	2-11
	351		
10.5.2	86		64, 65
	311	860932	202
10.5.3.1	11		14-14
	107	2.6.2.1	2-10
	311	860932	202
10.5.3.2	11		15-14
	11		14-29
	37	1, 090, 221, 101	
	37	2, 110, 321, 104	
	37	21105	
	19	DN3J4, DN3J3	15-14
10.5.3.3	11		14-15
	37	21103	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	131		50
10.5.3.4	37	21206	
	37	21302	
	107	2.6.2.1	2-10
10.6.2	2	5.2.6.6	46
	111		694
10.6.3	2	5.8.3.4.3	173
10.6.4	155	3.7.2.1	
10.7.2	37	20902 to 20904	
	37	20906	
	37	10106	
	107	2.6.1	2-10
	316		77-87
10.7.3	37	20902 to 20904	
	37	10106	
	37	30906	
	207	2.6.1	2-10
	316		77-87
10.8.2	37	20701	
	208		265-280
	320		
10.8.3.1	37	20701	
	208		256-280
10.8.3.2	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.8.4	343		
	341		
10.9.3	351		
10.9.3.1	366		
	320		
10.9.3.2.1	366		
	320		
10.9.3.2.2	366		
	20		
10.9.3.2.3	366		
	320		
10.9.3.2.4	366		
	320		
10.9.3.2.5	366		
	320		
10.9.3.2.6	366		
	320		
10.9.3.2.7	366		
	320		
10.9.3.3	366		
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.9.3.4.1	366		
	320		
10.9.3.4.2	366		
	320		
10.9.3.4.3	366		
	320		
10.9.3.4.4	366		
	320		
10.9.3.5.1	366		
	320		
10.9.3.5.2	366		
	320		
10.9.3.6.1	366		
	320		
10.9.3.6.2	366		
	320		
10.9.3.6.3	366		
	320		
10.9.3.6.4	366		
	320		
10.9.3.6.5	366		
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.9.3.6.6	366		
	320		
10.9.3.7.1	366		
	320		
10.9.3.7.2	366		
	320		
10.9.3.7.3	366		
	320		
10.9.3.7.4	366		
	320		
10.9.3.7.5	366		
	320		
10.9.3.8.1	366		
	320		
10.9.3.8.2	366		
	320		
10.9.3.8.3	366		
	320		
10.9.3.9.1	366		
	320		
10.9.3.9.2	366		
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.9.3.9.3	366		
	320		
10.9.3.9.4	366		
	320		
10.9.3.9.5	366		
	320		
10.9.3.10.1	366		
	320		
10.9.3.10.2	366		
	320		
10.9.3.10.3	366		
	320		
10.9.3.11.1	366		
	320		
10.9.3.11.2	366		
	320		
10.9.3.12.1	366		
	320		
10.9.3.12.2	366		
	320		
10.9.3.13	366		
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
10.9.3.13.1	366		
	320		
10.9.3.13.2	366		
	320		
10.9.3.14	366		
	320		
10.10.2	107	6.4	6-3, 6-4
	37	21505	
	37	10106	
10.10.3	107	6.4	6-3, 6-4
	37	21205	
	37	10106	
10.11.2	58	-	123-125
	37	10903	
	37	21301 to 21308	
	137		6-3 to -22
	108	c.4	95
10.11.3	155	3.7.2.4	3-150
	37	10903	
	37	21301 to 21308	
	42	DG-HMS-112	95
	107	8.1.4	8-3
10.12.1	160	1.4	3
10.12.2	37	10901	
	37	10905	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	37	21401	
	108		136-138
	111		428-429
10.12.3	8		123-125
	37	10901	
	37	10905	
	37	21401	
	42	DG-OPS-132	96
	108		136-138
			428-429

Appendix B
Paragraph References for Section 11

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.2.2	1	4.7	4.7-1
	114	2.6.2	25
	100	-	4-50
	320		
11.2.2.1	89	2.9	92
	111	-	657
	320		
11.2.2.2	100	4.2.17	4-40
11.2.3	1	4.7	4.7-1
	155	4.3	4-31
11.2.3.1.1	1	4.7	4.7-1
	111	-	658
11.2.3.1.2	1	4.7	4.7-1
	89	2.9	92
	37	30501-04	
	37	30502-01	
	37	30502-05	
	155	4.3	4-31
11.2.3.1.3	155	4.3	4-31
	1	4.7.1	4.7-2
	89	2.9	92
	320		
11.2.3.2	155	4.3	4-31
	5	5.8.10.1	381

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.2.3.3	1	4.7	4.7-1
	89	2.9	92
	155	4.3	4-31
	320		
11.2.3.4	37	30503-01 thru -281	
	108		
	37	30504-61 &-65	
	37	30505-01	
	155	4.3	4-31
	1	4.7.3	4.7-2
	89	2.9	92
	320		
11.2.3.5	37	30504-04	
	37	30505-01	
	5	5.8.10.4	381
	108	-	281
	320		
11.2.3.6	253	5.3.5	5-4 to 5
	253	2.7	2-10
11.2.3.7	155	4.7	4.7-1
	320		
11.2.4	150		3-33-10
11.2.4.1	150		3-33-10
	150		3-23-15
	150		3-23-14
	150		3-23-16

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	150		3-23-18
11.2.4.2	150	3.22.3	3.22-2
11.3.2	15	16.2.5	276
11.3.3.1	2	5.9.14.10	
	5	5.8.4.3.1	357
	5	5.8.4.3.4	359
	5	5.8.4.3.5	359
	5	5.8.4.3.6	350
	15	16.2.3	275
	15	16.2.5.1	276
	37	10603-02	
	155	4.2.2.3	4-15
	350		
11.3.3.2	15	16.2.5.1	276
11.3.3.3	15	16.2.3	275
	15	16.2.4	275
	15	16.2.5	276
11.3.3.4	2	5.9.2.1	180
	2	5.9.2.2	180
	2	5.9.2.3	180
	37	30303-04	
11.4.2	1	4.6	4.6-1
	155	3.2.8	3-76
	277	G-4	4-4
11.4.3	277	G-4	4-4

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	277	G-5	4-5
	320		
11.4.4	1	4.6	4-6
	155	3.2.8	3-76
11.5.3.1	2	5.9.12.1	198
	2	5.9.12.6	198
	2	5.9.12.11	198
	2	5.9.12.3	198
	155	4.2.2.3	4-15
	155	4.2.2	4-15
	155	4.2.2.1	4-14
	320		
11.5.3.2	1	4.8.4.2	4.8-6
	2	5.9.12.4	198
	2	5.9.12.5	198
	155	4.2.2.1	4-14
11.5.4	1	4.8.4.1	4.8-6
11.6.2	320		
11.6.3.1	2	5.9.11.5.1	196
	1	3.3.3.1	3.3-4
11.6.3.3	2	5.9.11.5.3	196
11.7.1	107	3.1	3-1
11.7.2.2	37		

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.7.2.3.1	1	4.2	4.2-1
	37	21501-03	
	37	21505-01	
	37	21501-01	
	37	21502-02	
	37	21502-07	
11.7.2.3.2.1	1	4.2	4.22
	1	4.2	4.2-1
	37	21501-02	
	37	21501-07	
	155	4.2.1.1	4.11
	37	21501-08	
	37	21501-09	
	37	21501-13	
	37	4.2	4.2-2
	351		
11.7.2.3.2.2	37	21501-08	
	37	21501-09	
	37	21501-13	
	1	4.2	4.2-2
	320		
11.7.2.3.2.3	37	4.2.3	4.2-3
	37	21501-05	
	37	21501-10	
	155	4.2.1.1	4-11
11.7.2.3.2.4	37	4.2.1	4.2-2
	19	Table 11.2-2	87
	100	3.2.4.3	7
	155	4.2.1.1	4.11

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	155	3.2.1	3-14
11.7.2.3.3.1	100	3.4.2.3	11
	100	3.4.2.4	11
	100	3.3.2.5	9
	100	3.3.2.3	9
	100	3.4.2.1.1	10
	100	3.3.2.4.1	9
11.7.2.3.3.2	100	3.3.2.2	9
	100	3.4.2.2	11
	100	3.1.4.11.1	6
	258	25.561	280
11.7.2.3.4	37	21504-02	
	37	21504-03	
	37	21504-04	
	37	21504-06	
	37	21504-GEN	
	150	Fig. 3.18-21	3.18-26
	37	21504-05	
	150	3.18.3	3.18-6
	155	3.7.1.1	3-139
	150	3.18.3	3.18-10
11.7.3.1	89	2.5	89
11.7.3.2	125	Summary	1
11.7.3.3	89	2.5	88
	6	4.2.6.2.7	149
	155	4.2.3	4-18
	155	4.1.6	4-5

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	155	4.1.6	4-6
	155	3.2.2.1	3-19, 21-24
	155	4.2.3	4-17
	156	E-6	32
11.7.3.4	150	3.4.1	3.4-2
	155	-	4-6
	132	-	45
	125	-	13, 14, 17
	125	-	27-33
	125	-	38, 39
	155	3.2.2	
11.8.2.1	1	4.1	4.1-1
	155	3.2.4	
11.8.2.2.1	1	4.1.3	4.1-2
11.8.2.2.2	1	4.1.4	4.1-3
11.8.2.2.3	1	4.1.4	4.1-2
11.8.2.2.4	1	4.1.2	4.1-2
11.8.2.2.5	1	4.1.5	4.1-3
11.8.2.2.6	1	4.1.1	4.1-1
	37	21505-03	
	37	21506-03	
11.8.3.2	1	3.3	3.3-3 to 4
	253	7.8	7-3

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.8.3.3	1	4.1.3	4.1-2
11.9.2	1	1.4.4	4.4-1
	4	6.9.6	6.9-8
	5	5.5.8.9	377-381
	8	-	155-156
	15	16.11	297-302
	19	2G3	2.1.2
	111	-	644-656
11.9.2	155	3.2.2.2	3-30/45
	155	3.3.3.1	3-81/82
	155	4.2.2.6	4-17
	253	2.5	2-8 -9
	320		
11.9.3.1	1	4.4	4.4-1
	1	4.4.6	4.4-5/6
	2	5.9.10.1	186
	2	5.9.10.3	186
	2	5.9.10.4	186
	2	5.9.10.5.3	187
	2	5.9.10.6	187
	4	6.9.6	6.9-8
	5	5.8.9.1	377
	5	5.8.9.2	3.79
	5	5.8.9.3	379-380
	5	5.8.9.4	380
	5	5.8.9.5	380-381
	6	4.2.5.1	146
	8	-	151-152
	15	16.11	297-302

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	111	-	644
	155	3.2.2.2	3-30
	253	2.5	2-8
	253	2.5.2	2-9
	320		
11.9.3.2	1	4.4	4.4-1/2
	1	4.4.6	4.4-6
	2	5.9.10.7	187
	5	5.8.9.2	378
	5	5.8.9.3	379-380
	6	4.2.5.1	146
	8	-	152, 153&55
	19	2G3	2.1.2
11.9.3.3	2	5.9.10.1	185-186
	2	5.9.10.5.2	156-187
	2	5.9.10.7	107
	2	5.9.10.8	187
	5	5.8.9.1	378
	5	5.8.9.2	378
	5	5.8.9.3	379
	8	-	154
	19	2G3	2.1.2
11.9.3.3	320		
11.9.3.4	1	4.4	4.4-1
	1	4.4.6	4.4-6
	155	3.2.2.2	3-30
	155	3.2.2.3	3-44/45
11.9.4	155	3.2.2.2	3-31ff

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.10.1	4	6.9.7	6.9-9
11.10.2	4	6.9.7	6.9-9
	8	2	138
	320		
11.10.3	320		
11.10.3.1	1	3.6.2.2	3.6-5
	1	3.6.2.1	3.6-3
	2	5.9.14.1	199
	5	5.8.14.1	387
11.10.3.2	2	5.9.14.1	199
	19	Ch. 2, Section 90	
	90	Standard #1	
	320		
	5	5.8.14.9-10	389
	8	2.3, 2.4	142
	5	5.8.14.7	388
	42	DG-EPD-091	93
	90	Std. #85 Rev A	
11.10.3.3	320		
11.10.3.5	15	-	290
	2	5.9.14.2	199
	1	4.8.4.1	4.8-6
	2	5.9.14.4-6	200
	5	5.8.14.4-6	388
	8	4	138
	8	3a-3c	143

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	8	14, 14a-b	141
	1	Fig. 4.8-1	4.8-6
	15	Fig. 5	21
	320		
11.10.3.6	5	5.8.14.2	387
	2	5.9.14.8	200
	1	Fig.3.5-6, 3.63.6-5	
	320		
11.10.4	15	Fig. 5	21
	19	Ch. 2, Sect. 2G9	
11.11.2.1	178	4.1	74-89
11.11.2.2	178	4.8	87-88
	320		
11.11.2.3	178	5.1.1.1	90
	178	5.1.1.2	93
	178	5.1.1.3	93
	277	11.11.3	4-28
11.11.2.4	37	10706-02	
	178	5.2	100-102
	178	5.2.3	102-104
11.11.3.1	1	4.5	4.5-1
	9	2	2-79
	37	10701-01	
	37	10702-02	
	37	10702-03b	
	37	10702-03c	

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	178	4.1	74-77
	178	4.1.1	77
	178	4.1.2.2	80
	178	4.3	82-63
	178	4.5	85-86
	178	4.6	86
	178	5.1.6	98
	198	4.5.5.2	22
	198	4.5.5.3	22
	198	4.5.5.3b	22
	198	4.5.5.4	23
	320		
	351		
	320		
	325		
11.11.3.2	1	4.5	4.5-1
	1	4.5.3	4.5-3
	9	11	2-78
	178	4.1.2.1	79
	178	4.8	89
	178	4.1.2.2	80
	320		
11.11.3.3	1	4.5	4.5-1
	1	4.5.1	4.5-3
	7	10703-04	
	178	5.1.1.3	93
	178	3.4.2.2	51
	178	5.1.5	96
	320		

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
11.11.3.4	1	4.5	4.5-3
	37	10703-05	
	37	10706-01	
	37	10706-02	
	42	DG-IFH-058	
	320		
11.11.4	178	all	
	155		
11.12.2	11		14-14
	146	2.2.3	5
	146	4.2.2	35
	320		
11.12.3	11		14-14/15
	19	3J2	10
	37	21103-01, 02, 03,	
	37	21407-01, -02, -03	
	42	App. D	94-95
	111		253
11.13.1.2.1	351		
11.13.1.3.1	5	5.7.2.1	315316
	37	21901-01, -02,	
		-05, -11, -12	
	107	6	6-1
	119	-	55
	139	5	
11.13.1.3.1	261	1.9.2	279
	261	1.15	363

References to Appendix A

Paragraph No.	Document Reference Id	Document Paragraph No.	Document Page No
	261	1.15.2	371
11.13.1.3.2	119	-	55
	139	6.5	6-6
	261	1.15	363
	320		
11.13.1.4	150	3.13	
11.13.2.2	150	3.13.3	3.13-30
	261	2.4	499
	261	1.9.2	279
11.13.2.4	150	3.13.2	3.13-20
11.14.2	19	Chap 2, Sect 2G, P8	
	249		H-43
11.14.3	19	Chap 2, Sect 2G, P8&9	
	320		
11.14.4	249		H-43
	218		K-6

Appendix B
Paragraph References for Section 12

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
12.1	1	3.6.2	3.6.2
	5	5.8.1	355
	8	1	126
12.2	155	3.3	3-77to3-80
12.3.1.1	37	10106.01	
	37	10402-01, -02	
	37	30308-01	
	42	DG-MSE-210	102
	238		12, 13, 27
	238		27, 33, 35
	238		36, 39, 40
	238		46, 47
12.3.1.2	1	3.6.2.2	3.6-3 to-5
	2	5.9.4. 1 thru .6181	
	2	5.9.9.4.1	183
	2	5.9.13.5	199
	2	5.9.17.2.2	201-202
	8		129131
	8		135
	19	4.1 & 4.3	DN2G310&11
	37	30301-05, -09, -l	
	37	30301-13, -16, -1201-202	
	42	DG-IFM-075	92
	78	Figs i, l, m, n, o,	3-25to3-35
	155	3.3.3.1	3-83
12.3.1.3	1	3.6.2.2	3.6-5 &-6
	2	5.9.9.1	183

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	2	5.9.9.5	186
	19	4.2 & 4.4	DN2G3-11
	37	30301-15	
	155	3.3.3.1	3-83
12.3.1.4	1	3.6.2.1	3.6-3
	1	3.6.2.2	3.6-5
	2	5.9.1.3	176
	2	5.9.4.1	181
	2	5.9.4.6	181
	4	6.9.3	6.9-2
	15	16.19c	325
	19	2.3	DN2G4-2
	37	10605-02	
	37	30303-15	
	37	30705-07, -08, -l	
	42	DG-IFM 078	92
	155	3.3.3.1	3-83
12.3.2.1	2	5.9.1.6	179
	2	5.9.17.1.1	201
	2	5.9.17.2.1	201
	6	7.2 ai	232
	37	21803-02	
	37	21807-01	
	37	30301-18	
	37	30304-01, -ll	
	37	30304-09	
	238		32, 35, 42
12.3.2.2	2	5.9.13.4	199
	2	5.9.14.9	200

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	2	5.9.15	201
	4	6.9.2	6.9-2
	5	5.8.15.1 a & f	389
	15	16.22	333 & 336
	37	30304-08	
	40	3.4.6.1	52
12.3.3	19	DH 2G7-2a thru 1	
	235	3.2.1.4	
	235	3.3.1.1	3-6, 3-7
	238		15-17

Appendix B
Paragraph References for Section 13

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
13.2.2	107	8.1.1	8-1
	107	8.3.2	8-5
	108	F.3	86-87
	108	H. 1	96
	131	-	49
	156	Feb-35	37
	158	1.2	1-1
	158	2.2.3	2-10/11/12
	158	3.1.1	3-1
	158	3.1.2	3-2
	158	3.1.3	3-2
13.2.3.1	37	21201-01,-02,-0	
	37	21201-09,-10	
	37	21107-02	
	37	21202-05	
	42	App.D, DG-HMS-0	
	42	App.D, DG-INT-0	
	42	App.D, DG-FSE-0	
	90	Std. 10, No. 1,2,	
	107	8	8-2
	107	8.1.1	8-1
	107	8.1.2	8-2
	107	8.1.3	8-2
	114	2.2.10	19
	158	2.2.5	2-12
	158	2.2.6	2-13
13.2.3.2	37	21201-07	
	37	21202-03,-04,-0	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
	37	21202-09	
	37	21107-01,-02	
	107	8.2.1	8-4
	108	F.3	85
	138	8.1	8-1
	150	3.22.3	3.22-2
	158	2.2.6	2-13
	232	4	22
13.2.3.3	37	21202-06	
	107	8.2.2	8-4
	108	F.2	84-85
	158	3.1.6	3-7 -8
	320		
13.2.3.4	108	H	86
	107	8.1.3	8-2
	155	3.7.9	3-201
	156	Feb-35	37
	158	3.1.3	3-2
	158	3.1.4	3-3
13.2.4	150	3.22.3	3.22-2
13.3.2	156	C-1	78
	156	K/MMC-1	105
	160	5.4	23
	159	Table 1	13-20
	160	5.2	21
	159	3.2.3	5.7
	320		

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
13.3.3.1	160	5.1	20
	37	21402-01,-02,-0	
	156	C-1	78
	156	K/MMC-1	105
	159	3.4	12
13.3.3.2	159	3.4	11-12
	160	5.4	23
	320		
13.4.2	150	3.2.1	3.2-1
	156	22-Jan	15
	228	A	
	231	all	
	235	3	
13.4.3.1	1	3.6.1	3.6-1
	155	3.8.2	3-202,-203
	155	3.8.3	3-203
	238		15-17
	320		
	351		
13.4.3.2	1	3.6.1	3.6-1,-2
	150	3.2.1	3.2-13
	155	3.8.3	3-203,-204
13.4.3.3	1	3.6.1	3.6-2
	37	10904-01	
	37	10904-O2	
	37	10904-03	
	37	10904-04	

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No	Document Page No
	37	40201-07	
	37	40201-09	
	37	40201-10	
	150	3.1	3.10-1
	150	3.8.3	3-205
	156	A.2, A.3	
	230		
	231	3.2.1.3	6
	231	3.2.3	7
		3.2.2.4	7
13.4.4	150	3.2	3.2-1

Appendix B
Paragraph References for Section 14

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
14.1.2	100	5.1	21
	100	5.4.2.1	26
	100	1.3	5-6
	259		2-34
	107	10.5	10-14
14.1.2.1.1	100	1.1	3 to 4
	266	2-Mar	3-3
	79	Table 1-1	1-9
14.1.2.1.3	79	Table 1-1	1-9
	100	5.3	26
14.1.2.1.4	37	30701-01	
	79	2.2	2-21 to 36
14.1.3	155	4.1.7	4-6
	100	2.3	81
	253	7	7-1 to 7-3
14.1.4	90	No. 130	
14.2.2.4	155	4.1.4	4-4
14.2.2.5	253	5.4.14	5-7
	263	4.2.3	4-7
14.2.2.6	260	3.4.2.1.7	116
14.2.2.7	260	Fig 3.5.2.3-15	248-251
	264	11.12	2
14.2.2.9	262		46
14.2.2.10	E. Normand	BAC	773-9951
14.2.2.11	155	4.1.5	4-5
	263	7.5.1	7-17
14.2.3.6	264	11.1.2	2
14.2.3.7	37	50601	
	260	Fig 3.5.7.3-15	239
	143		915

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	264		2
14.2.3.8	261	2.2.6	469
	264	11.1.6	3
14.2.3.9	262		46
14.2.3.10	E. Normand	BAC	773-9951
14.2.3.11	1	4.4.5	4.4-5
	263	7.5.1	7-16
14.2.4.1	262		56
14.2.4.2	262		56
14.2.4.3	265		3
14.2.4.4	100	5.1.4	21
	265		9
14.3.1	16		II-18
14.3.2	100	5.3	22
	16		III-18
14.3.2.1	107	3-Jun	
	263	10	10-1
14.3.2.1.1	263	7.5	7-13 -18
	100	2.8	91
	100	5.3.1	25
14.3.2.1.2	200	3.2.4.1.1	7
	100	2.5	86
14.3.2.1.3	253	5.2.5	5-1
	262		46
	263	6.6	6-11
	263	10	10-1
14.3.2.2	263	3.4	3-19
14.3.2.3	100	5.3	22

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
14.3.2.4	253	5.2.4	5-1
	1	2.2	
14.3.2.5	253	5.3	5-3 -5
	89		90
	263	4.2.2	4-5
14.3.2.6	89	4.3.4	4-53
	263	Table III	4-9
	1	4.1.3.3	4-3
14.4.2.2	253	5.3,5.4	5-4-5-12
14.4.2.3	1	5.2	
	1	5.3	
	1	5.4	
	1	*5.5*	
14.4.2.4	1	3.4	3.4-1 to 2
14.4.2.5	100		86
14.4.3.2	1	5.2 to 5.5	
	263		4-4
	2	5.1 to 5.5	
14.4.3.3	37	20401 to 20404	
	1	3.4	3.4-1 to 2
	253	5.7.1.8 to 5.7.5-13	
	1	4.9.1.2	4.9-13
14.4.3.4	1	4.2	4.2-1 to 5
	253	5.5.2	5-10

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	253	5.5.4.3	5-11
	200	3.3	9
14.4.3.5	100		9
	100	2.5	86-88
	200	3.3.2	9-10
14.4.4.1	100	2.6	90
	145		E-11
	145		F-1
14.4.4.2	145		P-25
	145		P-26
	145		W-1
14.5.2	100		26
	79		2-13,2-15
14.5.2.1	1	3.3	3.3-1 to 2
14.5.2.2	1	4.1	4.1-1 to 3
14.5.2.4	100	3.1	11
	1	3.2.2.4	3.2-5
14.5.2.5	1	3.2.2.2	3.2-3
	1	3.2.2.3	3.2-5
14.5.2.6	100	5.3.2	25
	1	3.3.4	3.3-4
	79		2-13,2-15
14.5.3.1	1	3.3	3.3-1 to 2

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
	79	2.8	B-7
	199	8.5.1	20
	1	4.1.1	4.1-1 to 3
14.5.3.2	1	4.1	4.1-1 to 3
	200	3.1.4.8	5
	100		80
14.5.3.3	100	2.5	86
	253	5.5.4.3	5-11
14.5.3.4	1	3.2.2.4	3.2-5
	155	3.2.6.1	3-65
14.5.3.5	ESSEX DATA		
	1	3.2.2.2	3.2-3
	1	3.2.2.3	3.2-5
14.5.3.6	1	3.3	3.3-3 to 4
	253	7.8	7-3
14.6.2.2	253	2.7.4.5	2-10
14.6.2.3	37	30501-2	
	1	3.6	3.6-4
14.6.2.4.1	145		3-9 to 10
14.6.2.4.2	145		P-35
14.6.3.2	1	4.4	4.4-1 to 6
	253		5-11 to 12
14.6.3.3	1	4.4.3	4.4-2

References to Appendix A

Paragraph No.	Document Reference Id.	Document Paragraph No.	Document Page No
14.6.4.2	253	5.3-5.4	5-4-5-12
14.6.4.3	253	2.5-2.10	5-5-5-6
14.7.2	253	6.2	6-1 to -2
14.7.3	253	6.4	6-2
14.7.4.1	145		M-3
14.7.4.2	79	2.2	2-29
	100	3.2	12
	262		10-32
14.7.4.3	145		M-1
	100	4.3	18

Appendix C
Glossary

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

USER'S GUIDE

This appendix contains a listing of the terms used in the text and figures of Volume I. Scroll down through the list or use the alphabetical links below to go directly to the section where your word is located.

