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LOFT TECHNICAL REPORT LTR 113-50
RE&C REPORT NUMBER RE-A-78-022
JUNE 1, 1978

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LOFT REFLOOD AS A FUNCTION OF
ACCUMULATOR INITIAL GAS VOLUME

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IDAHO OPERATIONS OFFICE UNDER CONTRACT EY-76-C-07-1570

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LTR NO. 113-50
RE&C Report # RE-A-78-022
DATE June 1, 1978
WORK REQUEST NO. 52191-200-200

RESEARCH, ENGINEERING AND CONSTRUCTION REPORT ENGINEERING ANALYSIS DIVISION

THERMAL ANALYSIS BRANCH

LOFT REFLOOD AS A FUNCTION OF
ACCUMULATOR INITIAL GAS VOLUME

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**LOFT TECHNICAL REPORT
LOFT PROGRAM**FORM EG&G-229
(Rev. 12-76)

TITLE LOFT Reflood as a Function of Accumulator Initial		REPORT NO. 113-50
Gas Volume		
AUTHOR H. F. Rhodes <i>H. F. Rhodes</i>		GWA NO. 52191-200-200
PERFORMING ORGANIZATION Thermal Analysis Branch		DATE June 1, 1978
LOFT APPROVAL PSE <i>E. B. Forest</i> RCSS Supv. RSB Mgr. PSB Mgr.		
SS&TSS Supv. P&CSB Mgr.		

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SUMMARY

The effect of the initial gas volume in the LOFT accumulators on the time to start of core reflood, after a LOCA, has been studied. The bases of the calculations are the data used and results presented in the Safety Analysis Report, Rev. 1, August 1977^[3], and the data in the RELAP and T00DEE2 program input and output listings^[4,5].

The results of this study show that an initial nitrogen volume of 12 cu ft, or more (at 600 psig initial pressure), would cause start of core reflood in time to prevent the cladding temperature from reaching 2200 °F. The 12 cu ft initial volume will expand from 600 psig, initial pressure, to about 10 psig (containment pressure shortly after start of LOCA is ~ 8 psig) when all ECC liquid has been expelled from the accumulator. This pressure margin is considered too small; the ECC flowrate will be zero before the accumulator is empty.

The recommended minimum initial gas volume is 20 cu ft. Flow tests should be made to compare the ECC delivery rates with the calculated values. The L-1 test series should provide the needed test data. Consideration of initial gas volumes less than 20 cu ft should be deferred until flow tests and calculations by RELAP and T00DEE2 are made and evaluated.

The use of lower initial pressure, 550 and 525 psig at 20 cu ft initial gas volume, was also studied for the hot leg break, the worst case. Using these pressures will delay start of core reflood by 0.3 and 0.45 sec respectively, from the results shown for 20 cu ft at 600 psig. The resulting increase in maximum clad temperature is only 11 °F and 16 °F, to about 2035 and 2040 °F, respectively. These are well below the upper limit of 2200 °F^[3].

LOFT REFLOOD AS A FUNCTION OF ACCUMULATOR INITIAL GAS VOLUME

I. INTRODUCTION

The "...minimum nitrogen volume...", the initial volume of pressurizing nitrogen (N_2) in the LOFT accumulators, that will "...give the minimum desired delivery rate..." (emergency core coolant [ECC] flowrate) to the reactor vessel (RV) during a 100% break loss of coolant accident (LOCA) is required^[1,2]. This study was made to determine that "...minimum (initial) volume..." and to define the "...minimum (acceptable) flowrate."

In the event of a LOCA the plant protective system (PPS) piping is lined up for ECC to flow from bottom nozzles in the accumulators through the 6 inch ECC lines, -106-VB and 107-VB, to the RV lower plenum and downcomer respectively. This is the normal line-up until just prior to LOCE tests. Thus, the total ECC volume in the accumulators is available for delivery to cool and protect the reactor core^[3].

If less initial N_2 fill is used, more ECC is used to fill the tank, providing an additional protective margin over that shown in Reference 3. But the smaller initial gas volume will depressurize faster, as a function of ECC delivered, and, therefore, the ECC flowrate will be less at all times after the ECC flow is initiated. However, because of this smaller ECC flowrate, less ECC - delivered during the "active blowdown period" - will be swept out of the break in the primary coolant line (PCL), and more ECC will remain for RV refill and core reflood after the RV pressure drops to the containment building pressure. This statement is based on the assumption that the differences in ECC flowrates to the RV for "large" and "small" initial N_2 volumes will not have any significant effect on the lower plenum pressure history or the ECC flowrate

in the core during blowdown. The ECC flowrate to the RV is affected by the lower plenum pressure.

The "desired" delivery rate is the smallest one which will deliver enough ECC to start core reflood and prevent the fuel pin cladding temperature from reaching the maximum allowable of 2200°F ^[3]. To determine this flowrate requires knowledge of the history of the parameters that effect core flow and cooling during blowdown and RV refill to start of core reflood. These data are shown in References 3, 4, and 5. After core reflood begins, experimental evidence^[6] shows that the rapid steam generation causes two phase flow and "frothing" throughout the core and effectively provides overall fuel pin cooling throughout the core. However, the analysis method used^[3,8] models a less effective entrainment method, which is conservative. Thus, the calculated temperatures are higher than experiment indicates they would be.

The calculated results^[3,4,5] are based on only one value of initial N_2 volume in the accumulators. These results are used here in estimating the latest time at which core reflood may begin. The initial N_2 volume was varied over a wide range in the calculations to evaluate the effect that this parameter has on the time that core reflood begins, and thus on maximum cladding temperature.

A subcase at reduced pressure--less than 600 psig--was added^[12] to this study. The reason for the additional calculations is to determine the effect of the normally expected accumulator pressure reading variation and control bandwidth on the time to start of reflood. The pressure range used in these calculations, 525 to 600 psig, is expected to be much greater than what will actually occur. Only one initial N_2 volume was used for this case, 20 cu ft. This subcase is considered for only the hot leg break because the consequences are potentially more severe in that case.

II. DISCUSSION OF DATA AND ANALYSIS METHODS

The data for the calculations in this study were taken^[2] from the data and results in Reference 3. The additional information from References 4 and 5 were also used. The equipment dimensional data used in these references was from design data circa 1974 and earlier. Test and calibration measurements made later show some differences^[6,7,9]. These "as built" data were used only for comparison of ECC flowrates from the accumulators.

1. ACCUMULATORS AND ECC LINES

Reference 3 shows the Accumulator A and B volumes to be ~ 128 and 126 cu ft respectively. The smaller volume was used here. The ECC initial volume is specified to be 86 cu ft minimum and the initial N₂ volume would be 40 cu ft. The initial pressure is maintained at 600 psig (612.5 psia), and the temperature was assumed to be 70. °F.

The test data show the accumulator volumes to be somewhat greater, about 134 cu ft for Accumulator A. The 86 cu ft ECC volume used, however, is more than enough to flood the core even on the very conservative basis used in the cold leg break analysis^[3], which requires more ECC for core flooding than does the hot leg break.

The accumulator vessel is about 4 ft inside diameter, and the 6 in. ECC line, located about 1 ft below the vessel, is 8.33 ft below the ECC injection nozzles in the RV^[7]. This ECC line has a volume of about 12.5 cu ft between the accumulator and the pressure transmitter (PT-120-64) connection just upstream of the ECC injection nozzle to the lower plenum. This line volume was included in the accumulator volume in the RELAP calculations made for the FSAR. The ECC injection line volume used was 1.235 cu ft^[4,5], and had 0.0668 sq ft flow area^[4].

This is nearly equal to the volume and flow area for the ECC line from the pressure connection at PT-P120-64 to its outlet in the RV lower plenum.

The loss coefficient used at Accumulator A^[3,4] was 13.0 based on 0.06447 sq ft flow area, and was 0.98 based on 0.0668 sq ft at the line exit in the lower plenum. In this study these loss coefficients were combined to 14.94 based on 0.0668 sq ft. Friction losses^[4] for the ECC line were calculated using Equation 11 shown in Reference 8, page 35. Reference 9, page 24, shows that the measured loss coefficients from both 6 in. accumulator lines are nearly the same. Only Accumulator A was modeled for this study and the results are used for both accumulators.

Note that a substantial portion of the pressure drop in the 6 in. line from the accumulators to the RV is caused by the orifices XRO-68 and -69 in the lines from Accumulators A and B, respectively. These orifice sizes can be varied for scaling purposes for the various experiments planned. For LOCE tests, Accumulator A flow is through the standpipe and 4 in. line which contains restriction orifice XRO-66, and then through XRO-68 in the 6 in. line. The orifices in the 6 in. line could be sized to obtain the desired ECC delivery to the RV, and time of start of reflood, in the event of a LOCA, with the desired initial N₂ volume. Then, for test purposes (LOCE's) the desired flow restriction could be obtained with the orifices in the 4 in. line (sometimes called the "bypass" line).

2. LOWER PLENUM VOLUME AND PRESSURE HISTORY

The RV lower plenum volume used for the RELAP runs^[3,4] was 27.23 cu ft. Values of ~ 19 and 23 cu ft were obtained from References 6 and 7. The differences are the result of differences in the definitions of "lower plenum volume". The RELAP value is used in this study.

The lower plenum pressure history during blowdown for both LOCA's was taken from Reference 4 and is shown in Figures 1 and 2 for the hot and cold leg breaks, respectively. The pressure history for the distributor plenum, where Accumulator B discharges, is not available. Accumulator B ECC flowrate is affected by that pressure. However, the results in Reference 4 show that Accumulator B flowrate to be ~ 30 lb/s or 12% greater than Accumulator A. It is conservative to assume both have the smaller rate.

3. COLD LEG LOCA ANALYSIS

The course of the blowdown transients are described in Reference 3 is used, as noted earlier, as the bases for calculations in this study. Table 15-XVIII from Reference 3 shows the timing of most of the significant events during the transient. That table is reproduced with other selected events denoted by an asterisk as Table I.

TABLE I^[a]

SUMMARY OF EVENTS FOR OFFSET SHEAR OF CIRCULATING
LOOP COLD LEG PIPING

Events	Value
Start of blowdown, s	0.1
P _{contain} = 3 psig*	0.7
Accumulator trip, s	1.6
Final containment pressure, psia	20.0
HPIS and LPIS Pumps start*	6.7
Primary system at containment pressure, s	7.6
End of core bypass flow*	9.3
Core begins to reflood, s	15.0
Minimum reactor vessel liquid inventory, s	2.0
Hot spot cladding temperature:	
(a) Prior to flooding, °F	1,170 @ 6.5 s
(b) Maximum during flooding, °F	1,804 @ 38 s
Maximum thickness of zirconium oxide, mil	0.191
Zirconium oxide % of cladding thickness	0.79

[a] Taken from Table 15-XVIII, Reference 3.

The lower plenum refill after end of bypass is by one accumulator ("A"), one HPIS and one LPIS pump^[3]. The liquid content of this space^[4] is shown on Figure 3. The refill rate is ~ 290 lb/s from 9.3 to 15 seconds. This rate is slightly greater than the flowrate from Accumulator A plus one LPIS pump. Because water from other spaces in the RV can also enter the lower plenum during this period, the difference between the ECC delivery rate and the lower plenum fill rate is assumed to come from these other spaces.

At other ECC flowrates from the accumulators resulting from initial gas volumes different from 40 cu ft, this water from the other spaces is assumed to enter the lower plenum at the same rate as for the 40 cu ft "base case" shown on Figure 3^[3]. Figure 4 shows the mass flowrate of ECC into the lower plenum from Accumulator A and LPIS pump A^[4]. Extrapolating this curve as a straight line from 9.3 seconds and integrating for the cumulative amount gives the curve added to Figure 3 and labeled "Cumulative ECC To Lower Plenum After End Of Bypass". The cumulative amount in the lower plenum, Figure 3, is extrapolated as a straight line from 12 seconds at 700 lb through 15 seconds at 1650 lb of liquid in the lower plenum. The difference in liquid mass between these two lines at any time is assumed to be from the other spaces in the reactor vessel. This difference has been calculated and is plotted on Figure 5. At some time, t , the sum of the liquid volume shown on Figure 5 and the amount delivered from Accumulator A and LPIS Pump A, using a specified initial N_2 volume, equals 27.23 cu ft (~ 1650 lb) and core flooding is assumed to begin for this particular initial N_2 volume.

The initial N_2 volumes of less than 40 cu ft will deliver ECC at a slower rate and delay the start of core flooding. This delay will allow the fuel pin cladding to be heated to a higher temperature by sensible and decay heat transfer. The cladding surface temperature from the time of core stagnation at ~ 7.6 seconds to beginning of core flooding increases from about 1250 °F to ~ 1550 °F for the

base case as reported in Reference 3. It is assumed, as discussed earlier, that a change in the ECC flowrate will have no effect on the cladding cooling history up to 15 seconds. Any delay of start of core flooding is assumed to allow cladding temperature rise to continue at the same rate as shown^[3] at 15 seconds, or about 20 °F/s.

This temperature rise rate is multiplied by the delay time to start of flooding to obtain the additional temperature rise that is assumed to result from the flooding delay, caused from use of smaller initial N₂ volumes. The peak cladding temperature was slightly over 1800 °F^[3], and each second delay in start of core flooding would raise the peak value of ~ 20 °F.

This approach yields conservative results because some of the additional decay heat generated in the fuel after 15 seconds, added to the sensible heat content of the fuel at 15 seconds, will not appear immediately in the cladding to raise its temperature. This delay of heat transfer from the fuel will reduce the net effective cladding temperature rise before start of core reflood.

4. HOT LEG LOCA ANALYSIS

The course of this blowdown transient is indicated in Table 15-XX in Reference 3. That table is reproduced with other selected events added in Table II.

TABLE II^[a]

SUMMARY OF EVENTS FOR OFFSET SHEAR OF CIRCULATING
LOOP HOT LEG PIPING

Event	Value
Start of blowdown, s	0
P _{contain} = 3 psig*	0.5
Accumulator trip, s	1.5
Final containment pressure, psia	20.0
Primary system at containment pressure, s	4.3
HPIS and LPIS Pumps start*	6.5
Core begins to reflood, s	7.0
Minimum reactor vessel liquid inventory, s	2.2
Hot spot cladding temperature:	
(a) Maximum prior to flooding, °F	1,560 @ 7.0 s
(b) Maximum during flooding, °F	1,989 @ 12.7 s
Maximum thickness of zirconium oxide, mil	0.499
Zirconium oxide % of cladding thickness	1.86

[a] Taken from Table 15-XX, Reference 3

In this transient, end of blowdown and flow stagnation in the core region occurs much sooner, 4.3 seconds after the break compared to 7.6 seconds in the cold leg LOCA^[3]. The lower plenum refills much faster, however, as shown by the plot of liquid mass in the lower plenum versus time^[4], shown in Figure 6. The average fill rate is about 350 lb/s between 4 and 6.8 seconds. Also, there is no "core bypass flow" and no artificial voiding and loss of coolant from the plenum (~ 400 lbs in the cold leg LOCA case, which represents ~ 1.5 seconds delay in start of core flooding). The total flow from both accumulators and one LPIS pump is available to fill the lower plenum but this flowrate, about 550 lbs/s (at 3 seconds) does not appear to accumulate there; it is "lost"

for purposes of lower plenum refilling. Figures 7, 8, and 9 show Accumulators A and B and lower plenum injection flowrates from Reference 4. The cumulative ECC delivered to the RV by the three sources was determined by numerical integration of curves on Figures 8 and 9 using the trapezoidal approximation, and is plotted on Figure 10, and also has been added to Figure 6.

The large difference between the amount of ECC delivered to the downcomer and lower plenum and the amount remaining in the lower plenum is "lost" (to other spaces in the RV) to be either accumulated there or to flow on to still other spaces. In any event, this "lost" ECC does not accumulate in either the lower plenum or the core, and in this study the amount lost at any time is assumed to be a direct function of the amount delivered to the lower plenum at that time regardless of how fast it got there. Therefore, at lower initial N_2 volumes the lower ECC delivery rate will, in essence, result in the shifting of the base-case lower plenum liquid content curve to a later time. This delay in start of core flooding will allow the fuel pins to continue heating.

The hot spot average fuel temperature at the start of flooding, 7 seconds after the break^[3], is about 1830 °F^[5] and is rising at the rate of about 30 to 35 °F/second (estimated from slope of the T00DEE2 plot) shown on Figure 11^[5]. The cladding surface temperature is rising much faster at this time and exceeds the average fuel temperature from about 7.5 to ~ 10 seconds; at 10 seconds both temperatures are about 1935 °F. The maximum average fuel temperature is about 2100 °F, reached at ~ 23 seconds, and the cladding surface maximum temperature is ~ 1990 °F reached at ~ 13 seconds^[3].

Except under unusual transient conditions in a reactor, cladding temperature will be less than the average fuel temperature, and will always be less than fuel surface temperature unless metal-water reactions become significant. The zircalloy-water reaction rate is considered to be insignificant at cladding temperatures below 2200°F^[3]. If a LOFT fuel pin that has been operating at power,

with heat removal at the cladding surface, and then subjected to a transient in power or heat removal, the cladding temperature will be less than the fuel surface temperature, which is less than the average fuel temperature. Therefore, if the average fuel temperature is less than 2200 °F, the cladding will also be less than 2200 °F.

For this case, the average fuel temperature heating rate is applied, as was the cladding surface heating rate for the cold leg break case, over the delay time to start of core reflood.

5. ACCUMULATOR FLOW CALCULATIONS

The ECC flow from the accumulator was calculated using the CSMP program^[10,11]. CSMP is an IBM program for simulating an analog model on a digital computer. The mathematical analysis^[11] of this part of the PPS is shown in Appendix A. The input data for CSMP are also shown there as Tables A-III, A-IV, and A-V for the cold leg break case with flow parameters (volumes and loss coefficients) as were used for the FSAR, and as measured, and for the hot leg break case with the flow parameters as used for the FSAR, respectively.

Table A-VI shows input for the 20 cu ft initial gas volume subcase at 525 and 550 psig initial gas pressure.

In this study the initial N₂ volume and pressure was varied. The maximum volume was taken at 50 cu ft, to be in excess of the amount used in the RELAP runs. Forty cubic feet was used to match the RELAP volume, and 34.2 cu ft was used to match test and calibration runs on the equipment to provide calculated versus-measured data for comparison^[6]. The minimum volume was 12 cu ft, chosen because at the time the accumulator empties, the gas pressure will have decreased to nearly 20 psia, the approximate containment (and RV lower plenum) pressure for the first half-hour after end of blowdown. The other values, 27.5, 20 and 16 cu ft were chosen to give approximately equal volume ratios from case-to-case.

Initial N_2 pressures of 525 and 550 psig were used in the subcase at the initial volume of 20 cu ft. The accumulator volume used was 134 cu ft, and the same flow area and loss coefficients were used as in the other cases.

For these calculations, the time step size for calculations was 0.05 second and printout was specified at 0.25 second. The calculations were stopped at the time that the accumulator was emptied (not including the line volume), or at 40 seconds after the break, whichever occurred first.

A discussion of the program logic is included in Appendix A, with a definition of the variable names contained in Table A-III.

III. RESULTS

1. CSMP OUTPUT

The output consists of tables listing some of the calculated results for each initial N_2 volume assumed. All of the results of interest were also recorded on magnetic tape. Plots have been made from the taped results, and are included.

2. COLD LEG LOCA (USING RELAP FLOW DATA)

The output listing is included in Appendix B for all 7 cases of initial N_2 volume, with plots of nine of the calculated results for each case. Figure 12 shows the calculated amount of ECC liquid delivered from Accumulator A to the RV lower plenum plotted versus time for these cases. The amount delivered after end of core bypass is also shown, and includes the flow from HPIS and LPIS pumps. The HPIS flow injects into the cold leg and is probably lost out the break. However, its rate is so small--0.06 cu ft/s -- that its contribution to plenum filling would not be significant--or missed--in this LOCA event. (Figure 12A shows these quantities for the cold leg LOCA cases where measured line loss data were used in the calculations.)

Figure 13 shows the total amount of coolant from all sources entering the lower plenum for all cases. These plots show the sum of the value on the curve in Figure 5, and the curves on Figure 12 that show the amount delivered after end of bypass. The times at which the lower plenum is filled--core reflood begins--is when the total amount delivered is 27.23 cu ft. The 40 cu ft case shows that the lower plenum is filled at 15.1 seconds, a very close check with the results reported in Reference 3. For the 20 cu ft case the time of filling is at about 15.9 seconds or a delay of 0.8 second. The hot surface cladding

temperature would rise about 15 °F higher than shown in Reference 3, or to ~ 1820 °F at about 39 seconds (Table I). Note that the cladding temperature prior to start of flooding is independent of ECC flowrate to the RV, by the assumption discussed in the Introduction.

At the time core flooding starts, ~ 15.8 seconds in the 20 cu ft case, the flowrate from one accumulator will be about 130 lb/s, and the remaining volume in the accumulator will be ~ 65 cu ft, based on 126 cu ft accumulator volume. For the 40 cu ft case, the flowrate at start of flooding is ~ 175 lbs/s, and the remaining volume in the accumulator is ~ 40 cu ft. For the 12 cu ft case, the delay time to start of reflood is about 1.6 seconds. The cladding surface temperature rise would be ~ 30 °F, to about 1835 °F maximum.

Table III lists the salient results of this study for the cold leg LOCA. The output tape is volume serial number T9B225, and the data set name, DSN= LOFTACCU.N2MINVOL.CLDLLOCA.

TABLE III

LOFT COLD LEG BREAK RESULTS FROM
VARYING ACCUMULATOR INITIAL NITROGEN VOLUMES

	Initial Gas Volume In LOFT Accumulators, Cubic Feet					
	<u>40.0</u>	<u>34.2</u>	<u>27.5</u>	<u>20.0</u>	<u>16.0</u>	<u>12.0</u>
Delay-Time To Start Of Core Reflood-Seconds	0.0	0.2	0.4	0.8	1.1	1.6
Cladding Surface Temp. Rise Because Of This Delay-°F	0	4	8	16	22	32
Calculated Maximum Cladding Surface Temperature-°F	1804	1808	1812	1820	1826	1836
Initial ECC Vol.-Cu Ft	86	91.8	98.5	106	110	114
<u>Conditions At End Of Core Bypass Flow (9.3 seconds)</u>						
ECC In Accum-Cu Ft	58.1	64.5	72.5	81.8	87.1	92.8
Flowrate - Cu Ft/s	3.4	3.3	3.0	2.8	2.6	2.3
Gas Pressure-PSIA	292	270	241	202	177	147
<u>Conditions At Start Of Core Reflooding</u>						
Time At Start Of Flooding-Seconds	15.0	15.2	15.4	15.8	16.1	16.6
ECC In Accum-Cu Ft	40.5	47.1	55.5	66.0	71.9	78.5
Flowrate-Cu Ft/s	2.8	2.7	2.4	2.1	2.0	1.7
Gas Pressure-PSIA	211	190	167	132	114	89
Gas Pressure When Accum is Empty-PSIA	123	99	73	47	34	23

The cold leg LOCA calculation and plots using measured flow data are included in Appendix B for comparison purposes only. Tape volume serial number is T9G021, and DSN=LOFTACC.N2MINVOL.

3. HOT LEG LOCA (USING RELAP FLOW DATA)

The output listings are included in Appendix C for all cases, and the plots for each case are also included.

Figure 14 shows the calculated volume of ECC delivered to the downcomer and the lower plenum for the 600 psig cases. This includes the LPIS pump A after it starts at ~ 6.5 seconds. The curves plotted on Figure 6, "Liquid Mass Volume 20"^[3] and "ECC Delivered to Reactor Vessel"^[3], are repeated on this plot. The ECC delivery calculated in this study for the 40 cu ft case checks very closely with that from Reference 3. The worst deviation is at about 3 seconds when the difference in the amount delivered is about 50 lbs (less than 1 cu ft). Later, at about 6 seconds, the two curves cross. The difference is very small at all times and the agreement is good.

The delay time to start of flooding is shown on Figure 14 to be about 0.65 seconds for initial N₂ volume case of 20 cu ft. The fuel average temperature would rise about 23 °F higher than shown in the T00DEE2 plot, or to about 2125 °F at about 24 seconds, based on the assumptions discussed previously. If one uses the full decay heat and prompt power curve in LTR 20-8 (page 16) at 6 seconds after scram, 9.2% of operating power (assume 55 MW), and a core average/hot spot ratio of 0.4 the adiabatic temperature rise rate of the fuel is ~ 45 °F/s. Then the average fuel temperature would be ~ 30 °F higher than shown on Figure 11.

In either case, the cladding temperature could not become greater than 2025 °F, well below the 2200 °F upper limit.

At the time core flooding starts, ~ 7.5 seconds for the 20 cu ft case, the ECC flowrate from the accumulator is about 185 lb/s and 85 cu ft of liquid remains in the accumulator. For the 40 cu ft case, the flowrate is ~ 225 lb/s at the time flooding starts and the remaining volume in the accumulator is ~ 65 cu ft.

Table IV lists the results of this study for the hot leg LOCA. The output tape volume serial number is T93570, and the DSN is LOFTACCU.N2MINVOL.HOTLLOCA.

TABLE IV
LOFT HOT LEG BREAK RESULTS FROM
VARYING ACCUMULATOR INITIAL NITROGEN VOLUMES

	<u>Initial Nitrogen Volumes - Cu Ft</u>					
	<u>40.0</u>	<u>34.2</u>	<u>27.5</u>	<u>20.0</u>	<u>16.0</u>	<u>12.0</u>
Delay to Start of Core Core Reflood-seconds	0.0	0.15	0.35	0.65	1.00	1.45
Cladding Surface Temperature Rise because of this Delay - °F	0	5	12	23	35	51
Calculated Maximum Cladding Surface Temperature - °F	2000	2005	2012	2023	2035	2051
Initial ECC Vol. - Cu Ft	86	91.8	98.5	106	110	114
	<u>Conditions at Start of Core Reflooding</u>					
	<u>40.0</u>	<u>34.2</u>	<u>27.5</u>	<u>20.0</u>	<u>16.0</u>	<u>12.0</u>
Reflood Start Time - Seconds	6.8 ^[a]	6.95	7.15	7.45	7.8	8.25
ECC In Accum - Cu Ft	65.3	71.0	77.7	85.5	89.6	93.8
Flowrate - Cu Ft/Seconds	3.7	3.5	3.3	3.0	2.7	2.4
Gas Pressure - PSIA	342	315	278	228	195	154

[a] This time differs from that shown in Reference 3 (and Table II), but coincides with the value shown in Figure 6^[4] which is the basis of the calculation made for the hot leg LOCA.

Results of the subcase at 20 cu ft initial gas volume and initial pressure of 550 and 525 psig are shown on Figures 15 and 16, with the results at 600 psig initial pressure added as a base point for comparison. At 550 psig initial pressure the delay to start of reflood is 0.95 sec compared to 0.65 sec at 600 psig. The cladding temperature rise at 0.95 sec is 33 °F compared to 23 °F at 600 psig. These results can be expressed as a delay time increase of 6 milliseconds/psi reduction in initial gas pressure, and clad temperature rise of 0.35°F/psi reduction. The pressure in the accumulator at the start of reflood is about 211 psia when the initial pressure is 550 psig compared to 228 at 600 psig. The gas pressure at the time the accumulator is empty--assuming the tank volume is 126 cu ft--is 43 psia compared to 47 psia when the initial pressure is 600 psig. See Figures 15 and 16 for a graphical comparison of these results.

The results using 16 cu ft initial volume at 600 psig is also shown on Figure 15. The difference in delay to start of reflood between this result (16 cu ft at 600 psig) and the 20 cu ft initial volume at lower pressures is trivial, about 0.1 sec or less. The pressure at start of reflood and at the time the accumulator is empty (using 126 cu ft capacity for all) is plotted versus initial pressure. The pressures at these times for the 16 cu ft and 12 cu ft initial volumes at 600 psig initial pressure is shown for comparison, and dotted lines are shown parallel to the 20 cu ft initial volume line.

The output tape VSN=A16403, and the DSN=L.LOFTACCU.N2VOL-20.PR-525PS.IG550.

4. EVALUATION OF RESULTS

Tables III and IV show that all initial N₂ volumes studied will start core flooding in time to prevent the hot spot cladding temperature from reaching 2200 °F.

By definition in Section I, the "minimum initial volume" is 12 cu ft, and the "minimum (acceptable) flowrate" is that produced by this N₂ volume. At start

of core flooding, that flowrate is 1.7 cu ft/sec for the cold leg break and 2.4 cu ft/sec for the hot leg break. However, the minimum flowrate produced by this gas volume will be zero before the accumulator is empty. This may not be desirable because not all of the ECC in the accumulators and the 6 inch ECC line can be driven to the RV until the RV pressure at the ECC injection nozzle decrease to ~ 15 psia.

