

LACSD1::MONROE

JOB 429

ARC695

Owner UIC: [MONROE]
Account: 355

Priority: 100
Submit queue: LALP01_ANSI
Submitted: 18-MAY-1992 15:53
Printer queue: LPS20\$LALP01
Printer node: LALP01
Started: 18-MAY-1992 15:51

Digital Equipment Corporation
VAX/VMS Version V5.4-1

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PrintServer 20

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ASPEN TECHNOLOGY, INC.
251 VASSAR STREET
CAMBRIDGE, MASSACHUSETTS 02139
617/497-9010

VERSION: DEC-VAX
RELEASE: 8.5-2
INSTALLATION: DOW-VAX

HOTLINE:
U.S.A. 617/497-9010
EUROPE (32) 2/732-6300

MAY 18, 1992
MONDAY
8:35:22 A.M.

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ARC INTERPRETATION
RUN CONTROL SECTION

RUN CONTROL INFORMATION

THIS VERSION OF ASPEN PLUS LICENSED TO THE DOW CHEMICAL COMPANY
TYPE OF RUN: NEW

INPUT FILE NAME: DISK\$PE2:[MONROE.PRLAD.REACTIVE]ARC695.INP;9

OUTPUT PROBLEM DATA FILE NAME: ARC695 VERSION NO. 1
LOCATED IN: DISK\$PE2:[MONROE.PRLAD.REACTIVE]

PDF SIZE USED FOR INPUT TRANSLATION:
NUMBER OF FILE RECORDS (PSIZE) = 99999
NUMBER OF IN-CORE RECORDS = 600
PSIZE NEEDED FOR SIMULATION = 2000

CALLING PROGRAM NAME: GENERAL
LOCATED IN: ASP\$ROOT:[ASPDOW]

SIMULATION REQUESTED FOR ENTIRE FLOWSHEET

DESCRIPTION

CALCULATIONS OF VLE, HEAT CAPACITY, AND DENSITIES TO IMPROVE
ACCURACY FOR ARC INTERPRETATION STUDIES. ETHANOLAMINES T-250
BOTTOMS SAMPLE ARC RCL: 92-0695

BLOCK STATUS

* ALL UNIT OPERATION BLOCKS WERE COMPLETED NORMALLY *
* ALL CONVERGENCE BLOCKS WERE COMPLETED NORMALLY *

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 2
ARC INTERPRETATION
INPUT SECTION

INPUT FILE(S)

>>ORIGINAL RUN MAY 18, 1992
8:33:13 A.M. MONDAY
INPUT FILE: DISK\$PE2:[MONROE.PRLAD.REACTIVE]ARC695.INP;9
OUTPUT PDF: ARC695 VERSION: 1
LOCATED IN: DISK\$PE2:[MONROE.PRLAD.REACTIVE]
1 ;
2 TITLE 'ARC INTERPRETATION'
3 ;
4 ;
5 ;
6 DESCRIPTION "Calculations of VLE, heat capacity, and densities to
7 improve accuracy for ARC interpretation studies.
8 Ethanolamines T-250 bottoms sample
9 ARC RCL: 92-0695"
10 ;
11 ;
12 ;
13 IN-UNITS MET TEMPERATURE-C PRESSURE-PSI MASS-GM
14 OUT-UNITS MET TEMPERATURE-C PRESSURE-PSI MASS-GM VOLUME-FLOW='L/HR'
15 ;
16 RUN-CONTROL MAX-TIME=1000
17 ;
18 ; SPECIFY THE PHYSICAL PROPERTY DATABANK
19 ;
20 DATABANKS DOW
21 ;
22 ; SPECIFY WHAT PROPERTIES YOU WANT ON PRINTOUT
23 ;
24 PROP-SET SET1 VMX UNITS="L/HR" PHASE-T
25 PROP-SET SET2 RHOMX UNITS="GM/CC" PHASE-L
26 PROP-SET SET3 CPMX UNITS="CAL/GM-K" PHASE-T
27 ;
28 ; SPECIFY THE COMPONENTS
29 ;
30 COMPONENTS N2 NITROGEN / CO2 CO2 / WATER WATER /
31 MEA MONOETHANOLAMINE / DEA DIETHANOLAMINE /
32 TEA TRIETHANOLAMINE / TEAGE 'TRIETHANOLAMINE GLYCOL ETHER'
33 ;
34 ;
35 ; SPECIFY THE PHYSICAL PROPERTIES METHOD
36 ; IDEAL VAPOR LIQUID EQUILIBRIUM
37 ;
38 PROPERTIES SYSOP0A HENRY-COMPS-LIST1
39 ;
40 HENRY-COMPS LIST1 N2 CO2
41 ;
42 ;
43 ; SPECIFY COMPONENT DIPOLE MOMENT, SO ASPEN CAN PREDICT
44 ; VAPOR VISCOSITY FOR MIXTURE.
45 ;
46 PROP-DATA
47 IN-UNITS MET
48 PROP-LIST MUP

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ARC INTERPRETATION
INPUT SECTION