Numerical

5th Percentile Japanese Female

Females falling at the 5th percentile based on the size of the Japanese female population. This is the smallest human size considered for design purposes.

95th Percentile Caucasian Male

Males falling at the 95th percentile based on the size of the Caucasian male population. This is the largest size considered for design purposes.

A

Abduction

The movement of a body segment away from the midline of the body or body part to which it is attached.

Acceleration

The rate of change of velocity with respect to time.

Acidosis

Reduction of alkali reserve due to excess of acid metabolites.

Actuation force

The force required to operate a mechanical device such as a tool, access door, or fastener.

Acute $C0_2$ Toxicity

Condition of exposure to high-level concentrations of carbon dioxide; associated physiological response.

Adaptive Response

Change in structure, form, or behavior of an organism to suit a new environment.

Adduction

The movement of a body segment or segment combination toward the midline of the body or body part to which it is attached.

Aerobic Power

Aerobic power is the total amount of power an individual generates. It is related to useable power output by an efficiency factor which varies with the task and the individual.

Alveolar Pressure

Gas pressure existing within alveoli.

Alveoli

The air-containing cells of the lungs.

Anatomical Position

A baseline posture for measuring joint motion range. The posture is standing upright, head facing forward, arms hanging down with the palms facing forward.

Annoyance

The sense of being troubled, irritated, or disturbed by unwanted noise.

Anoxia

Hypoxia especially of such severity as to result in permanent damage.

Anthropometry

Anthropometry is the application of scientific physical measurement methods to human subjects for the development of engineering design standards and specific requirements and for evaluation of engineering drawings, mock-ups, and manufactured products for the purpose of assuring suitability of these products for the intended user population.

Anxiety

Nervous or fear reaction to perception of danger.

Astigmatism

A defect of an optical system in consequence of which rays from a point fail to meet in a focal point resulting in a blurred and imperfect image.

Atelactasis

Collapsed or airless state of all or part of the lung.

Atmosphere

1. The mixture of gasses surrounding the Earth or filling the habitable volume of a spacecraft.

2. The pressure exerted by a column of mercury 760 mm high at 1 G, equal to 101.329 kilopascals.

B

Beats

A periodic sound resulting from the interaction of two or more sounds of different frequencies.

Bends

See Decompression Sickness.

Binary Number System

A base 2 number system using only 1's and 0's. Well suited for electronic logic where the 1's and 0's can be represented by signal present and signal absent.

Binaural

Of, relating to, or involving both ears.

Biomechanics

Biomechanics is the interdisciplinary science (comprising mainly anthropometry, mechanics, physiology, and engineering) of the mechanical structure and behavior of biological materials. It concerns primarily the dimensions, composition, and mass properties of body segments; the joints linking the body segments together; the mobility in the joints; the mechanical reactions of the body to force fields, vibrations, and impacts; the voluntary actions of the body in bringing about controlled movements, in applying forces, torques, energy and power to external objects like controls, tools, and other equipment.

Bit-Mapped Graphics

The data that defines the pixel color which is behind the screen pixel.

Blackout

See Graying of Vision.

Body Envelope

The volume envelope which just encloses the body and body motions during an activity.

Bolus

Used in this document to designate mass of fecal discharge.

Bremsstrahlung

1. Gamma radiation emitted by an electron when it is deflected by the Coulomb field of an atomic nucleus of charge Z; the fraction of energy radiated as photons by an electron of initial energy E (Mev) is approximated numerically by ZE/1000.

2. The electromagnetic radiation produced by the sudden retardation of a charged particle in an intense electric field (as of an atomic nucleus); *also* **:** the process that produces such radiation.

Brightness

The amount of light emitted or reflected from a surface.

Brightness Ratio

The ratio of the luminance of two areas or surfaces.

British Thermal Unit (Btu)

The amount of heat required to raise 1 lb of water 60 degrees F, 1 degree F.

C

Cabinet

A structural housing into which drawers and shelves are installed. Generally, there is no utility connections between the cabinet and the items installed within it. See Housing.

Carcinogenesis

Origin or production of cancer

Cardiac Arrhythmias

Periodic irregular heartbeat; an alteration in rhythm of the heartbeat either in time or force.

Cardiovascular System

Pertaining to the heart and blood vessels.

Cartwheeling

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the x-axis. (Refer to Figure 5.3.1-1).

Cataractogenesis

The formation of cataracts.

Central Acuity

Center part of the visual field.

Cerebral Hemodynamic Effects

Relating to or functioning in the mechanics of blood circulation in the brain.

Chassis Leakage Currents

Currents generated by such internal sources as filter capacitors terminated to accessible parts or ground, and capacitive and inductive coupling to accessible parts or ground. These currents can be conveyed form accessible parts and subsequently applied to a crew member.

Chokes

Syndrome of chest pain, cough, and respiratory distress.

Chronic CO_2Toxicity

Condition of exposure to long-term, low-level excess concentrations of carbon dioxide, associated physiological response.

Circadian Rhythms

Bodily functions rhythmically fluctuating with time. These functions include heart rate, blood pressure, body temperature, and respiratory volume. Generally, these metabolic functions slow for a period of time once during a 24 hour period. The most important activity geared to circadian rhythms is sleep.

CO_2Withdrawal

Symptoms arising from cessation of exposure to excess CO_2.

Color Saturation

Saturation is the extent to which an object has more or less color. Saturation is, therefore, relative colorfulness.

Coma

A state of profound unconsciousness caused by disease, injury, or poison.

Command Language (command set)

A set of terms, each with a precise function, used to control the operations of a computer.

Conjunctiva

The mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball.

Contaminants

Unwanted material or bacteria.

Continuous Noise

A noise with negligibly small fluctuations of level within the period of observation

Contrast

The difference between the luminance of an object or figure $C = [(Lc + Lr) - (Ld + Lr)] / (Lc + Ld + 2Lr)$

and its immediate background.

C = Contrast

Lc = Object luminance

Ld = Background luminance

Lr = Reflected luminance

Control

A manually operated hardware item used to operate or change the performance of a machine or system.

Core-Shell Concept

Concept of representing a human as a heat-producing core surrounded by a shell (skin) through which heat exchange with the environment takes place.

Coronary Occlusion

Occlusion of a branch of the arterial system that supplies blood to the heart muscle.

Coulomb Friction

Sliding or kinetic Friction.

Crew Station

Any location where a task or activity is performed. There are two basic types of crew stations: workstation and activity center.

Critical Flicker Fusion Frequency

The frequency at which a flashing light will appear as a steady state light - approximately 65 Hz.

Cyanosis

A bluish or purplish discoloration (as of skin) due to deficient oxygenation of the blood.

D

Dark Adaptation

Dark adaptation is the state of being adapted (sensitive) to low levels of ambient luminance (brightness). At any one time the visual system operates well within only a limited range of luminance levels. This range is centered about a particular adaptation level that is determined by the prevailing luminance. As the prevailing luminance changes the adaptation level will also change. The adaptation level shifts more quickly to higher than lower luminance levels.

Dead-Faced

An electrically conductive surface incapable of supplying sufficient energy under normal conditions to present a hazard (e.g., the output of a solid-state switch when in the "STANDBY" state).

Decompression Sickness

A sometimes fatal disorder that is marked by neuralgic pains and paralysis, distress in breathing, and often collapse and that is caused by the release of gas bubbles (as of nitrogen) in tissue upon too rapid decrease in air pressure after a stay in a compressed atmosphere; called also *caisson disease, the bends*.

Default Values

A value or option automatically provided by the computer system for use in processing when no alternative has been specified by the operator.

Delirium

A condition of mental confusion, often with hallucinations.

Denitrogenation

The act of reducing dissolved nitrogen concentration in tissues, usually by breathing mixture devoid of nitrogen.

Dependent Elbow

The elbow being engorged with blood during acceleration.

Design Eye Volume

That volume of space in front of a workstation within which a user's head and eyes should be located to guarantee visual access to all display information. The design of displays and display layout may be guided by a specified design eye volume.

Desquamation

To peel off in scales.

Diluent Gas

Physiologically inert component of an atmosphere, purpose of which is to reduce oxygen partial pressure.

Direct Contact

The personal contact of a crewmember to electrically powered surfaces.

Direct Glare

Glare produced by a light source located within a person's field-of-view.

Display

Hardware item used to present system information needed by the operator to make decisions for controlling the system.

Door

Used in Section 8.0, Architecture, to denote a full opening body passageway. A door opening is closed with a door cover. A door cannot be sealed against a differential pressure.

Double Insulated Enclosure/Chassis

An enclosure/chassis which incorporates an insulation system comprised of basic insulation and supplementary insulation with the two insulations physically separated and so arranged that they are not subject to the same deteriorating influences (e.g., temperature, contaminants, and the like) to the same degree.

Drawer

A hardware element designed to slide in and out of a cabinet, rack, or housing. See Equipment drawer.

Dry Bulb Temperature

Air temperature measured by a common thermometer.

Dysbarism

Condition arising from differential pressures between gas pockets in body and ambient. In this document, considered to indicate greater pressure within body cavities.

Dysentery

A disease characterized by severe diarrhea with passage of mucus and blood and usually caused by infection.

Dyskinesia

Impairment of voluntary movements resulting in fragmented or jerky motions (as in Parkinson's disease).

Dysmetria

Dysmetria is lack of coordination of movement typified by under- or over-shooting the intended position with the hand, arm or leg. Dysmetria of a hand can make writing and picking things up difficult or even impossible. Dysmetria that involves undershooting is called hypometria and overshooting is called hypermetria.

Dyspnea

Difficult or labored respiration.

E

Ear Clearing

Act of equalizing pressure between inner ear and ambient.

Ebullism

Vaporization of body fluids at body temperature and low barometric pressure.

Edema

An abnormal infiltration and excess accumulation of serous fluid in connective tissue or in a serous cavity (for example, Edematous Eyelids).

Edematous Eyelids

Excessive accumulation of fluid in eyelids due to the disturbances of fluid exchange.

Effective Temperature

Empirical sensory index accounting for temperature, humidity and air movement.

Electrical Shock

Sudden stimulation of the nerves and convulsive constriction of the muscles caused by the discharge of electricity through the body.

Embolus

An abnormal particle such as an air bubble circulating in the blood. Compare to Thrombus.

Embolism

Occlusion of a blood vessel. In the case of gas embolism, by a bubble of gas.

Emphysema

A condition characterized by air-filled expansions of body tissues; *specifically* **:** a condition of the lung marked by abnormal dilation of its air spaces and distension of its walls and frequently by impairment of heart action. See Mediastinal Emphysema.

Enclosure/Chassis

The outer casing of an electrical/electronic device.

Enhancement Coding

Any of a variety of techniques used to enhance, or increase the salience of selected items of information (e.g., color coding. It is well suited for interactive computer applications.

Environmental Control

Control of ambient conditions to produce habitable environments.

Equipment Drawer

A drawer used to house subsystem components. The installed components are generally attached to the drawer using fasteners which require tools for attachment/detachment. It has utility connections to its housing's utility distribution system.

Erythema

Abnormal redness of the skin due to capillary congestion.

EVA (Extravehicular Activity)

Activities performed by a space-suited crewmember in an unpressurized or space environment.

EVA Restraint

A means of stabilizing the EVA crewmember which requires physical ingress and egress by the crewmember.

EVA Workstation

Any area at which an EVA task is performed.

Exchange Rate

The increase in sound level (dBA) for which permissible exposure time is halved.

Exposure Limit

Maximum safe acceleration exposure limit as a function of vibration frequency and exposure time.

Extension

Straightening or increasing the angle between the parts of the body.

Extravasation

To pass by infiltration or effusion from a proper vessel or channel (as a blood vessel) into surrounding tissue.

Extravehicular Mobility Unit

An independent anthropometric space suit system that provides crewmembers with environmental protection, life support, mobility, communications, and visibility while performing various EVAs.

Eyeballs Down

Vernacular descriptive of inertial resultant of human body to linear acceleration in the upward + Gz vector. (Refer to Figure 5.3.1-1).

Eyeballs In

Vernacular descriptive of inertial resultant of human body to linear acceleration in the forward -Gx vector. (Refer to Figure 5.3.1-1).

Eyeballs Left

Vernacular descriptive of inertial resultant of human body to linear acceleration in the left yaw +Gy vector. (Refer to Figure 5.3.1-1).

Eyeballs Out

Vernacular descriptive of inertial resultant of human body to linear acceleration in the backward +Gx vector. (Refer to Figure 5.3.1-1).

Eyeballs Right

Vernacular descriptive of inertial resultant of human body to linear acceleration in the right yaw -Gy vector. (Refer to Figure 5.3.1-1).

Eyeballs Up

Vernacular descriptive of inertial resultant of human body to linear acceleration in the downward -Gz vector. (Refer to Figure 5.3.1-1).

F

Facility

Equipment or equipment and the area dedicated to a specific crew activity. Similar to the term "Center," but "Facility" can refer to only equipment without specifying an area of use. Examples: Shaving Facilities, Recreation Facility.

Fatigue Decreased Proficiency Boundary

Acceleration boundaries as a function of vibration and exposure time for the preservation of working efficiency.

Flexion

Bending or decreasing the angle between the parts of the body.

Follower

The visual movable indicator on a computer video screen that points to or marks the current position at which a character may be entered.

Foot Restraint

A restraint which stabilizes a crewmember by providing a platform for immobilizing the feet.

G

Gas Exchange

The flow of gas through a membrane in the small air sacs in the lungs to the blood stream and vice versa.

Gas Tension

The partial pressure exerted by a gas.

Glare

A consequence of bright light sources in the visual field that cause discomfort and/or a decrease in visual functioning. The effect is worse the closer the light source is to the line of gaze. The amount of light scattering within the eye (which varies between individuals effects susceptibility to glare.

Globe Temperature

Physical composite of dry bulb temperature, radiation, and wind effects measured by placing a temperature sensing device in the center of a blackened sphere.

Glottis

The elongated space between the vocal cords; *also* **:** the structures that surround this space.

Graying of Vision

Due to the draining of blood from the occipital region of the brain during acceleration, the vision begins to narrow (tunnel vision) and things appear less bright.

Grayout

See Graying of Vision.

Grounded Enclosure/Chassis

An enclosure/chassis electrically connected to the ground return.

Gustatory Sensations

Pertaining to the sense of taste.

H

Habitable Volume

Habitable volume is defined as free, pressurized volume, excluding the space required for equipment, fixtures, and stowage.

Handhold, Handrail

A handle or grasp area which is slightly larger than the hand and is used as a mobility aid, hand restraint, or as a hardware mounting surface.

Harmonic

An overtone having a frequency that is an integral multiple of a given primary tone.

Hatch

Used in this document to denote a full body passageway. A hatch opening is closed with a hatch cover. A hatch can be sealed against a differential pressure.

Heart Arrhythmia

An alteration in rhythm of the heartbeat either in time or force. See Cardiac Arrhythmia.

Heat Exhaustion

(Also known as heat prostration) - A syndrome resulting from exposure to high temperatures; characterized by a moist, cold skin, poor circulation, a normal temperature but elevated rectal temperature, restlessness and anxiety.

Heat Stroke

The body temperature rises because of faulty heat dissipation due to high environmental temperature and humidity. Rectal temperatures may go from 106 - 100 deg F.

Hematopoietic

Blood producing. Hematopoiesis is the formation of blood or of blood cells in the living body.

Hemoglobin

Oxygen carrying cells of the blood.

Hemorrhage

Escape of blood from vessels.

Hexadecimal Number System

A base 16 number system used by computers in which each digit represents a power of sixteen. For each digit of a hexadecimal number four digits (24=16) of binary logic are required.

Hierarchical Menu

A set of embedded menus such that entries in all but the lowest level menu will produce another menu when selected.

Housing

A structure into which equipment is installed. See Cabinet, Rack.

Hyperbaric

Dealing with ambient pressures which are greater than the gas pressures in the body.

Hyperoxia

Oxygen excess condition arising when greater than normal oxygen partial pressures are encountered.

Hypobaric

Dealing with ambient pressures which are less than the gas pressures within the body.

Hypotension

Abnormally low blood pressure.

Hypothermia

Subnormal temperature of the body.

Hypoxia

A deficiency of oxygen reaching the tissues of the body.

I

Icon

A symbol that graphically resembles its intended meaning (e.g., a schematic drawing or a headlight on the control that is used to control an automobile's headlights).

Illumination

The amount of light (luminance flux) falling on a surface. Measured in lumen/m2 lux = 0.093 ft-c. Illumination decreases with the square of the distance from a point source.

Impact Acceleration

Pulsed or short-duration accelerations of less than 1 second duration.

Impact Noise

See Impulse Noise.

Impulse Noise

A noise consisting of one or more bursts of sound energy, each of a duration less than about one second.

Inaccessible area

Any area with an opening that will accept a loose and floating object of 10mm (0.4in.) diameter and cannot be retrieved or captured by using a retrieval tool and/or crewmember reaching their hand and forearm into the area.

Inclusions

Tiny particles of foreign matter or air bubbles entrained in glass.

Incontinence

Unable to retain a bodily discharge (as urine) voluntarily. Inability to control the natural evacuation of the feces or urine; specifically, involuntary evacuation due to organic causes.

Infrasonic

Sound at frequencies below the audibility range of the human ear, f 20 Hz.

Indirect Contact

The contact of a crewmember to electrically powered surfaces through an electrically conducting medium (e.g., probe, rod).

In-Line Circuit Leakage Currents

Unintentional currents which can flow in a conductor. These currents may result from the inability of solid-state electronics to reach an "infinite" impedance "OFF" state, as is the ability of a mechanical switch. The solid-state electronic device has a finite impedance which undesirably completes the input/output circuit thus providing a means for current to flow. Connections to in-line circuits are normally isolated from crewmember inadvertent contact by barriers and may be considered a hazard if accessible to inadvertent crewmember contact. In-line circuits with leakage currents are referred to as in "STANDBY" when placed in the high impedance state since a complete disconnect is not possible and the circuit output is still energized.

Intermittent Noise

A noise whose level suddenly drops to the level of the background noise several times during the period of observation, the time during which the level remains at a constant value, different from that of the ambient being of the order of magnitude of one second or more.

Ischial Tuberoscities

Two bony protuberances in the hip structure. These bones support a major portion of the seated body weight in 1-G conditions.

Isolated Patient Contact

A direct or indirect patient contact that is deliberately separated from the supply circuit and ground by virtue of spacings, insulation, protective impedance, or a combination thereof (e.g. intra-aortic pressure monitor).

Isometric Joystick

The isometric joystick, often referred to as a force joystick or a pressure joystick, is a lever that doesn't move. The output of the isometric joystick is a function of the amount of force applied to it.

Isotonic Joystick

The isotonic joystick, often referred to as a displacement joystick, provides an output which is proportional to the displacement of the joystick from the center.

J

None

K

Keratitis

Inflammation of the cornea of the eye. See Photokeratitis.

Keystone Effect

A distortion in the shape of a projected image resulting from the film plane and screen plane not being parallel. Usually, magnification will vary from top to bottom or right to left.

Kinesthetic System

Sensations originating in the sense organs of the muscles, tendons, and joints that provide us with a sense of relative body segment movement and position.

L

Lacrimation

The secretion of tears especially when abnormal or excessive.

Lateral Rotation

The turning away from the midline of the body.

Leakage Currents

Unconditional currents which can be applied to a crewmember.

Level Equivalent or L_{eq}

Equivalent sound level or time-average sound level in dB. The level of steady sound which, in a stated time period and at a stated location, has the same A-weighted sound in dB energy as the time-varying sound.

Leukopenia

A condition in which the number of white blood cells circulating in the blood is abnormally low.

Light scatter fraction

The ratio of scattered light to specular reflected light.

Line of sight

The optical axis extending from the observers eyes to the target viewed.

Line of sight deviation

The angle which the line of sight is redirected into the eye due to intervening optically refractive material (e.g., prism).

Linear Acceleration

The rate of change of velocity of a mass; the direction of movement of which is kept constant.

Local Vertical

Local vertical is achieved by a consistent arrangement of vertical cues within a given visual field to provide an definable demarcation at the crew station boundary within the visual field. A consistent local vertical within modules is highly desirable.

Long Term Mission

Any mission in which crewmembers are away from earth for a period greater than two weeks.

Luminance

The photometric equivalent of the brightness of an area as viewed from a given direction. More technically, luminance flux per unit of projected area per unit solid angle. Measured in candela per square meter (cd/m2), foot-lamberts (ft-L, or millilamberts (mL). 1.0 cd/m2 0.31 mL = 0.29 ft-L. The luminance of a surface does not vary with the distance of the observer from the surface being viewed.

Luminance Ratio

The difference between the luminance of an object and its surroundings.

M

Masking Noise

A background noise or signal with dynamic range in frequency and level sufficient to obscure another noise or signal from aural awareness.

Mean Perception

A mild shock perceived by 50% of the population.

Medial Rotation

The toning toward the midline of the body.

Mediastinum

The space in the chest between the pleural sacs of the lungs that contains all the viscera of the chest except the lungs and pleurae; *also* **:** this space with its contents.

Mediastinal Emphysema

Accumulation of gas in the tissues of the chest, specifically in the Mediastinum. Compare to Emphysema.

Menu

A method for inputting information to a computer. The menu is a list of the available input options that may be selected.

Meridional

Of, relating to, or situated on or along a meridian. A line or a plane which is normal to the line of sight.

Metabolism

Physiological activity involving utilization of foodstuffs and oxygen to produce tissues and provide for production of energy.

Micturition

To urinate.

Minimal Passageway

A minimal passageway is a translation path which is only large enough to permit passage of a space suited crewmember with his or her long axis in the direction of travel.

Mobility Aid

A device (such as a handle) or a surface (padding which facilitates translation in a microgravity environment.

N

Narcosis

A state of profound stupor, produced by toxic effect of certain substances, in diluent gas narcosis, by excessive partial pressure of diluent.

Narrow Band Noise

A simple or complex tone having intense and steady state frequency components, relative to wideband noise components, in a very narrow band (1, of the octave band or 5Hz, whichever is less) and is heard as a musical sound either harmonic or discordant.

Nausea

Discomfort in stomach with aversion to food and tendency to vomit.

Neurocirculatory System

Concerned with both nervous and vascular systems.

Neutral Body Posture

The characteristic posture that the relaxed human body assumes in microgravity.

No Sensation

The level of perception only perceived by a fractional percentage of the population.

Noise Canceling

A technique to delete, neutralize, or counteract any unwanted electrical signal within a communication system that interferes with the sound or image being communicated.

Noise Shields

The physical coverings or shells used to protect or screen any unwanted electrical signal within a communication system that interferes with the sound or image being communicated.

Non-adaptive Response

Pathological response to a new environment which presents conditions beyond an organisms ability to adapt.

Normoxic

Having a normal level of oxygen.

Neurocirculatory collapse

R psychosomatic disorder characterized by dyspnea, palpitation, vertigo, faintness, fatigue. Tremor, caused by stress, fear, and violent exercise.

O

Octal Number System

A base 8 number system in which each digit represents a power of eight. For each digit of an octal number three digits (23 = 8 of binary logic are required.

Octave Band

The band of frequencies where the highest frequency is twice that of the lowest frequency.

One-Third Octave Band

The band of frequencies In which the ratio of the extreme frequencies is equal to the cubic root of 2: i.e. fn/fe 1.260, where fn and fe are the highest and lowest cutoff frequencies of the band.

Orbital Replacement Unit (ORU)

A piece of equipment (a single item or module containing an assembly of components) which is designed for removal and replacement as a unit.

Ordinary Patient Connection

A direct patient contact that does not have the spacing, insulation, or protective impedance associated with an isolated patient connection (e.g., blood pressure cuff).

Orthostatic Intolerance

Difficulty in standing erect in a l-G environment. This could be due to any number of effects of exposure to microgravity (cardiovascular, muscular, skeletal, or coordination.

ORU Chassis Leakage Currents

Currents generated by such internal sources as filter capacitors terminated to accessible parts or ground, and capacitive and inductive coupling to accessible parts or ground. These currents can be conveyed from accessible parts to ground or other accessible parts and subsequently applied to a crewmember.

Overall SPL

Overall SPL (Sound Pressure Level) is interpreted as including all noise within the frequency range from 22.4 to 11,200 Hz.

Oxygen Atelectasis

Collapse of the expanded lung.

Oxygen Toxicity

Toxic effects of excess oxygen partial pressure.

P

Parallax Error

The perceived change in relative position of objects at different distances from an observer when viewed from different positions. Can cause errors in the reading of some instruments.

Paresthesias

A sensation of tingling, crawling, or burning of the skin that has no objective cause.