The 16 cu ft gas volume would completely empty the accumulator and ECC line in about 90 to 100 seconds. The gas pressure at that time would be 34 psia, or 14 psi above the expected RV pressure. It is believed that more pressure differential margin is needed. The initial gas volume of 20 cu ft would have ~ 47 psia at the time the accumulator was emptied at around 80 seconds after the start of LOCA. The terminal flowrate is ~ 1.1 cu ft/sec compared to 0.8 cu ft/sec for the 16 cu ft case. But the higher pressure differential--by a factor of 2--insures uninterrupted ECC flow from the accumulators.

In the subcase with the initial N_2 volume of 20 cu ft and the initial pressure less than 600 psig, the accumulator pressure was higher at start of reflood and when the vessel was empty (using 126 cu ft volume) than for the case at 600 psig initial pressure and 16 cu ft initial volume. The ECC flow rate was greater at those times, too.

The use of 550 psig, or even 525 psig, initial pressure and 20 cu ft initial N_2 volume will provide start of core reflood well before clad temperatures reach 2200 °F. Using 20 cu ft initial N_2 volume at 550 psig would provide substantially the same maximum clad surface temperature as using 16 cu ft at 600 psig, and a higher ECC flowrate at all times after start of core reflood.

IV. RECOMMENDATIONS

The recommended minimum initial N_2 volume is 20 cu ft. Flow tests to determine flowrates and pressure histories should be made to check the assumptions discussed earlier, and the results of this study. The L-1 test series data could probably be used for this purpose.

RELAP and T00DEE2 calculations should be made to more accurately determine the cladding temperature history if using less than the 20 cu ft initial gas volume is desired.

The changes in orificing for XRO-68 and -69, discussed in Section II, 1, should be considered.

V. REFERENCES

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LOWER PLENUM PRESSURE, PSIA AP20

LOFT HOT LEG BREAK (LOCA) BK AREA CONCO=1.0

RELAP4/703 11/19/74 A /P /14

LTR113 50-3

LOFT COLD LEG BREAK (LOCA) CONCO=1.0

RLP4EH/003 11/19/74 M /A /22

LOFT COLD LEG BREAK (LOCA) CONCO=1.0

RLP4EM/003 11/19/74 M /A /22

25

LOFT COLD LEG BREAK (LOCA) CONCO=1.0

RLP4EM/003 11/19/74 M /A /22

LTR113 50

FIGURE 5: LOFT COLD LEG LOCA

COOLANT IN THE LOWER PLENUM, LBM,
COMING FROM OTHER VOLUMES
OF THE REACTOR VESSEL
(FROM RELAP CALCULATIONS
AND FSAR INFORMATION)

27

FIGURE 6. LOFT HOT LEG LOCA LIQUID CONTENT OF LOWER PLENUM AND ECC DELIVERED TO REACTOR VESSEL (FROM RELAP CALCULATIONS)

LOFT HOT LEG BREAK (LOCA) BK AREA CONCO=1.0

RELAP4/703 11/19/74 A /P /14

LR113 2044

JH59
ACCUMULATOR A FLOW RATE, LBS/SEC

FIGURE 7. LOFT HOT LEG LOCA ECC FLOWRATE
FROM ACCUMULATOR A (FROM RELAP RESULTS)

LOFT HOT LEG BREAK (LOCA) BK AREA CONCO=1.0

RELAP4/703 11/19/74 A /P /14

LIR113 50

MASS FLOW RATE JUNCTION 62 JH62

(INTO LOWER PLENUM)

FIGURE 9. HOT LEG LOCA ECC FLOWRATE INTO LOWER PLENUM FROM ACCUMULATOR A AND LPIS PUMP A (FROM RELAP RESULTS)

LOFT HOT LEG BREAK (LOCA) BK AREA CONCO=1.0

RELAP4/703 11/19/74 A /P /14

FIGURE 10

CUMULATIVE ECC DELIVERED TO REACTOR VESSEL
DURING HOT LEG LOCA VS TIME AFTER BREAK

(From Accumulators A and B, and LPIS Pump A)

3000

46 0780

2000

1000

ECC DELIVERED TO REACTOR VESSEL - LBS

LPIS INJECT. BEGINS

TIME AFTER BREAK - SECS

HFRHDD2
13 DEC 77

0 1 2 3 4 5 6 7 8

31

1000EE2

PWR LOFT HOT LEG BREAK (LOCA) HOT FUEL PIN

AVERAGE FUEL AND CLAD SURFACE TEMPERATURE

Figure 12

LOFT LOCA: Doubled-Ended Cold Leg Break
 Minimum Initial Nitrogen Volume
 Required For PPS Accumulators;
 Parametric Study Using Flow Data
 As in RELAP Runs.

LTR 113 50.3

Figure 12A

LOFT LOCA: Double-Ended Cold Leg Break
Minimum Initial Nitrogen Volume
For PPS Accumulators; Parametric
Study, Using Line Loss Data As
Measured.

FIGURE 13: LOF COLD LEG LOCA

VOLUME OF ECC ENTERING THE LOWER
PLENUM FROM THE PPS AND OTHER
VOLUMES OF THE VESSEL AFTER END
OF BYPASSFLOW (USING RELAP FLOW PARAMETERS)

35

LTR113 50.4

FIGURE 15- LOFT HOT LEG LOCA

EFFECT OF INITIAL GAS PRESSURE ON
REFLOOD START TIME; INITIAL GAS
VOLUME IS 20 CUFT. (USED RELAP DATA)

FIGURE 16 - LOFT HOT LEG LOCA

EFFECT OF INITIAL GAS PRESSURE ON
ACCUMULATOR PRESSURE AT START OF CORE
REFLOOD AND AT TIME VESSEL IS EMPTY
(BASED ON TANK VOLUME OF 126 CU FT)

24 APR 78
H.F. RHODES

APPENDIX A

LOFT REFLOOD AS A FUNCTION OF
ACCUMULATOR GAS VOLUME

Mathematical Analysis And CSMP Input Data

The gas (N_2) expansion has been shown to be very nearly isentropic,

$$P V_g^k = c \quad (1A)$$

where P is gas absolute pressure,
 V_g is gas volume, and
 k is the heat capacity ratio, about 1.4 for nitrogen.

As the gas expands, and forces liquid out of the vessel, and the liquid in the vessel decreases, these relationships hold:

$$\frac{d V_g}{dt} = - \frac{d V_\ell}{dt} = Q \quad (2A)$$

where V_ℓ is the liquid volume,
 t is time, and
 Q is the volume flowrate of the liquid, defined as positive when flowing from the vessel.

The flowrate is also defined by the conventional Darcy equation,

$$Q = \left[\frac{2g (P_a - P_b) A^2}{K_{f,f} \rho} \right]^{0.5} \quad (3A)$$

where g is the gravitational constant
 P_a and P_b are pressure in the accumulator and the bottom of the reactor vessel respectively,
 A is the flow area of the flow line,
 $K_{f,f}$ is the combined form and friction loss coefficient for the flow line based on the area, A , and
 ρ is fluid density.

The term, $(P_a - P_b)$, is adjusted to allow for elevation differences caused by equipment location and liquid level change in the accumulator as liquid flows out to the reactor vessel.

Form losses are considered to be independent of flowrate, or constant, and friction losses are related to flowrate by equation 4A (used in RELAP):

$$f^{-0.5} = 4 \log_{10} (N_{Re} f^{0.5}) - 0.4 \quad (4A)$$

where f is the friction factor, and

N_{Re} is the Reynolds number.

Then $K_{f,f} = K_f + f L/D \quad (5A)$

where K_f is the so called form loss coefficient,

L is the line length, and

D is the line diameter.

The mathematical analysis and program logic development for the CSMP program solutions are shown on the next page. The nomenclature is slightly different than that above, but the meaning is clear except for the words INTGRL and AFGEN. The first, INTGRL, is an instruction to the program to numerically integrate the variables shown in parentheses, the first one being the initial condition value, and the second one is the time dependent value of the derivative. The second word, AFGEN, is an instruction to linearly interpolate from a function table, whose name is the first variable in the parentheses, and the second is the independent variable which has its time dependent value.

The friction factor was calculated from Equation (4A) and was input as a function table. This friction factor table and the algorithm used to calculate it is shown in Table A-II.

The input to CSMP for the cold leg LOCA is shown in Table A-III for the case where RELAP flow data was used. The definitions of the variables are added to this computer listing. However, the following notes apply in general to all of the CSMP input data cases.

TABLE A-1: MATHEMATICAL ANALYSIS OF LOFT ACCUM SYSTEM FLOW HISTORY

LTR 113 50

22 SEP 1977

(See Figure A-1 for RELAP Model)

$$\rho_g V_g = C$$

$$\frac{d\rho_g}{\rho_g} + \rho_g \frac{dV_g}{V_g} = 0$$

$$(1) \quad \dot{\rho}_g = - \frac{\rho_g}{V_g} \dot{V}_g$$

$$(2) \quad \dot{V}_g = - \dot{V}_L$$

$$(3) \quad \dot{V}_L = - Q$$

$$P_2 - P_3 = \frac{R}{\phi} \omega^2 = R \phi Q^2$$

$$(4) \quad \text{so that } Q = \sqrt{Q^2} = \sqrt{\frac{P_2 - P_3}{R \phi}}$$

$$(5) \quad P_2 = P_g + \frac{Z_L \phi_L}{144}$$

$$(6) \quad Z_L = V_L / A_v$$

A_v : AREA OF VESSEL

$$(7) \quad P_3 = f(t)$$

$$D\rho_g = -\rho_g + K * DV_g / V_g$$

$$\rho_g = \text{INTGRL}(\rho_{g0}, D\rho_g)$$

PCL

$$DV_g = - DV_L$$

$$V_g = \text{INTGRL}(V_{g0}, DV_g)$$

$$DV_L = - Q$$

$$V_L = \text{INTGRL}(V_{L0}, DV_L)$$

$$Q = \text{SQRT}[(P_2 - P_3) / (RESIS * RH\phi L)]$$

$$P_2 = P_g + Z_L * RH\phi L / 144. - Z * RH\phi L / 144.$$

(Z = 8.33)

$$Z_L = V_L / A_v$$

$$P_3 = \text{AFGEN}(PCL, \text{TIME})$$

TABLE A-II: RELAP FRICTION FACTOR

LTR 113 50

WCT ①
22 No 77

~~B~~

$$\beta = \frac{1}{\gamma f} + 1.4 - 4 \log_{10} (N_2 \sqrt{F'})$$

600+3

3.18514-3

$$f' = f - \frac{\beta}{d\beta/dt}$$

$$= f - \frac{F(f)}{\frac{F(f_2) - F(f_1)}{f_2 - f_1}} = f - \frac{2(1.5)(f) F(f)}{F(f_2) - F(f_1)}$$

$$f_2 = (1 + 1.5) f$$

$$f_1 = (1 - 1.5) f$$

600+3

.003185

500+3

.003291

400+3

.003428

300+3

.003027

3.5-3

*

*

*

3-3

4

5

6

7

8

TABLE A-II (cont)

LTR 113 50.1

WCT ②

22 No 77

<u>N_{Re}</u>	<u>f_{FANNING}</u>	
1+5	.00450	.00450038
2+5	.00391	.00391170
4+5	.00343	.00342849
6+5	.00319	.00318514
8+5	.00303	.00302743
1+6	.00291	.00291282
2+6	.00259	.00259454
3+6	.00243	.00243140

INPUT AS FTABL;

INDEPENDENT VARIABLE IS REYNOLDS NO.;

DEPENDENT VARIABLE IS FRICTION FACTOR, f.

1. The INITIAL block defines all initial conditions for all cases in the problem and is entered before any of the DYNAMIC block cards.
2. An asterisk(*) in card column 1 indicates a comment card (non-executable statement).
3. A PROCEDURE section is a FORTRAN program section executed exactly as any FORTRAN program even though it contains "CSMP statements". The CSMP statements become, in essence, a FORTRAN statement. On the PROCEDURE card the dependent variables calculated and the independent variables used are listed thus: Dependent (or output) variables; the procedure name (a dummy name not used for any other purpose); and the independent (or input) variables used including all function names.
4. A FUNCTION (as used here) is a table of data with the entries as ordered sets of (independent, dependent) pairs with the independent variable increasing monotonically. The FUNCTION must be given a name, which is used for identification only.
5. The PRINT card lists the names of the variables whose current value is to be listed at each printout time.
6. The METHOD card specifies the integration method to be used.
7. The TIMER card specifies the time step size, DELT; calculation end-time, FINTIME; and printout time interval, PRDEL.
8. The PARAMETER card specifies the successive values to be used for the parameter that is varied.
9. The PREPARE card specifies the variables that are to be output to magnetic tape (on tape unit 15) at each printout time.
10. The FINISH card specifies another criterion for ending the calculation on each case of the problem.

These items are only the ones used in this study; for further information on the capabilities of CSMP, see Reference 10.

The input for the cold leg LOCA using measured flow line characteristics is shown in Table A-IV.

The input for the hot leg LOCA using RELAP flow data is shown in Table A-V.

The variable names' definitions are not repeated on Tables A-IV and -V.

TABLE A-III CSMP INPUT

LTR113 50-1

\$\$\$CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 TRANSLATOR OUTPUT\$\$\$

TITLE ACCUMM GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77

TITLE COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

INITIAL		VARIABLE NAME DEFINITIONS
*	VVES = 134.0	Accumulator Volume - cu ft
	VVES = 126.0	Horizontal cross-section area of accumulator, sq ft
	AVES = 12.57	Initial nitrogen pressure - psia
	PGO = 612.5	Density of ECC lb/cu ft
	RHOL = 62.3	Initial nitrogen temperature - °R
	TO = 70.0 + 460.0	Isentropic Expansion Coefficient for N ₂
	GASK = 1.4	N ₂ gas constant for 1.0 lb, cu ft/sq in - °R
	GASCON = 0.3832	Volume 51 in RELAP, cu ft
	FLOVOL = 1.2349	Flow area of Vol. 51, sq ft
	FLOA = 0.0668	Flow length of Vol. 51, ft
	FLOLG = FLOVOL / FLOA	Diameter of Vol. 51, ft
	FLODIA = 2.0*(FLOA/3.1416)**0.5	Form loss coefficient from RELAP
	FLINEK = 14.94	Kinematic viscosity of ECC, sq ft/s
	FLONU = 1.0E-5	
	FLOVD = FLOLG / FLODIA	
*	FLOA = 0.14686	
*	FLOVDK = 99.93	
	VLO = VVES - VGO	Initial liquid volume in accumulator, cu ft
	VFIL = 0.0	Volume ECC injected into lower plenum after "end of by-pass", cu ft
	VFILO = 0.0	Initial value of VFIL until "end of bypass", cu ft
DYNAMIC		
*	PCLTAB: LOWER PLENUM PRESSURE HISTORY FOR LOCA'S.	
*	FOR COLD LEG BREAK, USE THIS:	
	FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,....	
	3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,....	
	1000.,20.	
*	FOR HOT LEG BREAK, USE THIS:	
*	FUNCTION PCLTAB = 0.,2250., 1.5,625., 1.6,570., 2.,300., ...	
*	2.25,180., 2.5,120., 2.75,70., 3.,50., 4.5,20., 1000.,20.00	
	FUNCTION FTABL = 1.E5,4.5E-3, 2.E5,3.91E-3, 4.E5,3.43E-3, ...	
	6.E5,3.19E-3, 8.E5,3.03E-3, 1.E6,2.91E-3, 2.E6,2.59E-3, ...	
	3.E6,2.43E-3	
	DPG = -PG * GASK * DVG / VG	Derivative of gas pressure, lb/sq in-s
	VG = INTGRL(VGO, DVG)	Volume of gas in accumulator, cu ft
	DVG = -DVL	Derivative of gas volume cu ft/s
	PG = INTGRL(PGO, DPG)	Pressure of gas, psia
	DVL = -Q	Derivative of liquid volume in accumulator, cu ft/s
	VL = INTGRL(VLO, DVL)	Volume of liquid in accumulator, cu ft
	PCL = AFGEN(PCLTAB, TIME)	Pressure in lower plenum from table PCLTAB, psia
	P2 = PG+ ((ZL-8.33)*RHOL/144.) - PCL	Pressure difference between accumulator and lower plenum, psia
	DELTAP = LIMIT (1.0E-5, 10000.,P2)	Constrained value of P2: 1.0E-5<P2<10000, psia
*	CALCULATE FRICTION LOSSES IN LINE (VOLUME).	
	PROCEDURE Q, RENUM = DUMPRO (FLOA, FLINEK, DELTAP, FTABL)	
	F10 = 0.01	"First Guess" value of friction factor
10	FLOK = 4.* F10 * FLOVD	Friction flow loss coefficient
	FLOR = (FLINEK + FLOK)/(FLOA**2*288.*	32.2) Combined loss coefficients and other constants in Darcy Equation
	Q = SQRT(DELTAP/FLOR/RHOL)	Volume flow Rate from accumulator, cu ft/s
	RENUM = FLODIA * Q / FLOA / FLONU	Reynolds number
*	RENO = LIMIT(1.0E+5, 3.0E+6, RENUM)	Constrained value of RENUM: 1.0E5<RENUM<3.0E6
*	F1 = AFGEN(FTABL, RENO)	Friction Factor from FTABL
	IF(IRENUM .LE. 1.E+5) GO TO 20	
	IF(ABS((F10-F1)/F10) .LE. 1.E-3) GO TO 20	
	F10 = F1	

A-8

LTR113 50

TABLE A-III (concluded)

LTR 50

```

GO TO 10
* F1 HAS CONVERGED
20 FLOK = 4. * FI * FLOVD
   FLOR = (FLINEK + FLOK) / (FLOA**2*288.0*32.2)
   Q = SQRT(DELTAP / FLOR / RHOL)
ENDPRO

*
VELL = Q / FLOA           Velocity of ECC in RELAP Volume 51, ft/s
W    = Q * RHOL           Mass flowrate from accumulator, lb/s
TGAS = TO * (VGO / VG) ** (GASK - 1.0) - 460.0 Temperature of N2 in accumulator, °F
ZL   = VL / AVES          Height of liquid in accumulator, ft
VLD  = VLO - VL           Volume liquid expelled from accumulator, cu ft
VLDM = VLD * RHOL         Mass liquid expelled from accumulator, lb

* THIS PROCEDURE IS FOR A COLD LEG BREAK LOCA TO CALC LOW PLEN FILL RATE
* AFTER "END OF BYPASS" AS THE FSAR ANALYSIS IS DESCRIBED.
PROCEDURE VFIL = DUMFL(VFILO, Q)
IF(TIME .LT. 9.29) QQ = 0.0
IF(TIME .GT. 9.29) QQ = Q
VFIL = INTGRL(VFILO, QQ)      Dummy name for VFIL
IF(TIME.GT.9.295) VFIL=VFIL1+0.95*(TIME-9.3)
ENDPROCEDURE
VFILM = VFIL * RHOL          Mass of VFIL
PRINT VL, Q, W, VELL, VLD, VLDM, VFIL, VFILM
PRINT VL, Q, W, VLD, VLDM, VELL, DELTAP, RENUM
METHOD SIMP
*
TIMER DELT = .05, FINTIM = 75.0, PRDEL = 0.5
TIMER DELT = 0.05, FINTIM = 40., PRDEL = 0.25
PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0) Initial gas volume in accumulator, cu ft
PREPARE PG, VG, VL, ZL, Q, W, VLD, VLDM, DELTAP, TGAS, ...
      RENUM, VELL, PCL, VFIL, VFILM
FINISH ZL = 0.01
END
STOP

```

OUTPUT VARIABLE SEQUENCE

AVES	PGO	RHOL	TO	GASK	GASCON	FLINEK	FLONU	FLOVOL	FLOA
FLOLG	FLODIA	FLOVD	VVES	VLO	VFIL	VFILO	ZL	PCL	P2
DELTAP	Q	DVL	DVG	VG	DPG	PG	VL	RENUM	VELL
W	TGAS	VLD	VLDM	VFIL	VFILM				

\$\$\$ TRANSLATION TABLE CONTENTS \$\$\$

CURRENT

MAXIMUM

MACRO AND STATEMENT OUTPUTS	43	600
STATEMENT INPUT WORK AREA	83	1900
INTEGRATORS+MEMORY BLOCK OUTPUTS	4 + 0	300
PARAMETERS+FUNCTION GENERATORS	4 + 2	400
STORAGE VARIABLES+INTEGRATOR ARRAYS	0 + 0/2	50
HISTORY AND MEMORY BLOCK NAMES	21	50
MACRO DEFINITIONS AND NESTED MACROS	6	50
MACRO STATEMENT STORAGE	13	125
LITERAL CONSTANT STORAGE	0	100
SORT SECTIONS	2	20
MAXIMUM STATEMENTS IN SECTION	34	600

TABLE A-IV C5MP INPUT (USING MEASURED FLOW DATA)

\$\$\$CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 TRANSLATOR OUTPUT\$\$\$

TITLE ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
TITLE PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

```

INITIAL
VVES = 134.0
AVES = 12.57
PGO = 612.5
RHOL = 62.3
TO = 70.0 + 460.0
GASK = 1.4
GASCON = 0.3832
FLOA = 0.14686
FLOVDK = 99.93
VLO = VVES - VGO
FLOR = FLOVDK / (FLOA * FLOA * 144.0 * 2 * 32.2)
VFIL = 0.0
VFILO = 0.0
DYNAMIC
FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,...
                3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,...
                1000.,20.
DPG = -PG * GASK * DVG / VG
VG = INTGRL(VGO, DVG)
DVG = -DVL
PG = INTGRL(PGO, DPG)
DVL = -Q
VL = INTGRL(VLO, DVL)
Q = SQRT((DELTAP) / (FLOR * RHOL))
W = Q * RHOL
P2 = PG + ((ZL-8.33)*RHOL/144.) - PCL
DELTAP = LIMIT (1.0E-5, 10000., P2)
TGAS = TO * (VGO / VG) ** (GASK - 1.0) - 460.0
ZL = VL / AVES
PCL = AFGEN(PCLTAB, TIME)
VLD = VLO - VL
PROCEDURE VFIL = DUMFL(VFILO, Q)
IF(TIME.LT. 9.29) QQ = 0.0
IF(TIME.GT. 9.29) QQ = Q
VFIL1 = INTGRL(VFILO, QQ)
IF(TIME.GT.9.295) VFIL=VFIL1+0.95*(TIME-9.3)
ENDPROCEDURE
PRINT PG, VG, VL, ZL, Q, W, VFIL, VLD
METHOD SIMP
TIMER DELT = .05, FINTIM = 75.0, PRDEL = 0.5
PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0)
PREPARE PG, VG, VL, ZL, Q, W, VLD, TGAS, VFIL
FINISH ZL = 0.01
END
STOP

```

OUTPUT	VARIABLE	SEQUENCE
AVES	PGO	RHOL
FLOR	VFIL	VFILO
VG	DPG	PG
		VL
	GASK	
	PCL	
	W	
	GASCON	
	P2	
	TGAS	
	VVES	
	DELTAP	
	VLD	
	VLO	
	Q	
	VFIL	
	FLOVDK	
	DVL	
	FLOA	
	DVG	

A-10

LR115 50

TABLE A-V CSMP INPUT

TITLE ACCLUM GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-06DE77

TITLE **Hot** LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL PSAR RUNS + .

```

INITIAL
* VVES = 134.0
  VVES = 126.0
  AVES = 12.57
  PGO = 612.5
  RHOL = 62.3
  TO = 70.0 + 460.0
  GASK = 1.4
  GASCON = 0.3832
  FLOVOL = 1.2349
  FLOA = 0.0668
  FLOLS = FLOVOL / FLOA
  FLODIA = 2.0*(FLOA/3.1416)**0.5
  FLINEK = 14.94
  FLONU = 1.0E-5
  FLOVD = FLOLS / FLODIA
* FLOA = 0.14686
* FLOVDK = 99.93
  VLO = VVES - VGO
  VFIL = 0.0
  VFIL0 = 0.0

DYNAMIC
* PCLTAB: LOWER PLENUM PRESSURE HISTORY FOR LOCA'S.
* FOR COLD LEG BREAK, USE THIS
  FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,...
    3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,...
    1000.,20.
* FOR HOT LEG BREAK, USE THIS
  FUNCTION PCLTAB = 0.,2250., 1.5,625., 1.6,570., 2.,300., ...
    2.25,180., 2.5,120., 2.75,70., 3.,50., 4.5,20., 1000.,20.00
  FUNCTION FTABL = 1.E5,4.5E-3, 2.E5,3.91E-3, 4.E5,3.43E-3, ...
    6.E5,3.19E-3, 8.E5,3.03E-3, 1.E6,2.91E-3, 2.E6,2.59E-3, ...
    3.E6,2.43E-3
  DPG = -PG * GASK * DVG / VG
  VG = INTGRL(VGO, DVG)
  DVG = -DVL
  PG = INTGRL(PGO, DPG)
  DVL = -Q
  VL = INTGRL(VLO, DVL)
  PCL = AFGEN(PCLTAB, TIME)
  P2 = PG + ((ZL-8.33)*RHOL/144.) - PCL
  DELTAP = LIMIT(1.0E-5, 10000.,P2)
* CALCULATE FRICTION LOSSES IN LINE (VOLUME).
  PROCEDURE Q, RENUM = DUMPRO ( FLOA, FLINEK, DELTAP, FTABL )
  F10 = 0.01
  10 FLOK = 4.* F10 + FLOVD
  FLOR = (FLINEK + FLOK)/(FLOA**2*288.*32.2)
  Q = SQRT(DELTAP/FLOR/RHOL)
  RENUM = FLODIA * Q / FLOA / FLONU
  RENO = LIMIT(1.0E+5, 3.0E+6, RENUM)
  F1 = AFGEN(FTABL, RENO)
  IF(RENUM .LE. 1.E+5) GO TO 20
  IF(ABS((F10-F1)/F10) .LE. 1.E-3) GO TO 20
  F10 = F1

```


LTR 113 50.44

OUTPUT	VARIABLE	SEQUENCE							
AVES	PGO	RHOL	TO	GASK	GASCON	FLINEK	FLONU	FLOVDL	FLOA
FLOLG	FLODIA	FLOVD	VVFS	VLO	VFIL	VFILO	ZL	PIL	P2
DELTAP	Q	DVL	DVG	VG	DPG	PG	VL	RENUM	VELL
W	TGAS	VLD	VLDH						

\$\$\$END OF TRANSLATOR OUTPUT\$\$\$

LIB 113

FIGURE A-1 LOFT RELAP MODEL^[a]

[a] FIG. 15-50 RELAP4-EM SYSTEM MODEL (COLD LEG)
FROM REFERENCE 3.

TABLE A-VI CSMP INPUT

\$\$\$CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 TRANSLATOR OUTPUT\$\$\$

LTR 113-50

TITLE LOFT ACC PRESS CALC @ 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.

TITLE HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

INITIAL

```
* VVES = 134.0
* VVES = 126.0
  VVES = 134.0
  AVES = 12.57
* PGO = 612.5
  VGO = 20.0
  RHOL = 62.3
  TO = 70.0 + 460.0
  GASK = 1.4
  GASCON = 0.3832
  FLOVOL = 1.2349
  FLOA = 0.0668
  FLOLG = FLOVOL / FLOA
  FLODIA = 2.0*(FLOA/3.1416)**0.5
  FLINEK = 14.94
  FLONU = 1.0E-5
  FLOVD = FLOLG / FLODIA
* FLOA = 0.14686
* FLOVDK = 99.93
  VLO = VVES - VGO
  VFIL = 0.0
  VFIL0 = 0.0
```

DYNAMIC

```
* PCLTAB: LOWER PLENUM PRESSURE HISTORY FOR LOCA'S.
* FOR COLD LEG BREAK, USE THIS
* FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,...
*                 3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,...
*                 1000.,20.
* FOR HOT LEG BREAK, USE THIS
* FUNCTION PCLTAB = 0.,2250., 1.5,625., 1.6,570., 2.,300., ...
*                 2.25,180., 2.5,120., 2.75,70., 3.,50., 4.5,20., 1000.,20.00
* FRICTION FACTOR TABLE = "FTABL"
* FUNCTION FTABL = 1.E5,4.5E-3, 2.E5,3.91E-3, 4.E5,3.43E-3, ...
*                 6.E5,3.19E-3, 8.E5,3.03E-3, 1.E6,2.91E-3, 2.E6,2.59E-3, ...
*                 3.E6,2.43E-3
  DPG = -PG * GASK * DVG / VG
  VG = INTGRL(VGO, DVG)
  DVG = -DVL
  PG = INTGRL(PGO, DPG)
  DVL = -Q
  VL = INTGRL(VLO, DVL)
  PCL = AFGEN(PCLTAB, TIME)
  P2 = PG + ((ZL-8.33)*RHOL/144.) - PCL
  DELTAP = LIMIT(1.0E-5, 10000.,P2)
* CALCULATE FRICTION LOSSES IN LINE (VOLUME).
  PROCEDURE Q, RENUM = DUMPRO ( FLOA, FLINEK, DELTAP, FTABL )
  F10 = 0.01
10 FLOK = 4.* F10 * FLOVD
  FLOR = (FLINEK + FLOK)/(FLOA**2*288.*32.2)
  Q = SQRT(DELTAP/FLOR/RHOL)
  RENUM = FLODIA * Q / FLOA / FLONU
*
  RENO = LIMIT(1.0E+5, 3.0E+6, RENUM)
  F1 = AFGEN(FTABL, RENO)
*
```

A-14

TABLE A-VI (Concl.)