INPUT FILE(S) (CONTINUED)

```

49      PVAL    WATER    1.85
50      PVAL    MEA      2.60
51      PVAL    DEA      2.84
52      PVAL    TEA      3.60
53      PVAL    TEAGE    3.60
54      ;
55      ;   ENTER THE ENTHALPY POLYNOMIAL VIA THE WATSON EQUATION
56      ;
57      PROP-DATA
58      IN-UNITS ENG TEMPERATURE=C
59      PROP-LIST DHVLWT
60      PVAL TEAGE 24670.291 150.0 0.38 0 0
61      ;
62      ;   SPECIFY FLOWSHEET CONNECTIONS
63      ;
64      FLOWSHEET
65      BLOCK PAD    IN-COMP1    PADGAS    OUT-RESULT1
66      BLOCK B      IN-RESULT1   CO2B      OUT-RESULT2
67      BLOCK C      IN-RESULT2   CO2C      OUT-RESULT3
68      BLOCK D      IN-RESULT3   STEAMD    OUT-RESULT4
69      BLOCK E      IN-RESULT4   STEAME    OUT-RESULT5
70      BLOCK F      IN-RESULT5   STEAMF    OUT-RESULT6
71      BLOCK END    IN-RESULT6    OUT-FINAL
72
73      ; Design Basis: A small amount of water is added to the charge to
74      ; make ASPEN use Henry's law for the nitrogen solubility. The
75      ; Henry's law constants in water will be the default for all
76      ; components. Accuracy here is not critical since nitrogen is
77      ; essentially an inert gas.
78
79      STREAM COMP1    TEMP=25.0[C] PRES=14.7[PSI]
80      MASS-FLOW      DEA 2.85 / TEA 2.85 / WATER .0001
81
82      STREAM PADGAS    TEMP=25.0[C] PRES=14.7[PSI]
83      MASS-FLOW      N2 0.00532
84
85      STREAM CO2B      TEMP=25.0[C] PRES=14.7[PSI]
86      MASS-FLOW      CO2 0.00532
87
88      STREAM CO2C      TEMP=25.0[C] PRES=14.7[PSI]
89      MASS-FLOW      CO2 0.00532
90
91      STREAM STEAMD    TEMP=100    PRES=14.7
92      MOLE-FLOW      WATER .0388
93
94      STREAM STEAME    TEMP=100    PRES=14.7
95      MOLE-FLOW      WATER .0388
96
97      STREAM STEAMF    TEMP=100    PRES=14.7
98      MOLE-FLOW      WATER .0388
99
100     BLOCK PAD HEATER
101     ;This block adds nitrogen to estimate the ARC bomb loading under

```

ARC INTERPRETATION
INPUT SECTION

INPUT FILE(S) (CONTINUED)

```

102     ;nitrogen pad.
103     PARAM PRES=14.7 TEMP=25.
104
105     BLOCK B HEATER
106     ;Compute the moles of CO2 required to match ARC pressure data.
107     ;Includes pad gas and vapor pressure of charge materials.
108     PARAM PRES=97.4 TEMP=256.03
109
110     BLOCK C HEATER
111     ;Compute the moles of CO2 required to match ARC pressure data.
112     ;Includes pad gas and vapor pressure of charge materials.
113     PARAM PRES=127.3 TEMP=276.91
114
115     BLOCK D HEATER
116     ;Compute the moles of H2O required to match ARC pressure data.
117     ;Includes CO2 from previous blocks, pad gas and vapor pressure
118     ;of charge materials.
119     PARAM PRES=357.5 TEMP=301.11
120
121     BLOCK E HEATER
122     ;Compute the moles of H2O required to match ARC pressure data.
123     ;Includes CO2 from previous blocks, pad gas and vapor pressure
124     ;of charge materials.
125     PARAM PRES=759.4 TEMP=325.08
126
127     BLOCK F HEATER
128     ;Compute the moles of H2O required to match ARC pressure data.
129     ;Includes CO2 from previous blocks, pad gas and vapor pressure
130     ;of charge materials.
131     PARAM PRES=2707.9 TEMP=386.97
132
133     BLOCK END HEATER
134     ;Estimate pressure after cool down.
135     PARAM PRES=100.0 TEMP=25.0
136
137     DESIGN-SPEC A
138     DEFINE VOL STREAM-PROP STREAM-RESULT1 PROPERTY-SET1
139     SPEC VOL TO 10.0
140     TOL-SPEC .05
141     VARY STREAM-VAR STREAM-PADGAS VARIABLE-MASS-FLOW
142     LIMITS .001 .01
143
144     DESIGN-SPEC B
145     DEFINE VOL STREAM-PROP STREAM-RESULT2 PROPERTY-SET1
146     SPEC VOL TO 10.0
147     TOL-SPEC .05
148     VARY STREAM-VAR STREAM-CO2B VARIABLE-MASS-FLOW
149     ; VARY BLOCK-VAR BLOCK-B VARIABLE-PRES
150     LIMITS .001 1.0
151
152     DESIGN-SPEC C
153     DEFINE VOL STREAM-PROP STREAM-RESULT3 PROPERTY-SET1
154

```

INPUT FILE(S) (CONTINUED)

```

155 SPEC VOL TO 10.0
156 TOL-SPEC .05
157 VARY STREAM-VAR STREAM-CO2C VARIABLE-MASS-FLOW
158 ; VARY BLOCK-VAR BLOCK-C VARIABLE-PRES
159 LIMITS .001 1.0
160
161 DESIGN-SPEC D
162 DEFINE VOL STREAM-PROP STREAM-RESULT4 PROPERTY-SET1
163 SPEC VOL TO 10.0
164 TOL-SPEC .05
165 VARY STREAM-VAR STREAM-STEAMD VARIABLE-MASS-FLOW
166 ; VARY BLOCK-VAR BLOCK-D VARIABLE-PRES
167 LIMITS .001 3.0
168
169 DESIGN-SPEC E
170 DEFINE VOL STREAM-PROP STREAM-RESULT5 PROPERTY-SET1
171 SPEC VOL TO 10.0
172 TOL-SPEC .05
173 VARY STREAM-VAR STREAM-STEAME VARIABLE-MASS-FLOW
174 ; VARY BLOCK-VAR BLOCK-E VARIABLE-PRES
175 LIMITS .001 3.0
176
177 DESIGN-SPEC F
178 DEFINE VOL STREAM-PROP STREAM-RESULT6 PROPERTY-SET1
179 SPEC VOL TO 10.0
180 TOL-SPEC .05
181 VARY STREAM-VAR STREAM-STEAMF VARIABLE-MASS-FLOW
182 ; VARY BLOCK-VAR BLOCK-F VARIABLE-PRES
183 LIMITS .001 3.0
184
185 DESIGN-SPEC END
186 DEFINE VOL STREAM-PROP STREAM-FINAL PROPERTY-SET1
187 SPEC VOL TO 10.0
188 TOL-SPEC .05
189 VARY BLOCK-VAR BLOCK-END VARIABLE-PRES
190 LIMITS 25 300
191
192 REPORT INPUT
193 PROPERTY-REPORT NOCOMPS
194 STREAM-REPORT MASSFRAC MASSFLOW MOLEFRAC MOLEFLOW NOZEROFLOW &
195 PROPERTIES-SET1 SET2 SET3 &
196 INCL-STREAMS-COMP1 RESULT1 RESULT2 RESULT3 RESULT4 &
197 RESULT5 RESULT6 FINAL PADGAS CO2B &
198 CO2C STEAMD STEAME STEAMF

