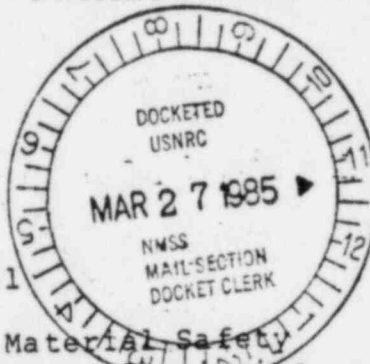




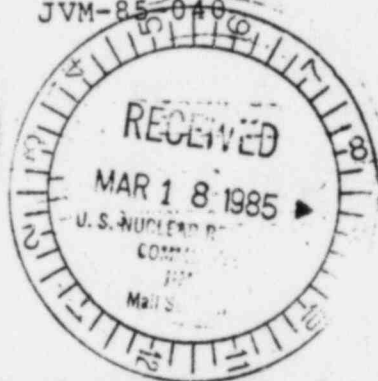
145 MARTINVALE LANE • SAN JOSE, CALIFORNIA 95119 • PHONE (408) 629-9800 • TELEX 352062

11-39
PDR

Mr. John P. Roberts
Project Manager
Advanced Fuel and Spent Fuel
Licensing Branch
Division of Fuel Cycle and Material Safety
United States Nuclear Regulatory Commission
Washington, D.C. 20555



March 7, 1985
JVM-85-040



Subject: Additional Information Required for Safety Review of
the NUHOMS Topical Report (Project M-39)

Mr. Roberts:

We are very pleased that you are proceeding with the evaluation of our topical report. We have reviewed your request for additional information (2/28/85) and have prepared a response to that request. The information is provided in the enclosure to this letter. In addition, we would like to suggest an alternative method of providing you with some of the bulkier information. We firmly believe that this alternative (a meeting) will provide you the necessary information in a faster, easier and more cost-effective manner.

The numerous calculation packages and computer printouts (set-up of HEATING6, 125°F HEATING6 case, vacuum HEATING case, HSM air flow, HSM and DSC shielding models, ORIGEN, KENO, ANISN, DOT, QADMOD-G, SKYSHINE, KENO benchmark case, FEM STARDYNE analysis of the thermal loads, DSC handling loads, dead weight loads, FEM analysis of the DSC support assembly, thermal analysis of the HSM, missile impact analysis, cask drop analysis, load combination analysis and the fatigue analysis) which you requested occupy several file cabinets and, hence, would represent a monumental copying task. Furthermore, the packages are interlaced with proprietary material and would either require the entire document to be proprietary or require an extensive sorting effort. Also, the cost of copying, manpower and shipping would be substantial. We have, however, tried to send as much material as we can at the present time. The enclosure to this letter discusses each item of your request and supplies the additional information which can be readily extracted.

As an alternative to us simply burying you and your reviewers in mountains of paper, we strongly suggest a meeting at our offices

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PDR PROJ
M-39 PDR

24964

Mr. John P. Roberts
United States Nuclear
Regulatory Commission

-2-

March 7, 1985
JVM-85-040

on March 18th and 19th. At this meeting we can answer any specific questions and go-over and discuss the material which your reviewers have requested. We can pull-out the individual calculation packages and computer printouts and have the engineer who did the work describe the models and directly answer any specific questions. We feel that this one-on-one meeting would be more effective and beneficial than having your reviewers sort through our calculation files for the exact information which they need.

Let us assure you that it is our intent to supply you with the requested information in a manner so as to maintain your review schedule. We have a very success oriented program for the Carolina Power and Light Cooperative Demonstration Project and wish to do everything possible to expedite the transfer of all necessary review information to your organization.

Thank you again for the prompt attention which you have given to our topical report. If you have any questions, please call me at (408) 281-6379.

Very truly yours,

John V. Massey, Ph.D.
NUHOMS Program Manager
NUTECH, Inc.