LTR 3-50

```

IF(RENUM .LE. 1.E+5) GO TO 20
IF(ABS((F10-F1)/F10) .LE. 1.E-3) GO TO 20
F10 = F1
GO TO 10
* F1 HAS CONVERGED
20 FLOK = 4. * F1 * FLOVD
FLOK = (FLINEK + FLOK) / (FLOA**2*288.0*32.2)
Q = SQRT(DELTA / FLOK / RHOL)
ENDPRO

*
VELL = Q / FLOA
W = Q * RHOL
TGAS = TO * (VGO / VG) ** (GASK - 1.0) - 460.0
ZL = VL / AVES
VLD = VLO - VL
VLDM = VLD * RHOL

* THIS PROCEDURE IS FOR A COLD LEG BREAK LOCA TO CALC LOW PLEN FILL RATE
* AFTER "END OF BYPASS" AS THE FSAR ANALYSIS IS DESCRIBED.
* PROCEDURE VFIL = DUMFL( VFILO, Q )
* IF(TIME .LT. 9.29) QQ = 0.0
* IF(TIME .GT. 9.29) QQ = Q
* VFILL = INTGRL(VFILO, QQ)
* IF(TIME.GT.9.295) VFIL=VFILL+0.95*(TIME-9.3)
* ENDPROCEDURE
* VFILM = VFIL * RHOL
* PRINT VL, Q, W, VELL, VLD, VLDM, VFIL, VFILM
* PRINT VL,Q,W,VLD,VLDM,VELL, DELTAP, RENUM
* METHOD SIMP
* TIMER DELT = .05, FINTIM = 75.0, PRDEL = 0.5
* TIMER DELT = 0.05, FINTIM = 40., PRDEL = 0.25
* TIMER DELT = 0.05, FINTIM = 200., PRDEL = 0.25
* PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0)
* PARAMETER PGO = (562.5, 537.5)
* PREPARE PG, VG, VL, ZL, Q, W, VLD,VLDM, DELTAP, TGAS, ...
* RENUM, VELL, PCL
* FINISH ZL = 0.01
END
STOP

```

OUTPUT	VARIABLE	SEQUENCE
AVES	RHOL	TO
FLODIA	FLOVD	VVES
DELTA	Q	DVL
W	TGAS	VLD
		VLDM
	GASCON	FLINEK
	FLOU	FLOVOL
	FLOA	FLOLG
	ZL	PCL
	RENUM	VELL

PG
VG
VL
VLD

Plot 1
PG-VG, VL, VLD
Sec = Q

Plot 2

SEC - W
PG, DELTAP, PCL

Plot 3
VLDM, TGAS, VELL
7000 - 212
20
2.5

APPENDIX B

LOFT REFLOOD AS A FUNCTION OF
ACCUMULATOR GAS VOLUME

CSMP Output Listing and Plots for Cold Leg LOCA

```

A A A A A A A A A A
A A A A A A A A A A
A A                A A
A A                A A
A A                A A
A A A A A A A A A A
A A A A A A A A A A
A A                A A
A A                A A
A A                A A
A A                A A
A A                A A

```

LOFT COLD LEG LOCA (CONCO=1.0)
USING RELAP FLOW PARAMETERS


```

//HFRNEBFA (D,52191-200-200,3510,X06740,N2BUBE),H.F.RHODES,
// TIME=003,CLASS=L,PRTY=03 COR=150,CPU=003,WT=000
//CSMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCDS,
// PREDECK='SYS2.',
// PRELOAD='SYS2.',STEPLIB=CSMPLOD3,SYSLIB=CSMPLOD3,
// SYSLINK=CSMPDCK3,VSY=DSKRES
//X EXEC PGM=DEJCSMP2,REGION=128K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
//CSMPLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=SHR,DSN=ELIBRARY 00000050
//FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=ELSYSIN, 00000060
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=800) 00000070
//FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
//FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
//FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
//FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
// DCB=(RECFM=VS,BLKSIZE=444) 00000140
//FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
//GO.FT15F001 DD DSN=LOFTACCU.N2MINVOL.CLDLLOCA,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=(SHR,PASS), 00000170
// DSN=PRELOAD&STEPLIB 00000180
//SYSLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=SHR,DSN=PRELOAD&SYSLIB 00000190
// DD DISP=SHR,DSN=SYS1.FORTLIB 00000200
//SYSLIN DD UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800 00000210
//SYSLINK DD UNIT=SYSDA,VOL=REF=*.SYSLIN,DISP=(OLD,PASS),DSN=*.SYSLIN 00000220
// DD UNIT=SDSYS,VOL=SER=VSYS,DISP=SHR, 00000230
// DSN=PREDECK&SYSLINK.(ELINKMEM) 00000240
//SYSLMOD DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=ENOSSET(DEJEXE) 00000250
//SYSUT1 DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(40,10)) 00000270
//FT03F001 DD SYSOUT=A 00000280
//FT08F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000290
//COMPRINT DD SYSOUT=A 00000300
//SYSPRINT DD SYSOUT=A 00000310
//FT06F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000320
// PEND CSMPX 00000330
// EXEC CSMPX
++CSMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCDS,
++ PREDECK='SYS2.',
++ PRELOAD='SYS2.',STEPLIB=CSMPLOD3,SYSLIB=CSMPLOD3,
++ SYSLINK=CSMPDCK3,VSY=DSKRES
++X EXEC PGM=DEJCSMP2,REGION=128K,
++ PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
++CSMPLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=SHR,DSN=ELIBRARY 00000050
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLIB3
++FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=ELSYSIN, 00000060
++ DCB=(RECFM=FB,LRECL=80,BLKSIZE=800) 00000070
++FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
++FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
++FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
++FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
++ DCB=(RECFM=VS,BLKSIZE=444) 00000140
++FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
++GO.FT15F001 DD DSN=LOFTACCU.N2MINVOL.CLDLLOCA,
++ DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
++ UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD DSN=SYS2.CSMPLIB3,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL
//STEPLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=(SHR,PASS), 00000170
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=(SHR,PASS),
++ DSN=PRELOAD&STEPLIB 00000180
IEF653I SUBSTITUTION JCL - DSN=SYS2.CSMPLIB3
//SYSLIB DD DSN=SYS2.CSMPLIB3,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL
//SYSLIB DD UNIT=SDSYS,VOL=SER=VSYS,DISP=SHR,DSN=PRELOAD&SYSLIB 00000190

```

DSKRES

SVS2.

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```

IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLJ03
++          DD DISP=SHR,DSN=SYS1.FORTLIB          00000200
++SYSLINK   DD UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800      00000210
++SYSLINK   DD UNIT=SYSDA,VOL=REF=*.SYSLINK,DISP=(OLD,PASS),DSN=*.SYSLINK 00000220
++          DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR,          00000230
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,
++          DSN=&PREDECK&SYSLINK.(&LINKMEM)          00000240
IEF653I SUBSTITUTION JCL - DSN=SYS2.CSMPOCK3(CTLCD5)
++SYSLMOD   DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=&&NOSET(DEJEXE) 00000250
++SYSUT1    DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(40,10)) 00000270
++FT03F001  DD SYSJUT=A          00000280
++FT08F001  DD SYSJUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)      00000290
++COMPRINT  DD SYSJUT=A          00000300
++SYSPRINT  DD SYSJUT=A          00000310
++FT06F001  DD SYSJUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)      00000320
//X.SYSIN    DD DSN=SYS77353.T123456.I0007.HFRNEBFA.S0000010,
// VOL=SER=(SPOL31),DISP=(OLD,DELETE),UNIT=DKSPOL
//

```

```

IEF236I ALLOC. FOR HFRNEBFA X
IEF237I 237 ALLOCATED TO CSMPLIB
IEF237I 231 ALLOCATED TO FT01F001
IEF237I 135 ALLOCATED TO FT02F001
IEF237I 230 ALLOCATED TO FT05F001
IEF237I 130 ALLOCATED TO FT07F001
IEF237I 231 ALLOCATED TO FT13F001
IEF237I 130 ALLOCATED TO FT14F001
IEF237I 000 ALLOCATED TO FT15F001
IEF237I 356 ALLOCATED TO STEPLIB
IEF237I 356 ALLOCATED TO SYSLIB
IEF237I 137 ALLOCATED TO
IEF237I 230 ALLOCATED TO SYSLIN
IEF237I 230 ALLOCATED TO SYSLINK
IEF237I 237 ALLOCATED TO
IEF237I 131 ALLOCATED TO SYSLMOD
IEF237I 231 ALLOCATED TO SYSUT1
IEF237I 354 ALLOCATED TO FT03F001
IEF237I 136 ALLOCATED TO FT08F001
IEF237I 235 ALLOCATED TO COMPRINT
IEF237I 354 ALLOCATED TO SYSPRINT
IEF237I 135 ALLOCATED TO FT06F001
IEF237I 354 ALLOCATED TO SYSIN

```

\$\$\$END OF TRANSLATOR OUTPUT\$\$\$

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```

0001      BLOCK DATA
0002      COMMON/ZZF0AT/F( 98)
          1 /ZZHIST/KEEP,NALARM,IZ0000,IZ0001,H( 11)
          2 /ZZISTC/I( 20)
0003      COMMON/ZZPGIN/NP(16)
0004      INTEGER NP/ 4, 20, 15, 27, 27, 29, 55, 55
          1, 54, 54, 11, 3, 98, 0, 1, 4/
0005      COMMON/ZZSYMB/SII( 41)
0006      REAL*8 SII/
          1,'TIMEDELT',' ZZDELT','DELMINZZ','DELNFINT','IMZZFINT','PRDEL ZZ'
          1,'PRDEOUTD','ELZZOUTD','DELMAXZZ','DELXVG ',' PG ','VL VF'
          1,'ILI DVG ',' DPG ','DVL QQ',' VGO ',' PG0 ','VLO VF'
          1,'ILO FTAB','L PCLTAB','AVES DE','LTAPFLIN','EKFLOA ','FLODIAFL'
          1,'OLG FLON','U FLOVD ','FLOVDLGA','SCONGASK',' PCL ','P2 Q'
          1,' RENU','M RHOL ','TGAS TO',' VELL',' VFIL ','VFILM VL'
          1,'D VLDM',' VVES ','W ZL',' '
          1/
0007      END

```

OPTIONS IN EFFECT NOID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
OPTIONS IN EFFECT NAME = BLK DATA, LINECNT = 58
STATISTICS NO DIAGNOSTICS GENERATED

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LIRI13 50

Line	Code	Statement	Comment
0001		SUBROUTINE UPDATE	
0002		COMMON TIME	
		1,ZZ0000,DELT ,ZZDELT,DELMIN,ZZDELN,FINTIM,ZZFINT,PRDEL ,ZZPRDE	CSMPDECK
		1,OUTDEL,ZZOUTD,DELMAX,ZZDELX,VG ,PG ,VL ,VFIL1 ,DVG	CSMPDECK
		1,DPG ,DVL ,QQ ,VGO ,PGO ,VLO ,VFILO ,FTABL ,PCLTAB	CSMPDECK
		1,AVES ,DELTAP,FLINEK,FLOA ,FLODIA,FLOLG ,FLONU ,FLOVD ,FLOVOL	CSMPDECK
		1,GASCON,GASK ,PCL ,P2 ,Q ,RENUM ,RHOL ,TGAS ,TO	CSMPDECK
		1,VELL ,VFIL ,VFILM ,VLD ,VLDM ,VVES ,W ,ZL	CSMPDECK
		COMMON/ZZHIST/KEEP,NALARM,IZ0000,IZ0001	CSMPDECK
0003		REAL LIMIT	CSMPDECK
0004		REAL*8 ZZTIME	CSMPDECK
0005		EQUIVALENCE(ZZTIME,TIME)	CSMPDECK
0006		GO TO(39995,39996,39997,39998),IZ0000	CSMPDECK
0007	C	SYSTEM SEGMENT OF MODEL	CSMPDECK
0008		39995 CONTINUE	CSMPDECK
0009		GO TO 39999	CSMPDECK
	C	INITIAL SEGMENT OF MODEL	CSMPDECK
0010		39996 CONTINUE	CSMPDECK
0011		AVES=12.57	CSMPDECK
0012		PGO=612.5	CSMPDECK
0013		RHOL=62.3	CSMPDECK
0014		TO=70.0+460.0	CSMPDECK
0015		GASK=1.4	CSMPDECK
0016		GASCON=0.3832	CSMPDECK
0017		FLINEK=14.94	CSMPDECK
0018		FLONU=1.0E-5	CSMPDECK
0019		FLOVOL=1.2349	CSMPDECK
0020		FLOA=0.0668	CSMPDECK
0021		FLOLG=FLOVOL/FLOA	CSMPDECK
0022		FLODIA=2.0*(FLOA/3.1416)**0.5	CSMPDECK
0023		FLOYD=FLOLG/FLODIA	CSMPDECK
0024		VVES=126.0	CSMPDECK
0025		VLO=VVES-VGO	CSMPDECK
0026		VFIL=0.0	CSMPDECK
0027		VFILO=0.0	CSMPDECK
0028		GO TO 39999	CSMPDECK
	C	DYNAMIC SEGMENT OF MODEL	CSMPDECK
0029		39997 CONTINUE	CSMPDECK
0030		ZL=VL/AVES	CSMPDECK
0031		PCL=AFGEN(1,PCLTAB,TIME)	CSMPDECK
0032		P2=PG+((ZL-8.33)*RHOL/144.))-PCL	CSMPDECK
0033		DELTAP=LIMIT(1.0E-5,10000.,P2)	CSMPDECK
0034		F10=0.01	CSMPDECK
0035	10	FLOK=4.*F10*FLOYD	CSMPDECK
0036		FLOR=(FLINEK+FLOK)/(FLOA**2*288.*32.2)	CSMPDECK
0037		Q=SQRT(DELTAP/FLOR/RHOL)	CSMPDECK
0038		RENUM=FLODIA*Q/FLOA/FLONU	CSMPDECK
0039		RENO=LIMIT(1.0E+5,3.0E+6,RENUM)	CSMPDECK
0040		F1=AFGEN(6,FTABL,RENO)	CSMPDECK
0041		IF(RENUM.LE.1.E+5)GO TO 20	CSMPDECK
0042		IF(ABS((F10-F1)/F10).LE.1.E-3)GO TO 20	CSMPDECK
0043		F10=F1	CSMPDECK
0044		GO TO 10	CSMPDECK
0045	20	FLOK=4.*F1*FLOYD	CSMPDECK
0046		FLOR=(FLINEK+FLOK)/(FLOA**2*288.0*32.2)	CSMPDECK
0047		Q=SQRT(DELTAP/FLOR/RHOL)	CSMPDECK

[illegible]

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0048		DVL=-Q				CSMPDECK
0049		DVG=-DVL				CSMPDECK
	C	VG	=INTGRL	(VG0	,DVG	CSMPDECK
0050		DPG=-PG*GASK*DVG/VG				CSMPDECK
	C	PG	=INTGRL	(PG0	,DPG	CSMPDECK
	C	VL	=INTGRL	(VLO	,DVL	CSMPDECK
0051		VELL=Q/FLQA				CSMPDECK
0052		W=Q*RHOL				CSMPDECK
0053		TGAS=TO*(VG0/VG)**(GASK-1.0)-460.0				CSMPDECK
0054		VLD=VLO-VL				CSMPDECK
0055		VLOM=VLD*RHOL				CSMPDECK
0056		IF(TIME.LT.9.29)QQ=0.0				CSMPDECK
0057		IF(TIME.GT.9.29)QQ=Q				CSMPDECK
	C	VFIL1	=INTGRL	(VFILO	,QQ	CSMPDECK
0058		IF(TIME.GT.9.295)VFIL=VFIL1+0.95*(TIME-9.3)				CSMPDECK
0059		VFILM=VFIL*RHOL				CSMPDECK
0060		GO TO 39999				CSMPDECK
	C	TERMINAL SEGMENT OF MODEL				CSMPDECK
0061		39998 CONTINUE				CSMPDECK
0062		39999 CONTINUE				CSMPDECK
0063		RETURN				CSMPDECK
0064		END				CSMPDECK

OPTIONS IN EFFECT NOID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
OPTIONS IN EFFECT NAME = UPDATE , LINECNT = 58
STATISTICS SOURCE STATEMENTS = 64,PROGRAM SIZE = 1410
STATISTICS NO DIAGNOSTICS GENERATED

STATISTICS NO DIAGNOSTICS THIS STEP

F88-LEVEL LINKAGE EDITOR OPTIONS SPECIFIED OVLY,SIZE=(120K,12K)
VARIABLE OPTIONS USED - SIZE=(122880,12288)

LTR

50

****DEJEHE DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET

B-9

LIR 13 50

TITLE ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REGMTS. HFR-16DE77
 TITLE COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,...
 3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,...
 1000.,20.

FUNCTION FTABL = 1.E5,4.5E-3, 2.E5,3.91E-3, 4.E5,3.43E-3, ...
 6.E5,3.19E-3, 8.E5,3.03E-3, 1.E6,2.91E-3, 2.E6,2.59E-3, ...
 3.E6,2.43E-3

PRINT VL, Q, W, VELL, VLD, VLDM, VFIL, VFILM

METHOD SIMP

TIMER DELT = 0.05, FINTIM = 40., PRDEL = 0.25

PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0)

PREPARE PG, VG, VL, ZL, Q, W, VLD,VLDM, DELTAP, TEAS, ...

RENUM, VELL, PCL, VFIL,VFILM

FINISH ZL = 0.01

END

TIMER VARIABLES		SIMP	INTEGRATION		START TIME = 0.0	
DELT	DELMIN	FINTIM	PRDEL	OUTDEL	DELMAX	
5.000000D-02	4.000000D-06	40.000	0.25000	0.25000	0.25000	

ACCUM GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 50.000

TIME	VL	Q	W	VELL	VLD	VLDL	VFIL	VFILM
0.0	76.000	6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	76.000	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	76.000	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	75.999	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	75.999	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	75.999	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	75.999	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	75.826	1.7442	108.66	26.110	0.17366	10.819	0.0	0.0
2.000000	75.243	2.8295	176.28	42.358	0.75691	47.156	0.0	0.0
2.250000	74.480	3.2666	203.51	48.901	1.5204	94.724	0.0	0.0
2.500000	73.615	3.6456	227.12	54.575	2.3855	148.62	0.0	0.0
2.750000	72.677	3.8501	239.86	57.636	3.3227	207.01	0.0	0.0
3.000000	71.690	4.0437	251.92	60.534	4.3097	268.49	0.0	0.0
3.250000	70.669	4.1269	257.11	61.780	5.3310	332.12	0.0	0.0
3.500000	69.627	4.2103	262.30	63.028	6.3732	397.05	0.0	0.0
3.750000	68.578	4.1811	260.48	62.591	7.4221	462.40	0.0	0.0
4.000000	67.536	4.1550	258.86	62.201	8.4641	527.31	0.0	0.0
4.250000	66.502	4.1169	256.48	61.630	9.4981	591.73	0.0	0.0
4.500000	65.477	4.0815	254.28	61.100	10.523	655.57	0.0	0.0
4.750000	64.461	4.0486	252.23	60.608	11.539	718.88	0.0	0.0
5.000000	63.453	4.0181	250.33	60.151	12.547	781.70	0.0	0.0
5.250000	62.452	3.9899	248.57	59.729	13.548	844.06	0.0	0.0
5.500000	61.457	3.9638	246.94	59.338	14.543	906.00	0.0	0.0
5.750000	60.470	3.9396	245.44	58.976	15.530	967.55	0.0	0.0
6.000000	59.487	3.9173	244.05	58.643	16.513	1028.7	0.0	0.0
6.250000	58.511	3.8969	242.77	58.336	17.489	1089.6	0.0	0.0
6.500000	57.539	3.8780	241.60	58.054	18.461	1150.1	0.0	0.0
6.750000	56.571	3.8608	240.53	57.796	19.429	1210.4	0.0	0.0
7.000000	55.608	3.8450	239.55	57.561	20.392	1270.4	0.0	0.0
7.250000	54.649	3.8284	238.51	57.312	21.351	1330.2	0.0	0.0
7.500000	53.694	3.8131	237.56	57.083	22.306	1389.7	0.0	0.0
7.750000	52.743	3.7851	235.81	56.663	23.257	1448.9	0.0	0.0
8.000000	51.802	3.7489	233.56	56.121	24.198	1507.6	0.0	0.0
8.250000	50.869	3.7138	231.37	55.595	25.131	1565.7	0.0	0.0
8.500000	49.945	3.6796	229.24	55.084	26.055	1623.3	0.0	0.0
8.750000	49.029	3.6465	227.18	54.588	26.971	1680.3	0.0	0.0
9.000000	48.121	3.6143	225.17	54.106	27.879	1736.9	0.0	0.0
9.250000	47.221	3.5829	223.22	53.637	28.779	1792.9	0.0	0.0
9.500000	46.329	3.5525	221.32	53.180	29.671	1848.5	0.93272	58.108
9.750000	45.445	3.5228	219.47	52.736	30.555	1903.6	2.0546	128.00
10.0000	44.568	3.4938	217.67	52.303	31.432	1958.2	3.1692	197.44
10.2500	43.698	3.4657	215.91	51.881	32.302	2012.4	4.2766	266.43
10.5000	42.835	3.4382	214.20	51.470	33.165	2066.2	5.3770	334.99
10.7500	41.979	3.4114	212.53	51.068	34.021	2119.5	6.4707	403.13
11.0000	41.129	3.3852	210.90	50.676	34.871	2172.4	7.5578	470.85
11.2500	40.286	3.3596	209.31	50.294	35.714	2225.0	8.6384	538.17
11.5000	39.449	3.3347	207.75	49.920	36.551	2277.1	9.7126	605.10
11.7500	38.619	3.3103	206.23	49.555	37.381	2328.9	10.781	671.64
12.0000	37.794	3.2864	204.74	49.198	38.206	2380.2	11.843	737.81
12.2500	36.975	3.2631	203.29	48.849	39.025	2431.2	12.899	803.61
12.5000	36.162	3.2403	201.87	48.507	39.838	2481.9	13.949	869.05
12.7500	35.355	3.2180	200.48	48.173	40.645	2532.2	14.994	934.14
13.0000	34.553	3.1961	199.12	47.846	41.447	2582.1	16.033	998.88
13.2500	33.757	3.1747	197.78	47.525	42.243	2631.7	17.067	1063.3

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 50.000

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
13.5000	32.966	3.1537	196.48	47.211	43.034	2681.0	18.096	1127.4
13.7500	32.180	3.1332	195.20	46.904	43.820	2730.0	19.119	1191.1
14.0000	31.399	3.1130	193.94	46.602	44.601	2778.6	20.137	1254.6
14.2500	30.623	3.0933	192.71	46.306	45.377	2827.0	21.151	1317.7
14.5000	29.852	3.0739	191.50	46.016	46.148	2875.0	22.159	1380.5
14.7500	29.086	3.0549	190.32	45.732	46.914	2922.7	23.163	1443.0
15.0000	28.325	3.0362	189.16	45.452	47.675	2970.2	24.161	1505.3
15.2500	27.568	3.0179	188.01	45.178	48.432	3017.3	25.156	1567.2
15.5000	26.816	2.9999	186.89	44.909	49.184	3064.2	26.145	1628.9
15.7500	26.068	2.9823	185.79	44.645	49.932	3110.8	27.131	1690.2
16.0000	25.325	2.9649	184.71	44.385	50.675	3157.1	28.111	1751.3
16.2500	24.586	2.9479	183.65	44.130	51.414	3203.1	29.088	1812.2
16.5000	23.851	2.9311	182.61	43.879	52.149	3248.9	30.060	1872.8
16.7500	23.120	2.9146	181.58	43.632	52.880	3294.4	31.028	1933.1
17.0000	22.393	2.8984	180.57	43.390	53.607	3339.7	31.992	1993.1
17.2500	21.671	2.8825	179.58	43.151	54.329	3384.7	32.953	2052.9
17.5000	20.952	2.8668	178.60	42.917	55.048	3429.5	33.909	2112.5
17.7500	20.237	2.8514	177.64	42.686	55.763	3474.0	34.861	2171.8
18.0000	19.526	2.8362	176.70	42.459	56.474	3518.3	35.809	2230.9
18.2500	18.819	2.8213	175.77	42.235	57.181	3562.4	36.754	2289.8
18.5000	18.115	2.8066	174.85	42.015	57.885	3606.2	37.695	2348.4
18.7500	17.416	2.7921	173.95	41.798	58.584	3649.8	38.632	2406.8
19.0000	16.719	2.7779	173.06	41.585	59.281	3693.2	39.566	2465.0
19.2500	16.027	2.7638	172.19	41.375	59.973	3736.3	40.496	2522.9
19.5000	15.337	2.7500	171.32	41.167	60.663	3779.3	41.423	2580.6
19.7500	14.651	2.7364	170.48	40.963	61.348	3822.0	42.346	2638.2
20.0000	13.969	2.7229	169.64	40.762	62.031	3864.5	43.266	2695.5
20.2500	13.290	2.7097	168.81	40.564	62.710	3906.8	44.182	2752.6
20.5000	12.614	2.6966	168.00	40.369	63.386	3948.9	45.096	2809.5
20.7500	11.942	2.6838	167.20	40.176	64.058	3990.8	46.006	2866.2
21.0000	11.272	2.6711	166.41	39.986	64.728	4032.5	46.912	2922.6
21.2500	10.606	2.6585	165.63	39.798	65.394	4074.0	47.816	2978.9
21.5000	9.9430	2.6462	164.86	39.614	66.057	4115.3	48.717	3035.0
21.7500	9.2830	2.6340	164.10	39.431	66.717	4156.5	49.614	3091.0
22.0000	8.6260	2.6220	163.35	39.251	67.374	4197.4	50.509	3146.7
22.2500	7.9720	2.6101	162.61	39.074	68.028	4238.1	51.400	3202.2
22.5000	7.3209	2.5984	161.88	38.898	68.679	4278.7	52.289	3257.6
22.7500	6.6728	2.5869	161.16	38.725	69.327	4319.1	53.174	3312.8
23.0000	6.0275	2.5754	160.45	38.555	69.972	4359.3	54.057	3367.7
23.2500	5.3851	2.5642	159.75	38.386	70.615	4399.3	54.937	3422.6
23.5000	4.7454	2.5531	159.06	38.219	71.255	4439.2	55.814	3477.2
23.7500	4.1085	2.5421	158.37	38.055	71.891	4478.8	56.688	3531.7
24.0000	3.4744	2.5312	157.69	37.892	72.526	4518.3	57.560	3586.0
24.2500	2.8429	2.5205	157.03	37.732	73.157	4557.7	58.429	3640.1
24.5000	2.2141	2.5099	156.37	37.573	73.786	4596.9	59.295	3694.1
24.7500	1.5879	2.4994	155.71	37.417	74.412	4635.9	60.159	3747.9
25.0000	0.96437	2.4891	155.07	37.262	75.036	4674.7	61.020	3801.5
25.2500	0.34338	2.4789	154.43	37.109	75.657	4713.4	61.878	3855.0
25.3500	9.56924E-02	2.4748	154.18	37.048	75.904	4728.8	62.221	3876.4