Paroxysm

A fit, attack, or sudden increase or recurrence of symptoms

Pass-Through

A pass-through is a translation path which is only large enough to permit passage by an IVA clothed crewmember with his or her long axis in the direction of travel.

Passageway

A pass-through area between non-adjacent modules or spaces.

Patient

A crewmember instrumented with electrical/electronic equipment.

Patient Connection Leakage Current

Leakage currents measured between patient leads at the patient interface, or between patient leads at the patient interface and ground.

Pattern Coding

A perceptual indicator used to differentiate areas of interest to the observer, or reduce operator search time.

Peak Pressure Level

Peak sound pressure for any specified time interval is the maximum absolute value of the instantaneous sound pressure in that interval.

Percentile

A point on a scale indicating the percentage of persons within a population who have a body dimension of a certain size or smaller. The value of the statistical variable that marks the boundary between the consecutive intervals in a distribution of 100 intervals, each containing one percent of the total population.

Perception

The awareness of the elements of environment through physical sensation such as perceiving a mild shock.

Perfusional changes

Changes in the flow rate of blood in blood vessels.

Petechial Hemorrhages

A minute reddish or purplish spot containing blood that appears in skin, mucous membrane, serous membrane, or on a cross-sectional surf ace of an organ especially in some infectious diseases.

Photokeratoconjunctivitis

Photochemical injury to the cornea of the eye by ultraviolet exposure may result in photokeratoconjunctivitis. This painful condition may last for several days and is very debilitating; called also *welders flash, snow blindness*. See Conjunctiva.

Photokeratitis

Photokeratitis is essentially a reversible sunburn of the cornea resulting from excessive UV-B exposure. It occurs when someone spends hours on the beach or snow without eye protection. It can be extremely painful for one to two days and can result in temporary loss of vision. See Keratitis.

Physiologically Inert

Substance that does not Interact chemically with the body.

Physiology

The organic processes and phenomena of an organism or any of its parts or of a particular bodily process.

Pixel Addressability

The capability to store or retrieve from, a specific location in memory, the basic unit or picture element that makes up the image displayed in a video screen.

Pleura

The delicate serous membrane that lines each half of the thorax of mammals and is folded back over the surface of the lung of the same side. This membrane envelopes the lung and lining the thoracic cavity.

Pneumothorax

A condition in which air or other gas is present in the pleural cavity and which occurs spontaneously as a result of disease or injury of lung tissue or puncture of the chest wall or is induced as a therapeutic measure to collapse the lung

Postrun Headache

Headache that occurs after an event.

Predicted Four-hour Sweat Rate

Empirical index incorporating environment, work and clothing to predict sweat production.

Pre-Emphasis

The intentional alteration of the relative strengths of signals at different frequencies (as in radio and in disc recording) to reduce adverse effects (as noise) in the following parts of the system.

Primary Passageway

A primary passageway is a translation path which accommodates a space suited crewmember in an upright working position or neutral body posture.

Prompt

A message or other signal displayed on a computer generated display advising the operator that he or she is expected to provide some specific response.

Pronation

The rotation of the hand and forearm so that the palm faces backwards or downwards.

Proxemics

The study of the nature, degree, and effect of the spatial separation individuals naturally maintain (as in various social and interpersonal situations) and of how this separation relates to environmental and cultural factors.

Proximity Operations

Any space module related activity that is performed outside the space module and within a specified boundary.

Q

None

R

R value

Ratio of initial nitrogen partial pressure to the final total pressure.

Rack

A structure into which equipment drawers or other types of equipment mounting hardware is installed. A rack generally has a built-in utility distribution system that provides interfaces far connecting the installed equipment's utilities.

Random Noise

A sound whose instantaneous amplitudes occur, as a function of time, according to a normal (Gaussian) distribution curve. Random noise need not have a uniform frequency spectrum.

Reaction Time

The time between the presentation of a stimulus and the beginning of a response to that stimulus.

Reduced Comfort Boundary

Acceleration boundaries as a function of vibration and exposure time for the preservation of comfort.

Remote Operation

An operation which permits personnel to send and receive information or commands to a distant environment.

Replacement Unit

General term that includes Orbital replacement units (ORU), Line replacement units (LRU), and Shop replacement units (SRU).

Respiration

The series of actions resulting in the supply of oxygen to tissues of the body.

Response Time

The time interval during which the actual response to the stimulus is accomplished.

Restraint

A mechanism for restricting unwanted movements of an object or a person in microgravity environments. Restraints can be mechanical (such as a strap) or non-mechanical (magnetism or vacuum.

Reverberation Time

Time required for the average sound energy density in an enclosure to decrease to -60 d B of the initial value after the source has stopped.

Roentgen Equivalents, Man

The absorbed dose of any ionizing radiation which produces the same biological effects in crewmembers as those resulting from the absorption of 1 roentgen of x-rays.

Rotational Acceleration

The rate of change of the direction of a mass, the velocity of which is kept constant. In this regard, the rotational acceleration is directly proportional to the square of the velocity and inversely proportional to the radius of the turn.

S

Sacrificial surfaces

A protective surface placed over a delicate surface which will absorb environmental damage.

Scrolling

An operation or facility of a VDT in which display elements make a continuous bottom-to-top vertical movement across the screen (or window) under control of the operator, with display lines appearing at the bottom edge and dropping off at the top.

Segment

A body segment is the largest dimensional mass which when moved will maintain a constant geometry.

Shock

Physical or emotional trauma; clinical manifestations of inadequate amount of circulating blood. See Impact Acceleration.

Shock - Electrical

See Electrical Shock

Shock Load

See Impact Acceleration

Signal-To-Noise Ratio

The ratio of the amplitude of the signal transmitted through an instrumentation system to the amplitude of the noise generated within the system.

Somersaulting

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the y-axis. (Refer to Figure 5.3.1-1).

Sonic

1. Relating to the speed of sound in air (about 761 miles per hour or 1224 kilometers per hour) at sea level at 59°F (15°C).

2. Sound at frequencies with the human ear's audibility limit (between 20 Hz and 20KHz). See Ultrasonic, Infrasonic.

Space Module

An inhabited establishment away from the earth.

Space Motion Sickness

A malady occurring in approximately 50, of people initially exposed to microgravity. Symptoms are similar to that of motion sickness and last 2-4 days. To date, susceptibility to space motion sickness has not been predictable from responses In a l-G environment. Only limited success has been achieved in controlling space motion sickness.

Specular

Of, relating to, or having the qualities of a mirror.

Specular Glare

Glare which is created by the image of a light source reflecting off a surface within a person's field-of-view.

Specular Reflection

The reflected image of the light source corresponds very closely in size and shape to the original light source.

Speech Interference Level

The background or sound noise level in dB at frequencies between 150 and 7500 Hz that will result in the loss of intelligibility conversation.

Squeeze

Condition arising when gas pocket is compressed to a smaller size than its normal residual volume.

Standby

A high impedance state of an electronic device, usually to minimize the amount of energy consumed or supplied (e.g., the off state of an electronic switch).

Standard Passageway

A standard passageway is a translation path which accommodates an IVA clothed crewmember in an upright working position or neutral body posture.

Stroke

Common term for apoplexy; hemorrhage into the brain, causing sudden onset of coma and neurological signs.

Subcutaneous Emphysema

Accumulation of gas under the surface of the skin.

Suffusion

1. To spread over or through in the manner of fluid or light.

2. A spreading or flow of any fluid of the body into surrounding tissue; an extensive superficial extravasation of blood.

Supination

The rotation of the forearm and hand so that the palm faces forward or upward and the radius lies parallel to the ulna

Symbol

A character or graphic that stands for or represents something else such as operations, quantities, elements, relations, or qualities.

Syncope

The loss of consciousness resulting from insufficient blood flow to the brain.

T

Teleoperator

A remotely controlled mobility module which incorporates sensory and manipulative subsystems for the purpose of extending the human operator's skills and cognitive capabilities into hostile or remote environments.

Tether

A hook and lanyard which is used to attach a crewmember or a piece of hardware to a piece of hardware.

Thermal Comfort

That condition of mind which expresses satisfaction with the thermal environment. Specifically, when the core temperature is normal, and the rate of body heat storage is zero.

Thermogenesis

The production of heat, for example, muscular heat production by shivering.

Thermoregulation

Regulation of temperature, particularly self-regulation of body temperature.

Thrombocytopenia

Persistent decrease in the number of blood platelets that is often associated with hemorrhagic conditions.

Thrombus

A clot of blood formed within a blood vessel and remaining attached to its place of origin. Compare to Embolus.

Tinnitus

A sensation of noise (as a ringing or roaring) that is caused by a bodily condition (as a disturbance of the auditory nerve or wax in the ear) and can usually be heard only by the one affected.

Tissue

An aggregate of cells usually of a particular kind together with their intercellular substance that form one of the structural materials of a plant or an animal.

Touch Temperature

Temperature of objects in direct physical contact.

Toxicity

The quality of poison; the kind and amount of poison produced by a microorganism.

Tracheal Pressure

Gas pressure existing within the trachea (wind pipe).

Translation

To move from one place to another by use of reaction power.

Transmissivity

The proportion of luminous flux which passes completely through a window to the eyes or sensor to the amount of luminous flux incident upon the outside of the window.

Troland

Retinal illuminance resulting from viewing a surface with a luminance of 1 cd/m^2 through an artificial pupil with an area of lmm^2.

Tunnel

A passageway which allows the crewmember to move only along his/her longitudinal axis.

Twist

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the z-axis. (Refer to Figure 5.3.1-1).

U

Ultrasonic

Sound at frequencies above the human ear's audibility limit of about 20,000 hertz -- used of waves and vibrations.

Urethra

The canal that carries urine from the bladder.

V

Vasoconstriction

Narrowing of the blood vessels in order to decrease blood flow to the skin to preserve body heat.

Vasodilation (Variant: Vasodilatation)

Widening of the blood vessels to allow increased blood flow to the skin to promote heat loss.

Vestibular System

Located in the inner ear, the vestibular system is responsible for the sense of balance (and relative position of the body with respect to the environment). The vestibular system senses acceleration and direction of gravity.

Viewport

A transparency located such that an observer can see from one compartment into another.

Visual acuity

Refers to the smallest resolvable detail an observer can see.

Visual Angle

The angle formed at the eye by two imaginary lines drawn to either side of the object in question.

Visual Clutter

Visual clutter results when the quantity of information in a visual display becomes great enough so that it starts to result in information overload. Accuracy and speed of performance will decline as visual clutter increases.

Visual Display Terminal

An electronic device used to present visual information that is usually computer generated. They are used in conjunction width both the Input and output of information. Examples include: cathode ray tub (CRT), liquid crystal diode (LCD, light emitting diode (LED), plasma, and electro-luminescent (EL).

W

Wavefront Deviation

Any change in the reflected wavefront of a set of rays as compared with the incident wavefront of the same set.

Wet Bulb Glove Temperature

Calculated refinement of globe temperature by weighting dry bulb and wet bulb temperatures with the standard globe temperature.

Wet/Dry Index

Calculated prediction of human stress temperature accounting for wet and dry bulb temperatures.

Wing Tab Connector

An electrical utilities or other connector with two opposed radial tabs to facilitate EVA connect or disconnect.

X

X-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of back to chest, anatomically.

Y

Y-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of right to left side, anatomically.

Z

Z-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of foot or buttocks to head, anatomically.

Appendix D
Abbreviations and Acronyms

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

USER'S GUIDE

This appendix contains an alphabetized listing of the abbreviations and acronyms used in the text and figures of Volume I. Scroll down through the list or use the alphabetical links below to go directly to the section where your word is located.

Symbols

+Gx	Forward acceleration (see Figure 5.3.1-1)
+Gy	Right yaw acceleration (see Figure 5.3.1-1)
+Gz	Upward acceleration (see Figure 5.3.1-1)
+Rx	Left roll velocity (see Figure 5.3.1-1)
+Ry	Forward pitch down velocity (see Figure 5.3.1-1)
+Rz	Right yaw velocity
- Gx	Backward acceleration (see Figure 5.3.1-1)
- Gy	Left yaw acceleration (see Figure 5.3.1-1)
- Gz	Downward acceleration (see Figure 5.3.1-1)
- Rx	Right roll velocity (see Figure 5.3.1-1)
- Ry	Backward pitch up velocity (see Figure 5.3.1-1)
- Rz	Left yaw velocity
1/3 OB	One-third octave band

A

ACGIH	American Conference of Governmental Industrial Hygienists
ADS	Altitude decompression sickness
A/E	Ascent and Entry

AFSC	Air Force Space Command
AI	Articulation index
ALARA	As low as reasonably achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
Ar	Argon
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ATA	Atmospheres, absolute
a_x	x-axis acceleration
a_y	y-axis acceleration
a_z	z-axis acceleration

B

BHS	Body heat storage
BIB	Built-in breathing
BITE	Built-in test equipment
BTPS	Body temperature and pressure saturated with water
Btu	British thermal unit

C

CCTV	Closed circuit television
CFU	Colony forming units
CO_2	Carbon dioxide
CRS	Cosmic ray source
CRT	Cathode ray tube

CWS	Control and warning system

D

D	Absorbed dose
DACT	Disposable absorbent containment trunk
dB	Decibels
DO	Dry bulb temperature
DCS	Decompression sickness
DE	Dose equivalent
DIPS	Dynamic isotope power system
DOD	Department of Defense

E

e	Electron
ECG	Electrocardiogram
ECLSS	Environmental control and life support system
ED10	10% of pop. showing physiological response to ionizing radation
EDK	Electric dynamic katathermometer
EEG	Electroencephalograph
EKG	Electrocardiogram
EL	Exposure limits
ELF	Extremely low frequencies
EM	Electromagnetic
EMU	Extravehicular mobility unit
ET	Effective temperature
ev	Electron volts

EVA	Extravehicular activity

F

FDA	Food and Drug Administration
FDP	Fatigue decreased proficiency
Fe	Iron
FMEA	Failure modes and effects analysis
FSW	Feet of seawater (33 FSW =1 Atmosphere)

G

G	Gravitational acceleration
GC/MS	Gas chromatograph/mass spectrometer
GCR	Galactic cosmic radiation
GEO	Geosynchronous Earth orbit
GIAG	Government Industry Advisory Group
GT	Globe temperature
g_x	Vibrational acceleration in the direction of the x-axis
g_y	Vibrational acceleration in the direction of the y-axis
Gy	Gray (radiation dosage unit of measure)
g_z	Vibrational acceleration in the direction of the z-axis

H

H	Hydrogen
He	Helium
HUT	Hard upper torso

Hx	Diatonic hydrogen
Hz	Hertz (cycles per second)
HZE	Ultra heavy nuclear particles

I

Icl	Insulation value of clothing
IDB	In-suit drink bag
IEEE	International Electronics and Electrical Engineers
INIRC	International Non-ionizing Radiation Committee
IR	Infrared
IRPA	International Radiation Protection Association
IS0	International Standards Organization
IVA	Intravehicular Activity

J

JSC	Johnson Space Center

K

kcal	Kilocalories (1000 calories)
kp	Kilopascal
Kr	Krypton
KSC	Kennedy Space Center

L

LBNP	Lower body negative pressure

LCVG	Liquid cooling ventilation garment
LD50	Lethal dose of ionizing radiation for 50% of population
LED	Light emitting diode
LEO	Low Earth orbit
L_{eq}	Equivalent level in dB
LET	Linear energy transfer
LOS	Line of sight
LTA	Lower torso assembly

M

MeV	Millions of electron volts
MFR	Manipulator foot restraint
MIL	Military
mmHg	Millimeters of mercury - used to indicate pressure level
MMU	Manned maneuvering unit
MSFC	Marshall Space Flight Center
MSIS	Man-Systems Integration Standards
MTBF	Mean time between failure
MW	Microwave

N

N_2	Nitrogen
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
Nc	Convective heat transfer coefficient
NC (Curve)	Noise criteria curve

NCRP	National Council on Radiation Protection and Measurements
Ne	Neon
NIR	Non-ionizing radiation
nm	Nanometer (1E-9 meters); (also) nautical miles
NTU	Nethlometric tubidity units

O

O_2	Diatonic oxygen
O_2	Oxygen
OASPL	Overall sound pressure level
OB	Octave band
OBS	Operational bioinstrumentation system
ORU	Orbital replacement unit
OSHA	Occupational Safety and Health Administration
OTC	Over the counter

P

p	Proton
P4SR	Predicted 4-hour sweat rate
PB	Phonetically Balanced
PEO	Polar Earth orbit
PFR	Portable foot restraint
pH	Measure of acidity
PLSS	Primary life support system
PSIL	Preferred speech interference level
Pt/Co	Platinum/cobalt color measurement

PTS	Permanent threshold shift

Q

Q	Quality factor
qs	Body heat storage index

R

Ra	Radium
rads	Radiation dose absorbed by tissue
RBE	Relative biological effectiveness
Rcl	Total heat transfer resistance
RDA	Recommended dietary allowance
REM, rem	Roentgen equivalent man
RF	Radio frequency
RFPG	Radio frequency protection guides
rms	Root -mean -square
RMS	Remote manipulator system
RTG	Radioisotope thermoelectric generator

S

SAA	South Atlantic anomaly
SAE	Society of Automotive Engineers
SAR	Specific absorption rate
SCR	Solar cosmic radiation
SDMS	Standards Database Management System

SEP	Solar energetic particles
SIL	Speech interference level
SMF	Space medical facility
SPE	Solar particle event
SPF	Specific pathogen free
SPL	Sound pressure level
Sr	Strontium
SSA	Space suit assembly
STD	Standard
STP	Standard temperature and pressure
STS	Space Transportation System
Sv	Sievert (radiation dose unit of measure)

T

tb	Weighted mean body temperatures
TBT	Total body temperature
tc	Core temperature
TLV	Threshold limit values
TMG	Thermal micrometeoroid garment
Tmrt	Mean radiant temperature
TOC	Total organic carbon
TON	Threshold odor number
tr	Skin temperature
TTN	Threshold taste number
TTS	Temporary threshold shift (hearing)
TTS2	Temporary threshold shift measured 2 minutes after exposure

U

UCD	Urine collection device
UV	Ultraviolet
UVR	Ultraviolet radiation

V

VDT	Visual display terminal

W

WB	Wet bulb temperature
WBGT	Wet bulb globe temperature
WD	Wet/dry index
WFI	Water for Injection

X

Xe	Xenon

Y

None

Z

Z	Ultra heavy nuclei

Appendix E
Units of Measure and Conversion Factors

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

USER'S GUIDE

This section presents definitions, physical constants and conversion factors that are used in the text and may be useful as reference data. Scroll down through the list or use the alphabetical links below to go directly to the section where your word or symbol is located.

A

ATMOSPHERE (atm):

The pressure exerted by 76 cm mercury with a density of 13.5951 gm/cm^3 at 1g (the standard barometric pressure at sea level).

1atm = 325 x 10^6 dynes/cm^2

1atm = 1033.2 gm/cm^2

1atm = 760 mm Hg

1atm = 14.696 psi

1atm = 101.329 kPa (kilo Pascals)

B

BRITISH THERMAL UNIT (Btu):

1 Btu = 1.0559×10^{10} ergs

1 Btu = 1055.9 joules

1 Btu = 251.995 gm-cal

1 Btu = 778.77 ft-lbs

1 Btu = 0.25199 kcal

1 Btu/hr = 0.1667 Btu/min

1 Btu/hr = 0.04199 kcal/min

1 Btu/hr = 0.2932 watt

1 Btu/min = 0.25199 kcal\min

1 Btu/min = 0.23599 hp

1 Btu/min = 17.595 watts

1 Btu/ft^2, hr = 2.7125 $kcal/m^2$ hr

Btu/hr to joules:

1 Btu/hr = 1.05435×10^3 joule/hr

800 Btu/hr x 1054.35 = 843480 joule/hr

C

CANDELA (cd):

1 cd = 1.018 candle

CANDLE (c):

The unit of luminous intensity.

1 c = 1 lumen/steradian

CELSIUS (^{o}C):

(See Degrees Centigrade)

CENTIGRADE (^{o}C):

(See Degrees Centigrade)

CENTIMETER (cm):

(See also Square Centimeter, Cubic Centimeter).

1 cm = 0.03280 ft

1 cm = 0.3937 in

1 cm = 0.01 m

1 cm = 10mm

1 cm = $1x10^{4}\mu$ (micron)

CENTIMETER-CANDLE (phot):

1 phot = 1 x 10^{4} lux

CENTIMETERS PER SECOND PER SECOND:

1 cm/sec^{2} = 0.0328 ft/sec^{2}

CLO (clo):

The unit of insulation resistance for clothing.

1 clo = 0.18°C m^2hr/kcal

1clo = 0.88°F ft^2hr/Btu

CUBIC CENTIMETER (cc or cm^3):

1 CC = 3.531 x 10^{-5} ft^3

1 CC = 0.061023 in^3

1 CC = 1 x 10-6 m^3

1 CC = 1000 mm^3

1 CC = 2.6417 x 10^{-4} gal (US fluid)

1 CC = 0.0338 oz (US fluid)

1 CC = 2.113 x 10^{-3} pint (US fluid)

1 cc/sec = 0.0021186 ft3/min

CUBIC FOOT

1 ft^3 = 1728 in^3

1 ft^3 = 28.32 liters

1 ft^3 = 0.02832 m^3

1 ft^3/min = 472.0 cc/sec

1 ft^3/min = 0.4720 liter/sec

1 ft^3/min = 62.43 lbs H_2O/min

1 ft^3/sec = 1699.3 liters/min

CUBIC INCH:

1 in^3 = 5.787 x 10^{-4} ft^3

1 in^3 = 1.639 x 10^2 liter

1 in^3 = 1.639 x 10^{-5} m^3

CUBIC METER:

1 m^3 = 35.3144 ft^3

1 m^3 = 6.1023 x 104 in^3

1 m^3 = 999.973 liters

D

DECIBEL (db):

Used for comparing power levels, acoustical or electrical. (See also Sound Pressure Level).

1 db = 10 $\log_{10}$ P/PO

where P is the power to be compared to a reference power PO

1db = 1 bel is equal to an increase in power (P) by a factor of 10

DEGREE (ANGULAR) (deg):

1 deg = 60 minutes

1 deg = 0.01745 radian

1 deg = 3600 seconds

1 deg = 3.0462 x 10^{-2} steradian

DEGREES TO RADIANS:

1 deg = π/180 rad

60° x π/180 = 1.0472 = 1 rad

DEGREES CENTIGRADE (^{o}C):

$^{\circ}$C = 5/9 * ($^{\circ}$F - 32)

DEGREES FAHRENHEIT (^{o}F):

$^{\circ}$F = (9/5 * $^{o\circ}$C) + 32

DEGREES PER SECOND:

1 deg/sec = 0.017453 radian/sec

1 deg/sec = 0.1667 rpm

DYNE (dyne):

1 dyne = 1.0197 x 10^{-6} kg

1 dyne = 2.2481 x 10^{-6} lb

1 dyne-cm = 1 erg

DYNE PER SQUARE CENTIMETER

1 dyne/cm^2 = 9.8692 x 10^{-7} atm

1 dyne/cm^2 = 0.0010197 gm/cm^2

1 dyne/cm^2 = 4.0148 x 10^{-4} in H_2O

1 dyne/cm^2 = 7.5006 x 10^{-4} mm Hg

1 dyne/cm^2 = 1.4504 x 10^{-5} psi

E

ERG (erg):

1 erg = 9.4805×10^{-11} Btu

1 erg = 7.3756×10^{-8} ft-lb

1 erg = 2.3889×10^{-11} kcal

1 erg = 8.8510×10^{-7} lb-in

1 erg = 1 dyne-cm

F

FAHRENHEIT (^{0}F):

(See Degrees Fahrenheit).

FOOT (ft):

(See also Square Foot, Cubic Foot).

1 ft = 30.48 cm

1 ft = 12 in

1 ft = 0.3048 m

FOOT-CANDLE (fc):

1 ft-c = 1 lumen/ft^2

1 ft-c = 10.764 lumen/m^2

1 ft-c = 10.75 lux

FOOT-LAMBERT (ft-L):

1 ft-L = 1.0764 millilamberts

1 ft-L = 0.32 decibels with respect to 1 mL

FOOT PER MINUTE

1 ft/min = 0.3048 m/min

1 ft/min = 0.005080 m/sec

1 ft/min = 0.011364 mph

FOOT PER SECOND:

1 ft/sec = 1.0973 km/hr

1 ft/sec = 0.5921 knot

1 ft/sec = 0.6818 mph

FOOT-POUND (ft-lb):

1 ft-lb = 0.001285 Btu

1 ft-lb = 1.3558×10^{7} ergs

1 ft-lb = 3.2389×10^{-4} kcal

1 ft-lb/min = 3.0303×10^{-5} hp

1 ft-lb/min = 0.01667 ft-lb/sec

1 ft-lb/min = 0.022597 watt

1 ft-lb/sec = 0.001818 hp

1 ft-lb/sec = 0.01943 kcal/min

1 ft-lb/sec = 1.3558 watts

G

G (g):

The acceleration of gravity (also the acceleration of a vehicle).