```

SIMULATION STARTED MODULE USED: GENERAL CREATION: 5/ 8/92 16:03:08
LOCATED IN: ASP\$ROOT:[ASPDOW]
SIMULATION COMPLETED FOR ENTIRE FLOWSHEET

FLOWSHEET CONNECTIVITY BY STREAMS

STREAM	SOURCE	DEST	STREAM	SOURCE	DEST
PADGAS	----	PAD	COMP1	----	PAD
CO2B	----	B	CO2C	----	C
STEAMD	----	D	STEAME	----	E
STEAMF	----	F	RESULT1	PAD	B
RESULT2	B	C	RESULT3	C	D
RESULT4	D	E	RESULT5	E	F
RESULT6	F	END	FINAL	END	----

FLOWSHEET CONNECTIVITY BY BLOCKS

BLOCK	INLETS	OUTLETS
PAD	COMP1 PADGAS	RESULT1
B	RESULT1 CO2B	RESULT2
C	RESULT2 CO2C	RESULT3
D	RESULT3 STEAMD	RESULT4
E	RESULT4 STEAME	RESULT5
F	RESULT5 STEAMF	RESULT6
END	RESULT6	FINAL

CONVERGENCE STATUS SUMMARY

DESIGN-SPEC SUMMARY

DESIGN SPEC	ERROR	TOLERANCE	ERR/TOL	VARIABLE	STAT	CONV BLOCK
A	-0.10014E-10	0.50000E-01	-0.20028E-09	0.56401E-02	#	\$SOLVER01
B	-0.61740E-03	0.50000E-01	-0.12348E-01	0.14338E-01	#	\$SOLVER02
C	-0.23733E-03	0.50000E-01	-0.47466E-02	0.78421E-02	#	\$SOLVER03
D	-0.30190E-01	0.50000E-01	-0.60380	0.18924	#	\$SOLVER04
E	0.30914E-01	0.50000E-01	0.61828	0.28907	#	\$SOLVER05
F	-0.16803E-02	0.50000E-01	-0.33607E-01	0.93811	#	\$SOLVER06
END	0.24016E-01	0.50000E-01	0.48032	48.756	#	\$SOLVER07

= CONVERGED
* = NOT CONVERGED
LB = AT LOWER BOUNDS
UB = AT UPPER BOUNDS

DESIGN-SPEC: A

SAMPLED VARIABLES:
VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT1

SPECIFICATION:
MAKE VOL APPROACH 10.0000
WITHIN 0.050000

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FLOWSHEET SECTION

DESIGN-SPEC: A (CONTINUED)

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM PADGAS SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 0.0100000 KG/HR
FINAL VALUE = 0.0056401 KG/HR

DESIGN-SPEC: B

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT2

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM CO2B SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 1.00000 KG/HR
FINAL VALUE = 0.014338 KG/HR

DESIGN-SPEC: C

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT3

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM CO2C SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 1.00000 KG/HR
FINAL VALUE = 0.0078421 KG/HR

DESIGN-SPEC: D

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT4

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

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ARC INTERPRETATION
FLOWSHEET SECTION

DESIGN-SPEC: D (CONTINUED)

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM STREAMD SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 3.00000 KG/HR
FINAL VALUE = 0.18924 KG/HR

DESIGN-SPEC: E

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT5

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM STREAME SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 3.00000 KG/HR
FINAL VALUE = 0.28907 KG/HR

DESIGN-SPEC: F

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM RESULT6

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

MANIPULATED VARIABLES:

VARY : TOTAL MASSFLOW IN STREAM STREAMF SUBSTREAM MIXED
LOWER LIMIT = 0.00100000 KG/HR
UPPER LIMIT = 3.00000 KG/HR
FINAL VALUE = 0.93811 KG/HR

DESIGN-SPEC: END

SAMPLED VARIABLES:

VOL : PROPERTY STRMPROP SET1 IN STREAM FINAL

SPECIFICATION:

MAKE VOL APPROACH 10.0000
WITHIN 0.050000

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DESIGN-SPEC: END (CONTINUED)

MANIPULATED VARIABLES:

VARY : SENTENCE=PARAM VARIABLE=PRE IN UOS BLOCK END
LOWER LIMIT = 25.0000 PSI
UPPER LIMIT = 300.000 PSI
FINAL VALUE = 48.7559 PSI

CONVERGENCE BLOCK: \$OLVER01

SPECS: A

MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08

THE NEW ALGORITHM WAS USED WITH BRACKETING=NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 3

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.5640144D-02	0.5640144D-02	-.2002842D-09