B-12

LTR113 50 M

\$\$\$ SIMUL HALTED FOR FINISH CONDITION 2L

7.61276E-03

LTI 150

LRI13 50

B-13

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

LTR113 50.3

VGO = 40.000

TIME	VL	Q	W	VELL	VLD	VLDM	VFIL	VFILM
0.0	86.000	6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	86.000	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	86.000	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	85.999	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	85.999	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	85.999	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	85.999	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	85.826	1.7394	108.36	26.038	0.17393	10.836	0.0	0.0
2.000000	85.246	2.8091	175.00	42.052	0.75397	46.972	0.0	0.0
2.250000	84.490	3.2307	201.27	48.364	1.5104	94.099	0.0	0.0
2.500000	83.635	3.5968	224.08	53.844	2.3648	147.33	0.0	0.0
2.750000	82.712	3.7885	236.02	56.713	3.2882	204.86	0.0	0.0
3.000000	81.742	3.9712	247.41	59.450	4.2584	265.30	0.0	0.0
3.250000	80.740	4.0436	251.91	60.532	5.2602	327.71	0.0	0.0
3.500000	79.720	4.1176	256.52	61.640	6.2804	391.27	0.0	0.0
3.750000	78.695	4.0779	254.05	61.046	7.3047	455.08	0.0	0.0
4.000000	77.680	4.0425	251.85	60.517	8.3197	518.32	0.0	0.0
4.250000	76.676	3.9957	248.93	59.816	9.3245	580.91	0.0	0.0
4.500000	75.682	3.9526	246.25	59.171	10.318	642.81	0.0	0.0
4.750000	74.699	3.9128	243.77	58.575	11.301	704.06	0.0	0.0
5.000000	73.725	3.8762	241.49	58.027	12.275	764.72	0.0	0.0
5.250000	72.760	3.8425	239.39	57.522	13.240	824.82	0.0	0.0
5.500000	71.804	3.8115	237.45	57.058	14.196	884.43	0.0	0.0
5.750000	70.854	3.7830	235.68	56.631	15.146	943.57	0.0	0.0
6.000000	69.912	3.7569	234.05	56.241	16.088	1002.3	0.0	0.0
6.250000	68.976	3.7330	232.57	55.883	17.024	1060.6	0.0	0.0
6.500000	68.045	3.7112	231.21	55.557	17.955	1118.6	0.0	0.0
6.750000	67.120	3.6913	229.97	55.260	18.880	1176.2	0.0	0.0
7.000000	66.199	3.6733	228.85	54.990	19.801	1233.6	0.0	0.0
7.250000	65.283	3.6546	227.68	54.710	20.717	1290.6	0.0	0.0
7.500000	64.372	3.6376	226.62	54.455	21.628	1347.4	0.0	0.0
7.750000	63.465	3.6074	224.74	54.002	22.535	1403.9	0.0	0.0
8.000000	62.568	3.5687	222.33	53.424	23.432	1459.8	0.0	0.0
8.250000	61.681	3.5313	220.00	52.864	24.319	1515.1	0.0	0.0
8.500000	60.803	3.4952	217.75	52.323	25.197	1569.8	0.0	0.0
8.750000	59.933	3.4602	215.57	51.799	26.067	1624.0	0.0	0.0
9.000000	59.072	3.4262	213.46	51.291	26.928	1677.6	0.0	0.0
9.250000	58.220	3.3933	211.41	50.799	27.780	1730.7	0.0	0.0
9.500000	57.376	3.3614	209.42	50.321	28.624	1783.3	0.89304	55.637
9.750000	56.539	3.3304	207.48	49.856	29.461	1835.4	1.9670	122.54
10.0000	55.710	3.3003	205.61	49.405	30.290	1887.1	3.0333	188.98
10.2500	54.889	3.2710	203.78	48.967	31.111	1938.2	4.0922	254.94
10.5000	54.075	3.2425	202.01	48.540	31.925	1989.0	5.1439	320.46
10.7500	53.267	3.2147	200.28	48.125	32.733	2039.2	6.1885	385.54
11.0000	52.467	3.1877	198.59	47.720	33.533	2089.1	7.2263	450.20
11.2500	51.673	3.1614	196.95	47.326	34.327	2138.5	8.2574	514.44
11.5000	50.886	3.1357	195.35	46.942	35.114	2187.6	9.2820	578.27
11.7500	50.105	3.1107	193.80	46.567	35.895	2236.2	10.300	641.71
12.0000	49.331	3.0863	192.27	46.201	36.669	2284.5	11.312	704.76
12.2500	48.562	3.0624	190.79	45.844	37.438	2332.4	12.318	767.44
12.5000	47.800	3.0391	189.34	45.496	38.200	2379.9	13.319	829.75
12.7500	47.043	3.0164	187.92	45.155	38.957	2427.0	14.313	891.70
13.0000	46.291	2.9941	186.53	44.822	39.709	2473.9	15.302	953.31
13.2500	45.545	2.9724	185.18	44.497	40.455	2520.3	16.285	1014.6

LTR113 50.3

B-14

ACCUM M COLD VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

LTR 1 50.0

VGO = 40.000

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
13.5000	44.805	2.9511	183.85	44.178	41.195	2566.4	17.263	1075.5
13.7500	44.070	2.9303	182.56	43.867	41.930	2612.3	18.236	1136.1
14.0000	43.340	2.9099	181.29	43.562	42.660	2657.7	19.203	1196.4
14.2500	42.615	2.8900	180.04	43.263	43.385	2702.9	20.166	1256.3
14.5000	41.895	2.8704	178.83	42.970	44.105	2747.8	21.123	1316.0
14.7500	41.179	2.8513	177.63	42.684	44.821	2792.3	22.076	1375.3
15.0000	40.469	2.8325	176.46	42.402	45.531	2836.6	23.024	1434.4
15.2500	39.763	2.8141	175.32	42.127	46.237	2880.6	23.967	1493.2
15.5000	39.062	2.7960	174.19	41.857	46.938	2924.3	24.906	1551.6
15.7500	38.365	2.7783	173.09	41.592	47.635	2967.7	25.840	1609.8
16.0000	37.672	2.7609	172.01	41.332	48.328	3010.8	26.770	1667.8
16.2500	36.984	2.7439	170.94	41.076	49.016	3053.7	27.695	1725.4
16.5000	36.300	2.7271	169.90	40.826	49.700	3096.3	28.617	1782.8
16.7500	35.621	2.7107	168.88	40.579	50.379	3138.6	29.534	1840.0
17.0000	34.945	2.6945	167.87	40.337	51.055	3180.7	30.447	1896.9
17.2500	34.273	2.6787	166.88	40.100	51.727	3222.6	31.356	1953.5
17.5000	33.606	2.6631	165.91	39.866	52.394	3264.2	32.261	2009.9
17.7500	32.942	2.6477	164.95	39.637	53.058	3305.5	33.163	2066.0
18.0000	32.282	2.6327	164.01	39.411	53.718	3346.7	34.060	2122.0
18.2500	31.625	2.6178	163.09	39.189	54.375	3387.5	34.954	2177.6
18.5000	30.973	2.6032	162.18	38.971	55.027	3428.2	35.844	2233.1
18.7500	30.324	2.5889	161.29	38.756	55.676	3468.6	36.731	2288.3
19.0000	29.678	2.5748	160.41	38.545	56.322	3508.9	37.614	2343.3
19.2500	29.036	2.5609	159.54	38.337	56.964	3548.9	38.493	2398.1
19.5000	28.398	2.5472	158.69	38.132	57.602	3588.6	39.369	2452.7
19.7500	27.762	2.5337	157.85	37.930	58.238	3628.2	40.241	2507.0
20.0000	27.131	2.5205	157.02	37.731	58.869	3667.6	41.111	2561.2
20.2500	26.502	2.5074	156.21	37.536	59.498	3706.7	41.977	2615.1
20.5000	25.877	2.4945	155.41	37.343	60.123	3745.7	42.839	2668.9
20.7500	25.255	2.4818	154.62	37.153	60.745	3784.4	43.699	2722.4
21.0000	24.636	2.4693	153.84	36.966	61.364	3823.0	44.555	2775.8
21.2500	24.020	2.4570	153.07	36.782	61.980	3861.4	45.408	2828.9
21.5000	23.407	2.4449	152.32	36.600	62.593	3899.5	46.259	2881.9
21.7500	22.797	2.4329	151.57	36.421	63.203	3937.5	47.106	2934.7
22.0000	22.191	2.4211	150.83	36.244	63.809	3975.3	47.950	2987.3
22.2500	21.587	2.4094	150.11	36.069	64.413	4012.9	48.791	3039.7
22.5000	20.986	2.3979	149.39	35.897	65.014	4050.4	49.630	3091.9
22.7500	20.388	2.3866	148.69	35.728	65.612	4087.6	50.465	3144.0
23.0000	19.792	2.3754	147.99	35.560	66.208	4124.7	51.298	3195.9
23.2500	19.200	2.3644	147.30	35.395	66.800	4161.6	52.128	3247.6
23.5000	18.610	2.3535	146.62	35.232	67.390	4198.4	52.955	3299.1
23.7500	18.023	2.3427	145.95	35.071	67.977	4235.0	53.780	3350.5
24.0000	17.439	2.3321	145.29	34.912	68.561	4271.4	54.601	3401.7
24.2500	16.857	2.3216	144.64	34.755	69.143	4307.6	55.421	3452.7
24.5000	16.278	2.3113	143.99	34.600	69.722	4343.7	56.237	3503.6
24.7500	15.701	2.3011	143.36	34.447	70.299	4379.6	57.051	3554.3
25.0000	15.127	2.2910	142.73	34.296	70.873	4415.4	57.863	3604.8
25.2500	14.556	2.2810	142.10	34.146	71.444	4451.0	58.672	3655.2
25.5000	13.987	2.2711	141.49	33.998	72.013	4486.4	59.478	3705.5
25.7500	13.420	2.2613	140.88	33.852	72.580	4521.7	60.282	3755.6
26.0000	12.856	2.2517	140.28	33.708	73.144	4556.9	61.084	3805.5
26.2500	12.294	2.2421	139.69	33.565	73.706	4591.9	61.883	3855.3
26.5000	11.735	2.2327	139.10	33.424	74.265	4626.7	62.680	3904.9
26.7500	11.178	2.2234	138.52	33.285	74.822	4661.4	63.474	3954.4

LTR 1 50

B-15

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

LTR113 50

VGO = 40.000

TIME	VL	Q	H	VELL	VLD	VLOM	VFIL	VFILM
27.0000	10.623	2.2142	137.94	33.147	75.377	4696.0	64.266	4003.8
27.2500	10.071	2.2051	137.38	33.010	75.929	4730.4	65.056	4053.0
27.5000	9.5207	2.1961	136.82	32.876	76.479	4764.7	65.844	4102.1
27.7500	8.9728	2.1872	136.26	32.742	77.027	4798.8	66.629	4151.0
28.0000	8.4271	2.1784	135.71	32.611	77.573	4832.8	67.412	4199.8
28.2500	7.8836	2.1697	135.17	32.480	78.116	4866.6	68.193	4248.4
28.5000	7.3423	2.1611	134.63	32.351	78.658	4900.4	68.972	4297.0
28.7500	6.8031	2.1525	134.10	32.224	79.197	4934.0	69.749	4345.3
29.0000	6.2660	2.1441	133.58	32.098	79.734	4967.4	70.523	4393.6
29.2500	5.7310	2.1358	133.06	31.973	80.269	5000.8	71.296	4441.7
29.5000	5.1981	2.1275	132.54	31.849	80.802	5034.0	72.066	4489.7
29.7500	4.6672	2.1193	132.03	31.727	81.333	5067.0	72.834	4537.6
30.0000	4.1384	2.1113	131.53	31.606	81.862	5100.0	73.601	4585.3
30.2500	3.6116	2.1032	131.03	31.486	82.388	5132.8	74.365	4632.9
30.5000	3.0868	2.0953	130.54	31.367	82.913	5165.5	75.127	4680.4
30.7500	2.5639	2.0875	130.05	31.250	83.436	5198.1	75.888	4727.8
31.0000	2.0430	2.0797	129.57	31.133	83.957	5230.5	76.646	4775.0
31.2500	1.5240	2.0720	129.09	31.018	84.476	5262.8	77.402	4822.2
31.5000	1.0070	2.0644	128.61	30.904	84.993	5295.1	78.157	4869.2
31.7500	0.49184	2.0569	128.14	30.791	85.508	5327.2	78.910	4916.1
31.9500	8.10656E-02	2.0509	127.77	30.702	85.919	5352.7	79.510	4953.5

LTR113 50

B-16

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

6.44913E-03

LT 3 50

LT 11.3 50

B-17

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 34.200

TIME	VL	Q	W	VELL	VLD	VLDL	VFIL	VFILM
0.0	91.800	-6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	91.800	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	91.800	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	91.799	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	91.799	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	91.799	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	91.799	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	91.626	1.7341	108.04	25.960	0.17389	10.833	0.0	0.0
2.000000	91.049	2.7913	173.90	41.785	0.75099	46.787	0.0	0.0
2.250000	90.299	3.2004	199.38	47.909	1.5014	93.535	0.0	0.0
2.500000	89.453	3.5561	221.55	53.235	2.3468	146.21	0.0	0.0
2.750000	88.541	3.7377	232.86	55.954	3.2587	203.02	0.0	0.0
3.000000	87.585	3.9122	243.73	58.566	4.2152	262.60	0.0	0.0
3.250000	86.599	3.9762	247.72	59.524	5.2012	324.03	0.0	0.0
3.500000	85.596	4.0434	251.90	60.530	6.2036	386.48	0.0	0.0
3.750000	84.592	3.9959	248.94	59.819	7.2084	449.09	0.0	0.0
4.000000	83.598	3.9538	246.32	59.188	8.2021	510.99	0.0	0.0
4.250000	82.616	3.9008	243.02	58.395	9.1838	572.15	0.0	0.0
4.500000	81.647	3.8522	239.99	57.668	10.153	632.52	0.0	0.0
4.750000	80.690	3.8077	237.22	57.001	11.110	692.17	0.0	0.0
5.000000	79.743	3.7669	234.68	56.390	12.057	751.16	0.0	0.0
5.250000	78.806	3.7295	232.35	55.831	12.994	809.53	0.0	0.0
5.500000	77.878	3.6953	230.22	55.319	13.922	867.35	0.0	0.0
5.750000	76.958	3.6641	228.27	54.852	14.842	924.66	0.0	0.0
6.000000	76.045	3.6357	226.50	54.426	15.755	981.51	0.0	0.0
6.250000	75.140	3.6097	224.89	54.038	16.660	1037.9	0.0	0.0
6.500000	74.240	3.5862	223.42	53.686	17.560	1094.0	0.0	0.0
6.750000	73.346	3.5649	222.09	53.367	18.454	1149.7	0.0	0.0
7.000000	72.458	3.5457	220.90	53.079	19.342	1205.0	0.0	0.0
7.250000	71.574	3.5259	219.67	52.784	20.226	1260.1	0.0	0.0
7.500000	70.694	3.5080	218.55	52.515	21.106	1314.9	0.0	0.0
7.750000	69.821	3.4766	216.59	52.045	21.979	1369.3	0.0	0.0
8.000000	68.956	3.4365	214.10	51.445	22.844	1423.2	0.0	0.0
8.250000	68.102	3.3979	211.69	50.867	23.698	1476.4	0.0	0.0
8.500000	67.257	3.3606	209.36	50.308	24.543	1529.0	0.0	0.0
8.750000	66.422	3.3245	207.12	49.768	25.378	1581.1	0.0	0.0
9.000000	65.595	3.2897	204.95	49.247	26.205	1632.6	0.0	0.0
9.250000	64.777	3.2559	202.84	48.741	27.023	1683.6	0.0	0.0
9.500000	63.967	3.2232	200.81	48.252	27.833	1734.0	0.86432	53.847
9.750000	63.165	3.1916	198.83	47.778	28.635	1784.0	1.9036	118.60
10.0000	62.371	3.1608	196.92	47.318	29.429	1833.4	2.9352	182.86
10.2500	61.584	3.1310	195.06	46.871	30.216	1882.4	3.9591	246.65
10.5000	60.805	3.1020	193.26	46.437	30.995	1931.0	4.9757	309.99
10.7500	60.033	3.0738	191.50	46.016	31.767	1979.1	5.9852	372.88
11.0000	59.268	3.0465	189.79	45.606	32.532	2026.7	6.9877	435.33
11.2500	58.510	3.0198	188.13	45.207	33.290	2074.0	7.9835	497.37
11.5000	57.758	2.9939	186.52	44.818	34.042	2120.8	8.9727	559.00
11.7500	57.013	2.9686	184.94	44.440	34.787	2167.2	9.9554	620.22
12.0000	56.274	2.9439	183.41	44.071	35.526	2213.3	10.932	681.06
12.2500	55.541	2.9199	181.91	43.711	36.259	2258.9	11.902	741.52
12.5000	54.814	2.8965	180.45	43.360	36.986	2304.2	12.867	801.61
12.7500	54.092	2.8736	179.03	43.018	37.708	2349.2	13.826	861.34
13.0000	53.377	2.8513	177.63	42.684	38.423	2393.8	14.779	920.72
13.2500	52.667	2.8295	176.28	42.357	39.133	2438.0	15.726	979.76

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ACCUM M GAS VOL: PARAMET CALCS FOR LJCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 34.200

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
13.5000	51.962	2.8081	174.95	42.038	39.838	2481.9	16.669	1038.5
13.7500	51.262	2.7873	173.65	41.726	40.538	2525.5	17.606	1096.8
14.0000	50.568	2.7669	172.38	41.421	41.232	2568.7	18.537	1154.9
14.2500	49.879	2.7470	171.14	41.122	41.921	2611.7	19.464	1212.6
14.5000	49.195	2.7275	169.92	40.830	42.605	2654.3	20.386	1270.0
14.7500	48.515	2.7084	168.73	40.544	43.285	2696.6	21.303	1327.2
15.0000	47.840	2.6896	167.56	40.264	43.960	2738.7	22.215	1384.0
15.2500	47.170	2.6713	166.42	39.990	44.630	2780.4	23.123	1440.5
15.5000	46.505	2.6533	165.30	39.721	45.295	2821.9	24.026	1496.8
15.7500	45.843	2.6357	164.21	39.457	45.957	2863.1	24.924	1552.8
16.0000	45.187	2.6184	163.13	39.198	46.613	2904.0	25.818	1608.5
16.2500	44.534	2.6015	162.07	38.945	47.266	2944.7	26.708	1663.9
16.5000	43.886	2.5849	161.04	38.696	47.914	2985.1	27.594	1719.1
16.7500	43.242	2.5686	160.02	38.452	48.558	3025.2	28.476	1774.0
17.0000	42.601	2.5525	159.02	38.212	49.199	3065.1	29.353	1828.7
17.2500	41.965	2.5368	158.04	37.976	49.835	3104.7	30.227	1883.1
17.5000	41.333	2.5214	157.08	37.745	50.467	3144.1	31.097	1937.3
17.7500	40.704	2.5062	156.14	37.518	51.096	3183.3	31.963	1991.3
18.0000	40.080	2.4913	155.21	37.295	51.720	3222.2	32.825	2045.0
18.2500	39.459	2.4766	154.29	37.075	52.341	3260.9	33.683	2098.5
18.5000	38.841	2.4622	153.40	36.859	52.959	3299.3	34.538	2151.7
18.7500	38.227	2.4480	152.51	36.647	53.573	3337.6	35.389	2204.7
19.0000	37.617	2.4341	151.64	36.439	54.183	3375.6	36.237	2257.6
19.2500	37.010	2.4204	150.79	36.233	54.790	3413.4	37.081	2310.2
19.5000	36.407	2.4069	149.95	36.031	55.393	3451.0	37.922	2362.5
19.7500	35.807	2.3936	149.12	35.833	55.993	3488.4	38.760	2414.7
20.0000	35.210	2.3805	148.31	35.637	56.590	3525.6	39.594	2466.7
20.2500	34.616	2.3677	147.51	35.444	57.184	3562.5	40.425	2518.5
20.5000	34.026	2.3550	146.72	35.254	57.774	3599.3	41.253	2570.0
20.7500	33.439	2.3425	145.94	35.068	58.361	3635.9	42.077	2621.4
21.0000	32.855	2.3302	145.17	34.883	58.945	3672.3	42.899	2672.6
21.2500	32.274	2.3181	144.42	34.702	59.526	3708.5	43.717	2723.6
21.5000	31.696	2.3062	143.67	34.523	60.104	3744.5	44.533	2774.4
21.7500	31.121	2.2944	142.94	34.347	60.679	3780.3	45.345	2825.0
22.0000	30.548	2.2828	142.22	34.173	61.252	3816.0	46.155	2875.4
22.2500	29.979	2.2713	141.50	34.002	61.821	3851.4	46.962	2925.7
22.5000	29.413	2.2600	140.80	33.832	62.387	3886.7	47.765	2975.8
22.7500	28.849	2.2489	140.10	33.666	62.951	3921.8	48.567	3025.7
23.0000	28.288	2.2379	139.42	33.501	63.512	3956.8	49.365	3075.4
23.2500	27.730	2.2270	138.74	33.339	64.070	3991.6	50.160	3125.0
23.5000	27.175	2.2163	138.08	33.178	64.625	4026.2	50.953	3174.4
23.7500	26.622	2.2058	137.42	33.020	65.178	4060.6	51.743	3223.6
24.0000	26.072	2.1953	136.77	32.864	65.728	4094.9	52.531	3272.7
24.2500	25.524	2.1850	136.13	32.710	66.276	4129.0	53.316	3321.6
24.5000	24.979	2.1749	135.50	32.558	66.821	4162.9	54.099	3370.3
24.7500	24.437	2.1649	134.87	32.408	67.363	4196.7	54.878	3418.9
25.0000	23.897	2.1550	134.25	32.260	67.903	4230.4	55.656	3467.4
25.2500	23.359	2.1452	133.64	32.113	68.441	4263.9	56.431	3515.6
25.5000	22.824	2.1355	133.04	31.969	68.976	4297.2	57.203	3563.8
25.7500	22.291	2.1260	132.45	31.826	69.509	4330.4	57.974	3611.8
26.0000	21.761	2.1165	131.86	31.685	70.039	4363.4	58.741	3659.6
26.2500	21.233	2.1072	131.28	31.545	70.567	4396.3	59.507	3707.3
26.5000	20.707	2.0980	130.71	31.408	71.093	4429.1	60.270	3754.8
26.7500	20.184	2.0889	130.14	31.271	71.616	4461.7	61.031	3802.2

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LFG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 34.200

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
27.0000	19.663	2.0799	129.58	31.137	72.137	4494.2	61.789	3849.5
27.2500	19.144	2.0710	129.03	31.004	72.656	4526.5	62.546	3896.6
27.5000	18.627	2.0623	128.48	30.872	73.173	4558.7	63.300	3943.6
27.7500	18.113	2.0536	127.94	30.742	73.687	4590.7	64.052	3990.4
28.0000	17.600	2.0450	127.40	30.614	74.200	4622.6	64.801	4037.1
28.2500	17.090	2.0365	126.87	30.486	74.710	4654.4	65.549	4083.7
28.5000	16.582	2.0281	126.35	30.361	75.218	4686.1	66.295	4130.2
28.7500	16.076	2.0198	125.83	30.236	75.724	4717.6	67.038	4176.5
29.0000	15.572	2.0116	125.32	30.113	76.228	4749.0	67.779	4222.7
29.2500	15.070	2.0034	124.81	29.991	76.730	4780.3	68.519	4268.7
29.5000	14.570	1.9954	124.31	29.871	77.230	4811.4	69.256	4314.7
29.7500	14.072	1.9874	123.82	29.752	77.728	4842.4	69.991	4360.5
30.0000	13.577	1.9795	123.32	29.634	78.223	4873.3	70.725	4406.1
30.2500	13.083	1.9717	122.84	29.517	78.717	4904.1	71.456	4451.7
30.5000	12.591	1.9640	122.36	29.401	79.209	4934.7	72.186	4497.2
30.7500	12.101	1.9564	121.88	29.287	79.699	4965.3	72.913	4542.5
31.0000	11.612	1.9488	121.41	29.174	80.188	4995.7	73.639	4587.7
31.2500	11.126	1.9413	120.94	29.062	80.674	5026.0	74.362	4632.8
31.5000	10.642	1.9339	120.48	28.951	81.158	5056.2	75.084	4677.7
31.7500	10.159	1.9266	120.02	28.841	81.641	5086.2	75.804	4722.6
32.0000	9.6785	1.9193	119.57	28.732	82.122	5116.2	76.522	4767.3
32.2500	9.1996	1.9121	119.12	28.624	82.600	5146.0	77.239	4812.0
32.5000	8.7224	1.9050	118.68	28.517	83.078	5175.7	77.953	4856.5
32.7500	8.2471	1.8979	118.24	28.412	83.553	5205.3	78.666	4900.9
33.0000	7.7735	1.8909	117.80	28.307	84.027	5234.9	79.377	4945.2
33.2500	7.3016	1.8840	117.37	28.203	84.498	5264.2	80.087	4989.4
33.5000	6.8315	1.8771	116.94	28.100	84.969	5293.5	80.794	5033.5
33.7500	6.3630	1.8703	116.52	27.998	85.437	5322.7	81.500	5077.5
34.0000	5.8963	1.8636	116.10	27.898	85.904	5351.8	82.204	5121.3
34.2500	5.4313	1.8569	115.68	27.798	86.369	5380.8	82.907	5165.1
34.5000	4.9679	1.8503	115.27	27.698	86.832	5409.6	83.608	5208.8
34.7500	4.5061	1.8437	114.86	27.600	87.294	5438.4	84.307	5252.3
35.0000	4.0460	1.8372	114.46	27.503	87.754	5467.1	85.004	5295.8
35.2500	3.5875	1.8307	114.05	27.406	88.212	5495.6	85.700	5339.1
35.5000	3.1306	1.8243	113.66	27.310	88.669	5524.1	86.395	5382.4
35.7500	2.6753	1.8180	113.26	27.215	89.125	5552.5	87.088	5425.5
36.0000	2.2216	1.8117	112.87	27.121	89.578	5580.7	87.779	5468.6
36.2500	1.7695	1.8055	112.48	27.028	90.031	5608.9	88.468	5511.6
36.5000	1.3189	1.7993	112.10	26.935	90.481	5637.0	89.156	5554.4
36.7500	0.86982	1.7932	111.71	26.844	90.930	5664.9	89.843	5597.2
37.0000	0.42229	1.7871	111.34	26.753	91.378	5692.8	90.528	5639.9
37.2000	6.53570E-02	1.7823	111.03	26.680	91.735	5715.1	91.075	5674.0