1 ft/sec = 1.0973 km/hr

1 ft/sec = 0.5921 knot

1 ft/sec = 0.6818 mph

GRAM (gm):

1 gm = 0.001 kg

1 gm = 1000 mg

1 gm = 0.03527 oz

1 gm = 0.0022046 lb

1 gm/cm^3 = 62.428 lbs/ft^3

1 gm/hr = 0.540 lb/day

1 gm/hr = 0.0003757 lb/min

1 gm/liter = 0.062427 lb/ft^3

1 gm/cm^2 = 9.6784×10^{-4} atm

1 gm/cm^2 = 980.665 $dynes/cm^2$

1 gm/cm^2 = 0.9356 mm Hg

1 gm/cm^2 = 0.014223 psi

1 $gm/m^2/hr$ = 2.78×10^{-5} $gm/cm^2/sec$

1 $gm/m^2/hr$ = 0.7448 $lb/ft^2/hr$

GRAM-CALORIE (gm-cal):

1 gm-cal = 30874 ft-lbs

1 gm-cal = 0.001 kcal

GRAY (Gy):

The International System of Units (SI) unit for the amount of ionizing radiation energy absorbed by tissue.

1 Gy = 100 rads

H

HORSEPOWER (hp):

1 hp = 3.300×10^4 ft-lbs/min

1 hp = 550 ft-lbs/sec

1 hp = 10.688 kcal/min

1 hp = 745.7 watts

I

INCH (in):

(See also Cubic Inch, Square Inch)

1 in = 2.540 cm

1 in = 0.0833 ft

1 in = 25.40 mm

INCH OF WATER (in H_2O):

1 in H_2O (at 4°C) = 0.002458 atm

1 in H_2O (at 4°C) = 2490.82 dynes/cm^2

1 in H_2O (at 4°C) = 0.0361 psi

1 in H_2O (at 4°C) = 1.868 mm Hg

J

JOULE (joule):

1 joule = 1 watt-sec

K

KILOGRAM (kg):

1 kg = 1000 gm

1 kg = 2.205 lb

1 kg = 35.28 oz

KILOGRAM-CALORIE (kcal or large Calorie):

1 kcal = 3.9683 Btu

1 kcal = 4.186 x 10^{10} ergs

1 kcal = 1000 gm-cal

1 kcal = 3087 ft-lbs

1 kcal/hr = 0.0661 Btu/min

1 kcal/hr = 0.857 ft-lbs/sec

1 kcal/hr = 0.1667 kcal/min

1 kcal/hr = 1.161 watts

1 kcal/m^2hr = 0.3687 Btu/ft^2hr

1 kcal/min = 3.9685 Btu/min

1 kcal/min = 51.457 ft-lbs/sec

1 kcal/min = 0.093557 hp

1 kcal/min = 69.767 watts

KILOGRAM-CENTIMETER SQUARED:

1 kg-cm^2 = 0.3417 lb-in^2

KILOGRAM-METER PER SECOND:

1 kg-m/sec = 7.2330 ft-lb/sec

1 kg-m/sec = 9.80665 watts

KILOMETER (km):

1 km = 105 cm

1 km = 3281 ft

1 km = 103 meters, m

1 km = 0.6214 statute miles, mi

1 km = 0.54 nautical miles, nm

KILOPASCAL:

1kPa = 6.895 psi

1kPa = 4.754 x 10^5 dynes/cm^2

1 psi = 0.145 kPa

KILOMETERS PER HOUR:

1 km/hr = 0.9113 ft/sec

1 km/hr = 0.5396 knot

1 km/hr = 0.6214 mph

KNOT (nautical mile per hour):

1 knot = 1.689 ft/sec

1 knot = 1.853 km/hr

1 knot = 1.1516 mph

L

LAMBERT (L):

Unit of surface brightness.

1L = 0.3183 c/cm^2

1L = 2.0536 c/in^2

1L = 1 $lumen/cm^2$

LITER (l):

1 liter = 0.03531 ft^3

1 liter = 61.02 in^3

1 liter = 1000 ml

1 liter/min = 5.886×10^{-4} ft^3/sec

1 liter/sec = 2.12 ft^3/min

LUMEN (lumen):

1 lumen = 0.001496 watt

1 lumen = 0.07958 spherical candle power

1 lumen/ft^2 = 1 ft-c

1 lumen/ft^2 = 10.764 lumen/m^2

LUMENS PER SQ. METER TO FT CANDLES:

1 lumen/m^2 = 0.0929 ft. candle

LUX:

1 lux = 0.093 ft-c (see meter-candle)

M

METER (m):

(See also Cubic Meter).

1m = 100 cm

1m = 3.281 ft

1m = 39.37 in

METER-CANDLE (lux):

1 lux = 1 lumen/m^2

1 lux = 0.092903 ft-c

METER PER SECOND (m/sec):

1 m/sec = 3.281 ft/sec

1 m/sec = 3.600 km/hr

1 m/sec = 2.2369 mph

MICRON (μ or mu):

A unit of length equal to one-millionth of a meter or one-thousandth of a millimeter, usually called micrometer.

1 μ = 10^{-6} meter

1 μ = 3.937×10^{-5} in

1 μ = 0.001 mm

MIL (mil):

1 mil = 0.001 in

1 mil = 0.0254 mm

1 mil = 25.40μ (microns)

MILES (statute) (mi):

1 mi = $1{,}609 \times 10^{5}$ cm

1 mi = 5,280 ft

1 mi = 1.609 km

MILES PER HOUR (mph)

1 mph = 88 ft/min

1 mph = 1.4667 ft/sec

1 mph = 1.6093 km/hr

1 mph = 0.8684 knot

MILLIGRAM (mg):

1 mg = 0.001 gm

1 mg = 3.5274×10^{-5} oz

1 mg = 2.2046×10^{-6} lb

1 mg/m^3 = 6.243×10^{-4} lb/ft^3

MILLILAMBERT (ml):

(perfectly diffused light)

1 mL = 0.929 lumen/ft^2

MILLILITER (ml):

1 ml = 1.000028 cc

1 ml = 0.061025 in^3

1 ml = 0.001 liter

1 ml = 0.0338 oz (US fluid)

MILLILITERS PER HOUR:

1 ml/hr = 0.06102 in^3/hr

MILLIMETER (mm):

(See also Square Millimeter)

1mm = 0.10 cm

1mm = 0.03937 in

1mm = 1000 μ

MILLIMETER OF MERCURY (mm Hg):

1mm Hg (at 0°C) = 0.0013158 atm

1mm Hg (at 0°C) = 1333.22 dyne/cm^2

1mm Hg (at 0°C) = 1.3595 gm/cm^2

1mm Hg (at 0°C) = 0.019337 psi

1mm Hg (at 0°C) = 0.535 in H_2O

1mm Hg (at 0°C) = 0.1333 kPa

MILLISECONDS (msec):

1 msec = 0.001 sec

N

NAUTICAL MILES (nm):

1 nm = 0.87 statute miles

1 nm = 1.85 kilometers

NEWTONS TO POUNDS:

1 N = 0.22507 lbf

NEWTON CENTIMETERS TO INCH OUNCES:

1 N-cm = 1/.706 in oz

70N-cm x 1/.706 = 99.15 = 100 in oz

NEWTON METERS TO FOOT POUNDS:

1Nm = 1/1.356 ft lb

15Nm x 1/1.356 = 11.06 = 11 ft lb

NEWTON METERS TO INCH POUNDS:

1 Nm = 1/.11298 in lb

4 Nm x 1/.11298 = 35.4 = 3 5 in lb

NIT:

Unit of luminance equal to the luminance provided by one candle of radiant flux emitted per square meter of surface - candela per square meter (Cd m^2).

O

OUNCE (oz):

1 oz = 28.3495 gm

1 oz = 0.0625 lb

P

PASCALS (Pa)

Pa = 4.75389 dynes/cm^2

Pa = 6.895 x 10^{-3} psi

PARTS PER MILLION (ppm).

1 ppm = 1.0 mg/liter of H_2O

1 ppm = 8.345 lbs/million gallons

PHON (phon):

1 phon unit = SPL of a 1000 cycle/sec tone

PHOT:

(See Centimeter Candle)

PHYSICAL CONSTANTS:

Acceleration of gravity (g)

= 32.17 ft/sec^2 = 980.6 cm/sec^2

Avogradro's number (N)

= 6.0221367 x 10^{23} molecules/gram-mole

Density of air at 0^{o}C and 760 mm Hg

= 0.0012929 grams/cm^3(0.0807 lb/ft^3)

Density of water at 0^{o}C

= .099984 grams/cm^3

Heat of fusion of water at 1.0 atm

= 79.7 calories/gram = 144 Btu/pound

Heat of vaporization of water at 1.0 atm

= 540 calories/gram = 970 Btu/pound

Naperian-logarithm base

= 2.71828183

Pi (π)

= 3.14159265

Specific heat of air

= Cp = 0.238 cal/gram ($^{\circ}$C)

Velocity of light (c)

= 2.99792458 x 10^{10} cm/sec

Velocity of sound in dry air at 0°C, 1 atm

= 33,136 cm/sec = 1,089 feet/sec

POISE: Unit of viscosity.

1 poise = 1 dyne/sec, cm^2

1 poise = 1 gm/cm, sec

1 poise = 0.067196 lb/ft, sec

POUND (lb):

1 lb = 453.5924 gm

1 lb = 0.45359 kg

1 lb = 16 oz

1 lb = 4.448 N

1 lb/day = 18.89 gm/hr

1 lb/hr = 0.7559 gm/min

1 lb/hr = 10.886 kg/day

POUND-INCH (lb-in):

1 lb-in = 1.1298 x 10^6 dyne/cm

POUND-INCH SQUARED:

Unit of moment of inertia

1 lb-in^2 = 2.9264 kg-cm^2

POUND OF WATER PER MINUTE (lb H_2O/min):

1 lb H_2O/min = 0.01603 ft^3/min

1 lb H_2O/min = 2.670 x 10-4 ft^3/sec

POUND PER CUBIC FOOT (lb/ft^3):

1 lb/ ft^3 = 0.01602 gm/ cm^3

POUNDS PER SQUARE INCH (psi):

1 psi = 0.06805 atm

1 psi = 6.8947 x 10^4 dyne/cm^2

1 psi = 70.307 gm/cm^2

1 psi = 51.715 mmHg

1 psi = 27.7 in H_2O

1 psi = 145.03 Pa

POUNDS PER SQUARE INCH ABSOLUTE (psia):

Absolute pressure, where 0 psia = vacuum

1psia = 0.1449 kpascals

POUND WEIGHT (1 wt):

1 lb wt = 4.4482×10^5 dynes

1 lb wt = 453.59 gm wt

1 lb wt = 16 oz

Q

none

R

RAD (rad):

Radiation absorbed dose.

1 rad = 100 ergs/gm of irradiated material

RADIAN (rad):

1 radian = ½π circumference revolution (0.15915)

1 radian = 57.296 deg

1 radian/sec = 57.296 deg/sec

1 radian/sec = 9.549 rpm

1 radian/sec^2 = 572.96 rpm^2

REVOLUTIONS PER MINUTE (rpm):

1 rpm = 6 deg/sec

1 rpm = 0.10472 radian/sec

1 rpm^2 = 0.001745 radian/sec^2

ROENTGEN (r):

1 r = ionization by x-rays or gamma-rays producing 1 electrostatic unit of charge in 1 cm^3 of air (STP)

1 r = 83.0 ergs/gm

S

SIEVIERT (Sv):

Sv is the International System of Units (SI) unit for ionizing radiation dose equivalent. (Refer to Figure 5.7.2.1.3.1-1 for definition of Q values)

1 Sv = 100 rem = (Gy) (Q)

SOUND PRESSURE LEVEL (SPL):

SPL is sound pressure related logarithmically to a reference level of pressure (P_o), which by convention is 0.0002 dynes/cm^2. The defining equation is:

SPL = 20 $\log_{10}$ P/PO in decibels

SQUARE CENTIMETER (cm2):

1 cm^2 = 1.076 x 10^{-3} ft^2

1 cm^2 = 0.1550 in^2

1 cm^2 = 100 mm^2

SQUARE FOOT (ft^2):

1 ft^2 = 929.0 m^2

1 ft^2 = 144 in^2

SQUARE INCH (in2):

1 in^2 = 6.4516 cm^2

1 in^2 = 0.006944 ft^2

1 in^2 = 645.1626 mm^2

SQUARE MILLIMETER (mm^2):

1 mm^2 = 0.01 cm^2

1 mm^2 = 0.001550 in^2

STERADIAN:

The solid angle which encloses a surface on a sphere equal to the square of the radius.

Appendix G
Acceleration Regime Applicability

USER'S GUIDE

Most sections of Volume I contain design considerations that are applicable to space and planetary missions. While some standards may only be relevant to microgravity operations (i.e., orbital operations), another standard may be applied to launch and entry conditions where extreme forces of gravity are imposed.

The code shown in brackets { } at the beginning of each section indicates which environment, or acceleration regime, is applicable to the section. Definitions of the codes are provided below:

{O} = Orbital: The microgravity acceleration environments encountered in orbital and very low acceleration transorbital operations.

{L} = Launch/Entry: The multi-G launch, entry, and abort acceleration environments.

{P} = Planetary: The G-loads encountered on the moon and Mars. Long-term, low-level accelerations encountered in some transorbital flight operations may be applicable. An artificial gravity system may also fall into this acceleration regime.

{ALL} This regime includes all of the above along with one-G acceleration environment.

(blank) None of the above apply.

The requirements in this document will be applied to equipment that is intended for different mission phases. For instance, a space shuttle handrail must withstand the pressures of launch acceleration whilst an object which is installed on-orbit would not. Thus, we have made an effort to identify which of these requirements must withstand launch accelerations, among others, and this data is presented here. You may investigate the applicable acceleration regime for specific requirements by looking in the appropriate sections below.

Acceleration Regime List

10 Regime for Activity Center Requirements

11 Regime for Hardware and Equipment Requirements

12 Regime for Design for Maintainability Requirements

13 Regime for Facility Management Requirements

14 Regime for Extravehicular Activity (EVA) Requirements

This appendix can also be used to identify all requirements that are applicable to these specific acceleration regimes: Orbital accelerations only, Planetary accelerations only, Launch and Re-entry accelerations only, and all of the acceleration regimes.

Appendix G
Acceleration Regime Applicability for Sections 1 & 2

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
1.0	All			
1.1	All			
1.2	All			
1.3	All			
1.4	All			
1.4.1	All			
1.4.2	All			
1.4.3	All			
1.4.3.1	All			
1.4.3.2	All			
1.4.3.3	All			
1.4.3.4	All			
1.4.3.5	All			
1.4.4	All			
1.5	All			
2.0	All			
2.1	All			
2.2	All			
2.2.1	All			
2.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
2.3	All			
2.3.1	All			
2.3.2	All			

Appendix G
Acceleration Regime Applicability for Section 3

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.0	All			
3.1	All			
3.1.1	All			
3.1.2	All			
3.2	All			
3.2.1	All			
3.2.2	All			
3.2.3	All			
3.2.3.1		Orbital		
3.2.3.2	All			
3.2.3.3	All			
3.3	All			
3.3.1	All			
3.3.1.1	All			
3.3.1.2	All			
3.3.1.3	All			
3.3.2	All			
3.3.2.1	All			
3.3.2.2	All			
3.3.2.2.1	All			
3.3.2.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.3.2.2.3	All			
3.3.2.3	All			
3.3.2.3.1	All			
3.3.2.3.2	All			
3.3.3	All			
3.3.3.1	All			
3.3.3.2	All			
3.3.3.2.1	All			
3.3.3.2.2	All			
3.3.3.2.3	All			
3.3.3.2.4	All			
3.3.3.2.5	All			
3.3.3.2.6	All			
3.3.3.3	All			
3.3.3.3.1	All			
3.3.3.3.2			Launch/ReEntry	
3.3.4		Orbital		
3.3.4.1		Orbital		
3.3.4.2		Orbital		
3.3.4.3	All			
3.3.5	All			
3.3.5.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.3.5.2	All			
3.3.5.3	All			
3.3.6	All			
3.3.6.1	All			
3.3.6.2	All			
3.3.6.3	All			
3.3.6.3.1	All			
3.3.6.3.2	All			
3.3.7	All			
3.3.7.1	All			
3.3.7.2	All			
3.3.7.3	All			
3.3.7.3.1	All			
3.3.7.3.1.1	All			
3.3.7.3.1.2	All			
3.3.7.3.2	All			
3.3.7.3.2.1	All			
3.3.7.3.2.2	All			
3.3.7.3.3	All			
3.3.7.3.3.1	All			
3.3.7.3.3.2	All			

Appendix G
Acceleration Regime Applicability for Section 4

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
4.0	All			
4.1	All			
4.2	All			
4.2.1	All			
4.2.2	All			
4.3	All			
4.3.1	All			
4.3.2	All			
4.3.2.1	All			
4.3.2.2	All			
4.4	All			
4.4.1	All			
4.4.2	All			
4.4.2.1	All			
4.4.2.2	All			
4.5	All			
4.5.1	All			
4.5.2		Orbital		
4.5.2.1		Orbital		
4.5.2.2		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
4.6	All			
4.6.1	All			
4.6.2		Orbital		
4.7	All			
4.7.1	All			
4.7.2		Orbital		
4.8		Orbital		
4.8.1		Orbital		
4.8.2		Orbital		
4.9	All			
4.9.1	All			
4.9.2		Orbital		
4.9.3		Orbital		
4.10	All			
4.10.2	All			
4.11	All			
4.11.1	All			
4.11.2	All			
4.11.3	All			

Appendix G
Acceleration Regime Applicability for Section 5

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.0	All			
5.1	All			
5.1.1	All			
5.1.2	All			
5.1.2.1	All			
5.1.2.1.1	All			
5.1.2.1.2	All			
5.1.2.1.3	All			
5.1.2.1.4	All			
5.1.2.1.4.1	All			
5.1.2.1.4.2	All			
5.1.2.1.4.3	All			
5.1.2.2	All			
5.1.2.2.1	All			
5.1.2.2.1.1	All			
5.1.2.2.1.2	All			
5.1.2.2.1.3	All			
5.1.2.2.1.4	All			
5.1.2.2.1.5	All			
5.1.2.2.1.6	All			
5.1.2.2.1.7	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.1.2.2.1.7.1	All			
5.1.2.2.1.7.2	All			
5.1.2.2.1.7.3	All			
5.1.2.3.	All			
5.1.2.3.1	All			
5.1.2 3.2	All			
5.1.2.3.3	All			
5.1.3	All			
5.1.3.1	All			
5.1.3.2	All			
5.1.3.3	All			
5.1.3.4	All			
5.1.3.4.1	All			
5.1.3.4.2	All			
5.1.3.4.3		Orbital	Launch/ReEntry	Planetary
5.1.3.5	All			
5.2		Orbital		
5.2.1		Orbital		
5.2.2		Orbital		
5.2.2.1		Orbital		
5.2.2.2.		Orbital		
5.2.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.3	All			
5.3.1	All			
5.3.2	All			
5.3.2.1	All			
5.3.2.1.1	All			
5.3.2.1.2	All			
5.3.2.1.3	All			
5.3.2.2	All			
5.3.2.2.1	All			
5.3.2.2.2	All			
5.3.2.2.3	All			
5.3.2.3	All			
5.3.2.4	All			
5.3.3	All			
5.3.3.1	All			
5.3.3.1.1	All			
5.3.3.2	All			
5.3.3.3	All			
5.4	All			
5.4.1	All			
5.4.2	All			
5.4.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.4.2.1.1			Launch/ReEntry	
5.4.2.1.2		Orbital		
5.4.2.1.3			Launch/ReEntry	
5.4.2.2	All			
5.4.2.3	All			
5.4.2.3.1	All			
5.4.2.3.2	All			
5.4.2.3.3	All			
5.4.2.4	All			
5.4.2.4.1	All			
5.4.2.4.1.1	All			
5.4.2.4.1.1.1	All			
5.4.2.4.1.1.2	All			
5.4.2.4.1.2	All			
5.4.2.4.2	All			
5.4.2.4.2.1	All			
5.4.2.4.2.2	All			
5.4.2.4.3	All			
5.4.2.4.3.1	All			
5.4.2.4.3.2	All			
5.4.3	All			
5.4.3.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.4.3.2	All			
5.4.3.2.1	All			
5.4.3.2.1.1	All			
5.4.3.2.1.2	All			
5.4.3.2.1.3	All			
5.4.3.2.1.4	All			
5.4.3.2.1.5	All			
5.4.3.2.2	All			
5.4.3.2.2.1	All			
5.4.3.2.2.2	All			
5.4.3.2.3	All			
5.4.3.2.3.1	All			
5.4.3.2.3.2	All			
5.4.3.2.3.3	All			
5.4.3.2.3.4	All			
5.4.3.2.4	All			
5.4.3.2.5	All			
5.4.4	All			
5.4.4.1	All			
5.4.4.2	All			
5.4.4.3	All			
5.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.5.1	All			
5.5.2	All			
5.5.2.1	All			
5.5.2.1.1			Launch/ReEntry	
5.5.2.1.2		Orbital		Planetary
5.5.2.1.3			Launch/ReEntry	
5.5.2.2	All			
5.5.2.3	All			
5.5.2.3.1	All			
5.5.2.3.2	All			
5.5.2.3.3	All			
5.5.2.4	All			
5.5.2.4.1	All			
5.5.2.4.2	All			
5.5.2.4.3	All			
5.5.2.4.4	All			
5.5.3	All			
5.5.3.1	All			
5.5.3.2	All			
5.5.3.2.1	All			
5.5.3.2.2	All			
5.5.3.2.3	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.5.3.2.4	All			
5.5.3.2.5	All			
5.5.3.3	All			
5.5.3.3.1			Launch/ReEntry	
5.5.3.3.2	All			
5.5.3.3.3	All			
5.5.3.3.4	All			
5.5.4	All			
5.5.4.1	All			
5.5.4.2	All			
5.5.4.3	All			
5.6	All			
5.7	All			
5.7.1	All			
5.7.2	All			
5.7.2.1	All			
5.7.2.1.1	All			
5.7.2.1.2	All			
5.7.2.1.2.1	All			
5.7.2.1.2.2	All			
5.7.2.1.2.3	All			
5.7.2.1.2.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.7.2.1.3	All			
5.7.2.1.3.1	All			
5.7.2.1.3.2	All			
5.7.2.1.3.3	All			
5.7.2.1.3.3.1	All			
5.7.2.1.3.3.2	All			
5.7.2.1.3.3.3	All			
5.7.2.1.3.3.4	All			
5.7.2.1.3.3.5	All			
5.7.3.1.3.3.6	All			
5.7.2.1.3.4	All			
5.7.2.1.4	All			
5.7.2.1.4.1	All			
5.7.2.1.4.2	All			
5.7.2.1.4.3	All			
5.7.2.1.4.4	All			
5.7.2.1.4.5	All			
5.7.2.1.4.6	All			
5.7.2.1.5	All			
5.7.2.2	All			
5.7.2.2.1	All			
5.7.2.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.7.2.2.3	All			
5.7.2.2.4	All			
5.7.3	All			
5.7.3.1	All			
5.7.3.1.1	All			
5.7.3.1.2	All			
5.7.3.1.3	All			
5.7.3.1.4	All			
5.7.3.2	All			
5.7.3.2.1	All			
5.7.3.2.2	All			
5.8	All			
5.8.1	All			
5.8.2	All			
5.8.2.1	All			
5.8.2.2	All			
5.8.2.2.1	All			
5.8.2.2.2	All			
5.8.2.2.2.1	All			
5.8.2.2.3	All			
5.8.2.2.4	All			
5.8.2.2.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.8.3	All			
5.8.3.1	All			
5.8.3.2	All			
5.9	All			
5.9.1	All			
5.9.2	All			

Appendix G
Acceleration Regime Applicability for Section 6

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.0	All			
6.1	All			
6.2	All			
6.2.1	All			
6.2.2	All			
6.2.2.1	All			
6.2.2.2	All			
6.2.3	All			
6.3	All			
6.3.1	All			
6.3.2	All			
6.3.3	All			
6.3.3.1	All			
6.3.3.2	All			
6.3.3.3	All			
6.3.3.4	All			
6.3.3.5	All			
6.3.3.6	All			
6.3.3.7	All			
6.3.3.8	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.3.3.9	All			
6.3.3.10	All			
6.3.3.11	All			
6.3.4	All			
6.4	All			
6.4.1	All			
6.4.2	All			
6.4.2.1	All			
6.4.2.1.1	All			
6.4.2.2	All			
6.4.2.2.1	All			
6.4.2.3	All			
6.4.2.4	All			
6.4.3	All			
6.4.3.1	All			
6.4.3.1.1	All			
6.4.3.2	All			
6.4.3.3	All			
6.4.3.4	All			
6.4.3.5	All			
6.4.3.6	All			
6.4.3.7	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.4.3.8	All			
6.4.3.9	All			
6.4.3.10	All			
6.4.3.11	All			
6.4.3.12	All			
6.4.3.13	All			
6.4.3.13.1	All			
6.4.3.14	All			
6.4.3.15	All			
6.4.3.15.1	All			
6.4.3.16	All			
6.4.3.17	All			
6.4.3.18	All			
6.4.3.18.1	All			
6.4.3.18.1.1	All			
6.4.3.18.1.2	All			
6.4.3.18.2	All			
6.4.3.18.2.1	All			
6.4.3.18.2.2	All			
6.4.3.18.2.3	All			
6.4.3.18.2.4	All			
6.4.3.18.2.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.4.3.19	All			
6.5	All			
6.5.1	All			
6.5.2	All			
6.5.3	All			
6.6	All			
6.6.1	All			
6.6.2	All			
6.6.3	All			
6.6.3.1	All			
6.6.3.1.1	All			
6.6.3.1.2	All			
6.6.3.2	All			
6.6.3.2.1	All			
6.6.3.2.2	All			
6.6.3.2.3	All			
6.6.3.3	All			
6.6.3.4	All			
6.7	All			
6.7.1	All			
6.7.2	All			
6.7.3	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.7.4	All			
6.7.5	All			