*** ITERATION HISTORY ***

DESIGN-SPEC ID: A

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.5275E-07 LB	-0.2795	-5.590
2	0.5364E-07 LB	-0.2009	-4.019
3	0.5593E-07 LB	-0.1001E-10	-0.2003E-09

CONVERGENCE BLOCK: \$OLVER02

SPECS: B

MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08

THE NEW ALGORITHM WAS USED WITH BRACKETING=NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 3

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.1433802D-01	0.1433802D-01	-.1234790D-01

*** ITERATION HISTORY ***

CONVERGENCE BLOCK: \$OLVER02 (CONTINUED)

DESIGN-SPEC ID: B

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.3358E-07 LB	-1.604	-32.08
2	0.9663E-07 LB	0.1729	3.457
3	0.9050E-07 LB	-0.6174E-03	-0.1235E-01

CONVERGENCE BLOCK: \$OLVER03

SPECS: C

MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08

THE NEW ALGORITHM WAS USED WITH BRACKETING=NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 3

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.7842128D-02	0.7842128D-02	-.4746603D-02

*** ITERATION HISTORY ***

DESIGN-SPEC ID: C

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.3358E-07 LB	-0.3281	-6.562
2	0.9663E-07 LB	0.9715	19.43
3	0.4950E-07 LB	-0.2373E-03	-0.4747E-02

CONVERGENCE BLOCK: \$OLVER04

SPECS: D

MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08

THE NEW ALGORITHM WAS USED WITH BRACKETING=NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 6

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.1892409D+00	0.1892409D+00	-.6037990D+00

*** ITERATION HISTORY ***

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FLOWSHEET SECTION

CONVERGENCE BLOCK: \$OLVER04 (CONTINUED)

DESIGN-SPEC ID: D

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.1078E-04	43.84	876.8
2	0.1124E-04	47.17	943.4
3	0.4689E-05	4.828	96.56
4	0.3822E-05	1.890	37.80
5	0.3132E-05	0.3398	6.796
6	0.2918E-05	-0.3019E-01	-0.6038

CONVERGENCE BLOCK: \$OLVER05

SPECS: E
MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08
THE NEW ALGORITHM WAS USED WITH BRACKETING-NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 5

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.2890664D+00	0.2890664D+00	0.6182818D+00

*** ITERATION HISTORY ***

DESIGN-SPEC ID: E

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.1078E-04	15.09	301.8
2	0.1124E-04	16.59	331.9
3	0.6143E-05	2.492	49.83
4	0.4958E-05	0.6284	12.57
5	0.4457E-05	0.3091E-01	0.6183

CONVERGENCE BLOCK: \$OLVER06

SPECS: F
MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08
THE NEW ALGORITHM WAS USED WITH BRACKETING-NO

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ARC INTERPRETATION
FLOWSHEET SECTION

CONVERGENCE BLOCK: \$OLVER06 (CONTINUED)
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 4

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
TOTAL MASSFL KG/HR	0.9381078D+00	0.9381078D+00	-.3360678D-01

*** ITERATION HISTORY ***

DESIGN-SPEC ID: F

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.1078E-04	-0.8268	-16.54
2	0.1124E-04	-0.7338	-14.68
3	0.1489E-04	0.1072	2.143
4	0.1446E-04	-0.1680E-02	-0.3361E-01

CONVERGENCE BLOCK: \$OLVER07

SPECS: END
MAXIT= 30 STEP-SIZE= 100.00 % OF RANGE
MAX-STEP= 100. % OF RANGE
XTOL= 1.000000E-08
THE NEW ALGORITHM WAS USED WITH BRACKETING-NO
METHOD: SECANT STATUS: CONVERGED
TOTAL NUMBER OF ITERATIONS: 5

*** FINAL VALUES ***

VARIABLE	VALUE	PREV VALUE	ERR/TOL
BLOCK-VAR PSI	0.4875588D+02	0.4875588D+02	0.4803238D+00

*** ITERATION HISTORY ***

DESIGN-SPEC ID: END

ITERATION	VARIABLE	ERROR	ERR/TOL
1	0.6895E+06	-2.481	-49.63
2	0.7084E+06	-2.540	-50.80
3	0.1724E+06 LB	4.974	99.49
4	0.4196E+06	-0.9784	-19.57
5	0.3362E+06	0.2402E-01	0.4803

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COMPUTATIONAL SEQUENCE

SEQUENCE USED WAS:

\$SOLVER01 PAD \$SOLVER01<--- \$SOLVER02 B \$SOLVER02<--- \$SOLVER03 C
\$SOLVER03<--- \$SOLVER04 D \$SOLVER04<--- \$SOLVER05 E \$SOLVER05<--- \$SOLVER06 F
\$SOLVER06<--- \$SOLVER07 END \$SOLVER07<---

OVERALL FLOWSHEET BALANCE

*** MASS AND ENERGY BALANCE ***			
	IN	OUT	RELATIVE DIFF.
CONVENTIONAL COMPONENTS (KMOL/HR)			
N2	0.201337E-03	0.201337E-03	0.000000E+00
CO2	0.503982E-03	0.503982E-03	0.000000E+00
WATER	0.786286E-01	0.786286E-01	0.000000E+00
MEA	0.000000E+00	0.000000E+00	0.000000E+00
DEA	0.271075E-01	0.271075E-01	0.000000E+00
TEA	0.191032E-01	0.191032E-01	0.000000E+00
TEAGE	0.000000E+00	0.000000E+00	0.000000E+00
TOTAL BALANCE			
MOLE (KMOL/HR)	0.125545	0.125545	0.000000E+00
MASS (KG/HR)	7.14434	7.14434	-0.310798E-16
ENTHALPY (CAL/SEC)	-3152.18	-3185.22	0.103727E-01