JVM/mh

Enclosure

cc: N. W. Edwards

nutech

M-39

Attachment 1

Drawings

PROPRIETARY DRAWINGS HAVE BEEN REMOVED
FROM THIS ATTACHMENT

24964

PARTS LIST
ADV001-0204

[illegible]

ADV001-0208

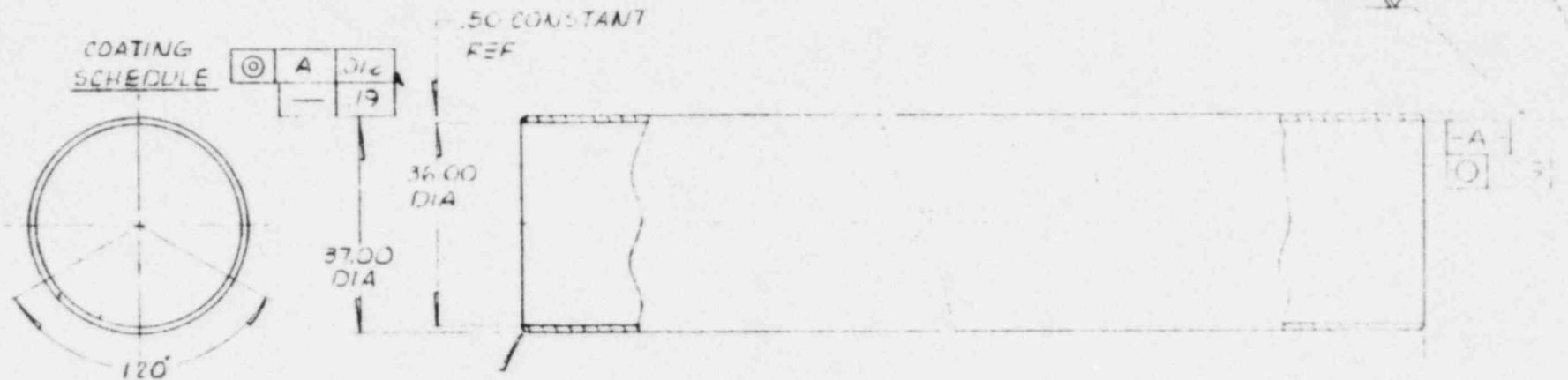
C

TOLEKANCE :

.X = ± .12

.XX = ± .02

ITEM NO	NO REQD	SIZE	DESCRIPTION	MATERIAL / MANUFACTURER
				ASME SA 358 WP 304 CL 10R3



COAT ON EXTERIOR 120° SECTOR
ALONG ENTIRE LENGTH WITH
EVERLUBE B12 PER MFR'S
RECOMMENDATION.

