Table 2-79b Excerpted from:

NASA Technical Memorandum 4511

Terrestrial Environment (Climatic) Criteria Guidelines for Use in Aerospace Vehicle Development, 1993 Revision

August, 1993

Based on turbulence data from:

C.G. Justus et al. NASA Technical Memorandum 4168

New Atmospheric Turbulence Model for Shuttle Applications

January, 1990

Table 2-79*b*. Mean horizontal and vertical turbulence (light, moderate, and severe) magnitudes (σ_h, σ_w), wind scale (L_h, L_w), and probability for encountering turbulence, versus altitude (MSL)

	Light Turbulence			Moderate Turbulence			Severe Turbulence			Turbulence Length Scales	
Altitude (MSL) km	Horizontal σ_h m/s	Vertical σ_w m/s	Probability of Light Turbulence	Horizontal σ_h m/s	Vertical σ_w m/s	Probability of Moderate Turbulence	Horizontal σ_h m/s	Vertical σ_w m/s	Probability of Severe Turbulence	Horizontal L_h km	Vertical L_w km
1	0.17	0.14	0.776	1.65	1.36	0.199	5.70	4.67	0.025	0.832	0.624
2	0.17	0.14	0.8910	1.65	1.43	0.0979	5.80	4.75	0.0111	0.902	0.831
4	0.20	0.17	0.9199	2.04	1.68	0.0738	6.24	5.13	0.0063	1.04	0.972
6	0.21	0.17	0.9294	2.13	1.69	0.0650	7.16	5.69	0.0056	1.04	1.01
8	0.22	0.17	0.9247	2.15	1.69	0.0704	7.59	5.98	0.0049	1.04	0.98
10	0.22	0.17	0.9280	2.23	1.73	0.0677	7.72	6.00	0.0043	1.23	1.10
12	0.25	0.18	0.9464	2.47	1.79	0.0502	7.89	5.71	0.0034	1.80	1.54
14	0.26	0.19	0.9605	2.62	1.91	0.0368	6.93	5.05	0.0027	2.82	2.12
16	0.24	0.21	0.9639	2.44	2.10	0.0337	5.00	4.31	0.0024	3.40	2.60
18	0.22	0.21	0.9703	2.21	2.07	0.0277	4.07	3.81	0.0020	5.00	3.34
20	0.23	0.20	0.9804	2.26	1.99	0.0180	3.85	3.38	0.0016	8.64	4.41
25	0.27	0.21	0.9839	2.71	2.09	0.0146	4.34	3.34	0.0015	12.0	6.56
30	0.37	0.24	0.9797	3.73	2.39	0.0185	5.60	3.59	0.0018	28.6	8.88
35	0.46	0.26	0.9726	4.59	2.58	0.0249	6.89	3.87	0.0025	35.4	8.33
40	0.53	0.29	0.9650	5.26	2.87	0.0318	7.89	4.30	0.0032	42.6	6.2
45	0.62	0.33	0.9575	6.22	3.25	0.0386	9.33	4.88	0.0039	50.1	5.2
50	0.73	0.42	0.9500	7.27	4.21	0.0455	10.90	6.31	0.0045	57.9	5.3
55	0.87	0.44	0.9250	8.70	4.40	0.0682	13.06	6.60	0.0068	66.0	6.0
60	1.01	0.44	0.9000	10.1	4.42	0.0917	15.1	6.63	0.0083	74.4	6.8
65	1.13	0.41	0.8250	11.3	4.05	0.1620	16.9	6.0	0.0130	83.2	7.5
70	1.59	0.50	0.7500	15.9	5.04	0.2336	23.8	7.5	0.0164	92.3	8.2
75	1.92	0.63	0.6750	19.2	6.3	0.3066	28.7	9.5	0.0184	102	9.0
80	2.26	0.83	0.6000	22.6	8.3	0.3810	33.8	12.4	0.0190	111	9.7
85	2.73	1.03	0.4000	27.3	10.3	0.5769	40.9	15.4	0.0231	121	10.4
90	3.32	1.18	0.2000	33.2	11.8	0.7767	49.8	17.7	0.0233	132	11.2
100	3.56	1.14	0.0000	35.6	11.4	0.9804	53.3	17.1	0.0196	153	12.7
120	4.23	1.07	0.0000	42.3	10.7	0.9901	63.4	16.0	0.0099	200	15.8
140	4.43	1.08	0.0000	44.3	10.8	0.9901	66.4	16.1	0.0099	232	17.6
160	4.82	1.17	0.0000	48.2	11.7	0.9901	72.2	17.6	0.0099	270	20.0
180	4.89	1.18	0.0000	48.9	11.8	0.9901	73.3	17.8	0.0099	300	22.2
200	4.95	1.20	0.0000	49.5	12.0	0.9901	74.2	18.1	0.0099	300	24.3