B-20

\$\$\$ SIMUL N HALTED FOR FINISH CONDITION ZL

5.19944E-03

LIR 1.50

B-21

LIR 1.50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 27.500

TIME	VL	Q	W	VELL	VLD	VLDL	VFIL	VFILM
0.0	98.500	-6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	98.500	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	98.500	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	98.499	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	98.499	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	98.499	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	98.499	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	98.326	1.7243	107.42	25.812	0.17357	10.813	0.0	0.0
2.000000	97.754	2.7611	172.02	41.334	0.74557	46.449	0.0	0.0
2.250000	97.014	3.1500	196.24	47.155	1.4858	92.564	0.0	0.0
2.500000	96.183	3.4896	217.40	52.239	2.3166	144.32	0.0	0.0
2.750000	95.290	3.6557	227.75	54.726	3.2099	199.97	0.0	0.0
3.000000	94.356	3.8179	237.86	57.155	4.1442	258.18	0.0	0.0
3.250000	93.395	3.8698	241.09	57.931	5.1050	318.04	0.0	0.0
3.500000	92.420	3.9271	244.66	58.789	6.0796	378.76	0.0	0.0
3.750000	91.446	3.8684	241.00	57.911	7.0539	439.46	0.0	0.0
4.000000	90.486	3.8168	237.79	57.138	8.0145	499.30	0.0	0.0
4.250000	89.539	3.7552	233.95	56.216	8.9609	558.26	0.0	0.0
4.500000	88.607	3.6993	230.46	55.378	9.8926	616.31	0.0	0.0
4.750000	87.689	3.6484	227.30	54.617	10.811	673.53	0.0	0.0
5.000000	86.783	3.6022	224.42	53.925	11.717	729.99	0.0	0.0
5.250000	85.887	3.5603	221.81	53.298	12.613	785.76	0.0	0.0
5.500000	85.002	3.5223	219.44	52.728	13.498	840.92	0.0	0.0
5.750000	84.126	3.4878	217.29	52.212	14.374	895.50	0.0	0.0
6.000000	83.258	3.4566	215.35	51.746	15.242	949.58	0.0	0.0
6.250000	82.397	3.4285	213.60	51.325	16.103	1003.2	0.0	0.0
6.500000	81.543	3.4032	212.02	50.946	16.957	1056.4	0.0	0.0
6.750000	80.695	3.3805	210.61	50.607	17.805	1109.2	0.0	0.0
7.000000	79.853	3.3603	209.35	50.304	18.647	1161.7	0.0	0.0
7.250000	79.015	3.3397	208.06	49.995	19.485	1213.9	0.0	0.0
7.500000	78.183	3.3212	206.91	49.718	20.317	1265.8	0.0	0.0
7.750000	77.356	3.2886	204.88	49.230	21.144	1317.3	0.0	0.0
8.000000	76.539	3.2469	202.28	48.607	21.961	1368.2	0.0	0.0
8.250000	75.732	3.2069	199.79	48.008	22.768	1418.4	0.0	0.0
8.500000	74.935	3.1684	197.39	47.432	23.565	1468.1	0.0	0.0
8.750000	74.148	3.1313	195.08	46.876	24.352	1517.1	0.0	0.0
9.000000	73.369	3.0956	192.85	46.341	25.131	1565.6	0.0	0.0
9.250000	72.600	3.0610	190.70	45.824	25.900	1613.6	0.0	0.0
9.500000	71.839	3.0276	188.62	45.324	26.661	1661.0	0.82363	51.312
9.750000	71.086	2.9954	186.61	44.841	27.414	1707.9	1.8140	113.01
10.0000	70.341	2.9641	184.67	44.373	28.159	1754.3	2.7964	174.22
10.2500	69.604	2.9339	182.78	43.920	28.896	1800.3	3.7711	234.94
10.5000	68.874	2.9046	180.95	43.481	29.626	1845.7	4.7384	295.20
10.7500	68.151	2.8761	179.18	43.055	30.349	1890.7	5.6985	355.01
11.0000	67.436	2.8485	177.46	42.642	31.064	1935.3	6.6515	414.39
11.2500	66.727	2.8217	175.79	42.240	31.773	1979.5	7.5978	473.34
11.5000	66.025	2.7956	174.16	41.850	32.475	2023.2	8.5374	531.88
11.7500	65.329	2.7702	172.59	41.470	33.171	2066.6	9.4706	590.02
12.0000	64.639	2.7456	171.05	41.101	33.861	2109.5	10.398	647.77
12.2500	63.956	2.7215	169.55	40.741	34.544	2152.1	11.318	705.14
12.5000	63.278	2.6981	168.09	40.391	35.222	2194.3	12.233	762.16
12.7500	62.607	2.6753	166.67	40.050	35.893	2236.1	13.143	818.78
13.0000	61.941	2.6531	165.29	39.717	36.559	2277.6	14.046	875.07
13.2500	61.280	2.6314	163.93	39.392	37.220	2318.8	14.944	931.02

ACCUM M VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 27.500

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
13.5000	60.625	2.6102	162.62	39.075	37.875	2359.6	15.837	986.63
13.7500	59.975	2.5895	161.33	38.765	38.525	2400.1	16.724	1041.9
14.0000	59.330	2.5693	160.07	38.463	39.170	2440.3	17.607	1096.9
14.2500	58.690	2.5496	158.84	38.167	39.810	2480.2	18.484	1151.5
14.5000	58.055	2.5303	157.64	37.878	40.445	2519.7	19.356	1205.9
14.7500	57.425	2.5114	156.46	37.596	41.075	2559.0	20.224	1260.0
15.0000	56.799	2.4929	155.31	37.319	41.701	2597.9	21.087	1313.7
15.2500	56.178	2.4748	154.18	37.049	42.322	2636.6	21.946	1367.2
15.5000	55.562	2.4571	153.08	36.784	42.938	2675.0	22.800	1420.4
15.7500	54.950	2.4398	152.00	36.524	43.550	2713.2	23.649	1473.3
16.0000	54.342	2.4228	150.94	36.270	44.158	2751.0	24.494	1526.0
16.2500	53.738	2.4062	149.90	36.021	44.762	2788.7	25.335	1578.4
16.5000	53.139	2.3899	148.89	35.776	45.361	2826.0	26.172	1630.5
16.7500	52.543	2.3738	147.89	35.537	45.957	2863.1	27.005	1682.4
17.0000	51.952	2.3581	146.91	35.302	46.548	2900.0	27.834	1734.1
17.2500	51.364	2.3427	145.95	35.071	47.136	2936.6	28.659	1785.5
17.5000	50.780	2.3276	145.01	34.845	47.720	2972.9	29.481	1836.6
17.7500	50.200	2.3128	144.09	34.622	48.300	3009.1	30.298	1887.6
18.0000	49.624	2.2982	143.18	34.404	48.876	3045.0	31.112	1938.3
18.2500	49.051	2.2839	142.28	34.189	49.449	3080.7	31.922	1988.7
18.5000	48.482	2.2698	141.41	33.978	50.018	3116.1	32.729	2039.0
18.7500	47.916	2.2559	140.54	33.771	50.584	3151.4	33.532	2089.0
19.0000	47.354	2.2423	139.69	33.567	51.146	3186.4	34.332	2138.9
19.2500	46.795	2.2289	138.86	33.367	51.705	3221.2	35.128	2188.5
19.5000	46.239	2.2157	138.04	33.169	52.261	3255.8	35.921	2237.9
19.7500	45.687	2.2028	137.23	32.975	52.813	3290.3	36.711	2287.1
20.0000	45.138	2.1900	136.44	32.785	53.362	3324.5	37.497	2336.1
20.2500	44.592	2.1775	135.66	32.597	53.908	3358.5	38.281	2384.9
20.5000	44.049	2.1651	134.89	32.412	54.451	3392.3	39.061	2433.5
20.7500	43.509	2.1530	134.13	32.230	54.991	3425.9	39.838	2481.9
21.0000	42.972	2.1410	133.38	32.051	55.528	3459.4	40.612	2530.2
21.2500	42.439	2.1292	132.65	31.875	56.061	3492.6	41.384	2578.2
21.5000	41.908	2.1176	131.93	31.701	56.592	3525.7	42.152	2626.1
21.7500	41.380	2.1062	131.22	31.530	57.120	3558.6	42.917	2673.8
22.0000	40.855	2.0949	130.51	31.361	57.645	3591.3	43.680	2721.3
22.2500	40.332	2.0838	129.82	31.195	58.168	3623.9	44.440	2768.6
22.5000	39.813	2.0729	129.14	31.031	58.687	3656.2	45.197	2815.8
22.7500	39.296	2.0621	128.47	30.869	59.204	3688.4	45.951	2862.8
23.0000	38.781	2.0514	127.80	30.710	59.719	3720.5	46.703	2909.6
23.2500	38.270	2.0410	127.15	30.553	60.230	3752.3	47.452	2956.2
23.5000	37.761	2.0306	126.51	30.398	60.739	3784.0	48.198	3002.7
23.7500	37.254	2.0204	125.87	30.245	61.246	3815.6	48.942	3049.1
24.0000	36.751	2.0103	125.24	30.095	61.749	3847.0	49.683	3095.3
24.2500	36.249	2.0004	124.62	29.946	62.251	3878.2	50.422	3141.3
24.5000	35.750	1.9906	124.01	29.799	62.750	3909.3	51.158	3187.2
24.7500	35.254	1.9809	123.41	29.654	63.246	3940.2	51.892	3232.9
25.0000	34.760	1.9713	122.81	29.511	63.740	3971.0	52.624	3278.5
25.2500	34.268	1.9619	122.23	29.370	64.232	4001.6	53.353	3323.9
25.5000	33.779	1.9526	121.65	29.230	64.721	4032.1	54.080	3369.2
25.7500	33.292	1.9434	121.07	29.093	65.208	4062.5	54.804	3414.3
26.0000	32.807	1.9343	120.51	28.957	65.693	4092.7	55.526	3459.3
26.2500	32.324	1.9253	119.95	28.822	66.176	4122.7	56.246	3504.1
26.5000	31.844	1.9165	119.40	28.690	66.656	4152.7	56.964	3548.9
26.7500	31.366	1.9077	118.85	28.558	67.134	4182.4	57.680	3593.4

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ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 27.500

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
27.0000	30.690	-1.8990	-118.31	28.429	67.610	4212.1	58.393	3637.9
27.2500	30.417	1.8905	117.78	28.301	68.083	4241.6	59.104	3682.2
27.5000	29.945	1.8820	117.25	28.174	68.555	4271.0	59.813	3726.3
27.7500	29.475	1.8737	116.73	28.049	69.025	4300.2	60.520	3770.4
28.0000	29.008	1.8654	116.21	27.925	69.492	4329.3	61.225	3814.3
28.2500	28.543	1.8572	115.71	27.803	69.957	4358.3	61.928	3858.1
28.5000	28.079	1.8491	115.20	27.682	70.421	4387.2	62.628	3901.7
28.7500	27.618	1.8412	114.70	27.562	70.882	4415.9	63.327	3945.3
29.0000	27.159	1.8333	114.21	27.444	71.341	4444.6	64.024	3988.7
29.2500	26.701	1.8254	113.72	27.327	71.799	4473.1	64.719	4032.0
29.5000	26.246	1.8177	113.24	27.211	72.254	4501.4	65.411	4075.1
29.7500	25.792	1.8100	112.76	27.096	72.708	4529.7	66.102	4118.2
30.0000	25.341	1.8024	112.29	26.983	73.159	4557.8	66.791	4161.1
30.2500	24.891	1.7949	111.82	26.870	73.609	4585.8	67.478	4203.9
30.5000	24.443	1.7875	111.36	26.759	74.057	4613.7	68.164	4246.6
30.7500	23.997	1.7802	110.90	26.649	74.503	4641.5	68.847	4289.2
31.0000	23.553	1.7729	110.45	26.540	74.947	4669.2	69.529	4331.6
31.2500	23.111	1.7657	110.00	26.433	75.389	4696.7	70.209	4374.0
31.5000	22.670	1.7586	109.56	26.326	75.830	4724.2	70.887	4416.2
31.7500	22.231	1.7515	109.12	26.220	76.269	4751.5	71.563	4458.4
32.0000	21.794	1.7445	108.68	26.116	76.706	4778.8	72.237	4500.4
32.2500	21.359	1.7376	108.25	26.012	77.141	4805.9	72.910	4542.3
32.5000	20.925	1.7308	107.83	25.910	77.575	4832.9	73.581	4584.1
32.7500	20.494	1.7240	107.40	25.808	78.006	4859.8	74.250	4625.8
33.0000	20.063	1.7173	106.99	25.708	78.437	4886.6	74.918	4667.4
33.2500	19.635	1.7106	106.57	25.608	78.865	4913.3	75.584	4708.9
33.5000	19.208	1.7040	106.16	25.509	79.292	4939.9	76.248	4750.3
33.7500	18.783	1.6975	105.75	25.412	79.717	4966.4	76.911	4791.5
34.0000	18.359	1.6910	105.35	25.315	80.141	4992.8	77.572	4832.7
34.2500	17.937	1.6846	104.95	25.219	80.563	5019.1	78.231	4873.8
34.5000	17.517	1.6783	104.56	25.124	80.983	5045.3	78.889	4914.8
34.7500	17.098	1.6720	104.16	25.029	81.402	5071.3	79.545	4955.7
35.0000	16.681	1.6657	103.77	24.936	81.819	5097.3	80.200	4996.5
35.2500	16.265	1.6595	103.39	24.843	82.235	5123.2	80.853	5037.1
35.5000	15.851	1.6534	103.01	24.752	82.649	5149.0	81.505	5077.7
35.7500	15.438	1.6473	102.63	24.661	83.062	5174.7	82.155	5118.2
36.0000	15.027	1.6413	102.25	24.571	83.473	5200.3	82.803	5158.6
36.2500	14.618	1.6353	101.88	24.481	83.882	5225.9	83.450	5198.9
36.5000	14.210	1.6294	101.51	24.393	84.290	5251.3	84.096	5239.2
36.7500	13.803	1.6236	101.15	24.305	84.697	5276.6	84.740	5279.3
37.0000	13.398	1.6177	100.78	24.218	85.102	5301.9	85.383	5319.3
37.2500	12.994	1.6120	100.43	24.131	85.506	5327.0	86.024	5359.3
37.5000	12.592	1.6062	100.07	24.046	85.908	5352.1	86.663	5399.1
37.7500	12.191	1.6006	99.715	23.961	86.309	5377.1	87.302	5438.9
38.0000	11.792	1.5949	99.365	23.876	86.708	5401.9	87.939	5478.6
38.2500	11.393	1.5894	99.017	23.793	87.107	5426.7	88.574	5518.2
38.5000	10.997	1.5838	98.672	23.710	87.503	5451.4	89.208	5557.7
38.7500	10.602	1.5783	98.329	23.628	87.898	5476.1	89.841	5597.1
39.0000	10.208	1.5729	97.990	23.546	88.292	5500.6	90.472	5636.4
39.2500	9.8151	1.5675	97.653	23.465	88.685	5525.1	91.102	5675.7
39.5000	9.4239	1.5621	97.318	23.385	89.076	5549.4	91.731	5714.8
39.7500	9.0341	1.5568	96.987	23.305	89.466	5573.7	92.358	5753.9
40.0000	8.6455	1.5515	96.658	23.226	89.854	5597.9	92.984	5792.9

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

LTR1 50

LTR1.3 50

B-25

LTR 13 50

ACCUM GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-160E77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VJL.

VGO = 20.000

TIME	VL	Q	W	VELL	VLD	VLDM	VFIL	VFILM
0.0	106.00	6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	106.00	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	105.83	1.7034	106.12	25.500	0.17249	10.746	0.0	0.0
2.000000	105.27	2.7037	168.44	40.474	0.73456	45.763	0.0	0.0
2.250000	104.54	3.0565	190.42	45.757	1.4557	90.687	0.0	0.0
2.500000	103.74	3.3689	209.89	50.433	2.2595	140.77	0.0	0.0
2.750000	102.88	3.5098	218.66	52.542	3.1194	194.34	0.0	0.0
3.000000	101.99	3.6531	227.59	54.688	4.0147	250.12	0.0	0.0
3.250000	101.07	3.6865	229.67	55.186	4.9320	307.26	0.0	0.0
3.500000	100.14	3.7299	232.38	55.837	5.8589	365.01	0.0	0.0
3.750000	99.218	3.6547	227.69	54.712	6.7817	422.50	0.0	0.0
4.000000	98.313	3.5897	223.64	53.738	7.6871	478.91	0.0	0.0
4.250000	97.425	3.5162	219.06	52.638	8.5752	534.24	0.0	0.0
4.500000	96.556	3.4504	214.96	51.653	9.4459	588.48	0.0	0.0
4.750000	95.699	3.3915	211.29	50.772	10.301	641.76	0.0	0.0
5.000000	94.858	3.3388	208.01	49.982	11.142	694.17	0.0	0.0
5.250000	94.029	3.2916	205.07	49.276	11.971	745.80	0.0	0.0
5.500000	93.211	3.2494	202.44	48.644	12.789	796.73	0.0	0.0
5.750000	92.404	3.2117	200.09	48.080	13.596	847.04	0.0	0.0
6.000000	91.605	3.1782	198.00	47.578	14.395	896.80	0.0	0.0
6.250000	90.814	3.1484	196.14	47.132	15.186	946.06	0.0	0.0
6.500000	90.031	3.1220	194.50	46.737	15.969	994.89	0.0	0.0
6.750000	89.253	3.0988	193.06	46.390	16.747	1043.3	0.0	0.0
7.000000	88.481	3.0785	191.79	46.086	17.519	1091.4	0.0	0.0
7.250000	87.714	3.0581	190.52	45.779	18.286	1139.2	0.0	0.0
7.500000	86.952	3.0401	189.40	45.510	19.048	1186.7	0.0	0.0
7.750000	86.195	3.0068	187.32	45.012	19.805	1233.9	0.0	0.0
8.000000	85.449	2.9638	184.65	44.369	20.551	1280.4	0.0	0.0
8.250000	84.713	2.9227	182.08	43.753	21.287	1326.2	0.0	0.0
8.500000	83.987	2.8833	179.63	43.163	22.013	1371.4	0.0	0.0
8.750000	83.271	2.8455	177.27	42.597	22.729	1416.0	0.0	0.0
9.000000	82.564	2.8091	175.01	42.053	23.436	1460.1	0.0	0.0
9.250000	81.866	2.7742	172.83	41.529	24.134	1503.5	0.0	0.0
9.500000	81.177	2.7405	170.73	41.025	24.823	1546.5	0.76383	47.587
9.750000	80.496	2.7080	168.71	40.539	25.504	1588.9	1.6824	104.81
10.000000	79.823	2.6767	166.76	40.070	26.177	1630.9	2.5829	161.54
10.250000	79.157	2.6464	164.87	39.617	26.843	1672.3	3.4858	217.79
10.500000	78.499	2.6172	163.05	39.179	27.501	1713.3	4.3812	273.57
10.750000	77.848	2.5889	161.29	38.756	28.152	1753.8	5.2795	328.91
11.000000	77.205	2.5615	159.58	38.345	28.795	1794.0	6.1607	383.81
11.250000	76.568	2.5349	157.92	37.948	29.432	1833.6	7.0353	438.30
11.500000	75.937	2.5092	156.32	37.562	30.063	1872.9	7.9033	492.37
11.750000	75.313	2.4841	154.76	37.188	30.687	1911.8	8.7649	546.05
12.000000	74.695	2.4599	153.25	36.824	31.305	1950.3	9.6204	599.35
12.250000	74.083	2.4363	151.78	36.471	31.917	1988.4	10.470	652.27
12.500000	73.477	2.4133	150.35	36.128	32.523	2026.2	11.314	704.84
12.750000	72.876	2.3910	148.96	35.794	33.124	2063.6	12.152	757.05
13.000000	72.281	2.3693	147.61	35.468	33.719	2100.7	12.984	808.91
13.250000	71.691	2.3481	146.29	35.151	34.309	2137.4	13.811	860.44

LTR 13 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 20.000

TIME	VL	Q	M	VELL	VLD	VLOM	VFIL	VFILM
13.5000	71.107	2.3275	145.00	34.843	34.893	2173.8	14.633	911.65
13.7500	70.527	2.3074	143.75	34.542	35.473	2209.9	15.450	962.54
14.0000	69.953	2.2878	142.53	34.248	36.047	2245.7	16.262	1013.1
14.2500	69.383	2.2686	141.33	33.961	36.617	2281.2	17.069	1063.4
14.5000	68.819	2.2498	140.16	33.680	37.181	2316.4	17.871	1113.4
14.7500	68.258	2.2315	139.02	33.406	37.742	2351.3	18.669	1163.1
15.0000	67.703	2.2136	137.91	33.138	38.297	2385.9	19.462	1212.5
15.2500	67.151	2.1962	136.82	32.877	38.849	2420.3	20.251	1261.6
15.5000	66.605	2.1791	135.76	32.621	39.395	2454.3	21.035	1310.5
15.7500	66.062	2.1623	134.71	32.370	39.938	2488.1	21.815	1359.1
16.0000	65.523	2.1460	133.69	32.125	40.477	2521.7	22.591	1407.4
16.2500	64.989	2.1299	132.69	31.885	41.011	2555.0	23.363	1455.5
16.5000	64.458	2.1142	131.72	31.650	41.542	2588.1	24.131	1503.4
16.7500	63.932	2.0988	130.76	31.420	42.068	2620.9	24.895	1551.0
17.0000	63.409	2.0838	129.82	31.194	42.591	2653.4	25.656	1598.3
17.2500	62.890	2.0690	128.90	30.973	43.110	2685.8	26.412	1645.5
17.5000	62.374	2.0545	128.00	30.756	43.626	2717.9	27.165	1692.4
17.7500	61.862	2.0403	127.11	30.543	44.138	2749.8	27.914	1739.1
18.0000	61.354	2.0263	126.24	30.334	44.646	2781.5	28.660	1785.5
18.2500	60.849	2.0126	125.39	30.129	45.151	2812.9	29.402	1831.8
18.5000	60.347	1.9992	124.55	29.928	45.653	2844.2	30.141	1877.8
18.7500	59.849	1.9860	123.73	29.730	46.151	2875.2	30.877	1923.6
19.0000	59.354	1.9730	122.92	29.536	46.646	2906.0	31.609	1969.3
19.2500	58.863	1.9603	122.13	29.346	47.137	2936.7	32.338	2014.7
19.5000	58.374	1.9478	121.35	29.158	47.626	2967.1	33.064	2059.9
19.7500	57.889	1.9354	120.58	28.974	48.111	2997.3	33.787	2104.9
20.0000	57.406	1.9233	119.82	28.793	48.594	3027.4	34.507	2149.8
20.2500	56.927	1.9114	119.08	28.614	49.073	3057.3	35.224	2194.4
20.5000	56.451	1.8997	118.35	28.439	49.549	3086.9	35.938	2238.9
20.7500	55.977	1.8882	117.64	28.267	50.023	3116.4	36.649	2283.2
21.0000	55.506	1.8769	116.93	28.097	50.494	3145.8	37.357	2327.3
21.2500	55.038	1.8657	116.23	27.930	50.962	3174.9	38.062	2371.3
21.5000	54.573	1.8547	115.55	27.765	51.427	3203.9	38.765	2415.0
21.7500	54.111	1.8439	114.87	27.603	51.889	3232.7	39.464	2458.6
22.0000	53.651	1.8332	114.21	27.444	52.349	3261.3	40.161	2502.1
22.2500	53.194	1.8227	113.56	27.286	52.806	3289.8	40.856	2545.3
22.5000	52.740	1.8124	112.91	27.131	53.260	3318.1	41.548	2588.4
22.7500	52.288	1.8022	112.27	26.978	53.712	3346.3	42.237	2631.4
23.0000	51.839	1.7921	111.65	26.828	54.161	3374.2	42.924	2674.2
23.2500	51.392	1.7822	111.03	26.679	54.608	3402.1	43.608	2716.8
23.5000	50.948	1.7724	110.42	26.533	55.052	3429.8	44.290	2759.3
23.7500	50.506	1.7628	109.82	26.389	55.494	3457.3	44.969	2801.6
24.0000	50.066	1.7532	109.23	26.246	55.934	3484.7	45.646	2843.8
24.2500	49.629	1.7439	108.64	26.106	56.371	3511.9	46.321	2885.8
24.5000	49.194	1.7346	108.07	25.967	56.806	3539.0	46.993	2927.7
24.7500	48.762	1.7255	107.50	25.830	57.238	3565.9	47.663	2969.4
25.0000	48.331	1.7165	106.94	25.696	57.669	3592.8	48.331	3011.0
25.2500	47.903	1.7076	106.38	25.562	58.097	3619.4	48.996	3052.5
25.5000	47.478	1.6988	105.83	25.431	58.522	3646.0	49.659	3093.8
25.7500	47.054	1.6901	105.29	25.301	58.946	3672.3	50.320	3135.0
26.0000	46.632	1.6816	104.76	25.173	59.368	3698.6	50.979	3176.0
26.2500	46.213	1.6731	104.23	25.046	59.787	3724.7	51.636	3216.9
26.5000	45.796	1.6647	103.71	24.921	60.204	3750.7	52.291	3257.7
26.7500	45.381	1.6565	103.20	24.798	60.619	3776.6	52.943	3298.4

LTR13 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-160E77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 20.000

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
27.0000	44.967	1.6484	102.69	24.676	61.033	3802.3	53.594	3338.9
27.2500	44.556	1.6403	102.19	24.555	61.444	3827.9	54.243	3379.3
27.5000	44.147	1.6323	101.69	24.436	61.853	3853.4	54.889	3419.6
27.7500	43.740	1.6245	101.20	24.319	62.260	3878.8	55.534	3459.7
28.0000	43.335	1.6167	100.72	24.202	62.665	3904.0	56.176	3499.8
28.2500	42.932	1.6090	100.24	24.087	63.068	3929.2	56.817	3539.7
28.5000	42.530	1.6014	99.769	23.973	63.470	3954.2	57.456	3579.5
28.7500	42.131	1.5939	99.301	23.861	63.869	3979.0	58.093	3619.2
29.0000	41.733	1.5865	98.838	23.750	64.267	4003.8	58.728	3658.7
29.2500	41.338	1.5791	98.380	23.640	64.662	4028.5	59.361	3698.2
29.5000	40.944	1.5719	97.928	23.531	65.056	4053.0	59.992	3737.5
29.7500	40.552	1.5647	97.480	23.423	65.448	4077.4	60.622	3776.7
30.0000	40.161	1.5576	97.037	23.317	65.839	4101.8	61.249	3815.8
30.2500	39.773	1.5505	96.599	23.212	66.227	4126.0	61.875	3854.8
30.5000	39.386	1.5436	96.165	23.107	66.614	4150.1	62.500	3893.7
30.7500	39.001	1.5367	95.736	23.004	66.999	4174.0	63.122	3932.5
31.0000	38.617	1.5299	95.311	22.902	67.383	4197.9	63.743	3971.2
31.2500	38.236	1.5231	94.891	22.801	67.764	4221.7	64.362	4009.7
31.5000	37.856	1.5164	94.475	22.701	68.144	4245.4	64.979	4048.2
31.7500	37.477	1.5098	94.063	22.502	68.523	4268.9	65.595	4086.6
32.0000	37.101	1.5033	93.655	22.504	68.899	4292.4	66.209	4124.8
32.2500	36.726	1.4968	93.251	22.407	69.274	4315.8	66.822	4163.0
32.5000	36.352	1.4904	92.851	22.311	69.648	4339.0	67.433	4201.0
32.7500	35.980	1.4840	92.455	22.216	70.020	4362.2	68.042	4239.0
33.0000	35.610	1.4777	92.063	22.122	70.390	4385.3	68.649	4276.9
33.2500	35.242	1.4715	91.674	22.028	70.758	4408.3	69.256	4314.6
33.5000	34.874	1.4653	91.290	21.936	71.126	4431.1	69.860	4352.3
33.7500	34.509	1.4592	90.909	21.844	71.491	4453.9	70.463	4389.9
34.0000	34.145	1.4531	90.531	21.754	71.855	4476.6	71.065	4427.3
34.2500	33.782	1.4471	90.157	21.664	72.218	4499.2	71.665	4464.7
34.5000	33.421	1.4412	89.786	21.575	72.579	4521.7	72.263	4502.0
34.7500	33.062	1.4353	89.419	21.486	72.938	4544.1	72.860	4539.2
35.0000	32.703	1.4294	89.055	21.399	73.297	4566.4	73.456	4576.3
35.2500	32.347	1.4237	88.694	21.312	73.653	4588.6	74.050	4613.3
35.5000	31.991	1.4179	88.336	21.226	74.009	4610.7	74.642	4650.2
35.7500	31.638	1.4122	87.982	21.141	74.362	4632.8	75.234	4687.1
36.0000	31.285	1.4066	87.630	21.057	74.715	4654.7	75.824	4723.8
36.2500	30.934	1.4010	87.282	20.973	75.066	4676.6	76.412	4760.5
36.5000	30.585	1.3954	86.936	20.890	75.415	4698.4	76.999	4797.0
36.7500	30.237	1.3900	86.594	20.808	75.763	4720.1	77.585	4833.5
37.0000	29.890	1.3845	86.254	20.726	76.110	4741.7	78.169	4869.9
37.2500	29.544	1.3791	85.918	20.645	76.456	4763.2	78.752	4906.2
37.5000	29.200	1.3737	85.584	20.565	76.800	4784.6	79.333	4942.5
37.7500	28.857	1.3684	85.252	20.485	77.143	4806.0	79.914	4978.6
38.0000	28.516	1.3631	84.923	20.406	77.484	4827.3	80.492	5014.7
38.2500	28.176	1.3579	84.596	20.328	77.824	4848.5	81.070	5050.7
38.5000	27.837	1.3527	84.272	20.250	78.163	4869.6	81.646	5086.6
38.7500	27.499	1.3475	83.951	20.173	78.501	4890.6	82.221	5122.4
39.0000	27.163	1.3424	83.633	20.096	78.837	4911.5	82.795	5158.1
39.2500	26.828	1.3373	83.317	20.020	79.172	4932.4	83.367	5193.8
39.5000	26.494	1.3323	83.003	19.945	79.506	4953.2	83.939	5229.4
39.7500	26.162	1.3273	82.692	19.870	79.838	4973.9	84.508	5264.9
40.0000	25.830	1.3224	82.383	19.796	80.170	4994.6	85.077	5300.3

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

LTR 115 50.1

LTR 115 50.1

B-29

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA: USING RELAP K & VOL.