MFR: E/M LUBRICANT
WEST LAFAYETTE
INDIANA

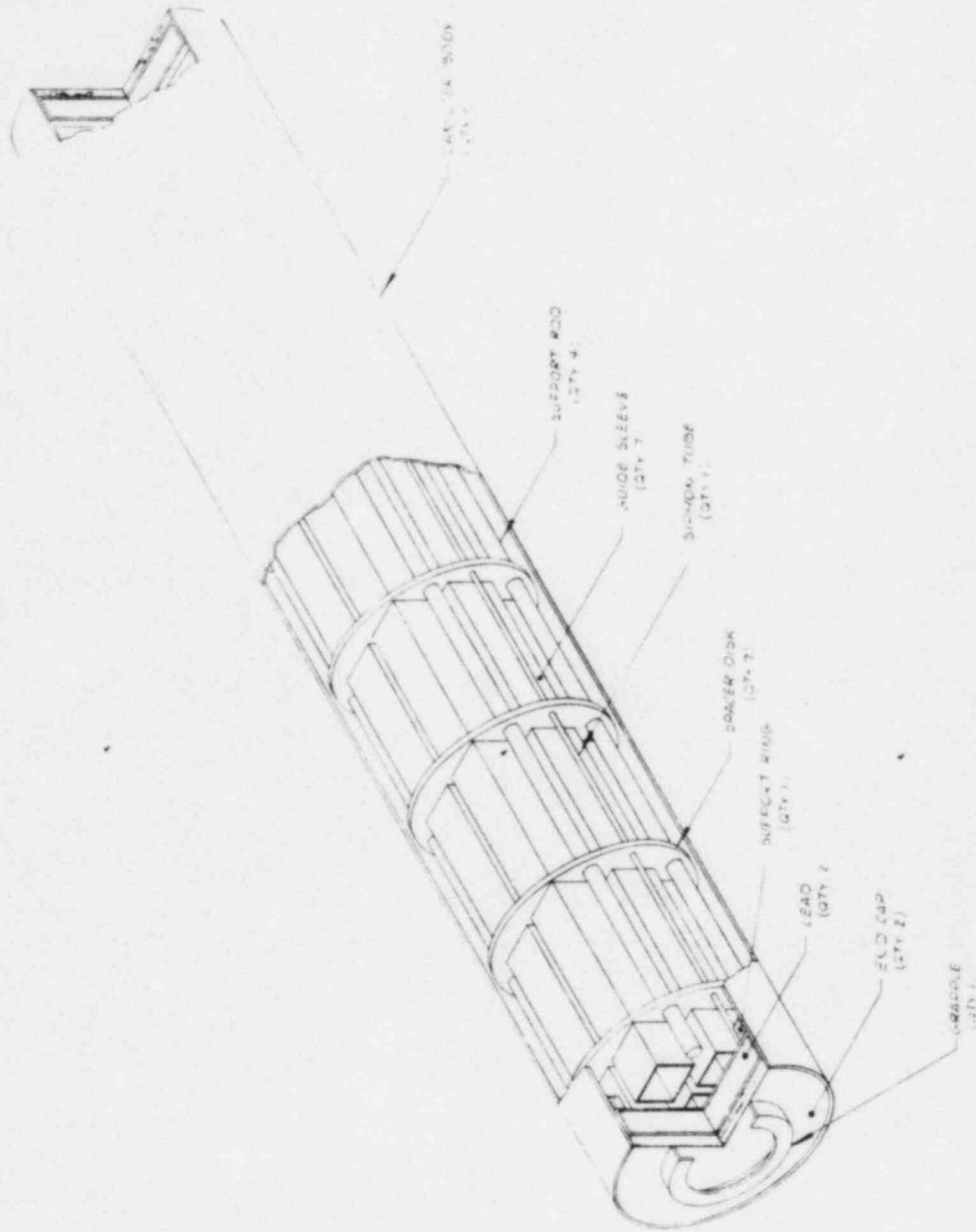
.25 x 45°
CHAMFER (2 PLACES)

REVISION	DESCRIPTION
1	DESIGN
2	DRAWN
3	CHECK
4	ISSUE

REFERENCE DRAWINGS	SYSTEM	OB NO	DRIVING	REV
ISO: N/A	LINE: N/A	400-01	ALV-001	0
PIPING: N/A	SUPPORT MAP: N/A	ALV-001-001		
BLDG: N/A				