BLOCK: B MODEL: HEATER

INLET STREAMS: RESULT1 CO2B
OUTLET STREAM: RESULT2
PROPERTY OPTION SET: SYSOP0A IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID: LIST1

*** MASS AND ENERGY BALANCE ***			
	IN	OUT	RELATIVE DIFF.
TOTAL BALANCE			
MOLE (KMOL/HR)	0.467433E-01	0.467433E-01	0.000000E+00
MASS (KG/HR)	5.72008	5.72008	0.194092E-16
ENTHALPY (CAL/SEC)	-1685.95	-1466.46	-0.130185

*** INPUT DATA ***
TWO PHASE TP FLASH
SPECIFIED TEMPERATURE C 256.030
SPECIFIED PRESSURE PSI 87.4000
MAXIMUM NO. ITERATIONS 30
CONVERGENCE TOLERANCE 0.000100000

*** RESULTS ***
OUTLET TEMPERATURE C 256.03
OUTLET PRESSURE PSI 87.400
HEAT DUTY CAL/SEC 219.49
VAPOR FRACTION 0.12048E-01

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.43073E-02	0.19464E-04	0.35592	18286.
CO2	0.69698E-02	0.13913E-03	0.56710	4075.9
WATER	0.11875E-03	0.11038E-03	0.80550E-03	7.2977
DEA	0.57992	0.58615	0.69490E-01	0.11855
TEA	0.40868	0.41358	0.66844E-02	0.16162E-01

BLOCK: C MODEL: HEATER

INLET STREAMS: RESULT2 CO2C
OUTLET STREAM: RESULT3
PROPERTY OPTION SET: SYSOP0A IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID: LIST1

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 15
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: C MODEL: HEATER (CONTINUED)

*** MASS AND ENERGY BALANCE ***
IN OUT RELATIVE DIFF.

TOTAL BALANCE			
MOLE (KMOL/HR)	0.469215E-01	0.469215E-01	0.000000E+00
MASS (KG/HR)	5.72792	5.72792	0.000000E+00
ENTHALPY (CAL/SEC)	-1471.12	-1446.97	-0.164164E-01

*** INPUT DATA ***

TWO PHASE TP FLASH			
SPECIFIED TEMPERATURE	C	276.910	
SPECIFIED PRESSURE	PSI	127.300	
MAXIMUM NO. ITERATIONS		30	
CONVERGENCE TOLERANCE		0.000100000	

*** RESULTS ***

OUTLET TEMPERATURE	C	276.91
OUTLET PRESSURE	PSI	127.30
HEAT DUTY	CAL/SEC	24.150
VAPOR FRACTION		0.16380E-01

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.42909E-02	0.20898E-04	0.26071	12475.
CO2	0.10741E-01	0.18742E-03	0.64449	3438.8
WATER	0.11830E-03	0.10775E-03	0.75173E-03	6.9765
DEA	0.57772	0.58593	0.84835E-01	0.14479
TEA	0.40713	0.41376	0.92141E-02	0.22269E-01

BLOCK: D MODEL: HEATER

INLET STREAMS:		RESULT3	STEAM2
OUTLET STREAM:		RESULT4	
PROPERTY OPTION SET:		SYSOP0A	IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID:		LIST1	

*** MASS AND ENERGY BALANCE ***
IN OUT RELATIVE DIFF.

TOTAL BALANCE			
MOLE (KMOL/HR)	0.574260E-01	0.574260E-01	0.000000E+00
MASS (KG/HR)	5.91716	5.91716	0.000000E+00
ENTHALPY (CAL/SEC)	-1642.24	-1595.73	-0.283219E-01

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 16
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: D MODEL: HEATER (CONTINUED)

*** INPUT DATA ***

TWO PHASE TP FLASH			
SPECIFIED TEMPERATURE	C	301.110	
SPECIFIED PRESSURE	PSI	357.500	
MAXIMUM NO. ITERATIONS		30	
CONVERGENCE TOLERANCE		0.000100000	

*** RESULTS ***

OUTLET TEMPERATURE	C	301.11
OUTLET PRESSURE	PSI	357.50
HEAT DUTY	CAL/SEC	46.511
VAPOR FRACTION		0.34335E-01

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.35060E-02	0.23008E-04	0.10146	4409.8
CO2	0.87762E-02	0.16147E-03	0.25106	1554.8
WATER	0.18302	0.16834	0.59588	3.5398
DEA	0.47204	0.48719	0.45943E-01	0.94302E-01
TEA	0.33266	0.34428	0.56530E-02	0.16420E-01

BLOCK: E MODEL: HEATER

INLET STREAMS:		RESULT4	STEAM2
OUTLET STREAM:		RESULT5	
PROPERTY OPTION SET:		SYSOP0A	IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID:		LIST1	

*** MASS AND ENERGY BALANCE ***
IN OUT RELATIVE DIFF.

TOTAL BALANCE			
MOLE (KMOL/HR)	0.734716E-01	0.734716E-01	0.000000E+00
MASS (KG/HR)	6.20623	6.20623	-0.178889E-16
ENTHALPY (CAL/SEC)	-1894.01	-1830.59	-0.334870E-01

*** INPUT DATA ***

TWO PHASE TP FLASH			
SPECIFIED TEMPERATURE	C	325.080	
SPECIFIED PRESSURE	PSI	759.400	
MAXIMUM NO. ITERATIONS		30	
CONVERGENCE TOLERANCE		0.000100000	

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 17
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: E MODEL: HEATER (CONTINUED)

