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BRIEF DESCRIPTION OF DATA PACKAGE

THIS MEMO PRESENTS THE RESULTS OF THE NUCLEAR ANALYSIS CONDUCTED ON THE PVC FOR USE IN SUBSEQUENT THERMAL ANALYSIS.

*REF. Press. Vessel Des. Rept # N8500:72-R-021-01

MASTER

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M E M O R A N D U M

TO: D. W. Tracy DATE: 18 January 1971
N4340:6394M

FROM: J. C. Courtney JCC:kn

SUBJECT: Nuclear Heating Rates in the Pressure Vessel -
Flight Environment

COPIES TO: A. L. Armitage, H. J. Bronner, A. D. Cornell, K. Sato,
L. A. Shurley, J. R. Smith, W. E. Stephens, P. P. Ventura

REFERENCE: (a) ANSC Memo 4340:6367M, dated 1 December 1970, subject:
"Pressure Vessel Heating Rates"
(b) ANSC Memo 4340:6388M, dated 4 January 1971, subject:
"Revised Maximum Pressure Vessel Heating Rates"

ENCLOSURE: (1) Nuclear Heating Rates in the Pressure Vessel -
Flight Environment

This memorandum is intended to serve as a documentation of the detailed specification extreme flight environment pressure vessel heating rates previously transmitted to the thermodynamics section on an informal basis.

These data supersede and replace the data presented in Reference (a). They are in agreement with the maximum heating rate data given in Reference (b).

The nuclear subsystem used for these analyses contained the graphite core (worst case). This design was received from WANL in October 1970. This is essentially the same as the NSS configuration presented by WANL in the December NSS-PDR, with the graphite fuel as opposed to the composite fuel.

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CLASSIFICATION CATEGORY	
UNCLASSIFIED	
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DET	Z DJM	R DJM	STA. NO.	HEATING RATES*	
				AFC HEIL BTU/IN ³ -SEC	STEEL BTU/IN ³ -SEC
1	0	22.383	194.930	9.0(-2)	
2	0	23.148	194.930	7.5(-2)	2.2(-1)
3	0	23.698	194.930	6.4(-2)	
4	0	24.702	194.930	5.0(-2)	
5	.667	22.383	194.263	9.2(-2)	
6	.667	23.148	194.263	8.2(-2)	2.4(-1)
7	.667	23.698	194.263	7.5(-2)	
8	.667	24.710	194.263	6.0(-2)	
9	1.334	22.383	193.596	9.7(-2)	
10	1.334	23.148	193.596	9.0(-2)	
11	1.334	23.698	193.596	8.6(-2)	
12	1.334	24.897	193.596	7.7(-2)	
13	2.000	22.496	192.930	9.8(-2)	
14	2.000	23.148	192.930	1.0(-1)	
15	2.000	23.698	192.930	1.0(-1)	
16	2.090	24.248	192.930	1.1(-1)	
17	2.500	24.702	192.430	1.1(-1)	
18	4.050	25.598	190.880	1.1(-1)	
19	3.850	25.898	191.080	9.7(-2)	
20	3.650	26.248	191.280	8.1(-2)	
21	11.250	27.160	180.520	1.5(-1)	
22	11.250	27.550	180.520	1.3(-1)	
23	11.250	27.940	180.520	1.1(-1)	
24	26.250	27.160	169.130	2.0(-1)	
25	26.250	27.940	169.130	1.6(-1)	
27	37.200	27.160	157.730	2.6(-1)	
28	37.200	27.550	157.730	2.2(-1)	
29	37.200	27.940	157.730	1.8(-1)	
30	50.800	27.160	144.130	2.2(-1)	
31	50.800	27.550	144.130	1.9(-1)	
32	50.800	27.940	144.130	1.6(-1)	
33	81.650	27.160	113.280	9.8(-3)	
34	81.650	27.550	113.280	8.5(-3)	
35	81.650	27.955	113.280	7.1(-3)	
36	82.650	27.160	112.280	8.5(-3)	
37	82.650	27.710	112.280	7.6(-3)	
38	82.650	28.260	112.280	6.1(-3)	
39	83.650	27.160	111.280	7.7(-3)	
40	83.650	27.860	111.280	5.9(-3)	
41	83.650	28.860	111.280	5.1(-3)	
42	84.650	27.160	110.280	7.2(-3)	
43	84.650	27.860	110.280	5.6(-3)	
44	84.650	28.910	110.280	4.1(-3)	1.2(-2)
45	84.650	30.06	110.280	7.6(-3)	
46	85.650	27.160	109.280	6.8(-3)	
47	85.650	27.860	109.280	5.4(-3)	
48	85.650	28.910	109.280	3.3(-3)	9.9(-3)
49	85.650	29.860	109.280	4.4(-3)	
50	85.650	30.325	109.280	4.7(-3)	
51	86.275	27.110	108.655	6.6(-3)	
52	86.275	27.860	108.655	5.4(-3)	
53	86.275	28.910	108.655	2.4(-3)	1.0(-2)
54	86.275	29.700	108.655	3.7(-3)	
55	86.275	30.325	108.655	3.7(-3)	
56	86.900	27.030	108.030	6.5(-3)	
57	86.900	27.860	108.030	5.3(-3)	