Appendix G
Acceleration Regime Applicability for Section 7

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.0		Orbital		Planetary
7.1	All			
7.2	All			
7.2.1	All			
7.2.2	All			
7.2.2.1	All			
7.2.2.2	All			
7.2.2.2.1	All			
7.2.2.2.2	All			
7.2.2.2.3	All			
7.2.2.3	All			
7.2.2.3.1	All			
7.2.2.3.2	All			
7.2.2.4		Orbital		Planetary
7.2.3		Orbital		Planetary
7.2.3.1		Orbital		Planetary
7.2.3.2		Orbital		Planetary
7.2.3.3		Orbital		Planetary
7.2.3.3.1		Orbital		Planetary
7.2.3.3.2		Orbital		Planetary

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.2.3.3.2.1		Orbital		Planetary
7.2.3.3.2.2		Orbital		Planetary
7.2.3.3.3		Orbital		Planetary
7.2.3.4		Orbital		Planetary
7.2.3.4.1		Orbital		Planetary
7.2.3.4.2		Orbital		Planetary
7.2.3.4.3		Orbital		Planetary
7.2.4	All			
7.2.4.1	All			
7.2.4.2	All			
7.2.4.3	All			
7.2.5	All			
7.2.5.1	All			
7.2.5.2	All			
7.2.5.1	All			
7.2.5.2	All			
7.2.5.3	All			
7.2.5.3.1	All			
7.2.5.3.2	All			
7.2.5.3.3	All			
7.2.5.3.4	All			
7.2.5.3.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.2.5.3.6	All			
7.2.6	All			
7.2.6.1	All			
7.2.6.2	All			
7.2.6.3	All			
7.2.7	All			
7.2.7.1	All			
7.2.7.2	All			
7.2.7.2.1	All			
7.2.7.2.2	All			
7.2.7.2.2.1	All			
7.2.7.2.2.2	All			
7.2.7.2.2.3	All			
7.2.7.3	All			
7.2.7.3.1	All			
7.2.7.3.2	All			
7.2.7.3.2.1	All			
7.2.7.3.2.2	All			
7.2.7.3.2.3	All			
7.2.7.3.2.4	All			
7.2.7.3.3	All			
7.2.8	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.3	All			
7.3.1	All			
7.3.2	All			
7.3.2.1	All			
7.3.2.2	All			
7.3.2.3	All			
7.3.3	All			
7.3.3.1	All			
7.3.3.2	All			
7.3.3.3	All			
7.3.3.4	All			
7.4	All			
7.4.1	All			
7.4.2	All			
7.4.3	All			
7.4.3.1	All			
7.4.3.2	All			

Appendix G
Acceleration Regime Applicability for Section 8

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.0	All			
8.1	All			
8.2	All			
8.2.1	All			
8.2.2	All			
8.2.2.1		Orbital		
8.2.2.2	All			
8.2.2.3	All			
8.2.2.4	All			
8.2.2.5	All			
8.2.2.6	All			
8.2.2.7	All			
8.2.2.8	All			
8.2.3	All			
8.2.3.1	All			
8.2.3.2	All			
8.3	All			
8.3.1	All			
8.3.2	All			
8.3.2.1	All			
8.3.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.3.3	All			
8.3.3.1	All			
8.3.3.2	All			
8.4		Orbital		
8.4.1		Orbital		
8.4.2		Orbital		
8.4.3		Orbital		
8.4.4		Orbital		
8.5	All			
8.5.1	All			
8.5.2	All			
8.5.2.1	All			
8.5.2.2	All			
8.5.3	All			
8.5.3.1	All			
8.5.3.2	All			
8.5.3.3	All			
8.5.3.4	All			
8.6	All			
8.6.1	All			
8.6.2	All			
8.6.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.6.2.2	All			
8.6.2.3	All			
8.6.2.4	All			
8.6.3	All			
8.6.3.1	All			
8.6.3.2	All			
8.6.4		Orbital		
8.6.4.1		Orbital		
8.6.4.2		Orbital		
8.6.4.3		Orbital		
8.7	All			
8.7.1	All			
8.7.2	All			
8.7.2.1	All			
8.7.2.2		Orbital		
8.7.2.3		Orbital		
8.7.3	All			
8.7.3.1	All			
8.7.3.2	All			
8.7.3.3	All			
8.7.3.4	All			
8.8	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.8.1		Orbital		
8.8.2		Orbital		
8.8.3	All			
8.8.3.1		Orbital		
8.8.3.2		Orbital		
8.8.3.3	All			
8.8.3.4	All			
8.9		Orbital		
8.9.1		Orbital		
8.9.2		Orbital		
8.9.2.1		Orbital		
8.9.2.2		Orbital		
8.9.3		Orbital		
8.9.3.1		Orbital		
8.9.3.2		Orbital		
8.9.4		Orbital		
8.10	All			
8.10.1	All			
8.10.2	All			
8.10.3	All			
8.10.3.1	All			
8.10.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.10.3.3	All			
8.10.3.4	All			
8.10.3.5	All			
8.10.3.6	All			
8.10.3.7	All			
8.10.4	All			
8.11	All			
8.11.1	All			
8.11.2	All			
8.11.2.1	All			
8.11.2.2	All			
8.11.3	All			
8.12	All			
8.12.1	All			
8.12.2	All			
8.12.2.1	All			
8.12.2.2	All			
8.12.2.3	All			
8.12.2.4	All			
8.12.3	All			
8.12.3.1	All			
8.12.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.12.3.3	All			
8.12.3.4	All			
8.12.3.5	All			
8.12.3.6	All			
8.13	All			
8.13.1	All			
8.13.2	All			
8.13.2.1	All			
8.13.2.2	All			
8.13.2.3	All			
8.13.2.4	All			
8.13.2.5	All			
8.13.2.6	All			
8.13.2.7	All			
8.13.3	All			
8.13.3.1	All			
8.13.3.1.1	All			
8.13.3.1.2	All			
8.13.3.1.3	All			
8.13.3.1.4	All			
8.13.3.2	All			
8.13.3.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.13.3.2.2	All			
8.13.3.2.3	All			
8.13.3.3	All			
8.13.3.4	All			
8.13.3.5	All			
8.13.3.6	All			

Appendix G
Acceleration Regime Applicability for Section 9

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.0	All			
9.1	All			
9.2	All			
9.2.1	All			
9.2.2	All			
9.2.2.1	All			
9.2.2.1.1	All			
9.2.2.1.2	All			
9.2.2.1.3	All			
9.2.2.2	All			
9.2.2.2.1	All			
9.2.2.2.2	All			
9.2.2.2.3	All			
9.2.2.2.4	All			
9.2.2.2.5	All			
9.2.2.2.6	All			
9.2.3	All			
9.2.3.1	All			
9.2.3.2	All			
9.2.3.2.1.	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.2.3.2.2	All			
9.2.3.2.3	All			
9.2.3.2.4.	All			
9.2.3.2.5	All			
9.2.3.2.6	All			
9.2.3.2.7	All			
9.2.3.2.8	All			
9.2.3.2.9	All			
9.2.3.2.10	All			
9.2.4	All			
9.2.4.1	All			
9.2.4.1.1	All			
9.2.4.2	All			
9.2.4.2.1	All			
9.2.4.2.2	All			
9.2.4.2.3	All			
9.2.5	All			
9.2.5.1	All			
9.2.5.1.1	All			
9.2.5.1.2	All			
9.2.5.2	All			
9.2.5.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.2.5.2.2		Orbital		Planetary
9.2.6	All			
9.3	All			
9.3.1	All			
9.3.2	All			
9.3.2.1	All			
9.3.2.2	All			
9.3.3	All			
9.3.3.1	All			
9.3.3.2	All			
9.3.3.3	All			
9.3.3.3.1	All			
9.3.3.3.2	All			
9.3.3.3.3	All			
9.3.3.3.4	All			
9.3.3.3.5	All			
9.3.3.3.6	All			
9.3.3.3.7	All			
9.3.3.3.8	All			
9.3.3.3.9	All			
9.3.3.3.10	All			
9.3.3.3.11	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.3.3.3.12	All			
9.3.3.3.13	All			
9.3.3.3.14	All			
9.3.3.3.15	All			
9.3.3.3.16	All			
9.3.3.3.17	All			
9.3.3.4	All			
9.3.3.4.1	All			
9.3.3.4.1.1	All			
9.3.3.4.1.2	All			
9.3.3.4.2	All			
9.3.3.4.3	All			
9.3.3.4.4	All			
9.3.3.4.5	All			
9.3.3.4.6	All			
9.3.3.4.7	All			
9.3.3.4.8	All			
9.3.3.5	All			
9.3.3.6	All			
9.3.3.7	All			
9.3.4	All			
9.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.1	All			
9.4.2	All			
9.4.2.1	All			
9.4.2.2	All			
9.4.2.3	All			
9.4.2.3.1	All			
9.4.2.3.1.1	All			
9.4.2.3.1.2	All			
9.4.2.3.1.3	All			
9.4.2.3.1.4	All			
9.4.2.3.1.5	All			
9.4.2.3.2	All			
9.4.2.3.3	All			
9.4.2.3.3.1	All			
9.4.2.3.3.2	All			
9.4.2.3.3.3	All			
9.4.2.3.3.4	All			
9.4.2.3.3.5	All			
9.4.2.3.3.6	All			
9.4.2.3.3.7	All			
9.4.2.3.3.8	All			
9.4.2.3.3.9	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.2.3.3.10	All			
9.4.2.3.4	All			
9.4.3	All			
9.4.3.1	All			
9.4.3.2	All			
9.4.3.3	All			
9.4.3.3.1	All			
9.4.3.3.2	All			
9.4.3.3.3	All			
9.4.3.3.4	All			
9.4.4	All			
9.4.4.1	All			
9.4.4.2	All			
9.4.4.3	All			
9.4.4.3.1	All			
9.4.4.3.1.1	All			
9.4.4.3.1.2	All			
9.4.4.3.1.3	All			
9.4.4.3.2	All			
9.4.4.3.3	All			
9.4.4.3.4	All			
9.4.4.3.4.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.4.3.4.2	All			
9.4.4.3.4.3	All			
9.4.5	All			
9.4.5.1	All			
9.4.5.1.1	All			
9.4.5.1.2	All			
9.5	All			
9.5.1	All			
9.5.2	All			
9.5.3	All			
9.5.3.1	All			
9.5.3.1.1	All			
9.5.3.1.2	All			
9.5.3.1.3	All			
9.5.3.1.4	All			
9.5.3.1.5	All			
9.5.3.1.6	All			
9.5.3.1.7	All			
9.5.3.1.8	All			
9.5.3.1.9	All			
9.5.3.1.10	All			
9.5.3.1.11	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.5.3.1.12	All			
9.5.3.1.13	All			
9.5.3.1.14	All			
9.5.3.1.14.1	All			
9.5.3.1.14.2	All			
9.5.3.1.14.3	All			
9.5.3.1.14.4	All			
9.5.3.1.14.5	All			
9.5.3.1.14.6	All			
9.5.3.1.14.7	All			
9.5.3.1.14.8	All			
9.5.3.1.14.9	All			
9.5.3.1.14.10	All			
9.5.3.2	All			
9.6	All			
9.6.1	All			
9.6.2	All			
9.6.2.1	All			
9.6.2.2	All			
9.6.2.3	All			
9.6.2.3.1	All			
9.6.2.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.2.4	All			
9.6.2.4.1	All			
9.6.2.4.2	All			
9.6.2.4.3	All			
9.6.2.4.3.1	All			
9.6.2.4.3.2	All			
9.6.2.4.4	All			
9.6.2.4.4.1	All			
9.6.2.4.4.2	All			
9.6.2.5	All			
9.6.2.5.1	All			
9.6.2.5.2	All			
9.6.2.6	All			
9.6.2.6.1	All			
9.6.2.6.2	All			
9.6.2.7	All			
9.6.2.7.1	All			
9.6.2.7.2	All			
9.6.2.8	All			
9.6.2.8.1	All			
9.6.2.8.2	All			
9.6.2.9	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.2.9.1	All			
9.6.2.9.2	All			
9.6.3	All			
9.6.3.1	All			
9.6.3.1.1	All			
9.6.3.1.2.	All			
9.6.3.1.3	All			
9.6.3.1.3.1	All			
9.6.3.1.3.2	All			
9.6.3.1.4	All			
9.6.3.1.5	All			
9.6.3.1.6	All			
9.6.3.1.6.1	All			
9.6.3.1.6.2	All			
9.6.3.1.6.3	All			
9.6.3.1.6.3.1	All			
9.6.3.1.6.3.2	All			
9.6.3.1.6.4	All			
9.6.3.1.6.4.1	All			
9.6.3.1.6.4.2	All			
9.6.3.1.7	All			
9.6.3.1.7.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.1.7.2	All			
9.6.3.1.7.3	All			
9.6.3.1.7.3.1	All			
9.6.3.1.7.3.2	All			
9.6.3.1.7.4	All			
9.6.3.1.7.5	All			
9.6.3.1.7.5.1	All			
9.6.3.1.7.5.2	All			
9.6.3.1.8	All			
9.6.3.1.8.1	All			
9.6.3.1.8.2	All			
9.6.3.2.8.3	All			
9.6.3.1.9	All			
9.6.3.1.9.1	All			
9.6.3.1.9.2	All			
9.6.3.1.10	All			
9.6.3.1.10.1	All			
9.6.3.1.10.2	All			
9.6.3.2	All			
9.6.3.2.1	All			
9.6.3.2.1.1	All			
9.6.3.2.1.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.2.2	All			
9.6.3.2.3	All			
9.6.3.2.4	All			
9.6.3.2.5	All			
9.6.3.2.5.1	All			
9.6.3.2.5.2	All			
9.6.3.3	All			
9.6.3.3.1	All			
9.6.3.3.1.1	All			
9.6.3.3.1.2	All			
9.6.3.3.1.3	All			
9.6.3.3.2	All			
9.6.3.3.2.1	All			
9.6.3.3.2.2	All			
9.6.3.4	All			
9.6.3.4.1	All			
9.6.3.4.2	All			
9.6.3.4.2.1	All			
9.6.3.4.2.2	All			
9.6.3.4.3	All			
9.6.3.4.3.1	All			
9.6.3.4.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.4.4	All			
9.6.3.4.5	All			
9.6.3.4.5.1	All			
9.6.3.4.5.2	All			
9.6.3.4.6	All			
9.6.3.4.6.1	All			
9.6.3.4.6.2	All			
9.6.3.4.7	All			
9.6.3.4.7.1	All			
9.6.3.4.7.2	All			
9.6.3.5	All			
9.6.4	All			
9.6.4.1	All			
9.6.4.2	All			
9.6.4.3	All			
9.6.4.4	All			

Appendix G
Acceleration Regime Applicability for Section 10

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.0	All			
10.1	All			
10.2	All			
10.2.1	All			
10.2.2	All			
10.2.3	All			
10.2.3.1	All			
10.2.3.2	All			
10.2.3.3	All			
10.2.3.4	All			
10.2.3.5	All			
10.3	All			
10.3.1	All			
10.3.2	All			
10.3.3	All			
10.3.3.1	All			
10.3.3.2	All			
10.3.4		Orbital		
10.4	All			
10.4.1	All			
10.4.2		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.4.3	All			
10.5	All			
10.5.1	All			
10.5.2	All			
10.5.3	All			
10.5.3.1	All			
10.5.3.2	All			
10.5.3.3	All			
10.5.3.4	All			
10.6	All			
10.6.1	All			
10.6.2	All			
10.6.3	All			
10.6.4		Orbital		
10.7	All			
10.7.1	All			
10.7.2	All			
10.7.3	All			
10.8		Orbital		
10.8.1		Orbital		
10.8.2		Orbital		
10.8.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.8.3.1		Orbital		
10.8. 3.1.1		Orbital		
10.8.3.1.2		Orbital		
10.8.3.1.2.1		Orbital		
10.8.3.1.2.2		Orbital		
10.8.3.2		Orbital		
10.8.3.2.1		Orbital		
10.8.3.2.1.1		Orbital		
10.8.3.2.1.2		Orbital		
10.8.3.2.1.3		Orbital		
10.8.3.3		Orbital		
10.8.3.4		Orbital		
10.8.3.5		Orbital		
10.8.4		Orbital		
10.9	All			
10.9.1	All			
10.9.2	All			
10.9.2.1	All			
10.9.2.2	All			
10.9.2.3	All			
10.9.3	All			
10.9.3.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.9.3.2	All			
10.9.3.2.1	All			
10.9.3.2.2	All			
10.9.3.2.3	All			
10.9.3.2.4	All			
10.9.3.2.5	All			
10.9.3.2.6	All			
10.9.3.2.7	All			
10.9.3.2.8	All			
10.9.3.2.9	All			
10.9.3.2.10	All			
10.9.3.2.11	All			
10.9.3.2.12	All			
10.9.3.2.13	All			
10.9.3.2.14	All			
10.9.3.2.15	All			
10.9.3.2.15.1	All			
10.9.3.2.15.2	All			
10.9.3.2.16	All			
10.10	All			
10.10.1	All			
10.10.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.10.3	All			
10.11	All			
10.11.1	All			
10.11.2	All			
10.11.3	All			
10.12	All			
10.12.1	All			
10.12.2	All			
10.12.3	All			

Appendix G
Acceleration Regime Applicability for Section 11

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.0	All			
11.1	All			
11.2	All			
11.2.1	All			
11.2.2	All			
11.2.2.1	All			
11.2.2.2	All			
11.2.3	All			
11.2.3.1	All			
11.2.3.1.1	All			
11.2.3.1.2	All			
11.2.3.1.3	All			
11.2.3.2	All			
11.2.3.3	All			
11.2.3.4	All			
11.2.3.5	All			
11.2.3.6	All			
11.2.3.7	All			
11.2.4	All			
11.2.4.1	All			
11.2.4.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.3	All			
11.3.1	All			
11.3.2	All			
11.3.3	All			
11.3.3.1	All			
11.3.3.2	All			
11.3.3.3	All			
11.3.3.4	All			
11.4	All			
11.4.1	All			
11.4.2	All			
11.4.3	All			
11.4.4	All			
11.5	All			
11.5.1	All			
11.5.2	All			
11.5.3.1	All			
11.5.3.2	All			
11.5.4	All			
11.6	All			
11.6.1	All			
11.6.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.6.3	All			
11.6.3.1	All			
11.6.3.2	All			
11.6.3.3	All			
11.6.3.4	All			
11.7	All			
11.7.1	All			
11.7.2	All			
11.7.2.1	All			
11.7.2.2	All			
11.7.2.3	All			
11.7.2.3.1	All			
11.7.2.3.2	All			
11.7.2.3.2.1	All			
11.7.2.3.2.2	All			
11.7.2.3.2.3	All			
11.7.2.3.2.4	All			
11.7.2.3.3	All			
11.7.2.3.3.1	All			
11.7.2.3.3.2		Orbital		
11.7.2.3.3.3	All			
11.7.2.3.3.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.7.2.3.4		Orbital		Planetary
11.7.2.4		Orbital		
11.7.3	All			
11.7.3.1	All			
11.7.3.2	All			
11.7.3.3	All			
11.7.3.4		Orbital		
11.8	All			
11.8.1	All			
11.8.2	All			
11.8.2.1	All			
11.8.2.2	All			
11.8.2.2.1	All			
11.8.2.2.2	All			
11.8.2.2.3	All			
11.8.2.2.4	All			
11.8.2.2.5	All			
11.8.2.2.6	All			
11.8.3	All			
11.8.3.1	All			
11.8.3.2	All			
11.8.3.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.9	All			
11.9.1	All			
11.9.2	All			
11.9.3	All			
11.9.3.1	All			
11.9.3.2	All			
11.9.3.3	All			
11.9.3.4	All			
11.9.4	All			
11.10	All			
11.10.1	All			
11.10.2	All			
11.10.3	All			
11.10.3.1	All			
11.10.3.2	All			
11.10.3.3	All			
11.10.3.4	All			
11.10.3.5	All			
11.10.3.6	All			
11.10.4	All			
11.11	All			
11.11.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.11.2	All			
11.11.2.1	All			
11.11.2.2	All			
11.11.2.3	All			
11.11.2.4	All			
11.11.3	All			
11.11.3.1	All			
11.11.3.1.1	All			
11.11.3.1.2	All			
11.11.3.1.3	All			
11.11.3.1.4	All			
11.11.3.1.5	All			
11.11.3.1.6	All			
11.11.3.1.7	All			
11.11.3.1.8	All			
11.11.3.1.9	All			
11.11.3.2	All			
11.11.3.2.1	All			
11.11.3.2.1.1	All			
11.11.3.2.2	All			
11.11.3.2.3	All			
11.11.3.2.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.11.3.3	All			
11.11.3.4	All			
11.11.3.5	All			
11.11.3.6	All			
11.11.4	All			
11.12	All			
11.12.1	All			
11.12.2	All			
11.12.3	All			
11.13	All			
11.13.1	All			
11.13.1.1	All			
11.13.1.2	All			
11.13.1.2.1	All			
11.13.1.2.2	All			
11.13.1.2.3	All			
11.13.1.3	All			
11.13.1.3.1	All			
11.13.1.3.2	All			
11.13.1.4	All			
11.13.2	All			
11.13.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.13.2.2	All			
11.13.2.3	All			
11.13.2.4	All			
11.14	All			
11.14.1	All			
11.14.2	All			
11.14.3	All			
11.14.4	All			

Appendix G
Acceleration Regime Applicability for Section 12

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
12.0	All			
12.1	All			
12.2	All			
12.3	All			
12.3.1	All			
12.3.1.1	All			
12.3.1.2	All			
12.3.1.3	All			
12.3.1.4	All			
12.3.2	All			
12.3.2.1	All			
12.3.2.2	All			
12.3.3	All			

Appendix G
Acceleration Regime Applicability for Section 13

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
13.0	All			
13.1	All			
13.2	All			
13.2.1	All			
13.2.2	All			
13.2.3	All			
13.2.3.1	All			
13.2.3.2	All			
13.2.3.3	All			
13.2.3.4	All			
13.2.4	All			
13.3	All			
13.3.1	All			
13.3.2	All			
13.3.3	All			
13.3.3.1	All			
13.3.3.2	All			
13.4	All			
13.4.1	All			
13.4.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
13.4.3	All			
13.4.3.1	All			
13.4.3.2	All			
13.4.3.3	All			
13.4.4	All			

Appendix G
Acceleration Regime Applicability for Section 14

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.0	All			
14.1	All			
14.1.1	All			
14.1.2	All			
14.1.2.1	All			
14.1.2.1.1	All			
14.1.2.1.2	All			
14.1.2.1.3	All			
14.1.2.1.4	All			
14.1.3	All			
14.1.4	All			
14.2	All			
14.2.1	All			
14.2.2	All			
14.2.2.1	All			
14.2.2.2	All			
14.2.2.3	All			
14.2.2.4	All			
14.2.2.5	All			
14.2.2.6	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.2 2.7	All			
14.2.2.8	All			
14.2.2.9	All			
14.2.2.10	All			
14.2.2.11	All			
14.2.3	All			
14.2.3.1	All			
14.2.3.2	All			
14.2.3.3	All			
14.2.3.4	All			
14.2.3.5	All			
14.2.3.6	All			
14.2.3.7	All			
14.2.3.8	All			
14.2.3.9	All			
14.2.3.10	All			
14.2.3.11	All			
14.2.4		Orbital		Planetary
14.2.4.1		Orbital		Planetary
14.2.4.2		Orbital		Planetary
14.2.4.3	All			
14.2.4.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.2.4.5	All			
14.3	All			
14.3.1	All			
14.3.2	All			
14.3.2.1	All			
14.3.2.1.1	All			
14.3.2.1.2	All			
14.3.2.1.3	All			
14.3.2.2	All			
14.3.2.3	All			
14.3.2.3.1	All			
14.3.2.4	All			
14.3.2.5	All			
14.3.2.6	All			
14.3.2.7	All			
14.3.3	All			
14.3.4	All			
14.3.4.1	All			
14.3.4.2	All			
14.3.4.3	All			
14.3.4.4	All			
14.3.4.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.4	All			
14.4.1	All			
14.4.2	All			
14.4.2.1	All			
14.4.2.2	All			
14.4.2.3	All			
14.4.2.4	All			
14.4.2.5	All			
14.4.3	All			
14.4.3.1	All			
14.4.3.2	All			
14.4.3.3	All			
14.4.3.4	All			
14.4.3.5	All			
14.4.4	All			
14.4.4.1	All			
14.4.4.2		Orbital		Planetary
14.4.4.3		Orbital		Planetary
14.5	All			
14.5.1	All			
14.5.2	All			
14.5.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.5.2.2	All			
14.5.2.3	All			
14.5.2.4	All			
14.5.2.5	All			
14.5.2.6	All			
14.5.3	All			
14.5.3.1	All			
14.5.3.2	All			
14.5.3.3	All			
14.5.3.4	All			
14.5.3.5	All			
14.5.3.6	All			
14.6	All			
14.6.1	All			
14.6.2	All			
14.6.2.1	All			
14.6.2.2	All			
14.6.2.3	All			
14.6.2.4	All			
14.6.2.4.1	All			
14.6.2.4.2	All			
14.6.3	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.6.3.1	All			
14.6.3.2	All			
14..6.3.3	All			
14.6.4	All			
14.6.4.1	All			
14.6.4.2	All			
14.6.4.3	All			
14.7	All			
14.7.1	All			
14.7.2	All			
14.7.3	All			
14.7.4	All			
14.7.4.1	All			
14.7.4.2		Orbital		
14.7.4.3		Orbital		