*** RESULTS ***
OUTLET TEMPERATURE C 325.08
OUTLET PRESSURE PSI 759.40
HEAT DUTY CAL/SEC 63.425
VAPOR FRACTION 0.50982E-01

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.27403E-02	0.25847E-04	0.53270E-01	2061.0
CO2	0.68595E-02	0.14224E-03	0.13190	927.31
WATER	0.36144	0.33889	0.78129	2.3054
DEA	0.36895	0.38719	0.29498E-01	0.76186E-01
TEA	0.26001	0.27376	0.40464E-02	0.14781E-01

BLOCK: END MODEL: HEATER

INLET STREAM: RESULT6
OUTLET STREAM: FINAL
PROPERTY OPTION SET: SYSOP0A IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID: LIST1

*** MASS AND ENERGY BALANCE ***

	IN	OUT	RELATIVE DIFF.
TOTAL BALANCE			
MOLE(KMOL/HR)	0.125545	0.125545	0.000000E+00
MASS(KG/HR)	7.14434	7.14434	0.000000E+00
ENTHALPY(CAL/SEC)	-2502.59	-3185.22	0.214312

*** INPUT DATA ***
TWO PHASE TP FLASH
SPECIFIED TEMPERATURE C 25.0000
SPECIFIED PRESSURE PSI 48.7559
MAXIMUM NO. ITERATIONS 30
CONVERGENCE TOLERANCE 0.000100000

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 18
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: END MODEL: HEATER (CONTINUED)

*** RESULTS ***
OUTLET TEMPERATURE C 25.000
OUTLET PRESSURE PSI 48.756
HEAT DUTY CAL/SEC -682.63
VAPOR FRACTION 0.43591E-02

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.16037E-02	0.14193E-04	0.36466	25692.
CO2	0.40144E-02	0.12762E-02	0.62942	493.18
WATER	0.62630	0.62902	0.59263E-02	0.94216E-02
DEA	0.21592	0.21686	0.42297E-07	0.19504E-06
TEA	0.15216	0.15283	0.26580E-09	0.17392E-08

BLOCK: F MODEL: HEATER

INLET STREAMS: RESULT5 STEAMF
OUTLET STREAM: RESULT6
PROPERTY OPTION SET: SYSOP0A IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID: LIST1

*** MASS AND ENERGY BALANCE ***

	IN	OUT	RELATIVE DIFF.
TOTAL BALANCE			
MOLE(KMOL/HR)	0.125545	0.125545	0.000000E+00
MASS(KG/HR)	7.14434	7.14434	-0.310798E-16
ENTHALPY(CAL/SEC)	-2798.60	-2502.59	-0.105774

*** INPUT DATA ***
TWO PHASE TP FLASH
SPECIFIED TEMPERATURE C 386.970
SPECIFIED PRESSURE PSI 2,707.90
MAXIMUM NO. ITERATIONS 30
CONVERGENCE TOLERANCE 0.000100000

DO A 017092
CONFIDENTIAL

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 19
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: F MODEL: HEATER (CONTINUED)

*** RESULTS ***

OUTLET TEMPERATURE	C	386.97
OUTLET PRESSURE	PSI	2707.9
HEAT DUTY	CAL/SEC	296.02
VAPOR FRACTION		0.40704E-01

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.16037E-02	0.66686E-04	0.37828E-01	567.25
CO2	0.40144E-02	0.19624E-03	0.93999E-01	478.99
WATER	0.62630	0.61681	0.84986	1.3778
DEA	0.21592	0.22442	0.15633E-01	0.69662E-01
TEA	0.15216	0.15850	0.26815E-02	0.16918E-01

BLOCK: PAD MODEL: HEATER

INLET STREAMS:	COMP1	PADGAS
OUTLET STREAM:	RESULT1	
PROPERTY OPTION SET:	SYSOP0A	IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID:	LIST1	

*** MASS AND ENERGY BALANCE ***

	IN	OUT	RELATIVE DIFF.
TOTAL BALANCE			
MOLE (KMOL/HR)	0.464176E-01	0.464176E-01	0.000000E+00
MASS (KG/HR)	5.70574	5.70574	0.000000E+00
ENTHALPY (CAL/SEC)	-1677.44	-1677.44	0.222276E-06

*** INPUT DATA ***

TWO PHASE TP FLASH		
SPECIFIED TEMPERATURE	C	25.0000
SPECIFIED PRESSURE	PSI	14.7000
MAXIMUM NO. ITERATIONS		30
CONVERGENCE TOLERANCE		0.000100000

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 20
ARC INTERPRETATION
U-O-S BLOCK SECTION

BLOCK: PAD MODEL: HEATER (CONTINUED)

*** RESULTS ***

OUTLET TEMPERATURE	C	25.000
OUTLET PRESSURE	PSI	14.700
HEAT DUTY	CAL/SEC	-0.37285E-03
VAPOR FRACTION		0.43258E-02

V-L PHASE EQUILIBRIUM :

COMP	F(I)	X(I)	Y(I)	K(I)
N2	0.43375E-02	0.11735E-04	1.0000	85215.
WATER	0.11959E-03	0.12009E-03	0.37526E-05	0.31249E-01
DEA	0.58399	0.58653	0.37942E-06	0.64689E-06
TEA	0.41155	0.41334	0.23843E-08	0.57685E-08

DO A 017093
CONFIDENTIAL

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 21
ARC INTERPRETATION
STREAM SECTION