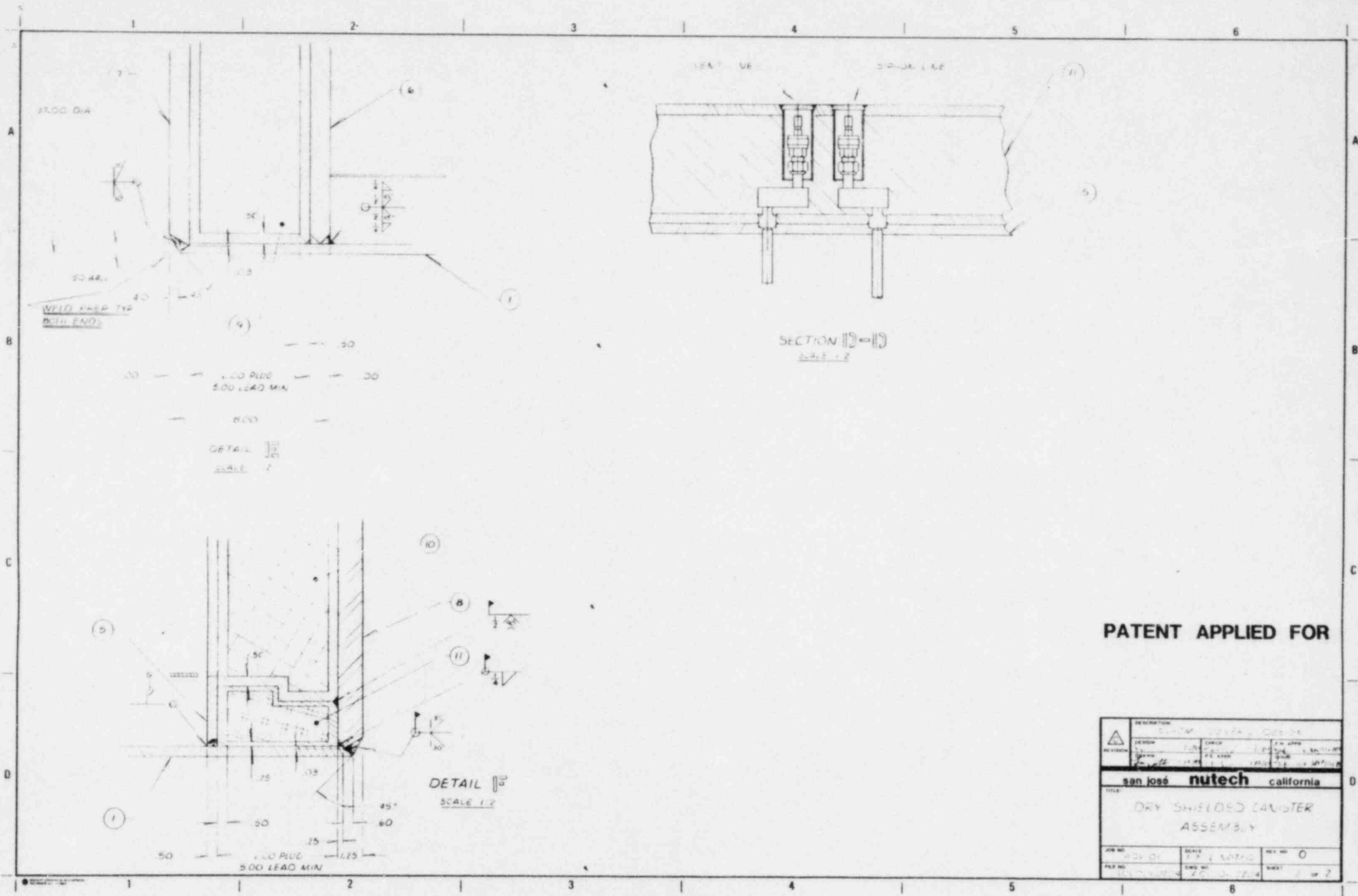


DRY SHIELDED CABLE



PATENT APPLIED FOR

DESCRIPTION		DRY SHIELDED CABLE	
DATE	10/1/54	BY	J. E. H. M.
DESIGNED BY	J. E. H. M.	CHECKED BY	J. E. H. M.
DRAWN BY		J. E. H. M.	
MATERIAL		CABLE	
QUANTITY		100	
UNIT		FEET	
PRICE		1.00	
TOTAL		100.00	
APPROVED BY		J. E. H. M.	
DATE		10/1/54	
BY		J. E. H. M.	
FOR		NUTECH	
CITY		SAN JOSE	
STATE		CALIFORNIA	
COUNTRY		U.S.A.	
PROJECT		DRY SHIELDED CABLE	
SUBJECT		INTERIOR	



PATENT APPLIED FOR

DESCRIPTION			
san José nutech california			
DRY SHIELDED CANISTER ASSEMBLY			
JOB NO.	DATE	REV. NO.	0
FILE NO.	DWG. NO.	SHEET	2 OF 2

M-
39

Attachment 2

HEATING6 Input and Output for the 125°F Inlet Air Case

PROPRIETARY PORTIONS HAVE BEEN REMOVED
FROM THIS ATTACHMENT

24964

1111111111222222222233333333333344444444445555555555666666666677777777778
 1234567890123456789012345678901234567890123456789012345678901234567890