Acceleration Regime Applicability for Orbital Acceleration Only

Paragraph Numbers

All Paragraphs applicable for Orbital acceleration			
3.2.3.1	7.2.3	8.7.2.3	10.8.3.1.2
3.3.4	7.2.3.1	8.8.1	10.8.3.1.2.1
3.3.4.1	7.2.3.2	8.8.2	10.8.3.1.2.2
3.3.4.2	7.2.3.3	8.8.3.1	10.8.3.2
4.5.2	7.2.3.3.1	8.8.3.2	10.8.3.2.1
4.5.2.1	7.2.3.3.2	8.9	10.8.3.2.1.1
4.5.2.2	7.2.3.3.2.1	8.9.1	10.8.3.2.1.2
4.6.2	7.2.3.3.2.2	8.9.2	10.8.3.2.1.3
4.7.2	7.2.3.3.3	8.9.2.1	10.8.3.3
4.8	7.2.3.4	8.9.2.2	10.8.3.4
4.8.1	7.2.3.4.1	8.9.3	10.8.3.5
4.8.2	7.2.3.4.2	8.9.3.1	10.8.4
4.9.2	7.2.3.4.3	8.9.3.2	11.7.2.3.3.2
4.9.3	8.2.2.1	8.9.4	11.7.2.3.4
5.2	8.4	9.2.5.2.2	11.7.2.4
5.2.1	8.4.1	10.3.4	11.7.3.4
5.2.2	8.4.2	10.4.2	11.8.3.3
5.2.2.1	8.4.3	10.6.4	14.2.4
5.2.2.2.	8.4.4	10.8	14.2.4.1
5.2.3	8.6.4	10.8.1	14.2.4.2
5.4.2.1.2	8.6.4.1	10.8.2	14.4.4.2
5.5.2.1.2	8.6.4.2	10.8.3	14.4.4.3

Paragraph Numbers

All Paragraphs applicable for Orbital acceleration			
7.0	8.6.4.3	10.8.3.1	14.7.4.2
7.2.2.4	8.7.2.2	10.8. 3.1.1	14.7.4.3

Acceleration Regime Applicability for Planetary Acceleration Only

These paragraphs are applicable for Planetary acceleration regimes:

5.5.2.1.2	7.0
7.2.2.4	7.2.3
7.2.3.1	7.2.3.2
7.2.3.3	7.2.3.3.1
7.2.3.3.2	7.2.3.3.2.1
7.2.3.3.2.2	7.2.3.3.3
7.2.3.4	7.2.3.4.1
7.2.3.4.2	7.2.3.4.3
9.2.5.2.2	11.7.2.3.4
14.2.4	14.2.4.1
14.2.4.2	14.4.4.2
14.4.4.3	

Appendix G
Acceleration Regime Applicability
for Launch and Re-Entry Acceleration Only

These paragraphs are applicable for Launch and Re-Entry acceleration regimes:

3.3.3.3.2	5.4.2.1.1
5.4.2.1.3	5.5.2.1.1
5.5.2.1.3	5.5.3.3.1

Appendix G
Acceleration Regime Applicability for All Regimes

Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

Sections 1 - 4

1.0	**2.0**	**3.0**	**3 (continued)**	**4.0**
1.1	2.1	3.1	3.3.3.2.4	4.1
1.2	2.2	3.1.1	3.3.3.2.5	4.2
1.3	2.2.1	3.1.2	3.3.3.2.6	4.2.1
1.4	2.2.2	3.2	3.3.3.3	4.2.2
1.4.1	2.3	3.2.1	3.3.3.3.1	4.3
1.4.2	2.3.1	3.2.2	3.3.4.3	4.3.1
1.4.3	2.3.2	3.2.3	3.3.5	4.3.2
1.4.3.1		3.2.3.2	3.3.5.1	4.3.2.1
1.4.3.2		3.2.3.3	3.3.5.2	4.3.2.2
1.4.3.3		3.3	3.3.5.3	4.4
1.4.3.4		3.3.1	3.3.6	4.4.1
1.4.3.5		3.3.1.1	3.3.6.1	4.4.2
1.4.4		3.3.1.2	3.3.6.2	4.4.2.1
1.5		3.3.1.3	3.3.6.3	4.4.2.2
		3.3.2	3.3.6.3.1	4.5
		3.3.2.1	3.3.6.3.2	4.5.1
		3.3.2.2	3.3.7	4.6
		3.3.2.2.1	3.3.7.1	4.6.1
		3.3.2.2.2	3.3.7.2	4.7
		3.3.2.2.3	3.3.7.3	4.7.1

Sections 1 - 4

1.0	**2.0**	**3.0**	**3 (continued)**	**4.0**
		3.3.2.3	3.3.7.3.1	4.9
		3.3.2.3.1	3.3.7.3.1.1	4.9.1
		3.3.2.3.2	3.3.7.3.1.2	4.10
		3.3.3	3.3.7.3.2	4.10.2
		3.3.3.1	3.3.7.3.2.1	4.11
		3.3.3.2	3.3.7.3.2.2	4.11.1
		3.3.3.2.1	3.3.7.3.3	4.11.2
		3.3.3.2.2	3.3.7.3.3.1	4.11.3
		3.3.3.2.3	3.3.7.3.3.2	

Section 5

5.0	**5 (continued)**	**5 (continued)**	**5 (continued)**
5.1	5.3.3	5.5	5.7.2.1.3.3.5
5.1.1	5.3.3.1	5.5.1	5.7.3.1.3.3.6
5.1.2	5.3.3.1.1	5.5.2	5.7.2.1.3.4
5.1.2.1	5.3.3.2	5.5.2.1	5.7.2.1.4
5.1.2.1.1	5.3.3.3	5.5.2.2	5.7.2.1.4.1
5.1.2.1.2	5.4	5.5.2.3	5.7.2.1.4.2
5.1.2.1.3	5.4.1	5.5.2.3.1	5.7.2.1.4.3
5.1.2.1.4	5.4.2	5.5.2.3.2	5.7.2.1.4.4
5.1.2.1.4.1	5.4.2.1	5.5.2.3.3	5.7.2.1.4.5
5.1.2.1.4.2	5.4.2.2	5.5.2.4	5.7.2.1.4.6
5.1.2.1.4.3	5.4.2.3	5.5.2.4.1	5.7.2.1.5

Section 5

5.0	**5 (continued)**	**5 (continued)**	**5 (continued)**
5.1.2.2	5.4.2.3.1	5.5.2.4.2	5.7.2.2
5.1.2.2.1	5.4.2.3.2	5.5.2.4.3	5.7.2.2.1
5.1.2.2.1.1	5.4.2.3.3	5.5.2.4.4	5.7.2.2.2
5.1.2.2.1.2	5.4.2.4	5.5.3	5.7.2.2.3
5.1.2.2.1.3	5.4.2.4.1	5.5.3.1	5.7.2.2.4
5.1.2.2.1.4	5.4.2.4.1.1	5.5.3.2	5.7.3
5.1.2.2.1.5	5.4.2.4.1.1.1	5.5.3.2.1	5.7.3.1
5.1.2.2.1.6	5.4.2.4.1.1.2	5.5.3.2.2	5.7.3.1.1
5.1.2.2.1.7	5.4.2.4.1.2	5.5.3.2.3	5.7.3.1.2
5.1.2.2.1.7.1	5.4.2.4.2	5.5.3.2.4	5.7.3.1.3
5.1.2.2.1.7.2	5.4.2.4.2.1	5.5.3.2.5	5.7.3.1.4
5.1.2.2.1.7.3	5.4.2.4.2.2	5.5.3.3	5.7.3.2
5.1.2.3.	5.4.2.4.3	5.5.3.3.2	5.7.3.2.1
5.1.2.3.1	5.4.2.4.3.1	5.5.3.3.3	5.7.3.2.2
5.1.2 3.2	5.4.2.4.3.2	5.5.3.3.4	5.8
5.1.2.3.3	5.4.3	5.5.4	5.8.1
5.1.3	5.4.3.1	5.5.4.1	5.8.2
5.1.3.1	5.4.3.2	5.5.4.2	5.8.2.1
5.1.3.2	5.4.3.2.1	5.5.4.3	5.8.2.2
5.1.3.3	5.4.3.2.1.1	5.6	5.8.2.2.1
5.1.3.4	5.4.3.2.1.2	5.7	5.8.2.2.2
5.1.3.4.1	5.4.3.2.1.3	5.7.1	5.8.2.2.2.1

Section 5

5.0	**5 (continued)**	**5 (continued)**	**5 (continued)**
5.1.3.4.2	5.4.3.2.1.4	5.7.2	5.8.2.2.3
5.1.3.4.3	5.4.3.2.1.5	5.7.2.1	5.8.2.2.4
5.1.3.5	5.4.3.2.2	5.7.2.1.1	5.8.2.2.5
5.3	5.4.3.2.2.1	5.7.2.1.2	5.8.3
5.3.1	5.4.3.2.2.2	5.7.2.1.2.1	5.8.3.1
5.3.2	5.4.3.2.3	5.7.2.1.2.2	5.8.3.2
5.3.2.1	5.4.3.2.3.1	5.7.2.1.2.3	5.9
5.3.2.1.1	5.4.3.2.3.2	5.7.2.1.2.4	5.9.1
5.3.2.1.2	5.4.3.2.3.3	5.7.2.1.3	5.9.2
5.3.2.1.3	5.4.3.2.3.4	5.7.2.1.3.1	
5.3.2.2	5.4.3.2.4	5.7.2.1.3.2	
5.3.2.2.1	5.4.3.2.5	5.7.2.1.3.3	
5.3.2.2.2	5.4.4	5.7.2.1.3.3.1	
5.3.2.2.3	5.4.4.1	5.7.2.1.3.3.2	
5.3.2.3	5.4.4.2	5.7.2.1.3.3.3	
5.3.2.4	5.4.4.3	5.7.2.1.3.3.4	

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
6.1	7.1	8.1	9.1	9.5.3.1
6.2	7.2	8.2	9.2	9.5.3.1.1
6.2.1	7.2.1	8.2.1	9.2.1	9.5.3.1.2

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
6.2.2	7.2.2	8.2.2	9.2.2	9.5.3.1.3
6.2.2.1	7.2.2.1	8.2.2.2	9.2.2.1	9.5.3.1.4
6.2.2.2	7.2.2.2	8.2.2.3	9.2.2.1.1	9.5.3.1.5
6.2.3	7.2.2.2.1	8.2.2.4	9.2.2.1.2	9.5.3.1.6
6.3	7.2.2.2.2	8.2.2.5	9.2.2.1.3	9.5.3.1.7
6.3.1	7.2.2.2.3	8.2.2.6	9.2.2.2	9.5.3.1.8
6.3.2	7.2.2.3	8.2.2.7	9.2.2.2.1	9.5.3.1.9
6.3.3	7.2.2.3.1	8.2.2.8	9.2.2.2.2	9.5.3.1.10
6.3.3.1	7.2.2.3.2	8.2.3	9.2.2.2.3	9.5.3.1.11
6.3.3.2	7.2.4	8.2.3.1	9.2.2.2.4	9.5.3.1.12
6.3.3.3	7.2.4.1	8.2.3.2	9.2.2.2.5	9.5.3.1.13
6.3.3.4	7.2.4.2	8.3	9.2.2.2.6	9.5.3.1.14
6.3.3.5	7.2.4.3	8.3.1	9.2.3	9.5.3.1.14.1
6.3.3.6	7.2.5	8.3.2	9.2.3.1	9.5.3.1.14.2
6.3.3.7	7.2.5.1	8.3.2.1	9.2.3.2	9.5.3.1.14.3
6.3.3.8	7.2.5.2	8.3.2.2	9.2.3.2.1.	9.5.3.1.14.4
6.3.3.9	7.2.5.1	8.3.3	9.2.3.2.2	9.5.3.1.14.5
6.3.3.10	7.2.5.2	8.3.3.1	9.2.3.2.3	9.5.3.1.14.6
6.3.3.11	7.2.5.3	8.3.3.2	9.2.3.2.4.	9.5.3.1.14.7
6.3.4	7.2.5.3.1	8.5	9.2.3.2.5	9.5.3.1.14.8
6.4	7.2.5.3.2	8.5.1	9.2.3.2.6	9.5.3.1.14.9
6.4.1	7.2.5.3.3	8.5.2	9.2.3.2.7	9.5.3.1.14.1

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
6.4.2	7.2.5.3.4	8.5.2.1	9.2.3.2.8	9.5.3.2
6.4.2.1	7.2.5.3.5	8.5.2.2	9.2.3.2.9	9.6
6.4.2.1.1	7.2.5.3.6	8.5.3	9.2.3.2.10	9.6.1
6.4.2.2	7.2.6	8.5.3.1	9.2.4	9.6.2
6.4.2.2.1	7.2.6.1	8.5.3.2	9.2.4.1	9.6.2.1
6.4.2.3	7.2.6.2	8.5.3.3	9.2.4.1.1	9.6.2.2
6.4.2.4	7.2.6.3	8.5.3.4	9.2.4.2	9.6.2.3
6.4.3	7.2.7	8.6	9.2.4.2.1	9.6.2.3.1
6.4.3.1	7.2.7.1	8.6.1	9.2.4.2.2	9.6.2.3.2
6.4.3.1.1	7.2.7.2	8.6.2	9.2.4.2.3	9.6.2.4
6.4.3.2	7.2.7.2.1	8.6.2.1	9.2.5	9.6.2.4.1
6.4.3.3	7.2.7.2.2	8.6.2.2	9.2.5.1	9.6.2.4.2
6.4.3.4	7.2.7.2.2.1	8.6.2.3	9.2.5.1.1	9.6.2.4.3
6.4.3.5	7.2.7.2.2.2	8.6.2.4	9.2.5.1.2	9.6.2.4.3.1
6.4.3.6	7.2.7.2.2.3	8.6.3	9.2.5.2	9.6.2.4.3.2
6.4.3.7	7.2.7.3	8.6.3.1	9.2.5.2.1	9.6.2.4.4
6.4.3.8	7.2.7.3.1	8.6.3.2	9.2.6	9.6.2.4.4.1
6.4.3.9	7.2.7.3.2	8.7	9.3	9.6.2.4.4.2
6.4.3.10	7.2.7.3.2.1	8.7.1	9.3.1	9.6.2.5
6.4.3.11	7.2.7.3.2.2	8.7.2	9.3.2	9.6.2.5.1
6.4.3.12	7.2.7.3.2.3	8.7.2.1	9.3.2.1	9.6.2.5.2
6.4.3.13	7.2.7.3.2.4	8.7.3	9.3.2.2	9.6.2.6

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
6.4.3.13.1	7.2.7.3.3	8.7.3.1	9.3.3	9.6.2.6.1
6.4.3.14	7.2.8	8.7.3.2	9.3.3.1	9.6.2.6.2
6.4.3.15	7.3	8.7.3.3	9.3.3.2	9.6.2.7
6.4.3.15.1	7.3.1	8.7.3.4	9.3.3.3	9.6.2.7.1
6.4.3.16	7.3.2	8.8	9.3.3.3.1	9.6.2.7.2
6.4.3.17	7.3.2.1	8.8.3	9.3.3.3.2	9.6.2.8
6.4.3.18	7.3.2.2	8.8.3.3	9.3.3.3.3	9.6.2.8.1
6.4.3.18.1	7.3.2.3	8.8.3.4	9.3.3.3.4	9.6.2.8.2
6.4.3.18.1.1	7.3.3	8.10	9.3.3.3.5	9.6.2.9
6.4.3.18.1.2	7.3.3.1	8.10.1	9.3.3.3.6	9.6.2.9.1
6.4.3.18.2	7.3.3.2	8.10.2	9.3.3.3.7	9.6.2.9.2
6.4.3.18.2.1	7.3.3.3	8.10.3	9.3.3.3.8	9.6.3
6.4.3.18.2.2	7.3.3.4	8.10.3.1	9.3.3.3.9	9.6.3.1
6.4.3.18.2.3	7.4	8.10.3.2	9.3.3.3.10	9.6.3.1.1
6.4.3.18.2.4	7.4.1	8.10.3.3	9.3.3.3.11	9.6.3.1.2.
6.4.3.18.2.5	7.4.2	8.10.3.4	9.3.3.3.12	9.6.3.1.3
6.4.3.19	7.4.3	8.10.3.5	9.3.3.3.13	9.6.3.1.3.1
6.5	7.4.3.1	8.10.3.6	9.3.3.3.14	9.6.3.1.3.2
6.5.1	7.4.3.2	8.10.3.7	9.3.3.3.15	9.6.3.1.4
6.5.2		8.10.4	9.3.3.3.16	9.6.3.1.5
6.5.3		8.11	9.3.3.3.17	9.6.3.1.6
6.6		8.11.1	9.3.3.4	9.6.3.1.6.1

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
6.6.1		8.11.2	9.3.3.4.1	9.6.3.1.6.2
6.6.2		8.11.2.1	9.3.3.4.1.1	9.6.3.1.6.3
6.6.3		8.11.2.2	9.3.3.4.1.2	9.6.3.1.6.3.1
6.6.3.1		8.11.3	9.3.3.4.2	9.6.3.1.6.3.2
6.6.3.1.1		8.12	9.3.3.4.3	9.6.3.1.6.4
6.6.3.1.2		8.12.1	9.3.3.4.4	9.6.3.1.6.4.1
6.6.3.2		8.12.2	9.3.3.4.5	9.6.3.1.6.4.2
6.6.3.2.1		8.12.2.1	9.3.3.4.6	9.6.3.1.7
6.6.3.2.2		8.12.2.2	9.3.3.4.7	9.6.3.1.7.1
6.6.3.2.3		8.12.2.3	9.3.3.4.8	9.6.3.1.7.2
6.6.3.3		8.12.2.4	9.3.3.5	9.6.3.1.7.3
6.6.3.4		8.12.3	9.3.3.6	9.6.3.1.7.3.1
6.7		8.12.3.1	9.3.3.7	9.6.3.1.7.3.2
6.7.1		8.12.3.2	9.3.4	9.6.3.1.7.4
6.7.2		8.12.3.3	9.4	9.6.3.1.7.5
6.7.3		8.12.3.4	9.4.1	9.6.3.1.7.5.1
6.7.4		8.12.3.5	9.4.2	9.6.3.1.7.5.2
6.7.5		8.12.3.6	9.4.2.1	9.6.3.1.8
		8.13	9.4.2.2	9.6.3.1.8.1
		8.13.1	9.4.2.3	9.6.3.1.8.2
		8.13.2	9.4.2.3.1	9.6.3.2.8.3
		8.13.2.1	9.4.2.3.1.1	9.6.3.1.9

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
		8.13.2.2	9.4.2.3.1.2	9.6.3.1.9.1
		8.13.2.3	9.4.2.3.1.3	9.6.3.1.9.2
		8.13.2.4	9.4.2.3.1.4	9.6.3.1.10
		8.13.2.5	9.4.2.3.1.5	9.6.3.1.10.1
		8.13.2.6	9.4.2.3.2	9.6.3.1.10.2
		8.13.2.7	9.4.2.3.3	9.6.3.2
		8.13.3	9.4.2.3.3.1	9.6.3.2.1
		8.13.3.1	9.4.2.3.3.2	9.6.3.2.1.1
		8.13.3.1.1	9.4.2.3.3.3	9.6.3.2.1.2
		8.13.3.1.2	9.4.2.3.3.4	9.6.3.2.2
		8.13.3.1.3	9.4.2.3.3.5	9.6.3.2.3
		8.13.3.1.4	9.4.2.3.3.6	9.6.3.2.4
		8.13.3.2	9.4.2.3.3.7	9.6.3.2.5
		8.13.3.2.1	9.4.2.3.3.8	9.6.3.2.5.1
		8.13.3.2.2	9.4.2.3.3.9	9.6.3.2.5.2
		8.13.3.2.3	9.4.2.3.3.10	9.6.3.3
		8.13.3.3	9.4.2.3.4	9.6.3.3.1
		8.13.3.4	9.4.3	9.6.3.3.1.1
		8.13.3.5	9.4.3.1	9.6.3.3.1.2
		8.13.3.6	9.4.3.2	9.6.3.3.1.3
			9.4.3.3	9.6.3.3.2
			9.4.3.3.1	9.6.3.3.2.1

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
			9.4.3.3.2	9.6.3.3.2.2
			9.4.3.3.3	9.6.3.4
			9.4.3.3.4	9.6.3.4.1
			9.4.4	9.6.3.4.2
			9.4.4.1	9.6.3.4.2.1
			9.4.4.2	9.6.3.4.2.2
			9.4.4.3	9.6.3.4.3
			9.4.4.3.1	9.6.3.4.3.1
			9.4.4.3.1.1	9.6.3.4.3.2
			9.4.4.3.1.2	9.6.3.4.4
			9.4.4.3.1.3	9.6.3.4.5
			9.4.4.3.2	9.6.3.4.5.1
			9.4.4.3.3	9.6.3.4.5.2
			9.4.4.3.4	9.6.3.4.6
			9.4.4.3.4.1	9.6.3.4.6.1
			9.4.4.3.4.2	9.6.3.4.6.2
			9.4.4.3.4.3	9.6.3.4.7
			9.4.5	9.6.3.4.7.1
			9.4.5.1	9.6.3.4.7.2
			9.4.5.1.1	9.6.3.5
			9.4.5.1.2	9.6.4
			9.5	9.6.4.1

Paragraphs 6 - 9

6.0	**7.0**	**8.0**	**9.0**	**9 (continue**
			9.5.1	9.6.4.2
			9.5.2	9.6.4.3
			9.5.3	9.6.4.4

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
10.1	11.1	12.1	13.1	14.1
10.2	11.2	12.2	13.2	14.1.1
10.2.1	11.2.1	12.3	13.2.1	14.1.2
10.2.2	11.2.2	12.3.1	13.2.2	14.1.2.1
10.2.3	11.2.2.1	12.3.1.1	13.2.3	14.1.2.1
10.2.3.1	11.2.2.2	12.3.1.2	13.2.3.1	14.1.2.1
10.2.3.2	11.2.3	12.3.1.3	13.2.3.2	14.1.2.1
10.2.3.3	11.2.3.1	12.3.1.4	13.2.3.3	14.1.2.1
10.2.3.4	11.2.3.1.1	12.3.2	13.2.3.4	14.1.3
10.2.3.5	11.2.3.1.2	12.3.2.1	13.2.4	14.1.4
10.3	11.2.3.1.3	12.3.2.2	13.3	14.2
10.3.1	11.2.3.2	12.3.3	13.3.1	14.2.1
10.3.2	11.2.3.3		13.3.2	14.2.2
10.3.3	11.2.3.4		13.3.3	14.2.2.1
10.3.3.1	11.2.3.5		13.3.3.1	14.2.2.2
10.3.3.2	11.2.3.6		13.3.3.2	14.2.2.3

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
10.4	11.2.3.7		13.4	14.2.2.4
10.4.1	11.2.4		13.4.1	14.2.2.5
10.4.3	11.2.4.1		13.4.2	14.2.2.6
10.5	11.2.4.2		13.4.3	14.2 2.7
10.5.1	11.3		13.4.3.1	14.2.2.8
10.5.2	11.3.1		13.4.3.2	14.2.2.9
10.5.3	11.3.2		13.4.3.3	14.2.2.1
10.5.3.1	11.3.3		13.4.4	14.2.2.1
10.5.3.2	11.3.3.1			14.2.3
10.5.3.3	11.3.3.2			14.2.3.1
10.5.3.4	11.3.3.3			14.2.3.2
10.6	11.3.3.4			14.2.3.3
10.6.1	11.4			14.2.3.4
10.6.2	11.4.1			14.2.3.5
10.6.3	11.4.2			14.2.3.6
10.7	11.4.3			14.2.3.7
10.7.1	11.4.4			14.2.3.8
10.7.2	11.5			14.2.3.9
10.7.3	11.5.1			14.2.3.1
10.9	11.5.2			14.2.3.1
10.9.1	11.5.3.1			14.2.4.3
10.9.2	11.5.3.2			14.2.4.4