COMP1 RESULT1 RESULT2 RESULT3 RESULT4

STREAM ID	COMP1	RESULT1	RESULT2	RESULT3	RESULT4
FROM :	----	PAD	B	C	D
TO :	PAD	B	C	D	E
SUBSTREAM: MIXED					
PHASE:	LIQUID	MIXED	MIXED	MIXED	MIXED
COMPONENTS: KMOL/HR					
N2	0.0	2.0134-04	2.0134-04	2.0134-04	2.0134-04
CO2	0.0	0.0	0.0	0.0	0.0
WATER	5.5508-06	5.5508-06	5.5508-06	5.5508-06	5.5508-06
DEA	2.7108-02	2.7108-02	2.7108-02	2.7108-02	2.7108-02
TEA	1.9103-02	1.9103-02	1.9103-02	1.9103-02	1.9103-02
COMPONENTS: MOLE FRAC					
N2	0.0	4.3375-03	4.3073-03	4.2909-03	3.5060-03
CO2	0.0	0.0	0.0	0.0	0.0
WATER	1.2011-04	1.1959-04	1.1875-04	1.1830-04	0.1830
DEA	0.5865	0.5839	0.5799	0.5777	0.4720
TEA	0.4133	0.4115	0.4086	0.4071	0.3326
COMPONENTS: KG/HR					
N2	0.0	5.6401-03	5.6401-03	5.6401-03	5.6401-03
CO2	0.0	0.0	0.0	0.0	0.0
WATER	1.0000-04	1.0000-04	1.0000-04	1.0000-04	0.1893
DEA	2.8500	2.8500	2.8500	2.8500	2.8500
TEA	2.8500	2.8500	2.8500	2.8500	2.8500
COMPONENTS: MASS FRAC					
N2	0.0	9.8850-04	9.8603-04	9.8468-04	9.5318-04
CO2	0.0	0.0	0.0	0.0	0.0
WATER	1.7544-05	1.7526-05	1.7482-05	1.7458-05	3.1999-02
DEA	0.4999	0.4995	0.4982	0.4975	0.4816
TEA	0.4999	0.4995	0.4982	0.4975	0.4816
TOTAL FLOW:					
KMOL/HR	4.6216-02	4.6418-02	4.6743-02	4.6922-02	5.7426-02
KG/HR	5.7001	5.7057	5.7200	5.7279	5.9171
L/HR	5.0888	10.0000	9.9993	9.9997	9.9698
STATE VARIABLES:					
TEMP C	25.0000	25.0000	256.0300	276.9100	301.1100
PRES PSI	14.7000	14.7000	87.4000	127.3000	357.5000
VFRAC	0.0	4.3258-03	1.2048-02	1.6380-02	3.4335-02
LFRAC	1.0000	0.9956	0.9879	0.9836	0.9656
SFRAC	0.0	0.0	0.0	0.0	0.0
ENTHALPY:					
CAL/MOL	-1.3066+05	-1.3010+05	-1.1294+05	-1.1102+05	-1.0004+05
CAL/GM	-1059.4144	-1058.3674	-922.9357	-909.4195	-970.8420
CAL/SEC	-1677.4356	-1677.4360	-1466.4624	-1446.9673	-1595.7302
ENTROPY:					
CAL/MOL-K	-309.3932	-308.0513	-264.7936	-260.3883	-212.9139
CAL/GM-K	-2.5085	-2.5060	-2.1638	-2.1330	-2.0663
DENSITY:					
MOL/CC	9.0818-03	4.6418-03	4.6746-03	4.6923-03	5.7600-03
GM/CC	1.1201	0.9705	0.9720	0.9728	0.9935
AVG MW	123.3354	122.9220	122.3720	122.0744	103.0397

MIXED SUBSTREAM PROPERTIES:

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 22
ARC INTERPRETATION
STREAM SECTION

COMP1 RESULT1 RESULT2 RESULT3 RESULT4 (CONTINUED)

STREAM ID	COMP1	RESULT1	RESULT2	RESULT3	RESULT4
*** ALL PHASES ***					
VMX L/HR	5.0888	10.0000	9.9993	9.9997	9.9698
CPMX CAL/GM-K	0.4898	0.9896	0.7092	0.7309	0.7966
*** LIQUID PHASE ***					
RHOMX GM/CC	1.1201	1.1201	0.9674	0.9495	0.9523

CO₂ to match pressures
H₂O to match pressures

$$\Phi = 1.68 \quad 1.68 \quad 1.47 \quad 1.45 \quad 1.42$$

DO A 017094
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ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 23
ARC INTERPRETATION
STREAM SECTION