125°F Air Case
 DSC model

1 NEWLY MODELED CANISTER WITH E=0.587, NUHOM TEMPS. =125F IN & 214F OUT.
 2 200 7 1 0.0 10.0 0.1 2 0 0
 3 0 0 1 -1 -2 0 1 0 200
 4 REGIONS
 5 8 19 5.7775 14.2225 0.7775 9.2225
 6 5 3 0 0 0 0
 7 9 19 0.0 4.2225 5.7775 14.2225
 8 5 3 1 0 0 0
 9 10 15 0.0 4.2225 -4.2225 4.2225
 10 6 2 1 0 0 0
 11 11 19 0.0 4.2225 -14.2225 -5.7775
 12 5 3 1 0 0 0
 13 12 19 5.7775 14.2225 -9.2225 -0.7775
 14 5 3 0 0 0 0
 15 13 2 4.5 5.5 9.5 14.5
 16 4 0 2 2 3 3
 17 14 2 4.5 5.5 -14.5 -9.5
 18 4 0 2 2 3 3
 19 15 2 5.5 13.0 9.5 14.5
 20 4 0 3 3 2 2
 21 16 2 5.5 13.0 -14.5 -9.5
 22 4 0 3 3 2 2
 23 17 2 14.5 15.5 0.0 9.5
 24 4 0 2 2 3 3
 25 18 2 14.5 15.5 -9.5 0.0
 26 4 0 2 2 3 3
 27 19 2 15.5 17.0 0.0 8.0
 28 4 0 3 3 0 1
 29 20 2 15.5 17.0 -8.0 0.0
 30 4 0 3 3 1 0
 31 21 2 17.0 18.0 0.0 5.5
 32 4 0 3 3 0 1
 33 22 2 17.0 18.0 -5.5 0.0
 34 4 0 3 3 1 0
 35 23 2 5.5 10.5 14.5 15.5
 36 4 0 3 3 3 3
 37 24 2 5.5 10.5 -15.5 -14.5
 38 4 0 3 3 3 3
 39 25 2 10.5 13.0 14.5 15.0
 40 4 0 3 3 3 3
 41 26 2 10.5 13.0 -15.0 -14.5
 42 4 0 3 3 3 3
 43 27 2 13.0 14.5 9.5 14.5
 44 4 0 3 3 2 2
 45 28 2 13.0 14.5 -14.5 -9.5
 46 4 0 3 3 2 2
 47 33 2 14.5 15.0 10.5 13.0
 48 4 0 3 3 3 3
 49 34 2 14.5 15.0 -13.0 -10.5
 50 4 0 3 3 3 3

12345678901111111111222222222233333333333344444444445555555555666666666677777777778
 0123456789012345678901234567890123456789012345678901234567890

11111111112222222222333333333344444444445555555555666666666677777777778
1234567890123456789012345678901234567890123456789012345678901234567890

51	35 2 14.5 15.5 9.5 10.5
52	4 0 3 3 3 3
53	35 2 14.5 15.5 -10.5 -9.5
54	4 0 3 3 3 3
55	37 2 5.5 8.0 15.5 17.0
56	4 0 0 1 3 3
57	38 2 5.5 8.0 -17.0 -15.5
58	4 0 0 1 3 3
59	39 2 0.0 5.5 17.0 18.0
60	4 0 1 1 3 3
61	40 2 0.0 5.5 -18.0 -17.0
62	4 0 1 1 3 3
63	41 2 0.0 5.5 14.5 17.0
64	4 0 1 0 2 2
65	42 2 0.0 5.5 -17.0 -14.5
66	4 0 1 0 2 2
67	43 8 4.5 5.5 4.5 9.5
68	4 0 2 2 3 3
69	44 8 4.5 5.5 -9.5 -4.5
70	4 0 2 2 3 3
71	45 8 4.5 5.5 -4.5 4.5
72	4 0 2 2 3 3
73	46 17 0.0 4.2225 14.2225 14.5
74	5 0 1 0 0 0
75	47 17 4.2225 4.5 5.5 14.5
76	5 0 0 0 0 0
77	48 17 0.0 4.2225 5.5 5.7775
78	5 0 1 0 0 0
79	49 8 0.0 4.5 4.5 5.5
80	5 0 1 0 2 2
81	50 17 0.0 4.2225 4.2225 4.5
82	5 0 1 0 0 0
83	51 17 5.7775 14.2225 9.2225 9.5
84	5 0 0 0 0 0
85	52 17 14.2225 14.5 0.5 9.5
86	5 0 0 0 0 0
87	53 17 5.7775 14.2225 0.5 0.7775
88	5 0 0 0 0 0
89	54 17 5.5 5.7775 0.5 9.5
90	5 0 0 0 0 0
91	55 8 5.5 14.5 -0.5 0.5
92	5 0 3 3 2 2
93	56 17 4.2225 4.5 -4.5 4.5
94	5 0 0 0 0 0
95	57 17 0.0 4.2225 -4.5 -4.2225
96	5 0 1 0 0 0
97	58 8 0.0 4.5 -5.5 -4.5
98	5 0 1 0 2 2
99	59 17 0.0 4.2225 -5.7775 -5.5
100	5 0 1 0 0 0