VGO = 16.000

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
0.0	110.00	6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.000000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.250000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.500000	110.00	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.750000	109.83	1.6828	104.84	25.192	0.17220	10.728	0.0	0.0
2.000000	109.27	2.6517	165.20	39.696	0.72504	45.170	0.0	0.0
2.250000	108.57	2.9745	185.31	44.529	1.4292	89.038	0.0	0.0
2.500000	107.79	3.2656	203.45	48.887	2.2097	137.67	0.0	0.0
2.750000	106.96	3.3874	211.03	50.709	3.0412	189.47	0.0	0.0
3.000000	106.10	3.5176	219.15	52.659	3.9042	243.23	0.0	0.0
3.250000	105.21	3.5382	220.43	52.967	4.7859	298.16	0.0	0.0
3.500000	104.33	3.5729	222.59	53.487	5.6745	353.52	0.0	0.0
3.750000	103.44	3.4866	217.22	52.195	6.5567	408.48	0.0	0.0
4.000000	102.58	3.4130	212.63	51.093	7.4190	462.20	0.0	0.0
4.250000	101.74	3.3321	207.59	49.882	8.2619	514.72	0.0	0.0
4.500000	100.91	3.2606	203.13	48.811	9.0859	566.05	0.0	0.0
4.750000	100.11	3.1973	199.19	47.863	9.8930	616.33	0.0	0.0
5.000000	99.315	3.1412	195.70	47.024	10.685	665.69	0.0	0.0
5.250000	98.536	3.0915	192.60	46.281	11.464	714.22	0.0	0.0
5.500000	97.768	3.0477	189.87	45.624	12.232	762.02	0.0	0.0
5.750000	97.011	3.0090	187.46	45.045	12.989	809.19	0.0	0.0
6.000000	96.264	2.9750	185.34	44.536	13.736	855.78	0.0	0.0
6.250000	95.524	2.9452	183.49	44.090	14.476	901.88	0.0	0.0
6.500000	94.791	2.9192	181.87	43.701	15.209	947.55	0.0	0.0
6.750000	94.064	2.8968	180.47	43.365	15.936	992.84	0.0	0.0
7.000000	93.342	2.8775	179.27	43.077	16.658	1037.8	0.0	0.0
7.250000	92.625	2.8582	178.06	42.787	17.375	1082.5	0.0	0.0
7.500000	91.912	2.8415	177.02	42.537	18.088	1126.9	0.0	0.0
7.750000	91.205	2.8085	174.97	42.044	18.795	1170.9	0.0	0.0
8.000000	90.509	2.7652	172.27	41.395	19.491	1214.3	0.0	0.0
8.250000	89.822	2.7238	169.70	40.776	20.178	1257.1	0.0	0.0
8.500000	89.146	2.6843	167.23	40.185	20.854	1299.2	0.0	0.0
8.750000	88.480	2.6465	164.88	39.618	21.520	1340.7	0.0	0.0
9.000000	87.823	2.6102	162.62	39.075	22.177	1381.6	0.0	0.0
9.250000	87.175	2.5754	160.45	38.554	22.825	1422.0	0.0	0.0
9.500000	86.535	2.5420	158.36	38.053	23.465	1461.9	0.72245	45.009
9.750000	85.904	2.5098	156.36	37.571	24.096	1501.2	1.5914	99.144
10.000000	85.280	2.4788	154.43	37.107	24.720	1540.1	2.4524	152.79
10.250000	84.664	2.4489	152.56	36.660	25.336	1578.4	3.3059	205.95
10.500000	84.055	2.4200	150.77	36.228	25.945	1616.3	4.1519	258.67
10.750000	83.454	2.3921	149.03	35.810	26.546	1653.8	4.9909	310.94
11.000000	82.859	2.3652	147.35	35.407	27.141	1690.9	5.8231	362.78
11.250000	82.271	2.3391	145.72	35.016	27.729	1727.5	6.6486	414.21
11.500000	81.690	2.3138	144.15	34.638	28.310	1763.7	7.4677	465.24
11.750000	81.114	2.2893	142.62	34.271	28.886	1799.6	8.2806	515.88
12.000000	80.545	2.2655	141.14	33.915	29.455	1835.1	9.0874	566.14
12.250000	79.981	2.2424	139.70	33.569	30.019	1870.2	9.8884	616.05
12.500000	79.423	2.2200	138.30	33.233	30.577	1904.9	10.684	665.59
12.750000	78.871	2.1981	136.94	32.906	31.129	1939.3	11.473	714.79
13.000000	78.324	2.1769	135.62	32.589	31.676	1973.4	12.258	763.66
13.250000	77.783	2.1563	134.34	32.280	32.217	2007.1	13.037	812.20

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. 4FR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VJL.

VGO = 16.000

TIME	VL	Q	W	VELL	VLO	VLDM	VFIL	VFILM
13.5000	77.246	2.1362	133.08	31.979	32.754	2040.6	13.811	860.42
13.7500	76.714	2.1166	131.86	31.686	33.286	2073.7	14.580	908.33
14.0000	76.188	2.0975	130.67	31.400	33.812	2106.5	15.344	955.95
14.2500	75.666	2.0789	129.52	31.121	34.334	2139.0	16.104	1003.3
14.5000	75.148	2.0607	128.38	30.849	34.852	2171.3	16.859	1050.3
14.7500	74.635	2.0430	127.28	30.584	35.365	2203.2	17.609	1097.1
15.0000	74.126	2.0257	126.20	30.325	35.874	2234.9	18.355	1143.5
15.2500	73.622	2.0088	125.15	30.072	36.378	2266.3	19.097	1189.7
15.5000	73.122	1.9923	124.12	29.824	36.878	2297.5	19.835	1235.7
15.7500	72.626	1.9761	123.11	29.582	37.374	2328.4	20.568	1281.4
16.0000	72.134	1.9603	122.13	29.346	37.866	2359.1	21.298	1326.9
16.2500	71.646	1.9448	121.16	29.114	38.354	2389.5	22.023	1372.1
16.5000	71.161	1.9297	120.22	28.888	38.839	2419.6	22.745	1417.0
16.7500	70.681	1.9149	119.30	28.666	39.319	2449.6	23.463	1461.8
17.0000	70.204	1.9003	118.39	28.448	39.796	2479.3	24.178	1506.3
17.2500	69.730	1.8861	117.50	28.235	40.270	2508.8	24.888	1550.5
17.5000	69.261	1.8721	116.63	28.026	40.739	2538.1	25.596	1594.6
17.7500	68.794	1.8585	115.78	27.821	41.206	2567.1	26.299	1638.5
18.0000	68.331	1.8450	114.95	27.620	41.669	2596.0	27.000	1682.1
18.2500	67.872	1.8319	114.13	27.423	42.128	2624.6	27.697	1725.5
18.5000	67.415	1.8189	113.32	27.230	42.585	2653.0	28.391	1768.7
18.7500	66.962	1.8062	112.53	27.039	43.038	2681.3	29.081	1811.8
19.0000	66.512	1.7938	111.75	26.853	43.488	2709.3	29.769	1854.6
19.2500	66.065	1.7815	110.99	26.669	43.935	2737.1	30.453	1897.2
19.5000	65.621	1.7695	110.24	26.489	44.379	2764.8	31.134	1939.7
19.7500	65.180	1.7576	109.50	26.312	44.820	2792.3	31.813	1981.9
20.0000	64.742	1.7460	108.78	26.138	45.258	2819.6	32.488	2024.0
20.2500	64.307	1.7346	108.06	25.967	45.693	2846.7	33.161	2065.9
20.5000	63.875	1.7233	107.36	25.798	46.125	2873.6	33.830	2107.6
20.7500	63.445	1.7123	106.67	25.633	46.555	2900.3	34.497	2149.2
21.0000	63.019	1.7014	106.00	25.470	46.981	2926.9	35.161	2190.6
21.2500	62.595	1.6907	105.33	25.310	47.405	2953.3	35.823	2231.8
21.5000	62.173	1.6801	104.67	25.152	47.827	2979.6	36.482	2272.8
21.7500	61.755	1.6698	104.03	24.996	48.245	3005.7	37.138	2313.7
22.0000	61.338	1.6595	103.39	24.843	48.662	3031.6	37.792	2354.4
22.2500	60.925	1.6495	102.76	24.693	49.075	3057.4	38.443	2395.0
22.5000	60.514	1.6396	102.14	24.544	49.486	3083.0	39.091	2435.4
22.7500	60.105	1.6298	101.54	24.398	49.895	3108.5	39.737	2475.6
23.0000	59.699	1.6202	100.94	24.254	50.301	3133.8	40.381	2515.7
23.2500	59.295	1.6107	100.35	24.112	50.705	3158.9	41.022	2555.7
23.5000	58.893	1.6013	99.762	23.972	51.107	3184.0	41.661	2595.5
23.7500	58.494	1.5921	99.188	23.834	51.506	3208.8	42.298	2635.2
24.0000	58.097	1.5830	98.621	23.698	51.903	3233.6	42.932	2674.7
24.2500	57.702	1.5740	98.062	23.563	52.298	3258.1	43.564	2714.1
24.5000	57.310	1.5652	97.511	23.431	52.690	3282.6	44.194	2753.3
24.7500	56.920	1.5565	96.967	23.300	53.080	3306.9	44.822	2792.4
25.0000	56.532	1.5478	96.430	23.171	53.468	3331.1	45.447	2831.4
25.2500	56.146	1.5393	95.900	23.044	53.854	3355.1	46.071	2870.2
25.5000	55.762	1.5309	95.378	22.918	54.238	3379.0	46.692	2908.9
25.7500	55.380	1.5227	94.861	22.794	54.620	3402.8	47.311	2947.5
26.0000	55.001	1.5145	94.352	22.672	54.999	3426.5	47.928	2985.9
26.2500	54.623	1.5064	93.848	22.551	55.377	3450.0	48.543	3024.3
26.5000	54.247	1.4984	93.351	22.431	55.753	3473.4	49.156	3062.4
26.7500	53.874	1.4905	92.860	22.313	56.126	3496.7	49.768	3100.5

B-31

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VCL.

VGO = 16.000

TIME	VL	Q	W	VELL	VLD	VLDM	VFIL	VFILM
27.0000	53.502	1.4827	92.375	22.197	56.498	3519.8	50.377	3138.5
27.2500	53.132	1.4751	91.896	22.082	56.868	3542.9	50.984	3176.3
27.5000	52.764	1.4675	91.422	21.968	57.236	3565.8	51.589	3214.0
27.7500	52.398	1.4599	90.954	21.855	57.602	3588.6	52.193	3251.6
28.0000	52.034	1.4525	90.492	21.744	57.966	3611.3	52.794	3289.1
28.2500	51.672	1.4452	90.034	21.634	58.328	3633.8	53.394	3326.4
28.5000	51.312	1.4379	89.582	21.526	58.688	3656.3	53.992	3363.7
28.7500	50.953	1.4307	89.135	21.418	59.047	3678.6	54.588	3400.8
29.0000	50.596	1.4237	88.693	21.312	59.404	3700.9	55.182	3437.8
29.2500	50.241	1.4166	88.256	21.207	59.759	3723.0	55.774	3474.7
29.5000	49.888	1.4097	87.824	21.103	60.112	3745.0	56.365	3511.5
29.7500	49.536	1.4028	87.396	21.000	60.464	3766.9	56.954	3548.2
30.0000	49.186	1.3960	86.973	20.899	60.814	3788.7	57.541	3584.8
30.2500	48.838	1.3893	86.555	20.798	61.162	3810.4	58.127	3621.3
30.5000	48.492	1.3827	86.140	20.699	61.508	3832.0	58.711	3657.7
30.7500	48.147	1.3761	85.730	20.600	61.853	3853.5	59.293	3694.0
31.0000	47.803	1.3696	85.324	20.503	62.197	3874.8	59.874	3730.1
31.2500	47.462	1.3631	84.922	20.406	62.538	3896.1	60.453	3766.2
31.5000	47.122	1.3567	84.524	20.310	62.878	3917.3	61.030	3802.2
31.7500	46.783	1.3504	84.129	20.215	63.217	3938.4	61.606	3838.1
32.0000	46.447	1.3441	83.739	20.122	63.553	3959.4	62.181	3873.8
32.2500	46.111	1.3379	83.353	20.029	63.889	3980.3	62.753	3909.5
32.5000	45.778	1.3318	82.970	19.937	64.222	4001.1	63.325	3945.1
32.7500	45.445	1.3257	82.591	19.846	64.555	4021.8	63.894	3980.6
33.0000	45.115	1.3197	82.216	19.756	64.885	4042.4	64.462	4016.0
33.2500	44.785	1.3137	81.844	19.666	65.215	4062.9	65.029	4051.3
33.5000	44.458	1.3078	81.476	19.578	65.542	4083.3	65.594	4086.5
33.7500	44.131	1.3019	81.111	19.490	65.869	4103.6	66.158	4121.6
34.0000	43.807	1.2961	80.750	19.403	66.193	4123.8	66.720	4156.7
34.2500	43.483	1.2904	80.392	19.317	66.517	4144.0	67.281	4191.6
34.5000	43.161	1.2847	80.037	19.232	66.839	4164.0	67.840	4226.4
34.7500	42.841	1.2791	79.685	19.148	67.159	4184.0	68.398	4261.2
35.0000	42.522	1.2735	79.337	19.064	67.478	4203.9	68.955	4295.9
35.2500	42.204	1.2679	78.992	18.981	67.796	4223.7	69.510	4330.5
35.5000	41.888	1.2624	78.649	18.899	68.112	4243.4	70.064	4365.0
35.7500	41.573	1.2570	78.310	18.817	68.427	4263.0	70.616	4399.4
36.0000	41.259	1.2516	77.974	18.736	68.741	4282.6	71.167	4433.7
36.2500	40.947	1.2462	77.640	18.656	69.053	4302.0	71.717	4467.9
36.5000	40.636	1.2409	77.310	18.577	69.364	4321.4	72.265	4502.1
36.7500	40.326	1.2357	76.982	18.498	69.674	4340.7	72.812	4536.2
37.0000	40.018	1.2304	76.657	18.420	69.982	4359.9	73.358	4570.2
37.2500	39.711	1.2253	76.334	18.342	70.289	4379.0	73.902	4604.1
37.5000	39.405	1.2201	76.014	18.266	70.595	4398.0	74.445	4637.9
37.7500	39.101	1.2150	75.697	18.189	70.899	4417.0	74.987	4671.7
38.0000	38.798	1.2100	75.383	18.114	71.202	4435.9	75.528	4705.4
38.2500	38.496	1.2050	75.071	18.039	71.504	4454.7	76.067	4739.0
38.5000	38.195	1.2000	74.761	17.964	71.805	4473.4	76.605	4772.5
38.7500	37.896	1.1951	74.454	17.891	72.104	4492.1	77.142	4805.9
39.0000	37.598	1.1902	74.150	17.817	72.402	4510.7	77.678	4839.3
39.2500	37.301	1.1854	73.847	17.745	72.699	4529.2	78.212	4872.6
39.5000	37.005	1.1805	73.547	17.673	72.995	4547.6	78.745	4905.8
39.7500	36.710	1.1758	73.250	17.601	73.290	4565.9	79.277	4939.0
40.0000	36.417	1.1710	72.954	17.530	73.583	4584.2	79.808	4972.0

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME

40.000

LTR 50.7

LTR 50.7

B-33

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
 COLJ LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 12.000

TIME	VL	Q	W	VELL	VLD	VLDM	VFIL	VFILM
0.0	114.00	6.42688E-04	4.00394E-02	9.62107E-03	0.0	0.0	0.0	0.0
0.250000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	2.28882E-04	1.42593E-02	0.0	0.0
0.500000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	4.57764E-04	2.85187E-02	0.0	0.0
0.750000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	6.86646E-04	4.27780E-02	0.0	0.0
1.00000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	9.15527E-04	5.70373E-02	0.0	0.0
1.25000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	1.14441E-03	7.12966E-02	0.0	0.0
1.50000	114.00	6.42688E-04	4.00394E-02	9.62107E-03	1.37329E-03	8.55560E-02	0.0	0.0
1.75000	113.83	1.6483	102.69	24.676	0.17017	10.601	0.0	0.0
2.00000	113.29	2.5683	160.00	38.447	0.70796	44.106	0.0	0.0
2.25000	112.61	2.8459	177.30	42.604	1.3852	86.299	0.0	0.0
2.50000	111.87	3.1078	193.61	46.523	2.1297	132.68	0.0	0.0
2.75000	111.08	3.2042	199.62	47.968	2.9183	181.81	0.0	0.0
3.00000	110.27	3.3190	206.77	49.685	3.7334	232.59	0.0	0.0
3.25000	109.44	3.3245	207.11	49.767	4.5634	284.30	0.0	0.0
3.50000	108.60	3.3503	208.72	50.154	5.3974	336.26	0.0	0.0
3.75000	107.78	3.2509	202.53	48.666	6.2222	387.64	0.0	0.0
4.00000	106.98	3.1679	197.36	47.424	7.0243	437.61	0.0	0.0
4.25000	106.20	3.0790	191.82	46.093	7.8049	486.24	0.0	0.0
4.50000	105.44	3.0017	187.01	44.936	8.5648	533.59	0.0	0.0
4.75000	104.69	2.9344	182.81	43.928	9.3066	579.80	0.0	0.0
5.00000	103.97	2.8757	179.15	43.049	10.033	625.04	0.0	0.0
5.25000	103.25	2.8246	175.97	42.284	10.745	669.42	0.0	0.0
5.50000	102.55	2.7802	173.21	41.620	11.446	713.07	0.0	0.0
5.75000	101.86	2.7418	170.82	41.045	12.136	756.06	0.0	0.0
6.00000	101.18	2.7087	168.75	40.550	12.817	798.51	0.0	0.0
6.25000	100.51	2.6804	166.99	40.126	13.491	840.47	0.0	0.0
6.50000	99.842	2.6563	165.49	39.766	14.158	882.03	0.0	0.0
6.75000	99.181	2.6362	164.23	39.464	14.819	923.24	0.0	0.0
7.00000	98.524	2.6195	163.20	39.215	15.476	964.16	0.0	0.0
7.25000	97.871	2.6027	162.15	38.963	16.129	1004.8	0.0	0.0
7.50000	97.222	2.5888	161.28	38.755	16.778	1045.3	0.0	0.0
7.75000	96.578	2.5570	159.30	38.279	17.422	1085.4	0.0	0.0
8.00000	95.944	2.5138	156.61	37.632	18.056	1124.9	0.0	0.0
8.25000	95.321	2.4727	154.05	37.017	18.679	1163.7	0.0	0.0
8.50000	94.707	2.4336	151.61	36.431	19.293	1201.9	0.0	0.0
8.75000	94.104	2.3962	149.28	35.871	19.896	1239.5	0.0	0.0
9.00000	93.509	2.3605	147.06	35.337	20.491	1276.6	0.0	0.0
9.25000	92.923	2.3263	144.93	34.825	21.077	1313.1	0.0	0.0
9.50000	92.346	2.2935	142.89	34.334	21.654	1349.1	0.67063	41.780
9.75000	91.776	2.2620	140.92	33.862	22.224	1384.5	1.4775	92.050
10.0000	91.215	2.2316	139.03	33.408	22.785	1419.5	2.2767	141.84
10.2500	90.660	2.2024	137.21	32.971	23.340	1454.1	3.0684	191.16
10.5000	90.113	2.1743	135.46	32.550	23.887	1488.1	3.8530	240.04
10.7500	89.573	2.1472	133.77	32.144	24.427	1521.8	4.6307	288.49
11.0000	89.040	2.1211	132.14	31.752	24.960	1555.0	5.4017	336.53
11.2500	88.512	2.0958	130.57	31.374	25.488	1587.9	6.1663	384.16
11.5000	87.992	2.0713	129.04	31.008	26.008	1620.3	6.9246	431.41
11.7500	87.477	2.0476	127.57	30.653	26.523	1652.4	7.6770	478.28
12.0000	86.968	2.0247	126.14	30.310	27.032	1684.1	8.4235	524.79
12.2500	86.464	2.0025	124.76	29.977	27.536	1715.5	9.1644	570.94
12.5000	85.966	1.9809	123.41	29.655	28.034	1746.5	9.8998	616.76
12.7500	85.474	1.9600	122.11	29.341	28.526	1777.2	10.630	662.24
13.0000	84.986	1.9397	120.84	29.037	29.014	1807.6	11.355	707.41
13.2500	84.504	1.9199	119.61	28.741	29.496	1837.6	12.075	752.26

B-201

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VJL.

VGO = 12.000

TIME	VL	Q	W	VELL	VLD	VLDL	VFIL	VFILM
13.5000	84.026	1.9006	118.41	28.453	29.974	1867.4	12.790	796.81
13.7500	83.553	1.8819	117.24	28.172	30.447	1896.8	13.500	841.06
14.0000	83.085	1.8637	116.11	27.900	30.915	1926.0	14.206	885.02
14.2500	82.621	1.8459	115.00	27.634	31.379	1954.9	14.907	928.71
14.5000	82.162	1.8286	113.92	27.374	31.838	1983.5	15.604	972.12
14.7500	81.707	1.8117	112.87	27.121	32.293	2011.9	16.296	1015.3
15.0000	81.256	1.7952	111.84	26.874	32.744	2039.9	16.985	1058.1
15.2500	80.809	1.7791	110.83	26.633	33.191	2067.8	17.669	1100.8
15.5000	80.366	1.7633	109.85	26.397	33.634	2095.4	18.349	1143.2
15.7500	79.927	1.7479	108.90	26.167	34.073	2122.7	19.026	1185.3
16.0000	79.492	1.7329	107.96	25.941	34.508	2149.8	19.698	1227.2
16.2500	79.061	1.7182	107.04	25.721	34.939	2176.7	20.367	1268.9
16.5000	78.633	1.7038	106.15	25.506	35.367	2203.4	21.032	1310.3
16.7500	78.209	1.6897	105.27	25.295	35.791	2229.8	21.694	1351.5
17.0000	77.788	1.6759	104.41	25.088	36.212	2256.0	22.352	1392.5
17.2500	77.371	1.6624	103.57	24.886	36.629	2282.0	23.007	1433.3
17.5000	76.957	1.6491	102.74	24.688	37.043	2307.8	23.658	1473.9
17.7500	76.546	1.6362	101.93	24.493	37.454	2333.4	24.307	1514.3
18.0000	76.139	1.6234	101.14	24.303	37.861	2358.8	24.951	1554.5
18.2500	75.734	1.6110	100.36	24.116	38.266	2383.9	25.593	1594.5
18.5000	75.333	1.5987	99.600	23.933	38.667	2408.9	26.232	1634.2
18.7500	74.935	1.5867	98.851	23.753	39.065	2433.7	26.867	1673.8
19.0000	74.540	1.5749	98.116	23.576	39.460	2458.4	27.500	1713.3
19.2500	74.148	1.5633	97.394	23.403	39.852	2482.8	28.130	1752.5
19.5000	73.758	1.5519	96.685	23.232	40.242	2507.1	28.757	1791.5
19.7500	73.371	1.5407	95.989	23.065	40.629	2531.2	29.381	1830.4
20.0000	72.988	1.5298	95.304	22.901	41.012	2555.1	30.002	1869.1
20.2500	72.607	1.5190	94.631	22.739	41.393	2578.8	30.621	1907.7
20.5000	72.228	1.5083	93.969	22.580	41.772	2602.4	31.236	1946.0
20.7500	71.852	1.4979	93.319	22.424	42.148	2625.8	31.850	1984.2
21.0000	71.479	1.4876	92.678	22.270	42.521	2649.1	32.460	2022.3
21.2500	71.108	1.4775	92.048	22.118	42.892	2672.1	33.068	2060.2
21.5000	70.740	1.4676	91.428	21.969	43.260	2695.1	33.674	2097.9
21.7500	70.375	1.4578	90.818	21.823	43.625	2717.9	34.277	2135.5
22.0000	70.011	1.4481	90.217	21.678	43.989	2740.5	34.878	2172.9
22.2500	69.650	1.4386	89.625	21.536	44.350	2763.0	35.476	2210.2
22.5000	69.292	1.4293	89.042	21.396	44.708	2785.3	36.072	2247.3
22.7500	68.936	1.4200	88.468	21.258	45.064	2807.5	36.666	2284.3
23.0000	68.582	1.4110	87.902	21.122	45.418	2829.6	37.257	2321.1
23.2500	68.230	1.4020	87.344	20.988	45.770	2851.5	37.846	2357.8
23.5000	67.881	1.3932	86.795	20.856	46.119	2873.2	38.433	2394.4
23.7500	67.533	1.3845	86.253	20.726	46.467	2894.9	39.018	2430.8
24.0000	67.188	1.3759	85.718	20.597	46.812	2916.4	39.600	2467.1
24.2500	66.845	1.3674	85.190	20.470	47.155	2937.7	40.181	2503.2
24.5000	66.505	1.3591	84.669	20.345	47.495	2959.0	40.759	2539.3
24.7500	66.166	1.3508	84.155	20.222	47.834	2980.1	41.335	2575.2
25.0000	65.829	1.3427	83.648	20.100	48.171	3001.0	41.909	2610.9
25.2500	65.494	1.3346	83.147	19.979	48.506	3021.9	42.481	2646.6
25.5000	65.162	1.3267	82.653	19.861	48.838	3042.6	43.051	2682.1
25.7500	64.831	1.3189	82.165	19.743	49.169	3063.2	43.619	2717.5
26.0000	64.502	1.3111	81.683	19.628	49.498	3083.7	44.186	2752.8
26.2500	64.175	1.3035	81.208	19.513	49.825	3104.1	44.750	2787.9
26.5000	63.850	1.2960	80.738	19.401	50.150	3124.3	45.312	2823.0
26.7500	63.527	1.2885	80.274	19.289	50.473	3144.4	45.873	2857.9

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-16DE77
COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; USING RELAP K & VOL.