DET	Z DIM	R DIM	STA.NO.	HEATING RATES *	
				ALUMINUM BTU/IN ³ -SEC	STEEL BTU/IN ³ -SEC
58	86.900	28.910	108.030	3.5(-3)	
59	86.900	29.700	108.030	3.6(-3)	1.1(-2)
60	86.900	30.325	108.030	3.0(-3)	
61	87.691	28.910	107.239	4.1(-3)	
62	88.710	26.450	106.220	6.3(-3)	1.2(-2)
63	88.940	26.970	105.990	5.5(-3)	
64	88.150	27.510	105.780	5.3(-3)	
65	91.730	25.960	103.200	4.4(-3)	
66	91.730	26.350	103.200	4.2(-3)	
67	91.730	26.730	103.200	4.0(-3)	
68	94.480	26.325	100.450	2.9(-3)	
69	94.480	26.530	100.450	2.9(-3)	
70	94.480	26.730	100.450	2.9(-3)	
71	96.900	27.016	98.030	2.3(-3)	
72	96.900	26.640	98.030	2.3(-3)	
73	96.900	22.360	98.030	2.8(-3)	
74	96.900	21.984	98.030	2.8(-3)	
75	95.650	20.850	99.280	3.1(-3)	
76	95.150	20.585	99.780	3.6(-3)	
77	94.650	20.300	100.28	4.2(-3)	
78	96.900	20.000	98.030	3.0(-3)	
79	97.400	20.000	97.530	3.0(-3)	
80	96.900	19.500	98.030	3.0(-3)	
81	97.400	19.500	97.530	3.0(-3)	9.0(-3)
82	97.940	19.500	96.990	3.0(-3)	9.0(-3)
83	96.900	18.600	98.030	3.0(-3)	9.0(-3)
84	97.400	18.600	97.530	3.0(-3)	
85	97.030	18.140	98.250	3.0(-3)	
86	96.500	17.900	98.430	3.2(-3)	
87	95.960	17.660	98.970	3.8(-3)	
88	98.600	17.840	96.330	2.7(-3)	
89	98.600	17.560	96.330	2.7(-3)	
90	98.600	14.440	96.330	2.7(-3)	
91	98.600	13.830	96.330	2.7(-3)	
92	98.000	13.660	96.930	3.0(-3)	
93	97.440	13.520	97.440	3.5(-3)	
94	99.100	11.520	95.830	2.7(-3)	
95	98.540	11.410	96.390	3.1(-3)	
96	98.000	11.280	96.930	3.4(-3)	
97	100.150	9.000	94.780	2.6(-3)	
98	99.110	9.000	95.820	2.9(-3)	
99	98.450	9.000	96.480	3.3(-3)	
100	100.150	8.000	94.780	2.6(-3)	
101	99.450	7.250	95.480	2.9(-3)	
102	98.760	7.300	96.170	3.3(-3)	
103	99.450	0	95.480	2.9(-3)	
104	98.760	0	96.170	3.3(-3)	
26	26.250	27.940	169.130	1.4(-1)	

*Read 3.5(-3) as 3.5×10^{-3}