12345678911111111112222222222333333333344444444445555555555666666666677777777778
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11111111112222222222333333333344444444445555555555666666666677777777778
1234567890123456789012345678901234567890123456789012345678901234567890

001	60	17	5.7775	14.2225	-0.7775	-0.5
002	5	0	0	0	0	
003	61	17	14.2225	14.5	-9.5	-0.5
004	5	0	0	0	0	
005	62	17	5.7775	14.2225	-9.5	-9.2225
006	5	0	0	0	0	
007	63	17	5.5	5.7775	-9.5	-0.5
008	5	0	0	0	0	
009	64	17	4.2225	4.5	-14.5	-5.5
010	5	0	0	0	0	
011	65	17	0.0	4.2225	-14.5	-14.2225
012	5	0	1	0	0	
013	66	1	0.0	5.5	18.0	18.5
014	5	0	1	1	0	15
015	67	1	5.5	8.0	17.0	17.5
016	4	0	1	1	0	16
017	68	1	8.0	10.5	15.5	16.0
018	4	0	1	1	0	17
019	69	1	10.5	13.0	15.0	15.5
020	4	0	1	1	0	18
021	70	1	13.0	14.5	14.5	15.0
022	4	0	1	1	0	19
023	71	1	14.5	15.0	13.0	14.5
024	4	0	0	20	1	1
025	72	1	15.0	15.5	10.5	13.0
026	4	0	0	21	1	1
027	73	1	15.5	16.0	8.0	10.5
028	4	0	0	22	1	1
029	74	1	17.0	17.5	5.5	8.0
030	4	0	0	23	1	1
031	75	1	18.0	18.5	0.0	5.5
032	4	0	0	24	0	1
033	76	1	18.0	18.5	-5.5	0.0
034	4	0	0	25	1	0
035	77	1	17.0	17.5	-8.0	-5.5
036	4	0	0	26	1	1
037	78	1	15.5	16.0	-10.5	-8.0
038	4	0	0	27	1	1
039	79	1	15.0	15.5	-13.0	-10.5
040	4	0	0	28	1	1
041	80	1	14.5	15.0	-14.5	-13.0
042	4	0	0	29	1	1
043	81	1	13.0	14.5	-15.0	-14.5
044	4	0	1	1	30	0
045	82	1	10.5	13.0	-15.5	-15.0
046	4	0	1	1	31	0
047	83	1	8.0	10.5	-16.0	-15.5
048	4	0	1	1	32	0
049	84	1	5.5	8.0	-17.5	-17.0
050	4	0	1	1	33	0

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1234567890123456789012345678901234567890123456789012345678901234567890