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
10.9.2.1	11.5.4			14.2.4.5
10.9.2.2	11.6			14.3
10.9.2.3	11.6.1			14.3.1
10.9.3	11.6.2			14.3.2
10.9.3.1	11.6.3			14.3.2.1
10.9.3.2	11.6.3.1			14.3.2.1
10.9.3.2.1	11.6.3.2			14.3.2.1
10.9.3.2.2	11.6.3.3			14.3.2.1
10.9.3.2.3	11.6.3.4			14.3.2.2
10.9.3.2.4	11.7			14.3.2.3
10.9.3.2.5	11.7.1			14.3.2.3
10.9.3.2.6	11.7.2			14.3.2.4
10.9.3.2.7	11.7.2.1			14.3.2.5
10.9.3.2.8	11.7.2.2			14.3.2.6
10.9.3.2.9	11.7.2.3			14.3.2.7
10.9.3.2.10	11.7.2.3.1			14.3.3
10.9.3.2.11	11.7.2.3.2			14.3.4
10.9.3.2.12	11.7.2.3.2.1			14.3.4.1
10.9.3.2.13	11.7.2.3.2.2			14.3.4.2
10.9.3.2.14	11.7.2.3.2.3			14.3.4.3
10.9.3.2.15	11.7.2.3.2.4			14.3.4.4
10.9.3.2.15.1	11.7.2.3.3			14.3.4.5

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
10.9.3.2.15.2	11.7.2.3.3.1			14.4
10.9.3.2.16	11.7.2.3.3.3			14.4.1
10.10	11.7.2.3.3.4			14.4.2
10.10.1	11.7.3			14.4.2.1
10.10.2	11.7.3.1			14.4.2.2
10.10.3	11.7.3.2			14.4.2.3
10.11	11.7.3.3			14.4.2.4
10.11.1	11.8			14.4.2.5
10.11.2	11.8.1			14.4.3
10.11.3	11.8.2			14.4.3.1
10.12	11.8.2.1			14.4.3.2
10.12.1	11.8.2.2			14.4.3.3
10.12.2	11.8.2.2.1			14.4.3.4
10.12.3	11.8.2.2.2			14.4.3.5
	11.8.2.2.3			14.4.4
	11.8.2.2.4			14.4.4.1
	11.8.2.2.5			14.5
	11.8.2.2.6			14.5.1
	11.8.3			14.5.2
	11.8.3.1			14.5.2.1
	11.8.3.2			14.5.2.2
	11.9			14.5.2.3

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.9.1			14.5.2.4
	11.9.2			14.5.2.5
	11.9.3			14.5.2.6
	11.9.3.1			14.5.3
	11.9.3.2			14.5.3.1
	11.9.3.3			14.5.3.2
	11.9.3.4			14.5.3.3
	11.9.4			14.5.3.4
	11.10			14.5.3.5
	11.10.1			14.5.3.6
	11.10.2			14.6
	11.10.3			14.6.1
	11.10.3.1			14.6.2
	11.10.3.2			14.6.2.1
	11.10.3.3			14.6.2.2
	11.10.3.4			14.6.2.3
	11.10.3.5			14.6.2.4
	11.10.3.6			14.6.2.4
	11.10.4			14.6.2.4
	11.11			14.6.3
	11.11.1			14.6.3.1
	11.11.2			14.6.3.2

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
	11.11.2.1			14.6.3.3
	11.11.2.2			14.6.4
	11.11.2.3			14.6.4.1
	11.11.2.4			14.6.4.2
	11.11.3			14.6.4.3
	11.11.3.1			14.7
	11.11.3.1.1			14.7.1
	11.11.3.1.2			14.7.2
	11.11.3.1.3			14.7.3
	11.11.3.1.4			14.7.4
	11.11.3.1.5			14.7.4.1
	11.11.3.1.6			
	11.11.3.1.7			
	11.11.3.1.8			
	11.11.3.1.9			
	11.11.3.2			
	11.11.3.2.1			
	11.11.3.2.1.1			
	11.11.3.2.2			
	11.11.3.2.3			
	11.11.3.2.4			
	11.11.3.3			

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.11.3.4			
	11.11.3.5			
	11.11.3.6			
	11.11.4			
	11.12			
	11.12.1			
	11.12.2			
	11.12.3			
	11.13			
	11.13.1			
	11.13.1.1			
	11.13.1.2			
	11.13.1.2.1			
	11.13.1.2.2			
	11.13.1.2.3			
	11.13.1.3			
	11.13.1.3.1			
	11.13.1.3.2			
	11.13.1.4			
	11.13.2			
	11.13.2.1			
	11.13.2.2			

Paragraphs 10 - 14

10.0	**11.0**	**12.0**	**13.0**	**14.0**
	11.13.2.3			
	11.13.2.4			
	11.14			
	11.14.1			
	11.14.2			
	11.14.3			
	11.14.4			

Appendix H
Video User's Guide

What is this videotape and why is it useful?

A videotape entitled, "Living and Working in Space," illustrates the various man-systems integration problems that have been identified during Gemini, Apollo, Skylab, and Shuttle manned space flights. The videotape contains scenes from on-orbit crew activities. The video has been prepared by the ex-Skylab astronauts, Bill Pogue and Jerry Carr, for the Boeing Aerospace Company. This videotape incorporates scenes from Gemini, Apollo, Skylab, and Shuttle. It is intended to provide a wide scope general introduction to microgravity human factors/human engineering issues.

This videotape is specifically designed to create awareness of the basic microgravity considerations for workers involved in planning, engineering, and design work who are new to space programs. The content is biased towards the specific requirements of the Space Station and other long-duration space flights.

How is this videotape to be used?

The 34 minute videotape has been divided into 37 scenes. An on-screen clock serves as a counter for locating these scenes. The time read-out correlates with paragraph numbers from Volume 1.

There are 3 lists that are to be used for locating human factors information on this videotape:

Appendix H1 - Video Scene Descriptions
The video scenes are listed by number. Links to applicable Volume I paragraphs are associated with each scene.

Appendix H2 - Video Scene Titles Organized by Section
The video scenes are provided in common groupings.

Appendix H3 - Paragraphs Applicable to Video Scenes
The video scenes are listed by associated paragraph in Volume I.

Appendix H1
Video Scene Titles with Paragraph References

Video Scenes and Applicable Paragraphs in Volume I

Number	Title	Applicable Paragraphs
1	Skylab in Orbit	5.1, 5.2
2	Shuttle Orbiter in orbit	5.1, 5.2
3	Crew on Orbiter flight deck	3.3.4, 5.2, 8.4, 8.6, 8.12, 8.13, 9.2.4, 10
4	Graphic: space neutral posture	3.3.4, 5.2, 8.4, 8.6, 9.2.4, 10.2.3.2, 10.4, 11.6, 11.7, 11.8, 12.3
5	Crewman at Skylab wardroom window	3.3.4, 5.2, 8.11, 9.2.5.1, 11.7, 11.11
6	Spacelab crewmember holds arms	3.3.4, 4.6, 5.2, 8.6, 8.9, 10.8, 11.7
7	Skylab crewmember on exercise ergometer	3.3.4, 5.2, 7.2.3, 8.9, 10.8, 11.7
8	Skylab crewmember don suits	3.3.2, 3.3.3, 4.8, 5.2, 8.6, 11.7, 11.9, 14
9	Space Motion Sickness Experiments: crew participation	4.5, 5.2, 7.2.3, 11.7
10	Fluid shift: graphics and discussion	5.2, 7.2.3, 7.2.7
11	Sequence showing body rotations and rapid translations	3.3, 4.0, 5.2, 6.3, 8.2, 8.6, 8.8, 8.9, 11.6,
12	Contingency maintenance: poor restraint & bad lighting	3.3, 4.2, 4.8, 5.2, 6.3, 8.2, 8.4, 8.6, 8.9, 11.6, 11.8, 11.9, 12.3
13	Earth scene & scene showing docking-discussion of sense of vision	4.2, 5.1, 10.7
14	Crewmember translate through Skylab-discussion of sense of orientation	4.2, 4.5, 4.6, 5.2, 6.3, 8.2, 8.3, 8.4, 8.6, 8.9, 8.10, 8.12, 8.13, 9.2.2, 9.2.4, 11.6,
15	Wardroom table and eating scenes from Skylab	3.3, 4.8, 5.2, 8.2, 8.6, 8.9, 8.12, 8.13, 10 11.7
16	Skylab and Orbiter sleep stations	3.3, 4.6, 4.10, 5.2, 7.2.4, 7.2.5, 8.4, 8.6,
17	Exercise: scenes from Skylab & Shuttle showing different types of exercise	3.3, 4.6, 4.8, 4.9, 4.10, 5.2, 7.2.3, 7.2.7, 8.9, 10.7, 10.8, 11.7
18	Body cleansing scenes from Skylab and Shuttle	8.6, 10.2.3.1, 10.2.3.2, 11.3, 11.7
19	Space Housekeeping on Shuttle and Skylab	5.2, 8.3, 8.6, 8.7, 8.8, 8.9, 8.10, 9.2.5.2, 11.4, 11.6, 11.7, 12.3, 13.2, 13.3
20	Medical monitoring: Shuttle	7.2.7, 10.9
21	Body restraint illustrations	3.3, 5.2, 6.4, 8.7, 8.8, 8.9, 11.2, 11.6, 11 11.10, 12.3
22	Paper/hand copy/document management, document restraint	4.8, 5.2, 8.6, 8.9, 11.7, 13.4
23	Manual dexterity during task performance: tool restraint during tasks	3.3.2, 4.8, 8.6, 8.9, 9.2.2, 9.2.4, 11.2, 11
24	Work bench innovations on Skylab: fan housing and filter screen	5.2, 8.4, 8.6, 9.2.2, 11.7, 12.3
25	Difficulty in handling small items	3.3.2, 3.3.3, 4.8, 5.2, 8.9, 9.2.2, 11.7, 11
26	Workstation/work area architecture and panel orientation considerations	4.2, 4.5, 5.2, 8.2, 8.3, 8.4, 8.6, 8.12, 9.2. 12.3
27	Windows as work stations: crowding and interference issues	3.3, 5.2, 8.6, 8.11, 9.2.2, 11.7, 11.11, 11

Video Scenes and Applicable Paragraphs in Volume I

Number	Title	Applicable Paragraphs
28	Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms	3.3, 4.2, 4.8, 4.9, 4.10, 5.1, 6.3, 8.6, 9.2 12.3, 13.4
29	Cable and hose management clutter, snag and interference potential	5.2, 6.3, 8.2, 8.7, 8.8, 11.14, 12.3
30	Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations	3.3, 4.8, 5.2, 6.3, 8.2, 8.6, 8.7, 8.8, 8.9, 11.7, 11.8
31	Equipment translation illustrations, body restraint during equipment handling	3.3, 4.8, 5.2, 8.6, 8.7, 8.8, 8.9, 11.7, 11.
32	Introduction to EVA-suited restrictions dexterity/mobility and body/equipment restraints and mobility aids	14.1, 14.2, 14.3, 14.4, 14.5
33	Body and equipment restraints: EVA considerations and provisions Gemini to Shuttle	14.3, 14.4
34	Equipment manipulation and translation - EVA	14.4, 14.5, 14.7
35	Manned maneuvering unit operations: satellite retrieval operations	14.5, 14.7
36	EVA lighting consideration, vehicle external lighting considerations/ requirements	14.4
37	Summary: Posture, restraints, access, single reference frame	

Appendix H2
Video Scene Titles Organized by Section

Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

Section 3 Anthropometry and Biomechanics

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Difficulty in handling small items

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Manual dexterity during task performance: tool restraint during tasks

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Spacelab crewmember holds arms

Section 4 Human Performance Capabilities

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Earth scene & scene showing docking-discussion of sense of vision

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Skylab crewmember don suits

Skylab and Orbiter sleep stations

Space Motion Sickness Experiments: crew participation

Spacelab crewmember holds arms

Workstation/work area architecture and panel orientation considerations

Wardroom table and eating scenes from Skylab

Section 5 Natural and Induced Environments

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Earth scene & scene showing docking-discussion of sense of vision

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Fluid shift: graphics and discussion

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Shuttle Orbiter in orbit

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Skylab in Orbit

Space Housekeeping on Shuttle and Skylab

Space Motion Sickness Experiments: crew participation

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 6 Crew Safety

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crewmember translate through Skylab-discussion of sense of orientation

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Section 7 Health Management

Body cleansing scenes from Skylab and Shuttle

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Fluid shift: graphics and discussion

Medical monitoring: Shuttle

Skylab crewmember on exercise ergometer

Skylab and Orbiter sleep stations

Space Motion Sickness Experiments: crew participation

Section 8 Architecture

Body cleansing scenes from Skylab and Shuttle

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Space Housekeeping on Shuttle and Skylab

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 9 Workstations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Spacelab crewmember holds arms

Space Housekeeping on Shuttle and Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 10 Activity Centers

Body cleansing scenes from Skylab and Shuttle

Crew on Orbiter flight deck

Earth scene & scene showing docking-discussion of sense of vision

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Medical monitoring: Shuttle

Skylab crewmember on exercise ergometer

Space Housekeeping on Shuttle and Skylab

Wardroom table and eating scenes from Skylab

Section 11 Hardware and Equipment

Body cleansing scenes from Skylab and Shuttle

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Space Housekeeping on Shuttle and Skylab

Space Motion Sickness Experiments: crew participation

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Section 12 Design for Maintainability

Body restraint illustrations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Difficulty in handling small items

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Space Housekeeping on Shuttle and Skylab

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 13 Facility Management

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Paper/hand copy/document management, document restraint

Space Housekeeping on Shuttle and Skylab

Section 14 Extravehicular Activity (EVA)

Body and equipment restraints: EVA considerations and provisions Gemini to Shuttle

Equipment manipulation and translation - EVA

EVA lighting consideration, vehicle external lighting considerations/ requirements

Introduction to EVA-suited restrictions dexterity/mobility and body/equipment restraints and mobility aids

Manned maneuvering unit operations: satellite retrieval operations

Skylab crewmember don suits

Appendix H3
Paragraphs Applicable to Video Scenes

Section | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

3.0 Anthropometry and Biomechanics

3.3.1	Scenes:	11, 12, 15, 16, 17, 21, 27, 28, 30, 31
3.3.2	Scenes:	8, 11, 12, 15, 16, 17, 21, 23, 25, 27, 28, 30, 31
3.3.3	Scenes:	8, 11, 12, 15, 16, 17, 21, 27, 28, 30, 31
3.3.4	Scenes:	3, 4, 5, 6, 7, 11, 12, 15, 16, 17, 21, 27, 28, 30, 31

4.0 Human Performance Capabilities

4.2	Scenes:	12, 13, 14, 26
4.3	Scenes:	13
4.5	Scenes:	9, 13, 14, 26
4.6	Scenes:	13, 14, 16, 17
4.8	Scenes:	8, 13, 15, 17, 22, 23, 25, 28, 30, 31
4.9	Scenes:	13, 17, 28
4.10	Scenes:	13, 16, 17, 28

5.0 Natural and Induced Environments

5.1 Virtually all scenes

6.0 Crew Safety

6.3	Scenes:	11, 12, 14, 28, 29, 30
6.4	Scenes:	21

7.0 Health Management

7.2.3	Scenes:	7, 9, 10, 17
7.2.4	Scenes:	16
7.2.5	Scenes:	16
7.2.7	Scenes:	10, 17, 20

8.0 Architecture

8.2	Scenes:	11, 12, 14, 26, 29, 30
8.3	Scenes:	14, 19, 26
8.4	Scenes:	3, 12, 14, 16, 17, 24, 26
8.6	Scenes:	3, 4, 6, 8, 11, 12, 17, 18, 19, 22, 23, 24, 26, 27, 28, 30, 31
8.7	Scenes:	11, 14, 19, 21, 29, 30, 31
8.8	Scenes:	11, 14, 19, 21, 29, 30, 31
8.9	Scenes:	9, 11, 12, 14, 17, 19, 21, 22, 23, 25, 30

8.10 Scenes: 14, 19
8.11 Scenes: 5, 27
8.12 Scenes: 3, 14, 26
8.13 Scenes: 3, 12, 14

9.0 Workstations

9.2.2 Scenes: 12, 14, 22, 24, 25, 26, 27, 28, 30
9.2.3 Scenes: 26
9.2.4 Scenes: 4, 6, 14, 23
9.2.5.1 Scenes: 5
9.2.5.2 Scenes: 19

10.0 Activity Centers

10.2.3.1 Scenes: 18
10.2.3.2 Scenes: 4, 18
10.4 Scenes: 4
10.5 Scenes: 15
10.6 Scenes: 3, 15
10.7 Scenes: 17
10.8 Scenes: 4, 9, 17
10.9 Scenes: 4, 20
10.11 Scenes: 19

11.0 Hardware and Equipment

11.2 Scenes: 21, 23
11.3 Scenes: 18
11.4 Scenes: 19
11.6 Scenes: 4, 5, 6, 11, 12, 14, 19, 21, 30
11.7 Scenes: 4, 5, 6, 7, 8, 9, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 30, 31
11.8 Scenes: 4, 5, 11, 12, 14, 21, 30, 31
11.9 Scenes: 8, 12
11.10 Scenes: 21
11.11 Scenes: 6, 27
11.13 Scenes: 25
11.14 Scenes: 27, 29

12.0 Design for Maintainability

12.3 Scenes: 4, 12, 19, 21, 23, 24, 25, 26, 28, 29

13.0 Facility Management

13.2 Scenes: 19

13.3 Scenes: 19
13.4 Scenes: 22, 28

14.0 Extravehicular Activity (EVA)

14.1 Scenes: 32
14.2 Scenes: 32
14.3 Scenes: 32, 33
14.4 Scenes: 8, 32, 34, 36
14.5 Scenes: 32, 34, 35
14.7 Scenes: 34, 35

Appendix J
Keyword List

Lists: | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

USER'S GUIDE

In the years before the search engine was created, the keyword was used to assist with finding standards related to specific keywords. For example, the user may find standards relating to "acceleration" by scanning the "A" list (available by clicking on the "A").

Underneath the keyword is provided a list of section subheadings where the relevant standards can be found. Although a subheading may not include the keyword itself, once reviewing the section, the user would find that it contains information that is relevant to the subject. In order to review the section material, it is necessary to open the applicable section of Volume I.

The keyword list is not absolute but it provides a starting place for those researching specific subject matter.