RESULT5 RESULT6 FINAL PADGAS CO2B

STREAM ID	RESULT5	RESULT6	FINAL	PADGAS	CO2B
FROM :	E	F	END	----	----
TO :	F	END	----	PAD	B
SUBSTREAM: MIXED					
PHASE:	MIXED	MIXED	MIXED	VAPOR	VAPOR
COMPONENTS: KMOL/HR					
N2	2.0134-04	2.0134-04	2.0134-04	2.0134-04	0.0
CO2	5.0398-04	5.0398-04	5.0398-04	0.0	3.2579-04
WATER	2.6556-02	7.8629-02	7.8629-02	0.0	0.0
DEA	2.7108-02	2.7108-02	2.7108-02	0.0	0.0
TEA	1.9103-02	1.9103-02	1.9103-02	0.0	0.0
COMPONENTS: MOLE FRAC					
N2	2.7403-03	1.6037-03	1.6037-03	1.0000	0.0
CO2	6.8595-03	4.0144-03	4.0144-03	0.0	1.0000
WATER	0.3614	0.6263	0.6263	0.0	0.0
DEA	0.3689	0.2159	0.2159	0.0	0.0
TEA	0.2600	0.1521	0.1521	0.0	0.0
COMPONENTS: KG/HR					
N2	5.6401-03	5.6401-03	5.6401-03	5.6401-03	0.0
CO2	2.2180-02	2.2180-02	2.2180-02	0.0	1.4338-02
WATER	0.4784	1.4165	1.4165	0.0	0.0
DEA	2.8500	2.8500	2.8500	0.0	0.0
TEA	2.8500	2.8500	2.8500	0.0	0.0
COMPONENTS: MASS FRAC					
N2	9.0879-04	7.8946-04	7.8946-04	1.0000	0.0
CO2	3.5739-03	3.1046-03	3.1046-03	0.0	1.0000
WATER	7.7085-02	0.1982	0.1982	0.0	0.0
DEA	0.4592	0.3989	0.3989	0.0	0.0
TEA	0.4592	0.3989	0.3989	0.0	0.0
TOTAL FLOW:					
KMOL/HR	7.3472-02	0.1255	0.1255	2.0134-04	3.2579-04
KG/HR	6.2062	7.1443	7.1443	5.6401-03	1.4338-02
L/HR	10.0309	9.9983	10.0240	4.9243	7.9683
STATE VARIABLES:					
TEMP C	325.0800	386.9700	25.0000	25.0000	25.0000
PRES PSI	759.4000	2707.9000	48.7558	14.7000	14.7000
VFRAC	5.0982-02	4.0704-02	4.3591-03	1.0000	1.0000
LFRAC	0.9490	0.9593	0.9956	0.0	0.0
SFRAC	0.0	0.0	0.0	0.0	0.0
ENTHALPY:					
CAL/MOL	-8.9696+04	-7.1762+04	-9.1336+04	0.0	-9.4054+04
CAL/GM	-1061.8553	-1261.0424	-1605.0163	0.0	-2137.1149
CAL/SEC	-1830.5878	-2502.5862	-3185.2153	0.0	-8.5116
ENTROPY:					
CAL/MOL-K	-168.0670	-98.9012	-137.2710	-1.0509-03	0.6943
CAL/GM-K	-1.9896	-1.7379	-2.4122	-3.7514-05	1.5777-02
DENSITY:					
MOL/CC	7.3245-03	1.2557-02	1.2524-02	4.0886-05	4.0886-05
GM/CC	0.6187	0.7145	0.7127	1.1454-03	1.7994-03
AVG MW	84.4710	56.9067	56.9067	28.0134	44.0098

IXED SUBSTREAM PROPERTIES:

ASPEN PLUS VER: DEC-VAX REL: 8.5-2 INST: DOW-VAX 5/18/92 PAGE 24
ARC INTERPRETATION
STREAM SECTION

RESULT5 RESULT6 FINAL PADGAS CO2B (CONTINUED)

STREAM ID	RESULT5	RESULT6	FINAL	PADGAS	CO2B
*** ALL PHASES ***					
VHX L/HR	10.0309	9.9983	10.0240	4.9243	7.9683
CPHX CAL/GM-K	0.9115	0.8102	0.6027	0.2486	0.2007
*** LIQUID PHASE ***					
RHODX GM/CC	0.9443	0.8273	1.1895	MISSING	MISSING

$$I = 1 + \frac{(15.73 \times 12)}{(5.7 \times \text{CPHX})} = 1.36 \quad 1.41$$

Predicted Cool Down Pressure

DO A 017095
CONFIDENTIAL

CO2C STEAMD STEAME STEAMF

STREAM ID	CO2C	STEAMD	STEAME	STEAMF
FROM :	----	----	----	----
TO :	C	D	E	F
SUBSTREAM: MIXED				
PHASE:	VAPOR	LIQUID	LIQUID	LIQUID
COMPONENTS: KMOL/HR				
CO2	1.7819-04	0.0	0.0	0.0
WATER	0.0	1.0504-02	1.6046-02	5.2073-02
COMPONENTS: MOLE FRAC				
CO2	1.0000	0.0	0.0	0.0
WATER	0.0	1.0000	1.0000	1.0000
COMPONENTS: KG/HR				
CO2	7.8421-03	0.0	0.0	0.0
WATER	0.0	0.1892	0.2890	0.9381
COMPONENTS: MASS FRAC				
CO2	1.0000	0.0	0.0	0.0
WATER	0.0	1.0000	1.0000	1.0000
TOTAL FLOW:				
KMOL/HR	1.7819-04	1.0504-02	1.6046-02	5.2073-02
KG/HR	7.8421-03	0.1892	0.2890	0.9381
L/HR	4.3582	0.1986	0.3034	0.9847
STATE VARIABLES:				
TEMP C	25.0000	100.0000	100.0000	100.0000
PRES PSI	14.7000	14.7000	14.7000	14.7000
VFRAC	1.0000	0.0	0.0	0.0
LFRAC	0.0	1.0000	1.0000	1.0000
SFRAC	0.0	0.0	0.0	0.0
ENTHALPY:				
CAL/MOL	-9.4054+04	-6.6923+04	-6.6923+04	-6.6923+04
CAL/GM	-2137.1149	-3714.7757	-3714.7757	-3714.7757
CAL/SEC	-4.6554	-195.2743	-298.2824	-968.0166
ENTROPY:				
CAL/MOL-K	0.6943	-34.8674	-34.8674	-34.8674
CAL/GM-K	1.5777-02	-1.9354	-1.9354	-1.9354
DENSITY:				
MOL/CC	4.0886-05	5.2879-02	5.2879-02	5.2879-02
GM/CC	1.7994-03	0.9526	0.9526	0.9526
AVG MW	44.0098	18.0152	18.0152	18.0152
MIXED SUBSTREAM PROPERTIES:				
*** ALL PHASES ***				
VNX L/HR	4.3582	0.1986	0.3034	0.9847
CPHX CAL/GM-K	0.2007	1.1700	1.1700	1.1700
*** LIQUID PHASE ***				
RHOMX GM/ C	MISSING	0.9526	0.9526	0.9526