151 52 1 0.0 5.5 -18.5 -18.0
152 4 0 1 1 34 0
153 MATERIALS
154 1 SS304 0 0.2853 0 -3 0 -4
155 2 HELCANS 1.0 0 0.124 ⁽⁵⁾ -6
156 3 HELSSGAP 0 0.09381 0 -7 0 -8
157 4 AIR 0 0 0 -9 -10 -11
158 5 CARSTEEL 0 0.2818 0.113 -12
159 6 AIRCANS 1.0 0 0 2 -10 -11
160 17 BALGAP 1.0 0.08113 0.1574 ⁽⁻¹⁴⁾
161 8 HELIUMNP 0 0 0.124 -13 -6
162 9 HELGRPR 0 0 0.124 -15 -6
163 10 AIRGRPR 0 0 0 -16 -10 -11
164 11 HECNCST 0 0 0.124 -5 -6
165 12 ALUMINUM 0.1778 0.078 0.27
166 13 FLCST 0 0.1473 0.0696 -14
167 14 FLAIR 1.0 0.1473 0.0696 2
168 15 FLI 1.0 0.1473 0.0696 ⁽⁻¹⁴⁾
169 19 FLII 1.0 0.1473 0.0696 ⁽⁻¹⁴⁾
170 INITIAL TEMPERATURES
171 4 300.0
172 5 500.0
173 6 600.0
174 HEAT GENERATIONS
175 2 5.9769D-3
176 3 5.9769D-3
177 BOUNDARY CONDITIONS
178 1 0
179 0.0 0.0 0.0 0.0 0.0 0
180 2 3
181 0.0 1.1645D-13 0.0 0.0 0.0 0 C
182 3 3
183 0.0 1.9838D-13 0.0 0.0 0.0 0
184 13 2 310.0
185
186 14 2 264.0
187
188 15 2 339.84
189
190 16 2 336.64
191
192 17 2 328.68
193
194 18 2 327.13
195
196 19 2 324.85
197
198 20 2 312.80
199
200 21 2 319.07

insubstantials

1234567891111111112222222222333333333344444444445555555555666666666677777777778
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11111111112222222222333333333344444444445555555555666666666677777777778
1234567890123456789012345678901234567890123456789012345678901234567890

201
202 22 2 317.28
203
204 23 2 315.01
205
206 24 2 310.20
207
208 25 2 304.31
209
210 26 2 299.65
211
212 27 2 284.99
213
214 28 2 284.62
215
216 29 2 283.49
217
218 30 2 281.35
219
220 31 2 279.15
221
222 32 2 277.64
223
224 33 2 276.96
225
226 34 2 277.75
227
228 XGRID
229 0.0 4.2225 4.5 5.5 5.7775 8.0 10.5 13.0 14.2225
230 14.5 15.0 15.5 16.0 17.0 17.5 18.0 18.5
231 7 1 1 1 2 2 2 1 1 1 1 1 1 1 1
232 YGRID
233 -16.5 -18.0 -17.5 -17.0 -16.0 -15.5 -15.0
234 -14.5 -14.2225 -13.0 -10.5 -9.5 -9.2225 -8.0 -5.7775 -5.5 -4.5
235 -4.2225 -0.7775
236 -0.5 0.0 0.5 0.7775 4.2225 4.5 5.5 5.7775 8.0 9.2225 9.5
237 10.5 13.0 14.2225 14.5 15.0 15.5 16.0 17.0 17.5 18.0 18.5
238 1 1 1 1 1 1 1 1 2 1 1 1 2 1 1 1 5 1 1 1 5 1 1 1 2 1
239 1 1 2 1 1 1 1 1 1 1 1 1
240 ANALYTICAL FUNCTIONS
241 1 2
242 4 0.03 5 0.0087266
243 2 0
244 TABULAR FUNCTIONS
245 1 4
246 0.0 0.15 12.0 0.15 12.01 0.0 24.0 0.0
247 3 4
248 -60.0 1.06940-2 140.0 1.2430-2 640.0 1.604170-2 1640.0 2.16670-2
249 4 4
250 -60.0 0.10 140.0 0.115 640.0 0.135 1640.0 0.156
251 5 7
252 -100.0 1.49330-4 80.0 1.92450-4 260.0 2.28670-4 440.0 2.60220-4
253 2620.0 2.6890-4 980.0 3.37780-4 1520.0 4.02220-4

304.17 array

PRE-CERTIFIED VERSION 1.00 CRAY

08/28/84

LISTING OF INPUT DATA

248 2620.0 2.9398D-6 980.0 2.2049D-6 1520.0 1.603D-6
249 7 4
250 80.0 1.783D-4 260.0 2.302D-4 620.0 2.675D-4 1520.0 3.724D-4

1234567891111111112222222222333333333344444444445555555555666666666677777777778
01234567890123456789012345678901234567890123456789012345678901234567890