A

5.1 Atmosphere

Atmospheric composition

5.1.2.1 Safe Atmospheres - Design Considerations

5.1.2.1.1 Gas Composition and Pressure Design Considerations

5.1.2.1.2 Gas Pressure Design Considerations

5.1.2.1.4 Human Response to the Diluent Gas Environment Design Considerations

5.1.2.1.4.1 Metabolic Factors Design Considerations

5.1.2.1.4.2 Thermal Factors Design Considerations

5.1.2.2.1.4 Chronic CO2 Toxicity Design Considerations

5.1.2.2.1.5 Acute CO2 Toxicity Design Considerations

5.1.2.2.1.7 Dysbarism Sickness Design Considerations

5.1.3.1 Atmosphere Composition and Pressure Design Requirements

Atmospheric contamination

5.1.2.3.2 Atmosphere Microbiological Monitoring Design Considerations

Atmospheric control

5.1.3.1 Atmosphere Composition and Pressure Design Requirements

Atmospheric monitoring

5.1.2.3.3 Baro-Thermal Monitoring Design Considerations

5.1.3.2 Atmosphere Monitoring Design Requirements

5.1.3.4 Atmosphere Microbiological Monitoring & Control

Design Considerations

7.2.7.3.3 Environmental Monitoring Design Requirements

Atmospheric parameters

5.8.3.1 Temperature, Humidity, and Ventilation Design Requirements

Atmospheric pressure

5.1.2.1 Safe Atmospheres - Design Considerations

5.1.2.1.1 Gas Composition and Pressure Design Considerations

B

C

5.1.2.1.4.2 Thermal Factors Design Considerations

Cabin pressure

4.3.2.2 Noise Design Considerations

5.1.2 Atmosphere Design Considerations

Cabinets

11.3.2 Drawer and Rack Design Considerations

12.3.1.2 Physical Accessibility Design Requirements

Cable identification

11.14.4 Example Cable Management Design Solutions

Cable location

11.14.3 Cable Management Design Requirements

Cable maintenance

11.14.2 Cable Management Design Considerations

Cable management

11.14 Cable management

11.14.3 Cable Management Design Requirements

Cable marking

11.14.4 Example Cable Management Design Solutions

Cable protection

11.14.3 Cable Management Design Requirements

Cable retention

11.14.3 Cable Management Design Requirements

Cable routing

11.14.3 Cable Management Design Requirements

Cables

11.10.3.2 Electrical Connectors Design Requirements

11.10.3.5 Connector Identification/Alignment Design Requirements

9.6.3.1.7.5.2 Design Requirements for Interactions with Windows

Closures

11.4 Closures and Covers

13.2.3.1 General Housekeeping Design Requirements

Clothing

3.2.2 Application of Anthropometric Data - Design Considerations

3.3.3.2.5 Clothing Design Considerations

5.8.2 Thermal Environment Design Considerations

7.2.5.3.5 Personal Clothing & Equipment Cleansing Design Requirements

10.4.3 Individual Crew Quarters Design Requirements

10.10.2 Laundry Facility Design Considerations

11.13 Crew Personal Equipment

3.3.1.2 Body Size Design Considerations

Clothing comfort

11.13.1.3.1 General Clothing Design Requirements

Clothing considerations

11.13.1.2.1 Preliminary Clothing Design Considerations

Clothing design

11.13.1.2 Clothing Design Considerations

11.13.1.3 Clothing Design Requirements

11.13.1.4 Example Clothing Design Solutions

Clothing doffing

11.13.1.3.1 General Clothing Design Requirements

11.13.1.3.1 General Clothing Design Requirements

Clothing environmental protection

11.13.1.3.1 General Clothing Design Requirements

Clothing esthetics

11.13.1.3.1 General Clothing Design Requirements

Clothing identification

11.13.1.3.2 Clothing Packaging and Storage Design Requirements

Clothing material

11.13.1.3.1 General Clothing Design Requirements

Clothing packaging

11.13.1.3.2 Clothing Packaging and Storage Design Requirements

Clothing quantities

11.13.1.2.3 Frequency of Clothing Change

Clothing selection

11.13.1.3.1 General Clothing Design Requirements

Clothing sizes

11.13.1.3.1 General Clothing Design Requirements

Clothing storage

11.13.1.3.2 Clothing Packaging and Storage Design Requirements

Clothing use rates

11.13.1.2.3 Frequency of Clothing Change

Coarse control

9.2.3.2.9 Control/Display Movement Ratio Design Requirements

Code brightness

9.5.3.2 Coding Design Requirements

Code color

9.5.3.2 Coding Design Requirements

Code location

9.5.3.2 Coding Design Requirements

Code pattern

9.5.3.2 Coding Design Requirements

8.6.2.2 Visual Design Considerations

8.12.2.1 General Interior Decor Design Considerations

8.12.2.2 Decorative Technique Design Considerations

8.12.2.3 Psychological Effects Design Considerations

8.12.3.3 Color Selection

8.13.3.3 Light Color Design Requirements

9.2.2.2.4 Workstation Color Design Requirements

9.2.5.1.2 Window Workstation Design Requirements

9.4.2.3.3.9 Visual Display Terminal (VDT) Design Requirements

Color coding

8.5.3.3 Location & Orientation By Color Coding Design Requirements

9.4.2.3.3.4 Scales and Pointers Design Requirements

9.4.2.3.3.8 Light Emitting Diode (LED) Design Requirements

9.5.3.1.5 Alignment Marks/Interface Identification Design Requirements

9.5.3.2 Coding Design Requirements

Color rendition

8.13.3.3 Light Color Design Requirements

Color temperature

8.13.3.3 Light Color Design Requirements

Columns

9.6.2.4.3.2 Design Requirements for Matrix Tables

Combined stressors

5.9.2 Combined Environmental Effects Design Considerations

Comfort

13.2.2 Housekeeping Design Considerations

Command area

9.6.3.1.3.2 Design Requirements for Command Language

Control uses

9.3.2.1 Input Devices Design Considerations

Control/display complexity

9.2.3.2.10 Control/Display Complexity and Precision Design Requirements

Control/display grouping

9.2.3.2.3 Control/Display Grouping Design Requirements

Control/display integration

9.2.3 Control/Display Placement and Integration

Control/display labels

9.2.3.2.8 Control/Display Movement Compatibility Design Requirements

Control/display location

9.2.3.2.4 Preferred Control/Display Location Design Requirements

Control/display maintenance

9.2.3.2.6 Maintenance Controls/Displays Design Requirements

Control/display movement compatibility

9.2.3.2.8 Control/Display Movement Compatibility Design Requirements

Control/display movement ratio

9.2.3.2.9 Control/Display Movement Ratio Design Requirements

Control/display placement

9.2.3 Control/Display Placement and Integration

Control/display relationship

9.2.3.2.4 Preferred Control/Display Location Design Requirements

Controls

6.3.3.8 Levers Cranks Hooks and Controls Requirements

9.2.2.2.4 Workstation Color Design Requirements

9.3 Controls

9.3.3 Control Design Requirements

Crew comfort

5.8.2 Thermal Environment Design Considerations

5.8.2.1 Mission Thermal Environment Design Considerations

5.8.2.2 Human Responses to Thermal Environments - Design Considerations

5.8.2.2.5 Special Ventilation & Metabolic Heat Removal Design Considerations

10.2.2 Personal Hygiene Design Considerations

10.5.3.1 Overall Galley and Wardroom Layout - Design Requirements

11.7.2.3.1 General Personnel Restraints Design Requirements

11.7.2.3.2.1 General Foot Restraint Design Requirements

Crew functions

8.3.2.2 Specific Adjacency Design Considerations

Crew quarter functions

10.4.2 Individual Crew Quarters Design Considerations

Crew quarter size

10.4.3 Individual Crew Quarters Design Requirements

Crew quarters

8.6.2.4 Social Design Considerations

10.4 Crew quarters

Crew station accessibility

8.2.3.1 Crew Station Arrangement and Grouping Design Requirements

Crew station activities

8.2.3.2 Dedicated vs. Multipurpose Space Utilization Design Requirements

Crew station adjacencies

8.3 Crew station adjacencies

Crew station escape

8.7.3.4 Emergency and Escape Route Design Requirements

Crew station location

D

E

EVA applications

14.1.2.1.1 Applications of EVA

EVA atmosphere

14.2.2.9 EVA Suit Pressure Design Considerations

EVA battery powered tools

14.6.2.3 EVA Tools Design Requirements

EVA body waste management

14.2.2.7 EVA Body Waste Management Design Considerations

14.2.3.7 EVA Body Waste Management Design Requirements

14.2.4.1 EVA Body Waste Management Example Design Solutions

EVA bolt fasteners

14.6.3.3 EVA Fasteners Design Requirements

EVA boots

14.3.2.1.2 Space Suit Boot Design Considerations and Dimensions

14.3.4.2 STS EMU Boot Dimensions

EVA captive fasteners

14.6.3.3 EVA Fasteners Design Requirements

EVA caution and warning

14.2.3.8 EVA Medical Monitoring Design Requirements

14.5.3.1 EVA Translation Route Design Requirements

EVA checkout time

14.2.3.8 EVA Medical Monitoring Design Requirements

EVA clearances

14.3.2.5 EVA Working Envelopes

EVA coding

14.4.2.3 EVA Controls and Displays Design Considerations

14.4.3.2 EVA Control and Display Design Requirements

EVA enhancement systems

14.7 EVA enhancement systems

EVA equipment

14.5.3.1 EVA Translation Route Design Requirements

EVA equipment tethers

14.4.3.5 EVA Equipment Tether Design Requirements

EVA equipment transfer

14.5.2.6 EVA Equipment Transfer Design Considerations

14.5.3.6 EVA Equipment Transfer Design Requirements

EVA eye/hand coordination

14.2.2.2 EVA Eye/Hand Coordination Design Considerations

14.2.3.2 EVA Eye/Hand Coordination Design Requirements

EVA fastener size

14.6.3.3 EVA Fasteners Design Requirements

EVA fasteners

14.6 EVA Tools, Fasteners and Connectors

14.6.3.2 EVA Fasteners Design Considerations

EVA field of view

14.3.2.6 EVA Head Movement and Viewing Limits

14.4.3.1 EVA Work Envelope Design Requirements

14.4.3.3 EVA Workstation Lighting Design Requirements

EVA flashlights

14.4.4.1 EVA Workstation Lighting Example Design Solutions

EVA food

14.2.2.6 EVA Food and Drinking Water Design Considerations

14.2.3.6 EVA Food and Drinking Water Design Requirements

14.2.4.2 EVA Food and Drinking Water Example Design Solution

EVA foot restraints

14.4.2.5 EVA Crew Restraint Design Considerations

14.4.3.4 EVA Crew Restraint Design Requirements

14.4.4.2 EVA Crew Restraint Example Design Solutions

EVA glove

14.2.2.11 EVA Touch Temperature Considerations

14.2.3.11 EVA Touch Temperature and Pressure Design Requirements

14.2.4.5 EVA Glove Example Design Solutions

14.3.2.1 Space Suit Design Considerations and Dimensions

14.3.2.1.1 Space Suit Glove Design Considerations and Dimensions

EVA glove assembly

14.3.2.1.1 Space Suit Glove Design Considerations and Dimensions

EVA glove sections

14.2.4.5 EVA Glove Example Design Solutions

EVA handholds

14.4.2.5 EVA Crew Restraint Design Considerations

14.4.3.4 EVA Crew Restraint Design Requirements

14.5.3.1 EVA Translation Route Design Requirements

14.5.3.2 EVA Mobility Aids Design Requirements

EVA handrails

14.5.3.2 EVA Mobility Aids Design Requirements

EVA hardware

14.4.2 EVA Workstation and Restraint Design Considerations

14.4.2.2 Hardware Design Considerations for EVA Access

EVA hatches

14.5.2.1 EVA Translation Route Design Considerations

14.5.3.1 EVA Translation Route Design Requirements

EVA restraints

14.4 EVA Workstations and Restraints

14.4.2 EVA Workstation and Restraint Design Considerations

14.4.4 Example EVA Workstation and Restraint Design Solutions

14.5.2.3 EVA Translation Restraints Design Considerations

EVA safety

14.1.2.1.3 Limitations of EVA

14.1.3 General EVA Safety Design Requirements

14.4.2.4 EVA Workstation Lighting Design Considerations

EVA safety hooks

14.4.3.4 EVA Crew Restraint Design Requirements

EVA space suit

14.3.2.1 Space Suit Design Considerations and Dimensions

14.3.2.2 Space Suit Joint Motion Design Considerations

14.3.2.7 EVA Space Suit Measurement Considerations

EVA strength

14.2.2.4 EVA Strength-Related Design Considerations

14.2.3.4 EVA Strength-Related Design Requirements

EVA suit measurements

14.3.2.7 EVA Space Suit Measurement Considerations

EVA suit pressure

14.2.2.9 EVA Suit Pressure Design Considerations

14.2.3.9 EVA Suit Pressure Design Requirements

EVA system designs

14.1.3 General EVA Safety Design Requirements

EVA tether attachment points

14.4.3.5 EVA Equipment Tether Design Requirements

EVA translation

14.5 EVA Mobility and Translation

14.5.2.4 EVA Airlock Design Considerations

14.5.3 EVA Mobility and Translation Design Requirements

14.5.3.6 EVA Equipment Transfer Design Requirements

EVA translation routes

14.5.3.1 EVA Translation Route Design Requirements

EVA translation restraints

14.5.2.3 EVA Translation Restraints Design Considerations

14.5.3.3 EVA Translation Restraints Design Requirements

EVA translation routes

14.5.2.1 EVA Translation Route Design Considerations

EVA tunnels

14.5.2.5 EVA Passageway Design Considerations

EVA vision

14.2.3.1 EVA Vision Design Requirements

14.2.2.3 EVA Reaction Time Design Considerations

14.2.2.1 EVA Vision Design Considerations

EVA vision cone

14.3.2.6 EVA Head Movement and Viewing Limits

EVA waist tethers

14.4.4.2 EVA Crew Restraint Example Design Solutions

EVA water

14.2.2.6 EVA Food and Drinking Water Design Considerations

14.2.3.6 EVA Food and Drinking Water Design Requirements

14.2.4.2 EVA Food and Drinking Water Example Design Solution

EVA wing connectors

5.1.2.1 Safe Atmospheres - Design Considerations

5.1.2.1.1 Gas Composition and Pressure Design Considerations

5.1.2.3.1 Atmosphere Toxicological Monitoring Design Considerations

10.4.3 Individual Crew Quarters Design Requirements

Environmental effects

5.9 Combined Environmental Effects

Environmental monitoring equipment

10.9.3.2.2 Environmental Monitoring Equipment

Environmental monitoring system

5.1.3.5 Baro-Thermal Monitoring Design Requirements

Environmental stressors

5.9.2 Combined Environmental Effects Design Considerations

Equipment

8.3.3.1 Adjacent Crew Station Design Requirements

8.4.2 Orientation Design Considerations

9.5.2 Labeling and Coding Design Considerations

11.0 Hardware and Equipment

Equipment accessibility

12.3.1.2 Physical Accessibility Design Requirements

Equipment accidents

6.2.2.2 Crew Induced Accidents

Equipment arrangement

8.2.2.4 Module Layout and Arrangement Design Considerations

Equipment cleansing

7.2.5.3.5 Personal Clothing & Equipment Cleansing Design Requirements

Equipment clearance

8.8.3.2 Clearances Design Requirements

F

G

H

I

J

K

9.3.3.4.1.2 General

Key noise

9.3.3.4.1.2 General

Key operated activation

9.3.3.3.17 Key-Operated Switch Design Requirements

Key operated displacement

9.3.3.3.17 Key-Operated Switch Design Requirements

Key operated shape

9.3.3.3.17 Key-Operated Switch Design Requirements

Key operated switch

9.3.3.3.17 Key-Operated Switch Design Requirements

Key operated switch color

9.3.3.3.17 Key-Operated Switch Design Requirements

Keyboard

9.3.3.4.1 Keyboard Design Requirements

9.3.3.4.1.2 General

9.3.3.4.4 Mouse Design Requirements

9.3.3.4.5 Track Ball (Rolling Ball) Design Requirements

9.3.3.4.7 Touch-Sensitive Display Design Requirements

Keyboard commands

9.6.3.1.4 Design Requirements for Command Keystrokes

Keyboard layout

9.3.3.4.1.1 Layout

Keying

11.10.3.5 Connector Identification/Alignment Design Requirements

Keys

9.3.3.4.1.1 Layout

L

9.5 Labeling and Coding

10.12.3 Stowage Facility Design Requirements

Labeling categories

9.5.3.1.1 Labeling Standardization Design Requirements

Labeling factors

9.5.2 Labeling and Coding Design Considerations

Labeling standardization

9.5.3.1.1 Labeling Standardization Design Requirements

Labels

9.6.2.4.1 Design Considerations for Tables

9.6.2.4.2 Design Requirements for Tables

9.6.2.4.3.2 Design Requirements for Matrix Tables

9.6.2.8 Design Requirements for Format

11.2.3.5 Tool Labeling and Identification Design Requirements

11.3.3.3 Stowage Drawer Design Requirements

11.6.3.1 General Handle and Grasp Area Design Requirements

11.9.3.1 General Fastener Design Requirements

11.9.3.3 Tool-Actuated Fastener Design Requirements

11.10.3.5 Connector Identification/Alignment Design Requirements

11.10.4 Example Connector Design Solutions

11.12.3 Packaging Design Requirements

11.14.3 Cable Management Design Requirements

12.3.1.3 Visual Access Design Requirements

12.3.1.4 Removal Replacement and Modularity Design Requirements

12.3.2.2 Test Point Design Requirements

Lamp replacement

9.4.2.3.4 Display Maintenance Design Requirements

8.13.3.2.2 Reflected Glare Design Requirements

8.13.2.3 Placement of Sources Design Considerations

8.13.2.5 Characteristics of Task Materials Design Considerations

Lighting

8.2.3.6 Decor and Lighting

8.3.2.1 General Adjacency Design Considerations

8.5.3.3 Location & Orientation By Color Coding Design Requirements

8.6.2.2 Visual Design Considerations

8.11.2.1 Location of Windows Within Space Module-Design Consideration

8.12.2.2 Decorative Technique Design Considerations

8.12.2.3 Psychological Effects Design Considerations

8.13 Lighting

9.4.2.3.1.1 Illumination Design Requirements

9.4.2.3.3.2 Large Screen Display Design Requirements

10.2.3.4 Hair Cutting Design Requirements

10.2.3.5 Grooming and Shaving Design Requirements

10.5.3.1 Overall Galley and Wardroom Layout - Design Requirements

10.6.2 Meeting Facility Design Considerations

10.6.3 Meeting Facility Design Requirements

10.9.3.1 Medical Communications/Computing Design Requirements

13.2.3.3 Vacuum Cleaning Design Requirements

Lighting level

8.13.3.1.2 Illumination For Specific Tasks Design Requirements

8.13.3.1.3 Illumination Levels of Sleeping Areas Design Requirements

Lighting measurement

8.13.3.1.2 Illumination For Specific Tasks Design Requirements

Lighting psychological factors

Long term hearing

5.4.3.2.1.2 Narrow-Band Long-Term Hearing Conservation Noise Exposure Requirements

Long term noise

5.4.2.4.1.1 Long-Term Hearing Conservation Criteria Considerations

5.4.2.4.3.1 Long-Term Annoyance Noise Criteria Considerations

5.4.3.2.1.1 Wide-Band Long-Term Hearing Conservation Noise Exposure Requirements

5.4.3.2.3.1 Wide-Band Long-Term Annoyance Noise Exposure Requirements

Longitudinal vibration

5.5.3.2.1 Severe Discomfort Boundary

5.5.3.2.2 Decreased Proficiency Boundary

5.5.3.2.3 Reduced Comfort Boundary

5.5.3.3.1 Fatigue-Decreased Proficiency Boundary

5.5.3.3.2 Vibration Exposure Limit

Longitudinal vibration acceleration exposure

5.5.3.3.3 Reduced Comfort Boundary

Loose restraints

11.7.3.3 Equipment Restraint Design Requirements

Loudspeakers

9.4.3.3.2 Audio Input/Output Equipment Design Requirements

Low frequency noise

5.4.2.2 Propagation of Noise - Design Considerations

Low frequency radiation

5.7.3.1.1 Types of Nonionizing Radiation

Low level lighting

8.13.3.1.4 Illumination Levels for Dark Adaptation Design Requirements

Low temperature

M

Mechanical hazards

6.3.2 Mechanical Hazards Design Considerations

6.3.3 Mechanical Hazards Design Requirements

Mechanical protrusions

6.3.2 Mechanical Hazards Design Considerations

Mechanical surfaces

6.3.2 Mechanical Hazards Design Considerations

Mechanical transfer aids

11.8.3.1 Equipment Mobility Aid Design Considerations

Mechanical vibration

5.5.2.2 Vibration Propagation Design Considerations

Medical care

7.3 Medical care

7.3.3 Medical Care - Design Requirements

Medical care facility

7.3.2.1 Objectives of Medical Care - Design Considerations

Medical communications

10.9.3.1 Medical Communications/Computing Design Requirements

Medical computing

10.9.3.1 Medical Communications/Computing Design Requirements

Medical equipment

10.9.3.2.13 Central Supply

Medical facility

7.3.2.3 Earth- versus Space-Based Medical Care-Design Considerations

7.3.3.1 General Design Requirements

7.3.3.2 Prevention - Design Requirements

7.3.3.3 Diagnosis - Design Requirements

Medical facility link

10.8.3.2 Countermeasure Monitoring Design Requirements

Medical life support

10.9.3.2.4 Advanced Life Support

Medical lighting

8.13.3.5 Medical Lighting Requirements

Medical stabilization

7.3.3.4 Treatment (Therapeutics) Design Requirements

Medical supplies inventory

10.9.3.2.1 Data Base and Communications Capability

Medical team

7.3.2.3 Earth- versus Space-Based Medical Care-Design Considerations

Medical training

7.3.2.3 Earth- versus Space-Based Medical Care-Design Considerations

10.9.2.3 Crewmember Skills - Design Considerations

Medical treatment

7.3.3.4 Treatment (Therapeutics) Design Requirements

Meeting facility

10.6 Meeting Facility

Meeting facility design

10.6.3 Meeting Facility Design Requirements

Meeting facility equipment

10.6.2 Meeting Facility Design Considerations

Meeting facility furnishings

10.6.3 Meeting Facility Design Requirements

Meeting facility location

10.6.2 Meeting Facility Design Considerations

N

Narrow band hearing

5.4.3.2.1.2 Narrow-Band Long-Term Hearing Conservation Noise Exposure Requirements

Narrow band noise

5.4.2.4.1.1.2 Narrow-Band Long-Term Hearing Conservation Considerations

5.4.3.2.3.2 Narrow-Band Annoyance Noise Exposure Requirements

Nasal congestion

4.4.2.1 Olfaction

Neutral body posture

3.2.3.1 Microgravity Effects Design Considerations

3.3.3.2.2 Body Posture Design Considerations

3.3.4 Neutral Body Posture

8.11.2.2 Window Configuration Design Considerations

9.2.4.2.3 Workstation Restraints and Mobility Aid Design Requirements

Night vision

5.1.2.2.1.2 Night Vision Abnormalities Design Considerations

No hands input/output

9.2.5.2.1 Maintenance Workstation Design Considerations

Noise

4.3.2.2 Noise Design Considerations

8.3.2.1 General Adjacency Design Considerations

8.3.2.2 Specific Adjacency Design Considerations

10.4.3 Individual Crew Quarters Design Requirements

10.5.3.1 Overall Galley and Wardroom Layout - Design Requirements

10.6.2 Meeting Facility Design Considerations

10.8.3.4 Exercise Environment Design Requirements

10.9.3.1 Medical Communications/Computing Design Requirements

O

P

Panel color

9.2.2.2.4 Workstation Color Design Requirements

Pantry

10.5.3.2 Food Selection Preparation Consumption -Design Requirements

Parallax error

9.2.3.2.2 Display Readability Design Requirements

Parentheses

9.5.3.1.14.2 Punctuation Design Requirements

Partial body cleansing

10.2.3.1 Partial Body Cleansing Design Requirements

Partial body washing

10.2.3.1 Partial Body Cleansing Design Requirements

Particulate monitoring

5.1.3.3 Atmosphere Toxicological Monitoring Design Requirements

7.2.7.3.3 Environmental Monitoring Design Requirements

Pathogen free animals

5.1.3.4.3 Cross Contamination Design Requirements

Pattern coding

9.4.2.3.3.4 Scales and Pointers Design Requirements

Payloads

12.3.1.4 Removal Replacement and Modularity Design Requirements

Peak clipping

9.3.3.5 Speech Transmission Equipment Design Requirements

Pedal control return

9.3.3.3.10 Pedal Design Requirements

Pedal surface

9.3.3.3.10 Pedal Design Requirements

Q

R

Radiation dose

5.7.2.2.2 Ionizing Radiation Protection Design Requirements

5.7.2.2.3 Ionizing Radiation Monitoring and Dosimetry

Design Requirements

Radiation dose prognosis

5.7.2.1.3.3.3 Hematological Effects

Radiation effects

5.7.2.1.3.3.5 Reproductive Cell Effects

5.7.2.1.3.3.6 Performance Degradation Effects

Radiation exposure

5.7.2.1.3.3.3 Hematological Effects

Radiation exposure effects

5.7.2.1.3.3 Acute Effects of Ionizing Radiation

5.7.2.1.3.3.1 Whole-Body Irradiation Effects

5.7.2.1.3.3.2 Gastrointestinal or Precursor Effects

Radiation exposure limits

5.7.2.1.3.2 Late Effects of Ionizing Radiation

5.7.3.1.3 Human Responses to Nonionizing Radiation

5.7.3.2.1 Nonionizing Radiation Exposure Limits

Radiation fields

5.7.2.1.4.5 Radiation Fields in Polar and Geosynchronous Orbit

Radiation measurements

5.7.2.1.3.1 Units of Measure Used to Describe Human Responses to IO

Radiation monitoring

5.7.2.1.4.6 Radiation Monitoring

5.7.2.2.2 Ionizing Radiation Protection Design Requirements

5.7.2.2.3 Ionizing Radiation Monitoring and Dosimetry

Recreational materials

10.7.2 Recreation Facility Design Considerations

Rectilinear vibration

5.5.2.4.1 Vibration Direction Criteria Design Considerations

Recuperation period

7.3.2.2 Anticipated Illnesses and Injuries - Design Considerations

Red light

8.13.2.1 Color of Light Source Design Considerations

8.13.3.1.4 Illumination Levels for Dark Adaptation Design Requirements

Reduced comfort boundary

5.5.2.4.2 Vibration Exposure Criteria Design Considerations (0.1 to 1 Hz)

5.5.2.4.3 Vibration Exposure Criteria Design Considerations (1 to 80 Hz)

5.5.3.2.3 Reduced Comfort Boundary

5.5.3.3.3 Reduced Comfort Boundary

Reduced gravity

7.2.3.2 Reduced Gravity Countermeasures Design Considerations

Reduced gravity countermeasures

7.2.3 Reduced Gravity Countermeasures

Reflectance

11.11.3.2.4 Reflectance

Reflections

8.13.3.6 Workstation Illumination Design Requirements

9.2.2.2.4 Workstation Color Design Requirements

9.4.2.3.1.3 Reflections Design Requirements

11.11.2.1 Optical Characteristics Design Considerations

11.11.3.1.2 Surface Reflections

Response time

9.2.3.2.8 Control/Display Movement Compatibility Design Requirements

9.6.2.9.1 Design Considerations for Information Display Rate

9.6.2.9.2 Design Requirements for Information Display Rate

Restraint cleaning

11.7.2.3.1 General Personnel Restraints Design Requirements

Restraint color

11.7.3.3 Equipment Restraint Design Requirements

Restraint location

8.9.2.2 Considerations for Location of IVA Personnel Restraints

8.9.3.2 IVA Restraint Integration Design Requirements

Restraint repair

11.7.2.3.1 General Personnel Restraints Design Requirements

Restraint system

3.3.3.2.3 Restraint Design Considerations

Restraints

4.9.2 Strength - Design Considerations

8.2.2.1 Microgravity Design Considerations

8.9 Mobility Aids and Restraints Architectural Integration

8.10.3.4 Operating Forces Design Requirements

8.11.2.2 Window Configuration Design Considerations

8.11.3 Window Integration Design Requirements

9.2.4.1.1 Restraint Selection Design Considerations

9.2.5.1.2 Window Workstation Design Requirements

9.2.5.2.2 Maintenance Workstation Design Requirements

9.3.3.3.5 Handwheel Design Requirements

10.2.2 Personal Hygiene Design Considerations

S

T

11.9.2 Fastener Design Considerations

11.9.3.1 General Fastener Design Requirements

11.9.3.3 Tool-Actuated Fastener Design Requirements

11.9.3.4 IVA Fastener Design Requirements

Tool actuation force

11.2.3.1.3 Tool Actuation Forces and Direction of Action Design Requirements

Tool caddy

11.2.2 Tool Design Considerations

Tool carriers

11.2.3.3 Tool Tethering/Retention Design Requirements

Tool clearance

11.9.2 Fastener Design Considerations

Tool commonality

11.2.2 Tool Design Considerations

Tool design

11.2.3 Tool Design Requirements

Tool disassembly

11.2.3.3 Tool Tethering/Retention Design Requirements

Tool finish

11.2.3.7 Special Tool Features Design Requirements

Tool handle

11.2.3.1.2 Tool Handedness Design Requirements

Tool handles

11.2.3.6 Tool Access Design Requirements

Tool head

11.2.3.6 Tool Access Design Requirements

Tool identification

U

V

Vibration environment

5.5.2 Vibration Design Considerations

5.5.2.1 Vibration Environments Design Considerations

5.5.2.1.1 Launch Phase Vibration Environment

Vibration environmental parameters

5.5.3 Vibration Design Requirements

Vibration exposure

5.5.2.4.2 Vibration Exposure Criteria Design Considerations (0.1 to 1 Hz)

5.5.3.3 Vibration Exposure (1 to 80 Hz) Design Requirements

Vibration exposure limits

5.5.2.4.3 Vibration Exposure Criteria Design Considerations (1 to 80 Hz)

Vibration exposure times

5.5.2.4.4 Vibration Duration Criteria Design Considerations

Vibration limits

5.5.2.4.4 Vibration Duration Criteria Design Considerations

Vibration measurement

5.5.3.1 General Vibration Design Requirements

Vibration paths

5.5.2.2 Vibration Propagation Design Considerations

5.5.4.2 Control of Vibration - Path Transmission

Vibration protection

5.5.4.3 Vibration Protection

Vibration resonant frequency region

5.5.2.3.1 Physiological Effects of Vibration

Vibration sources

5.5.4.1 Vibration Control at the Source

Videotape

9.4.2.2 Visual Display Design Considerations

9.4.2.3.3.9 Visual Display Terminal (VDT) Design Requirements

Visual displays

9.4.2 Visual Displays

Visual distractions

9.2.4.2.2 Visual Space Design Requirements

Visual indicator absence

9.4.2.3.2 Information Presentation Design Requirements

Visual orientation

8.4.2 Orientation Design Considerations

8.4.3 Orientation Design Requirements

Visual perception

4.2.2 Vision - Design Considerations

Visual problems

4.2.2 Vision - Design Considerations

Visual protection

11.11.2.2 Visual Protection Design Considerations

11.11.3.3 Visual Protection Design Requirements

Visual space

9.2.4.2.2 Visual Space Design Requirements

Visual spaciousness

8.6.2.2 Visual Design Considerations

Voice activation

9.3.2.2 Computer Input Devices - Design Considerations

Voice communication

5.4.2.4.2 Voice Communications Criteria Considerations

W

X

Y

Z

9.3.3.4.5 Track Ball (Rolling Ball) Design Requirements