VGO = 12.000

TIME	VL	Q	W	VELL	VLD	VLOM	VFIL	VFILM
27.0000	63.206	1.2812	79.816	19.179	50.794	3164.5	46.432	2892.7
27.2500	62.887	1.2739	79.363	19.070	51.113	3184.4	46.988	2927.4
27.5000	62.569	1.2667	78.915	18.963	51.431	3204.1	47.543	2962.0
27.7500	62.253	1.2596	78.473	18.856	51.747	3223.8	48.097	2996.4
28.0000	61.939	1.2526	78.036	18.751	52.061	3243.4	48.648	3030.8
28.2500	61.627	1.2456	77.604	18.647	52.373	3262.8	49.198	3065.0
28.5000	61.316	1.2388	77.176	18.545	52.684	3282.2	49.746	3099.2
28.7500	61.007	1.2320	76.754	18.443	52.993	3301.4	50.292	3133.2
29.0000	60.700	1.2253	76.336	18.343	53.300	3320.6	50.837	3167.1
29.2500	60.395	1.2187	75.923	18.243	53.605	3339.6	51.380	3201.0
29.5000	60.091	1.2121	75.514	18.145	53.909	3358.5	51.921	3234.7
29.7500	59.789	1.2056	75.110	18.048	54.211	3377.4	52.461	3268.3
30.0000	59.488	1.1992	74.710	17.952	54.512	3396.1	52.999	3301.8
30.2500	59.189	1.1928	74.314	17.857	54.811	3414.7	53.535	3335.2
30.5000	58.891	1.1866	73.922	17.763	55.109	3433.3	54.070	3368.6
30.7500	58.596	1.1803	73.535	17.670	55.404	3451.7	54.603	3401.8
31.0000	58.301	1.1742	73.151	17.577	55.699	3470.0	55.135	3434.9
31.2500	58.008	1.1681	72.771	17.486	55.992	3488.3	55.665	3468.0
31.5000	57.717	1.1620	72.395	17.396	56.283	3506.4	56.194	3500.9
31.7500	57.427	1.1561	72.023	17.306	56.573	3524.5	56.721	3533.7
32.0000	57.139	1.1501	71.654	17.218	56.861	3542.4	57.247	3566.5
32.2500	56.852	1.1443	71.289	17.130	57.148	3560.3	57.771	3599.2
32.5000	56.567	1.1385	70.928	17.043	57.433	3578.1	58.294	3631.7
32.7500	56.283	1.1327	70.570	16.957	57.717	3595.8	58.816	3664.2
33.0000	56.000	1.1270	70.215	16.872	58.000	3613.4	59.336	3696.6
33.2500	55.719	1.1214	69.864	16.788	58.281	3630.9	59.854	3728.9
33.5000	55.440	1.1158	69.516	16.704	58.560	3648.3	60.371	3761.1
33.7500	55.161	1.1103	69.171	16.621	58.839	3665.7	60.887	3793.3
34.0000	54.884	1.1048	68.829	16.539	59.116	3682.9	61.401	3825.3
34.2500	54.609	1.0994	68.491	16.458	59.391	3700.1	61.914	3857.3
34.5000	54.335	1.0940	68.155	16.377	59.665	3717.2	62.426	3889.1
34.7500	54.062	1.0886	67.822	16.297	59.938	3734.2	62.936	3920.9
35.0000	53.790	1.0833	67.493	16.218	60.210	3751.1	63.445	3952.6
35.2500	53.520	1.0781	67.166	16.139	60.480	3767.9	63.953	3984.3
35.5000	53.251	1.0729	66.842	16.061	60.749	3784.7	64.459	4015.8
35.7500	52.984	1.0677	66.521	15.984	61.016	3801.3	64.964	4047.3
36.0000	52.717	1.0626	66.202	15.908	61.283	3817.9	65.468	4078.6
36.2500	52.452	1.0576	65.886	15.832	61.548	3834.4	65.970	4110.0
36.5000	52.188	1.0525	65.573	15.757	61.812	3850.9	66.472	4141.2
36.7500	51.926	1.0476	65.263	15.682	62.074	3867.2	66.972	4172.3
37.0000	51.665	1.0426	64.955	15.608	62.335	3883.5	67.470	4203.4
37.2500	51.404	1.0377	64.649	15.535	62.596	3899.7	67.968	4234.4
37.5000	51.146	1.0328	64.346	15.462	62.854	3915.8	68.464	4265.3
37.7500	50.888	1.0280	64.045	15.389	63.112	3931.9	68.959	4296.2
38.0000	50.632	1.0232	63.747	15.318	63.368	3947.9	69.453	4326.9
38.2500	50.376	1.0185	63.451	15.247	63.624	3963.8	69.946	4357.6
38.5000	50.122	1.0138	63.158	15.176	63.878	3979.6	70.437	4388.2
38.7500	49.869	1.0091	62.866	15.106	64.131	3995.3	70.928	4418.8
39.0000	49.618	1.0044	62.577	15.037	64.382	4011.0	71.417	4449.3
39.2500	49.367	0.99984	62.290	14.968	64.633	4026.6	71.905	4479.7
39.5000	49.118	0.99527	62.006	14.899	64.882	4042.2	72.391	4510.0
39.7500	48.869	0.99074	61.723	14.831	65.131	4057.6	72.877	4540.2
40.0000	48.622	0.98624	61.443	14.764	65.378	4073.0	73.362	4570.4

B-31

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

LTR 50

OUTPUT VARIABLE RANGES FOR ALL RUNS IN CASE

VARIABLE	MINIMUM	MAXIMUM	VARIABLE	MINIMUM	MAXIMUM
TIME	0.0	40.0000	PG	45.0679	612.500
VG	12.0000	125.925	VL	6.535697E-02	114.000
ZL	5.199440E-03	9.06921	Q	6.426875E-04	4.21030
W	4.003942E-02	262.302	VLD	0.0	91.7346
VLDH	0.0	5715.07	DELTAP	1.000000E-05	416.593
TGAS	-208.506	70.0000	RENUM	269.158	1.838139E 06
VELL	9.621069E-03	63.0284	PCL	20.0000	2250.00
VFIL	0.0	92.9843	VFILM	0.0	5792.92

LTR13 50

B-38

IEF142I - STEP WAS EXECUTED - COND CODE 0000
 IEF285I SYS2.CSMPLIB3 KEPT
 IEF285I VOL SER NOS= DSKRES.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.SYSIN DELETED
 IEF285I VOL SER NOS= DSK005.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000024 DELETED
 IEF285I VOL SER NOS= SPOL01.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000025 DELETED
 IEF285I VOL SER NOS= DSK002.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000026 DELETED
 IEF285I VOL SER NOS= DSK001.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000027 DELETED
 IEF285I VOL SER NOS= DSK005.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000028 DELETED
 IEF285I VOL SER NOS= DSK001.
 IEF285I LOFTACCU.N2MINVOL.CLDLLOCA KEPT
 IEF285I VOL SER NOS= T9B225.
 IEF285I SYS2.CSMPLD03 KEPT
 IEF285I VOL SER NOS= SYSIPL.
 IEF285I SYS2.CSMPLD03 KEPT
 IEF285I VOL SER NOS= SYSIPL.
 IEF285I SYS1.FORTLIB KEPT
 IEF285I VOL SER NOS= DSKIPL.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000029 DELETED
 IEF285I VOL SER NOS= DSK002.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000029 PASSED
 IEF285I VOL SER NOS= DSK002.
 IEF285I SYS2.CSMPDCK3 KEPT
 IEF285I VOL SER NOS= DSKRES.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.N0SET DELETED
 IEF285I VOL SER NOS= DSK004.
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000030 DELETED
 IEF285I VOL SER NOS= DSK005.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000031 DELETED
 IEF285I VOL SER NOS= SPOL31.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000032 SYSOUT
 IEF285I VOL SER NOS= SPOL03.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000033 SYSOUT
 IEF285I VOL SER NOS= SPOL02.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000034 SYSOUT
 IEF285I VOL SER NOS= SPOL31.
 IEF285I SYS77353.T150051.SV000.HFRNEBFA.R0000035 SYSOUT
 IEF285I VOL SER NOS= SPOL01.
 IEF285I SYS77353.T123456.I0007.HFRNEBFA.S0000010 SYSIN
 IEF285I VOL SER NOS= SPOL31.
 IEF285I SYS77353.T123456.I0007.HFRNEBFA.S0000010 DELETED
 IEF285I VOL SER NOS= SPOL31.

OUTPUT TAPE
 KEPT

IEF373I STEP /X / START 77353.1838
 IEF374I STEP /X / STOP 77353.1850 CPU 1MIN 14.17SEC MAIN 126K LCS OK
 WAIT 0002MIN 15.67SEC SYSIN 00092REC UNUSED CORE 002K EXCPS 004619 SYSHRS .047319
 237 000000X;231 000022X;135 000000X;230 000034X;130 000194X;231 002083X;130 000104X;000 001049X;356 000082X;356 000179X
 137 000101X;230 000006X;230 000007X;237 000043X;131 000285X;231 000178X;354 000000X;136 000013X;235 000111X;354 000005X
 135 000116X;354 000007X
 IEF285I SYS77353.T150051.RV000.HFRNEBFA.R0000029 KEPT
 IEF285I VOL SER NOS= DSK002.
 IEF375I JOB /HFRNEBFA/ START 77353.1838
 IEF376I JOB /HFRNEBFA/ STOP 77353.1850 CPU 1MIN 14.17SEC
 WAIT 0002MIN 15.67SEC SYSIN 00092REC EXCPS 004619 SYSHRS .047319 DPSU .0473 REL 21.8

B-39

LTR 1 3 50

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-50.0CUFT

B-40

LIR113 50.3

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-50.0CUFT

B-41

LTR113 50 7

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-40.0CUFT

B-42

LTR113 50 7

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO=40.0CUFT

B-43

LTR113 50.3

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-34.2CUFT

B-44

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-34.2CUFT

B-45

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-27.5CUFT

B-46

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-27.5CUFT

B-47

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO=20.0CUFT

B-48

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO=20.0CUFT

B-49

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-16.0CUFT

B-50

LR113 50.7

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-16.0CUFT

B-51

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-12.0CUFT

B-52

ACCU MIN N2 VOL RELAP INP. DATA COLD LG BRK VGO-12.0CUFT

B-53

[illegible]

A 10x10 grid of black squares forming a stylized letter 'A'. The grid is 10 columns wide and 10 rows high. The letter 'A' is formed by black squares, with the top row being 10 squares wide, the middle row being 6 squares wide, and the bottom row being 10 squares wide. The letter is centered horizontally.

LOFT Cold Leg Brk w/ $K = 79.93$ on Flow area: $.14686 \text{ ft}^2$

$= 19.25 \text{ oz} \quad \cdot 06447 \text{ oz/g}$

(MEASURED FLOW CHARACTERISTICS)

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//HFRN38FA JOB (D,52191-200-200,3510,X06740),H.F.RHODES,
// TIME=003,CLASS=L,PRTY=03 CUR=150,CPU=003,WT=001
//CSMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCD5,
// PREDECK='SYS2.',
// PRELOAD='SYS2.',STEPLIB=CSMPLD03,SYSLIB=CSMPLD03,
// SYSLINK=CSMPDCK3,VSY=DSKRES
//X EXEC PGM=DEJCSMP2,REGION=128K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))',
//CSMPLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=SHR,DSN=ELIBRARY 00000050
//FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=66SYSIN, 00000060
// DCB=(RECFM=F,RECL=80,BLKSIZE=800) 00000070
//FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
//FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
//FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
//FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
// DCB=(RECFM=VS,BLKSIZE=444) 00000140
//FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
//GO.FT15F001 DD DSN=LOFTACC,N2MINVOL,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=(SHR,PASS), 00000170
// DSN=6PRELOAD6STEPLIB 00000180
//SYSLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=SHR,DSN=6PRELOAD6SYSLIB 00000190
// CD DISP=SHR,DSN=SYS1.FORTLIB 00000200
//SYSLIN DD UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800 00000210
//SYSLINK DD UNIT=SYSDA,VOL=REF=*,SYSLIN,DISP=(OLD,PASS),DSN=*.SYSLIN 00000220
// DD UNIT=EDSYS,VOL=SER=6VSY,DISP=SHR, 00000230
// DSN=6PREDECK6SYSLINK,6LINKMEM 00000240
//SYSLMOD DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=66NOSET(DEJEXE) 00000250
//SYSDA DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(40,10)) 00000270
//FT03F001 DD SYSOUT=A 00000280
//FT08F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000290
//COMPRINT DD SYSOUT=A 00000300
//SYSPRINT DD SYSOUT=A 00000310
//FT06F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000320
// PEND 00000330
//CSMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCD5,
// PREDECK='SYS2.',
// PRELOAD='SYS2.',STEPLIB=CSMPLD03,SYSLIB=CSMPLD03,
// SYSLINK=CSMPDCK3,VSY=DSKRES
//X EXEC PGM=DEJCSMP2,REGION=128K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))',
//CSMPLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=SHR,DSN=ELIBRARY 00000050
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLIB3
//FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=66SYSIN, 00000060
// DCB=(RECFM=F,RECL=80,BLKSIZE=800) 00000070
//FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
//FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
//FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
//FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
// DCB=(RECFM=VS,BLKSIZE=444) 00000140
//FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
//GO.FT15F001 DD DSN=LOFTACC,N2MINVOL,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD DSN=SYS2.CSMPLD03,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL 00000170
//STEPLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=(SHR,PASS), 00000180
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=(SHR,PASS),
// DSN=6PRELOAD6STEPLIB
IEF653I SUBSTITUTION JCL - DSN=SYS2.CSMPLD03
//SYSLIB DD DSN=SYS2.CSMPLD03,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL 00000190
//SYSLIB DD UNIT=EDSYS,VOL=SER=6VSY,DISP=SHR,DSN=6PRELOAD6SYSLIB
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLD03

```

```

++SYSLIN DD DISP=SHR,DSN=SYS1.FORTLIB 00000200
++SYSLINK DD UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800 00000210
++SYSLINK DD UNIT=SYSDA,VOL=REF=*,SYSLIN,DISP=(OLD,PASS),DSN=*.SYSLIN 00000220
++SYSLINK DD UNIT=SYSDA,VOL=SER=*,SYSLIN,DISP=SHR, 00000230
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,
++ DSN=PREDECK&SYSLINK.(&LINKMEM) 00000240
IEF653I SUBSTITUTION JCL - DSN=SYS2.CSMPDCK3(CTLCD3)
++SYSLMOD DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=66N03ET(DEJEXE) 00000250
++SYSLMOD DD UNIT=SYSDA,SEP=(SYSLMOD,SYSLINK),SPACE=(3500,(40,10)) 00000270
++FT03FOO1 DD SYSOUT=A 00000280
++FT08FOO1 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000290
++COMPRINT DD SYSOUT=A 00000300
++SYSPRINT DD SYSOUT=A 00000310
++FT06FOO1 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000320
//X.SYSIN DD DSN=SYS77312.I123456.I0307.HFRN38FA.S0000038,
// VOL=SER=(SP0L02),DISP=(OLD,DELETE),UNIT=DKSP0L
//
IEF244I HFRN38FA.X .FT15FOO1 UNABLE TO ALLOCATE
IEF388I HFRN38FA.X .FT15FOO1 WAITING FOR DEVICES
IEF236I ALLDC. FOR HFRN38FA X
IEF237I 237 ALLOCATED TO CSMPLIB
IEF237I 231 ALLOCATED TO FT01FOO1
IEF237I 354 ALLOCATED TO FT02FOO1
IEF237I 131 ALLOCATED TO FT05FOO1
IEF237I 230 ALLOCATED TO FT07FOO1
IEF237I 331 ALLOCATED TO FT13FOO1
IEF237I 130 ALLOCATED TO FT14FOO1
IEF237I 0D0 ALLOCATED TO FT15FOO1
IEF237I 356 ALLOCATED TO STEPLIB
IEF237I 356 ALLOCATED TO SYSLIB
IEF237I 137 ALLOCATED TO
IEF237I 231 ALLOCATED TO SYSLIN
IEF237I 231 ALLOCATED TO SYSLINK
IEF237I 237 ALLOCATED TO
IEF237I 131 ALLOCATED TO SYSLMOD
IEF237I 230 ALLOCATED TO SYSUT1
IEF237I 354 ALLOCATED TO FT03FOO1
IEF237I 135 ALLOCATED TO FT08FOO1
IEF237I 236 ALLOCATED TO COMPRINT
IEF237I 354 ALLOCATED TO SYSPRINT
IEF237I 135 ALLOCATED TO FT06FOO1
IEF237I 235 ALLOCATED TO SYSIN

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LTR 113-SZ

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LTR 113-SZ

\$\$\$ TRANSLATION TABLE CONTENTS \$\$\$

	CURRENT	MAXIMUM
MACRO AND STATEMENT OUTPUTS	35	600
STATEMENT INPUT WORK AREA	72	1900
INTEGRATORS+MEMORY BLOCK OUTPUTS	4 + 0	300
PARAMETERS+FUNCTION GENERATORS	4 + 1	400
STORAGE VARIABLES+INTEGRATOR ARRAYS	0 + 0 1/2	50
HISTORY AND MEMORY BLOCK NAMES	21	50
MACRO DEFINITIONS AND NESTED MACROS	6	50
MACRO STATEMENT STORAGE	13	125
LITERAL CONSTANT STORAGE	0	100
SORT SECTIONS	2	20
MAXIMUM STATEMENTS IN SECTION	18	600

\$\$\$END OF TRANSLATOR OUTPUT\$\$\$

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REF 50

```
0001      BLOCK DATA
0002      COMMON/ZZFDAT/F( 78)
1 /ZZHIST/KEEP,NALARM,I2000C,I2000I,H( 6)
2 /ZZISTD/I( 20)
0003      COMMON/ZZPOIN/NP(16)
0004      INTEGER NP/ 4, 20, 15, 27, 0, 27, 1, 28, 4, 46, 46
0005      COMMON/ZZSYMB/S11( 34)
0006      REAL*8 S11/
1 /TIMEDELT, ZZDELT, DELMINZZ, DELNFINT, IMZZFINT, PRDEL ZZ,
1 /PRDEOUTD, ELZZOUTD, DELMAXZZ, DELXVG, PG, VL, VF,
1 /IL1 DVG, DPG, DVL QQ, VGO, PGO, VLO, VF,
1 /ILO PCLT, ABVES, DELTAPFL, QA FLOR, FLOVDK, GASCONGA,
1 /SK PCL, Q2, Q RH, OL TGAS, TO, VFIL VL,
1 /D VVES, W, ZL
0007      END
```

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18 13 50

FORTRAN IV 3 LEVEL 21

BLK DATA

DATE = 77312

18/02/18

PAGE 0002

OPTIONS IN EFFECT NOIO,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
OPTIONS IN EFFECT NAME = BLK DATA, LINECNT = 58
STATISTICS NO DIAGNOSTICS GENERATED

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1111350

```

0001 SUBROUTINE UPDATE
0002 COMMON TIME
      1,ZZOCCO,DELT,ZZDELT,DELMIN,ZZDELN,FINTIM,ZZFINT,PRDEL,ZZPRDE
      1,OUTDCL,ZZOUTD,JELMAX,ZZDELX,VG,PG,VL,VFILL,DVG
      1,DPG,DVL,QQ,VGO,PGO,VLO,VFILO,PCLTAB,AVES
      1,DELTAP,FLOA,FLOR,FLOVDK,GASCON,GASK,PCL,P2,O
      1,RHOL,TGAS,TO,VFIL,VLD,VVES,W,ZL
      COMMON/ZZHIST/KEEP,NALARM,IZO000,IZO0C1
      REAL LIMIT
      REAL*8 ZZTIME
      EQUIVALENCE(ZZTIME,TIME)
      GO TO(39995,39996,39997,39998),IZO000
C     SYSTEM SEGMENT OF MODEL
39995 CONTINUE
      GO TO 39999
C     INITIAL SEGMENT OF MODEL
39996 CONTINUE
      AVES=12.57
      PGO=612.5
      RHOL=62.3
      TO=7C.0+460.0
      GASK=1.4
      GASCON=0.3832
      VVES=134.0
      VLO=VVES-VGO
      FLOVDK=99.93
      FLOA=0.14686
      FLOR=FLOVDK/(FLOA*FLOA*144.0*2*32.2)
      VFIL=0.0
      VFILO=0.0
      GO TO 39999
C     DYNAMIC SEGMENT OF MODEL
39997 CONTINUE
      ZL=VL/AVES
      PCL=AFGEN(1,PCLTAB,TIME)
      P2=PG+((ZL-8.33)*RHOL/144.0)-PCL
      DELTAP=LIMIT(1.0E-5,10000.,P2)
      Q=SQRT((DELTAP)/(FLOR*RHOL))
      DVL=-Q
      DVG=-DVL
C     VG=INTGRL(VGO,DVG)
      DPG=-PG*GASK*DVG/VG
C     PG=INTGRL(PGO,DPG)
C     VL=INTGRL(VLO,DVL)
      W=Q*RHOL
      TGAS=TO*(VGO/VG)*((GASK-1.0)-460.0
      VLD=VLC-VL
      IF(TIME.LT.9.29)QQ=0.0
      IF(TIME.GT.9.29)QQ=Q
C     VFILL=INTGRL(VFILO,QQ)
      IF(TIME.GT.9.295)VFIL=VFILL+0.95*(TIME-9.3)
      GO TO 39999
C     TERMINAL SEGMENT OF MODEL
39998 CONTINUE
39999 CONTINUE
      RETURN

```

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TR 113 50

FORTRAN IV G LEVEL 21
0044 END

UPDATE

DATE = 77312

18/02/18

PAGE 0002

CSMPDECK

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TR 1 3 50 71

FORTRAN IV G LEVEL 21

UPDATE

DATE = 77312

18/02/18

PAGE 0003

LTR 113-50

OPTIONS IN EFFECT NOID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
OPTIONS IN EFFECT NAME = UPDATE , LINECNT = 58
STATISTICS SOURCE STATEMENTS = 44,PROGRAM SIZE = 970
STATISTICS NO DIAGNOSTICS GENERATED
STATISTICS NO DIAGNOSTICS THIS STEP

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LTR 113-50

F88-LEVEL LINKAGE EDITOR OPTIONS SPECIFIED ONLY, SIZE=(120K,12K)
VARIABLE OPTIONS USED - SIZE=(122880,12288)
***DEJEKE DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET

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18113-50

\$\$\$ CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 EXECUTION OUTPUT \$\$\$

TITLE ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77

TITLE PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

FUNCTION PCLTAB = 0.0,2250.,1.6,612.5,2.,410.,2.5,260.,...

3.,160.,3.5,100.,4.,85.,7.,30.,7.6,20.,...

1000.,20.

PRINT PG, VG, VL, ZL, Q, W, VFIL, VLD

METHOD SIMP

TIMER DELT = .05, FINTIM = 75.0, PRDEL = 0.5

PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0)

PREPARE PG, VG, VL, ZL, Q, W, VLD, T GAS, VFIL

FINISH ZL = 0.01

END

TIMER VARIABLES		SIMP	INTEGRATION		START TIME = 0.0	
DELT	DELMIN	FINTIM	PRDEL	OUTDEL	DELMAX	
5.000000-02	7.500000-06	75.000	0.50000	0.50000	0.50000	

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181350

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FL300 REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 15, 12 CU FT @612.5PSIA

VGO = 50.000

TIME	PR	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118	V119	V120	V121	V122	V123	V124	V125	V126	V127	V128	V129	V130	V131	V132	V133	V134	V135	V136	V137	V138	V139	V140	V141	V142	V143	V144	V145	V146	V147	V148	V149	V150	V151	V152	V153	V154	V155	V156	V157	V158	V159	V160	V161	V162	V163	V164	V165	V166	V167	V168	V169	V170	V171	V172	V173	V174	V175	V176	V177	V178	V179	V180	V181	V182	V183	V184	V185	V186	V187	V188	V189	V190	V191	V192	V193	V194	V195	V196	V197	V198	V199	V200	V201	V202	V203	V204	V205	V206	V207	V208	V209	V210	V211	V212	V213	V214	V215	V216	V217	V218	V219	V220	V221	V222	V223	V224	V225	V226	V227	V228	V229	V230	V231	V232	V233	V234	V235	V236	V237	V238	V239	V240	V241	V242	V243	V244	V245	V246	V247	V248	V249	V250	V251	V252	V253	V254	V255	V256	V257	V258	V259	V260	V261	V262	V263	V264	V265	V266	V267	V268	V269	V270	V271	V272	V273	V274	V275	V276	V277	V278	V279	V280	V281	V282	V283	V284	V285	V286	V287	V288	V289	V290	V291	V292	V293	V294	V295	V296	V297	V298	V299	V300	V301	V302	V303	V304	V305	V306	V307	V308	V309	V310	V311	V312	V313	V314	V315	V316	V317	V318	V319	V320	V321	V322	V323	V324	V325	V326	V327	V328	V329	V330	V331	V332	V333	V334	V335	V336	V337	V338	V339	V340	V341	V342	V343	V344	V345	V346	V347	V348	V349	V350	V351	V352	V353	V354	V355	V356	V357	V358	V359	V360	V361	V362	V363	V364	V365	V366	V367	V368	V369	V370	V371	V372	V373	V374	V375	V376	V377	V378	V379	V380	V381	V382	V383	V384	V385	V386	V387	V388	V389	V390	V391	V392	V393	V394	V395	V396	V397	V398	V399	V400	V401	V402	V403	V404	V405	V406	V407	V408	V409	V410	V411	V412	V413	V414	V415	V416	V417	V418	V419	V420	V421	V422	V423	V424	V425	V426	V427	V428	V429	V430	V431	V432	V433	V434	V435	V436	V437	V438	V439	V440	V441	V442	V443	V444	V445	V446	V447	V448	V449	V450	V451	V452	V453	V454	V455	V456	V457	V458	V459	V460	V461	V462	V463	V464	V465	V466	V467	V468	V469	V470	V471	V472	V473	V474	V475	V476	V477	V478	V479	V480	V481	V482	V483	V484	V485	V486	V487	V488	V489	V490	V491	V492	V493	V494	V495	V496	V497	V498	V499	V500	V501	V502	V503	V504	V505	V506	V507	V508	V509	V510	V511	V512	V513	V514	V515	V516	V517	V518	V519	V520	V521	V522	V523	V524	V525	V526	V527	V528	V529	V530	V531	V532	V533	V534	V535	V536	V537	V538	V539	V540	V541	V542	V543	V544	V545	V546	V547	V548	V549	V550	V551	V552	V553	V554	V555	V556	V557	V558	V559	V560	V561	V562	V563	V564	V565	V566	V567	V568	V569	V570	V571	V572	V573	V574	V575	V576	V577	V578	V579	V580	V581	V582	V583	V584	V585	V586	V587	V588	V589	V590	V591	V592	V593	V594	V595	V596	V597	V598	V599	V600	V601	V602	V603	V604	V605	V606	V607	V608	V609	V610	V611	V612	V613	V614	V615	V616	V617	V618	V619	V620	V621	V622	V623	V624	V625	V626	V627	V628	V629	V630	V631	V632	V633	V634	V635	V636	V637	V638	V639	V640	V641	V642	V643	V644	V645	V646	V647	V648	V649	V650	V651	V652	V653	V654	V655	V656	V657	V658	V659	V660	V661	V662	V663	V664	V665	V666	V667	V668	V669	V670	V671	V672	V673	V674	V675	V676	V677	V678	V679	V680	V681	V682	V683	V684	V685	V686	V687	V688	V689	V690	V691	V692	V693	V694	V695	V696	V697	V698	V699	V700	V701	V702	V703	V704	V705	V706	V707	V708	V709	V710	V711	V712	V713	V714	V715	V716	V717	V718	V719	V720	V721	V722	V723	V724	V725	V726	V727	V728	V729	V730	V731	V732	V733	V734	V735	V736	V737	V738	V739	V740	V741	V742	V743	V744	V745	V746	V747	V748	V749	V750	V751	V752	V753	V754	V755	V756	V757	V758	V759	V760	V761	V762	V763	V764	V765	V766	V767	V768	V769	V770	V771	V772	V773	V774	V775	V776	V777	V778	V779	V780	V781	V782	V783	V784	V785	V786	V787	V788	V789	V790	V791	V792	V793	V794	V795	V796	V797	V798	V799	V800	V801	V802	V803	V804	V805	V806	V807	V808	V809	V810	V811	V812	V813	V814	V815	V816	V817	V818	V819	V820	V821	V822	V823	V824	V825	V826	V827	V828	V829	V830	V831	V832	V833	V834	V835	V836	V837	V838	V839	V840	V841	V842	V843	V844	V845	V846	V847	V848	V849	V850	V851	V852	V853	V854	V855	V856	V857	V858	V859	V860	V861	V862	V863	V864	V865	V866	V867	V868	V869	V870	V871	V872	V873	V874	V875	V876	V877	V878	V879	V880	V881	V882	V883	V884	V885	V886	V887	V888	V889	V890	V891	V892	V893	V894	V895	V896	V897	V898	V899	V900	V901	V902	V903	V904	V905	V906	V907	V908	V909	V910	V911	V912	V913	V914	V915	V916	V917	V918	V919	V920	V921	V922	V923	V924	V925	V926	V927	V928	V929	V930	V931	V932	V933	V934	V935	V936	V937	V938	V939	V940	V941	V942	V943	V944	V945	V946	V947	V948	V949	V950	V951	V952	V953	V954	V955	V956	V957	V958	V959	V960	V961	V962	V963	V964	V965	V966	V967	V968	V969	V970	V971	V972	V973	V974	V975	V976	V977	V978	V979	V980	V981	V982	V983	V984	V985	V986	V987	V988	V989	V990	V991	V992	V993	V994	V995	V996	V997	V998	V999	V1000	V1001	V1002	V1003	V1004	V1005	V1006	V1007	V1008	V1009	V1010	V1011	V1012	V1013	V1014	V1015	V1016	V1017	V1018	V1019	V1020	V1021	V1022	V1023	V1024	V1025	V1026	V1027	V1028	V1029	V1030	V1031	V1032	V1033	V1034	V1035	V1036	V1037	V1038	V1039	V1040	V1041	V1042	V1043	V1044	V1045	V1046	V1047	V1048	V1049	V1050	V1051	V1052	V1053	V1054	V1055	V1056	V1057	V1058	V1059	V1060	V1061	V1062	V1063	V1064	V1065	V1066	V1067	V1068	V1069	V1070	V1071	V1072	V1073	V1074	V1075	V1076	V1077	V1078	V1079	V1080	V1081	V1082	V1083	V1084	V1085	V1086	V1087	V1088	V1089	V1090	V1091	V1092	V1093	V1094	V1095	V1096	V1097	V1098	V1099	V1100	V1101	V1102	V1103	V1104	V1105	V1106	V1107	V1108	V1109	V1110	V1111	V1112	V1113	V1114	V1115	V1116	V1117	V1118	V1119	V1120	V1121	V1122	V1123	V1124	V1125	V1126	V1127	V1128	V1129	V1130	V1131	V1132	V1133	V1134	V1135	V1136	V1137	V1138	V1139	V1140	V1141	V1142	V1143	V1144	V1145	V1146	V1147	V1148	V1149	V1150	V1151	V1152	V1153	V1154	V1155	V1156	V1157	V1158	V1159	V1160	V1161	V1162	V1163	V1164	V1165	V1166	V1167	V1168	V1169	V1170	V1171	V1172	V1173	V1174	V1175	V1176	V1177	V1178	V1179	V1180	V1181	V1182	V1183	V1184	V1185	V1186	V1187	V1188	V1189	V1190	V1191	V1192	V1193	V1194	V1195	V1196	V1197	V1198	V1199	V1200	V1201	V1202	V1203	V1204	V1205	V1206	V1207	V1208	V1209	V1210	V1211	V1212	V1213	V1214	V1215	V1216	V1217	V1218	V1219	V1220	V1221	V1222	V1223	V1224	V1225	V1226	V1227	V1228	V1229	V1230	V1231	V1232	V1233	V1234	V1235	V1236	V1237	V1238	V1239	V1240	V1241	V1242	V1243	V1244	V1245	V1246	V1247	V1248	V1249	V1250	V1251	V1252	V1253	V1254	V1255	V1256	V1257	V1258	V1259	V1260	V1261	V1262	V1263	V1264	V1265	V1266	V1267	V1268	V1269	V1270	V1271	V1272	V1273	V1274	V1275	V1276	V1277	V1278	V1279	V1280	V1281	V1282	V1283	V1284	V1285	V1286	V1287	V1288	V1289	V1290	V1291	V1292	V1293	V1294	V1295	V1296	V1297	V1298	V1299	V1300	V1301	V1302	V1303	V1304	V1305	V1306	V1307	V1308	V1309	V1310	V1311	V1312	V1313	V1314	V1315	V1316	V1317	V1318	V1319	V1320	V1321	V1322	V1323	V1324	V1325	V1326	V1327	V1328	V1329	V1330	V1331	V1332	V1333	V1334	V1335	V1336	V1337	V1338	V1339	V1340	V1341	V1342	V1343	V1344	V1345	V1346	V1347	V1348	V1349	V1350	V1351	V1352	V1353	V1354	V1355	V1356	V1357	V1358	V1359	V1360	V1361	V1362	V1363	V1364	V1365	V1366	V1367	V1368	V1369	V1370	V1371	V1372	V1373	V1374	V1375	V1376	V1377	V1378	V1379	V1380	V1381	V1382	V1383	V1384	V1385	V1386	V1387	V1388	V1389	V1390	V1391	V1392	V1393	V1394	V1395	V1396	V1397	V1398	V1399	V1400	V1401	V1402	V1403	V1404	V1405	V1406	V1407	V1408	V1409	V1410	V1411	V1412	V1413	V1414	V1415	V1416	V1417	V1418	V1419	V1420	V1421	V1422	V1423	V1424	V1425	V1426	V1427	V1428	V1429	V1430	V1431	V1432	V1433	V1434	V1435	V1436	V1437	V1438	V1439	V1440	V1441	V1442	V1443	V1444	V1445	V1446	V1447	V1448	V1449	V1450	V1451	V1452	V1453	V1454	V1455	V1456	V1457	V1458	V1459	V1460	V1461	V1462	V1463	V1464	V1465	V1466	V1467	V1468	V1469	V1470	V1471	V1472	V1473	V1474	V1475	V1476	V
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ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT 3612.5PSIA