11111111112222222222333333333344444444445555555555666666666677777777778
 1234567890123456789012345678901234567890123456789012345678901234567890

251 8 4
 252 -60.0 3.2880-2 140.0 3.7810-2 640.0 4.4390-2 1640.0 5.1290-2
 253 9 7
 254 -100.0 1.45830-5 80.0 2.11110-5 260.0 2.69440-5 440.0 3.250-5
 254 2620.0 3.73610-5 980.0 4.63890-5 1520.0 5.79170-5
 255 10 7
 256 -100.0 6.3660-5 80.0 4.25350-5 260.0 3.18870-5 440.0 2.55210-5
 256 2620.0 2.12380-5 980.0 1.59140-5 1520.0 1.18630-5
 257 11 7
 258 -100.0 0.24 80.0 0.24 260.0 0.244 440.0 0.246 620.0 0.251 980.0
 258 20.262 1520.0 0.277
 259 12 5
 260 32.0 3.4720-2 212.0 3.4720-2 572.0 3.1940-2 1112.0 2.6390-2
 260 21832.0 2.2220-2
 261 13 7
 262 -100.0 9.3330-5 80.0 1.20280-4 260.0 1.42920-4 440.0 1.62640-4
 262 2620.0 1.80560-4 980.0 2.11110-4 1520.0 2.51390-4
 263 14 7
 264 -100.0 4.38650-4 80.0 5.65320-4 260.0 6.71720-4 440.0 7.6440-4
 264 2620.0 8.46630-4 980.0 9.92220-4 1520.0 1.18150-3
 265 15 7
 266 -100.0 3895.64 80.0 681.79 260.0 199.65 440.0 77.153 620.0 35.801
 266 2980.0 10.619 1520.0 2.678
 267 16 7
 268 -100.0 290183.3 80.0 42290.0 260.0 11345.7 440.0 4201.9
 268 2620.0 1905.7 980.0 564.26 1520.0 150.524
 269 PRINTOUT TIMES
 270 0.5 1.0 2.0 4.0 10.0
 271 NODES MONITORED
 272 105 109 113 249 255 259 413 609 721 861 1019 1015 1009 1145
 272 21141 1137 12 17 47 80 100 122 166 236 311 391 643 895 973
 272 21044 1112 1154 1172 1190 1221 1244 1239 393 397 402 654 850
 272 2845 841 645
 273 STEADY STATE PARAMETERS
 274 -5 0.001
 275 TRANSIENT PARAMETERS
 276 0.001 2 0.001
 277 0.1 1.2 5 0 0 10.0
 278 Z

1234567891111111112222222222333333333344444444445555555555666666666677777777778
 01234567890123456789012345678901234567890123456789012345678901234567890

LIMIT (DIMENSIONS FOR THE E-ARRAY) IS 1375854 WHICH USES 5375K BYTES OF CORE.
 (LIMIT IS COMPUTED BY ALGCAT AND IS A FUNCTION OF THE COMPUTER CORE REQUEST.)
 THE VARIABLY DIMENSIONED ARRAYS REQUIRE 1375854 SINGLE WORDS OR 5375K BYTES OF CORE.

GROSS GRID

STEADY STATE TEMPERATURE DISTRIBUTION AFTER 2 ITERATIONS, TIME = 0.00000E+00

[illegible]

0.00 0.00

0.00
0.00

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10

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— 50 —

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10.00
10.50

40 92

1

PRE-CERTIFIED VERSION 1.00 CRAY 08/28/84
ED CANISTER WITH E=0.567, NUHM TEMPS. =125F IN & 214F OUT.

NEWLY MODELED CANISTER WITH $E=0.567$, NUHOM TEMPS. =125F IN & 214F OUT.

[illegible]

92

53

18.00

0.00

0.00

0-00

0.00

504

22

11-11-11

NEWLY MODELED CANISTER WITH $E=0.587$, NUHOM TEMPS. $=125F$ IN & $214F$ OUT.

THE STEADY STATE CALCULATIONS HAVE BEEN COMPLETED.

NUMBER OF ITERATIONS COMPLETED = 2