VGO = 50.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
27.0000	175.57	122.05	11.946	0.95035	2.2126	137.84	63.195	72.054
27.5000	173.38	123.15	10.844	0.85270	2.1963	136.83	64.772	73.156
28.0000	171.24	124.24	9.7499	0.77565	2.1804	135.84	66.341	74.250
28.5000	169.17	125.33	8.6637	0.68923	2.1646	134.86	67.902	75.336
29.0000	167.15	126.41	7.5851	0.60343	2.1495	133.91	69.456	76.415
29.5000	165.19	127.48	6.5141	0.51823	2.1345	132.98	71.002	77.486
30.0000	163.28	128.54	5.4506	0.43362	2.1198	132.06	72.540	78.549
30.5000	161.42	129.60	4.3943	0.34959	2.1053	131.16	74.071	79.606
31.0000	159.61	130.65	3.3452	0.26613	2.0912	130.28	75.595	80.655
31.5000	157.84	131.69	2.3031	0.18322	2.0773	129.42	77.112	81.697
32.0000	156.12	132.72	1.2679	0.10086	2.0637	128.57	78.622	82.732
32.5000	154.44	133.75	0.23938	1.90440E-02	2.0503	127.73	80.126	83.761
32.6000	154.11	133.96	3.44865E-02	2.74356E-03	2.0476	127.57	80.426	83.965

B-66

LR13 50

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL 2.74356e-03

B-67

NR113.50

ACCUM M GAS VOL: PARAMET CALCS FOR LUCA FLOOD #COMTS. HFR-240077
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 18, 12 CU FT @12.5PSIA

VGO 40.000

TIME	VG	VL	ZL	VFIL	VLD
0.000000	612.20	40.000	7.4781	0.000000	0.000000
0.500000	612.49	40.000	7.4781	0.000000	0.000000
1.000000	612.49	40.000	7.4781	0.000000	0.000000
1.500000	612.48	40.000	7.4781	0.000000	0.000000
2.000000	598.62	40.660	7.4256	0.000000	0.000000
2.500000	570.67	42.072	7.3132	0.000000	0.000000
3.000000	540.50	43.736	7.1808	0.000000	0.000000
3.500000	511.12	45.518	7.0391	0.000000	0.000000
4.000000	484.08	47.319	6.8957	0.000000	0.000000
4.500000	459.80	49.091	6.7548	0.000000	0.000000
5.000000	437.93	50.830	6.6164	0.000000	0.000000
5.500000	418.08	52.542	6.4802	0.000000	0.000000
6.000000	399.96	54.231	6.3459	0.000000	0.000000
6.500000	383.34	55.906	6.2131	0.000000	0.000000
7.000000	368.02	57.553	6.0816	0.000000	0.000000
7.500000	353.84	59.190	5.9513	0.000000	0.000000
8.000000	340.73	60.808	5.8225	0.000000	0.000000
8.500000	328.66	62.395	5.6963	0.000000	0.000000
9.000000	317.11	63.952	5.5724	0.000000	0.000000
9.500000	307.18	65.481	5.4508	0.000000	0.000000
10.000000	297.57	66.983	5.3313	0.000000	0.000000
10.500000	288.62	68.450	5.2137	0.000000	0.000000
11.000000	280.26	69.814	5.0981	0.000000	0.000000
11.500000	272.42	71.144	4.9843	0.000000	0.000000
12.000000	265.06	72.533	4.8722	0.000000	0.000000
12.500000	258.13	74.142	4.7617	0.000000	0.000000
13.000000	251.61	75.511	4.6528	0.000000	0.000000
13.500000	245.44	76.860	4.5454	0.000000	0.000000
14.000000	239.61	78.192	4.4394	0.000000	0.000000
14.500000	234.08	79.506	4.3349	0.000000	0.000000
15.000000	228.84	80.804	4.2316	0.000000	0.000000
15.500000	223.85	82.086	4.1297	0.000000	0.000000
16.000000	219.10	83.352	4.0289	0.000000	0.000000
16.500000	214.58	84.603	3.9294	0.000000	0.000000
17.000000	210.26	85.840	3.8310	0.000000	0.000000
17.500000	206.14	87.063	3.7337	0.000000	0.000000
18.000000	202.20	88.272	3.6374	0.000000	0.000000
18.500000	198.42	89.469	3.5422	0.000000	0.000000
19.000000	194.80	90.652	3.4481	0.000000	0.000000
19.500000	191.33	91.824	3.3545	0.000000	0.000000
20.000000	188.00	92.984	3.2626	0.000000	0.000000
20.500000	184.80	94.132	3.1712	0.000000	0.000000
21.000000	181.71	95.269	3.0807	0.000000	0.000000
21.500000	178.75	96.395	2.9911	0.000000	0.000000
22.000000	175.89	97.511	2.9024	0.000000	0.000000
22.500000	173.14	98.615	2.8144	0.000000	0.000000
23.000000	170.48	99.712	2.7273	0.000000	0.000000
23.500000	167.92	100.80	2.6409	0.000000	0.000000
24.000000	165.44	101.87	2.5553	0.000000	0.000000
24.500000	163.04	102.94	2.4704	0.000000	0.000000
25.000000	160.73	104.00	2.3862	0.000000	0.000000
25.500000	158.48	105.05	2.3028	0.000000	0.000000
26.000000	156.31	106.09	2.2200	0.000000	0.000000
26.500000	154.21	107.12	2.1379	0.000000	0.000000

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LR 13-50

ACCUM M GAS VOL: PARAMET CALCS FOR LICA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=5G, 40, 34.2, 27.3, 20, 15, 12 CU FT @12.5PSIA

VGO = 40.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
27.0000	152.17	108.14	25.850	2.0565	2.0393	127.05	60.111	68.150
27.5000	150.19	109.16	24.834	1.9757	2.0234	126.06	51.602	69.166
28.0000	148.27	110.17	23.826	1.8955	2.0078	125.09	63.085	70.174
28.5000	146.40	111.17	22.826	1.8159	1.9926	124.14	64.560	71.174
29.0000	144.59	112.16	21.833	1.7369	1.9777	123.21	66.027	72.167
29.5000	142.83	113.14	20.848	1.6586	1.9630	122.30	67.487	73.152
30.0000	141.12	114.12	19.870	1.5808	1.9487	121.41	68.940	74.130
30.5000	139.46	115.09	18.899	1.5035	1.9347	120.53	70.386	75.101
31.0000	137.84	116.06	17.935	1.4263	1.9209	119.67	71.825	76.065
31.5000	136.26	117.01	16.978	1.3507	1.9074	118.83	73.257	77.022
32.0000	134.73	117.96	16.023	1.2751	1.8942	118.01	74.682	77.972
32.5000	133.24	118.91	15.084	1.2000	1.8812	117.20	76.101	78.916
33.0000	131.78	119.84	14.147	1.1254	1.8684	116.40	77.513	79.853
33.5000	130.36	120.78	13.215	1.0513	1.8559	115.62	78.919	80.785
34.0000	128.97	121.70	12.291	0.9777	1.8436	114.86	80.319	81.709
34.5000	127.62	122.62	11.372	0.9046	1.8315	114.10	81.712	82.628
35.0000	126.30	123.53	10.459	0.8320	1.8196	113.36	83.100	83.541
35.5000	125.02	124.44	9.552	0.7594	1.8079	112.64	84.482	84.448
36.0000	123.76	125.34	8.651	0.6862	1.7965	111.92	85.858	85.349
36.5000	122.53	126.23	7.755	0.6170	1.7852	111.22	87.226	86.244
37.0000	121.33	127.12	6.865	0.5462	1.7741	110.53	88.593	87.134
37.5000	120.16	128.01	5.981	0.4758	1.7632	109.85	89.952	88.018
38.0000	119.02	128.89	5.102	0.4059	1.7524	109.18	91.306	88.897
38.5000	117.90	129.76	4.229	0.3364	1.7418	108.52	92.655	89.771
39.0000	116.80	130.63	3.360	0.2673	1.7314	107.87	93.998	90.639
39.5000	115.73	131.49	2.497	0.1987	1.7212	107.23	95.336	91.502
40.0000	114.68	132.35	1.639	0.1304	1.7111	106.60	96.669	92.360
40.5000	113.65	133.20	0.786	6.2569E-02	1.7011	105.98	97.997	93.214
40.9000	112.85	133.88	0.107	8.5610E-03	1.6933	105.49	99.056	93.892

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\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

8.56105E-03

B-70

LR13 50

ACCUM M GAS VOL: PARAMET CALCS FOR LUCA FLJDD REQMTS. HFR-040C77
 PARAMS: VGC=50, 40, 34.2, 27.5, 20, 16, 12 CU FT 0612.5PSIA

VGO = 34.200

TIME	PG	VG	VL	ZL	2	N	VFIL	VLD
0.0	612.50	34.200	99.800	7.9395	5.66808E-04	3.53121E-02	0.0	0.0
0.50000	612.49	34.200	99.800	7.9395	5.66808E-04	3.53121E-02	0.0	3.05176E-04
1.00000	612.49	34.200	99.799	7.9395	5.66808E-04	3.53121E-02	0.0	6.10352E-04
1.50000	612.48	34.200	99.799	7.9395	5.66808E-04	3.53121E-02	0.0	9.15527E-04
2.00000	596.37	34.658	99.142	7.8872	2.4457	152.37	0.0	0.65826
2.50000	564.36	36.256	97.741	7.7757	3.1258	194.74	0.0	2.0593
3.00000	530.38	37.903	96.096	7.6449	3.4481	214.82	0.0	3.7041
3.50000	497.81	39.658	94.341	7.5052	3.5734	222.62	0.0	5.4592
4.00000	468.29	41.428	92.571	7.3645	3.5072	218.50	0.0	7.2288
4.50000	442.18	43.161	90.838	7.2266	3.4284	213.59	0.0	8.9623
5.00000	418.93	44.858	89.141	7.0915	3.3616	209.43	0.0	10.659
5.50000	398.08	46.524	87.474	6.9590	3.3050	205.90	0.0	12.326
6.00000	379.23	48.164	85.834	6.8285	3.2573	202.93	0.0	13.966
6.50000	362.08	49.782	84.216	6.6997	3.2174	200.44	0.0	15.584
7.00000	346.39	51.383	82.615	6.5724	3.1844	198.39	0.0	17.185
7.50000	331.98	52.967	81.031	6.4464	3.1533	196.45	0.0	18.769
8.00000	318.73	54.530	79.468	6.3220	3.0934	192.72	0.0	20.332
8.50000	306.61	56.060	77.937	6.2003	3.0296	188.74	0.0	21.863
9.00000	295.48	57.560	76.437	6.0809	2.9697	185.01	0.0	23.363
9.50000	285.23	59.030	74.967	5.9639	2.9134	181.51	0.79935	24.833
10.0000	275.74	60.474	73.523	5.8491	2.8604	178.20	2.71777	26.277
10.5000	266.94	61.891	72.106	5.7363	2.8102	175.08	4.6102	27.694
11.0000	258.75	63.284	70.713	5.6255	2.7627	172.12	6.4783	29.087
11.5000	251.11	64.654	69.342	5.5165	2.7177	169.31	8.3233	30.458
12.0000	243.96	66.002	67.994	5.4093	2.6748	166.64	10.146	31.806
12.5000	237.25	67.329	66.667	5.3037	2.6339	164.09	11.948	33.133
13.0000	230.95	68.636	65.360	5.1997	2.5949	161.66	13.731	34.440
13.5000	225.01	69.924	64.072	5.0972	2.5577	159.34	15.494	35.728
14.0000	219.42	71.194	62.802	4.9962	2.5220	157.12	17.238	36.998
14.5000	214.12	72.446	61.550	4.8965	2.4878	154.99	18.966	38.250
15.0000	209.11	73.682	60.314	4.7982	2.4549	152.94	20.676	39.486
15.5000	204.36	74.901	59.094	4.7012	2.4233	150.97	22.371	40.706
16.0000	199.85	76.105	57.890	4.6054	2.3930	149.08	24.050	41.910
16.5000	195.56	77.294	56.701	4.5108	2.3637	147.26	25.714	43.099
17.0000	191.47	78.469	55.526	4.4174	2.3355	145.50	27.364	44.274
17.5000	187.58	79.630	54.365	4.3250	2.3083	143.80	28.999	45.435
18.0000	183.86	80.777	53.218	4.2337	2.2819	142.17	30.622	46.582
18.5000	180.30	81.912	52.083	4.1434	2.2565	140.58	32.231	47.717
19.0000	176.90	83.034	50.961	4.0542	2.2319	139.05	33.828	48.839
19.5000	173.64	84.143	49.851	3.9659	2.2080	137.56	35.413	49.949
20.0000	170.52	85.242	48.733	3.8785	2.1849	136.12	36.986	51.047
20.5000	167.52	86.326	47.666	3.7920	2.1625	134.72	38.548	52.134
21.0000	164.64	87.404	46.590	3.7064	2.1407	133.37	40.099	53.210
21.5000	161.87	88.469	45.525	3.6217	2.1195	132.05	41.639	54.275
22.0000	159.21	89.524	44.470	3.5378	2.0990	130.77	43.168	55.330
22.5000	156.54	90.569	43.425	3.4547	2.0790	129.52	44.688	56.375
23.0000	154.17	91.603	42.391	3.3724	2.0595	128.31	46.197	57.409
23.5000	151.79	92.627	41.366	3.2903	2.0406	127.13	47.697	58.434
24.0000	149.49	93.643	40.350	3.2100	2.0221	125.98	49.188	59.450
24.5000	147.27	94.650	39.343	3.1299	2.0041	124.86	50.669	60.457
25.0000	145.12	95.647	38.346	3.0506	1.9866	123.76	52.142	61.454
25.5000	143.05	96.636	37.357	2.9719	1.9694	122.70	53.606	62.443
26.0000	141.04	97.616	36.376	2.8939	1.9527	121.65	55.061	63.424
26.5000	139.10	98.589	35.404	2.8165	1.9364	120.64	56.508	64.396

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41813550

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLUDD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12- CU FI #512.5PSIA

VGO 34.200

TIME	PG	VG	VL	ZL	G	W	VFIL	VLD
27.0000	137.21	99.553	34.439	2.7398	1.9204	119.64	57.947	65.361
27.5000	135.39	100.51	33.433	2.6637	1.9048	118.67	59.379	66.317
28.0000	133.62	101.46	32.534	2.5863	1.8896	117.72	60.802	67.266
28.5000	131.90	102.40	31.593	2.5134	1.8746	116.79	62.218	68.207
29.0000	130.24	103.33	30.659	2.4391	1.8600	115.88	63.627	69.141
29.5000	128.62	104.26	29.733	2.3654	1.8457	114.99	65.026	70.067
30.0000	127.05	105.18	28.814	2.2922	1.8317	114.12	66.422	70.986
30.5000	125.52	106.09	27.901	2.2197	1.8180	113.26	67.810	71.899
31.0000	124.04	107.00	26.995	2.1476	1.8046	112.42	69.190	72.805
31.5000	122.59	107.84	26.096	2.0761	1.7914	111.60	70.564	73.704
32.0000	121.19	108.79	25.204	2.0051	1.7785	110.80	71.932	74.596
32.5000	119.82	109.67	24.318	1.9346	1.7658	110.01	73.293	75.482
33.0000	118.49	110.55	23.438	1.8646	1.7533	109.23	74.647	76.362
33.5000	117.19	111.43	22.564	1.7951	1.7411	108.47	75.996	77.236
34.0000	115.92	112.29	21.697	1.7261	1.7291	107.72	77.338	78.104
34.5000	114.69	113.16	20.835	1.6575	1.7174	106.99	78.675	78.965
35.0000	113.48	114.01	19.979	1.5894	1.7058	106.27	80.006	79.821
35.5000	112.31	114.86	19.129	1.5218	1.6944	105.56	81.331	80.671
36.0000	111.16	115.71	18.284	1.4546	1.6832	104.87	82.650	81.516
36.5000	110.05	116.54	17.445	1.3879	1.6722	104.18	83.964	82.355
37.0000	108.95	117.36	16.612	1.3216	1.6614	103.51	85.272	83.188
37.5000	107.89	118.21	15.784	1.2557	1.6508	102.85	86.575	84.016
38.0000	106.84	119.03	14.961	1.1902	1.6404	102.19	87.873	84.839
38.5000	105.82	119.85	14.143	1.1252	1.6301	101.55	89.165	85.657
39.0000	104.83	120.66	13.331	1.0605	1.6199	100.92	90.453	86.469
39.5000	103.85	121.47	12.523	0.99630	1.6100	100.30	91.735	87.276
40.0000	102.90	122.27	11.721	0.93246	1.6002	99.690	93.012	88.079
40.5000	101.97	123.07	10.923	0.86900	1.5905	99.086	94.285	88.877
41.0000	101.06	123.86	10.130	0.80592	1.5810	98.495	95.553	89.670
41.5000	100.16	124.65	9.3423	0.74322	1.5716	97.910	96.816	90.458
42.0000	99.287	125.43	8.5588	0.68089	1.5623	97.334	98.074	91.241
42.5000	98.430	126.21	7.7799	0.61893	1.5532	96.767	99.328	92.020
43.0000	97.590	126.98	7.0055	0.55732	1.5443	96.207	100.58	92.794
43.5000	96.768	127.75	6.2356	0.49607	1.5354	95.655	101.82	93.564
44.0000	95.962	128.52	5.4731	0.43517	1.5267	95.111	103.06	94.330
44.5000	95.172	129.28	4.7089	0.37462	1.5181	94.574	104.30	95.091
45.0000	94.397	130.04	3.9520	0.31440	1.5096	94.045	105.53	95.848
45.5000	93.637	130.79	3.1994	0.25452	1.5012	93.523	106.76	96.601
46.0000	92.892	131.54	2.4508	0.19498	1.4929	93.007	107.98	97.349
46.5000	92.161	132.28	1.7064	0.13576	1.4847	92.499	109.20	98.094
47.0000	91.444	133.02	0.96609	7.68569E-02	1.4767	91.997	110.42	98.834
47.5000	90.740	133.76	0.22975	1.82775E-02	1.4687	91.501	111.63	99.570
47.6000	90.600	133.90	8.29548E-02	6.59943E-03	1.4671	91.403	111.87	99.717

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11113 50

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

6.59943E-03

B-73

LR1350

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 27.500

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
0.0	612.50	27.500	106.50	8.4726	5.66808E-04	3.53121E-02	0.0	0.0
0.500000	612.49	27.500	106.50	8.4725	5.66808E-04	3.53121E-02	0.0	3.05176E-04
1.000000	612.48	27.500	106.50	8.4725	5.66808E-04	3.53121E-02	0.0	6.10352E-04
1.500000	612.47	27.500	106.50	8.4725	5.66808E-04	3.53121E-02	0.0	9.15527E-04
2.000000	592.65	28.154	105.85	8.4205	2.4227	150.93	0.0	0.65465
2.500000	554.20	29.536	104.46	6.3105	3.0743	191.53	0.0	2.0365
3.000000	514.44	31.149	102.85	6.1822	3.3742	210.21	0.0	3.6496
3.500000	477.29	32.862	101.14	8.0459	3.4810	216.87	0.0	5.3629
4.000000	444.41	34.580	99.418	7.9092	3.3972	211.65	0.0	7.0816
4.500000	415.94	36.255	97.744	7.7759	3.3044	205.86	0.0	8.7564
5.000000	391.07	37.887	96.111	7.6461	3.2269	201.03	0.0	10.389
5.500000	369.11	39.484	94.514	7.5191	3.1622	197.01	0.0	11.986
6.000000	349.53	41.051	92.947	7.3944	3.1086	193.67	0.0	13.553
6.500000	331.93	42.594	91.404	7.2716	3.0645	190.92	0.0	15.096
7.000000	316.00	44.117	89.881	7.1504	3.0285	188.68	0.0	16.619
7.500000	301.50	45.622	88.375	7.0307	2.9953	186.61	0.0	18.125
8.000000	288.29	47.106	86.892	6.9126	2.9625	182.69	0.0	19.608
8.500000	276.31	48.555	85.442	6.7973	2.9359	178.54	0.0	21.058
9.000000	265.40	49.972	84.025	6.6846	2.9038	174.68	0.0	22.475
9.500000	255.42	51.359	82.638	6.5742	2.8757	171.06	0.76448	23.862
10.000000	246.25	52.719	81.279	6.4661	2.8512	167.66	2.5986	25.221
10.500000	237.79	54.051	79.946	6.3601	2.8400	164.47	4.4062	26.554
11.000000	229.96	55.359	78.638	6.2560	2.8317	161.46	6.1890	27.862
11.500000	222.70	56.643	77.354	6.1538	2.8259	158.61	7.9483	29.146
12.000000	215.93	57.905	76.092	6.0534	2.8206	155.91	9.6854	30.408
12.500000	209.61	59.146	74.851	5.9547	2.8155	153.35	11.401	31.649
13.000000	203.70	60.367	73.630	5.8576	2.8123	150.91	13.097	32.870
13.500000	198.16	61.568	72.428	5.7620	2.8050	148.58	14.774	34.072
14.000000	192.95	62.752	71.244	5.6678	2.8093	146.36	16.432	35.256
14.500000	188.04	63.918	70.078	5.5750	2.8152	144.24	18.073	36.422
15.000000	183.40	65.067	68.929	5.4836	2.8226	142.20	19.698	37.571
15.500000	179.02	66.200	67.795	5.3934	2.8312	140.25	21.306	38.705
16.000000	174.87	67.318	66.677	5.3045	2.8412	138.38	22.899	39.823
16.500000	170.94	68.422	65.574	5.2167	2.8519	136.58	24.477	40.926
17.000000	167.20	69.511	64.484	5.1300	2.8644	134.84	26.041	42.016
17.500000	163.64	70.586	63.409	5.0445	2.8776	133.17	27.592	43.091
18.000000	160.26	71.648	62.347	4.9600	2.8917	131.56	29.129	44.153
18.500000	157.03	72.698	61.297	4.8765	2.9067	130.00	30.654	45.203
19.000000	153.94	73.735	60.260	4.7939	2.9225	128.50	32.166	46.240
19.500000	151.00	74.760	59.234	4.7123	2.9392	127.04	33.666	47.266
20.000000	148.17	75.774	58.220	4.6317	2.9566	125.63	35.155	48.280
20.500000	145.47	76.777	57.217	4.5519	1.9946	124.27	36.633	49.283
21.000000	142.88	77.769	56.225	4.4730	1.9734	122.94	38.099	50.275
21.500000	140.39	78.750	55.244	4.3949	1.9527	121.66	39.556	51.256
22.000000	138.01	79.721	54.272	4.3176	1.9327	120.41	41.002	52.228
22.500000	135.71	80.683	53.311	4.2411	1.9133	119.20	42.438	53.189
23.000000	133.50	81.634	52.359	4.1654	1.8943	118.02	43.865	54.141
23.500000	131.37	82.577	51.416	4.0904	1.8759	116.87	45.283	55.084
24.000000	129.32	83.510	50.483	4.0161	1.8580	115.75	46.691	56.017
24.500000	127.34	84.435	49.558	3.9426	1.8405	114.66	48.091	56.942
25.000000	125.43	85.351	48.642	3.8697	1.8235	113.60	49.482	57.858
25.500000	123.59	86.258	47.734	3.7975	1.8069	112.57	50.864	58.766
26.000000	121.81	87.158	46.835	3.7259	1.7907	111.56	52.238	59.665
26.500000	120.08	88.049	45.943	3.6550	1.7749	110.58	53.605	60.557

18.0 Secs

B-74

LRI 13 50.4

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @12.5PSIA

VGO = 27.500

TIME	PG	JG	VL	ZL	Q	W	VFIL	VLD
27.0000	118.42	88.932	45.060	3.5847	1.7595	109.62	54.963	61.440
27.5000	116.80	89.808	44.164	3.5150	1.7444	108.68	56.314	62.316
28.0000	115.24	90.677	43.315	3.4459	1.7297	107.76	57.658	63.185
28.5000	113.72	91.538	42.454	3.3774	1.7153	106.86	58.994	64.046
29.0000	112.25	92.392	41.600	3.3094	1.7012	105.98	60.323	64.900
29.5000	110.83	93.239	40.753	3.2420	1.6874	105.13	61.645	65.747
30.0000	109.45	94.079	39.912	3.1752	1.6739	104.28	62.960	66.588
30.5000	108.10	94.913	39.078	3.1089	1.6607	103.46	64.269	67.422
31.0000	106.80	95.740	38.251	3.0431	1.6477	102.65	65.571	68.249
31.5000	105.53	96.561	37.431	2.9778	1.6350	101.86	66.866	69.069
32.0000	104.29	97.375	36.616	2.9130	1.6226	101.09	68.156	69.884
32.5000	103.09	98.183	35.808	2.8487	1.6104	100.33	69.439	70.692
33.0000	101.93	98.985	35.006	2.7848	1.5984	99.582	70.716	71.494
33.5000	100.79	99.781	34.209	2.7215	1.5867	98.850	71.987	72.291
34.0000	99.682	100.57	33.419	2.6586	1.5752	98.132	73.253	73.081
34.5000	98.603	101.36	32.634	2.5962	1.5638	97.427	74.512	73.866
35.0000	97.551	102.14	31.855	2.5342	1.5527	96.734	75.766	74.645
35.5000	96.526	102.91	31.081	2.4726	1.5416	96.054	77.015	75.419
36.0000	95.526	103.68	30.313	2.4115	1.5311	95.386	78.258	76.187
36.5000	94.551	104.44	29.550	2.3508	1.5205	94.729	79.496	76.950
37.0000	93.599	105.20	28.792	2.2905	1.5102	94.083	80.728	77.708
37.5000	92.669	105.95	28.039	2.2307	1.5000	93.447	81.956	78.461
38.0000	91.762	106.70	27.292	2.1712	1.4899	92.823	83.178	79.208
38.5000	90.875	107.44	26.549	2.1121	1.4801	92.208	84.396	79.951
39.0000	90.009	108.18	25.812	2.0534	1.4704	91.603	85.606	80.688
39.5000	89.162	108.91	25.079	1.9951	1.4608	91.007	86.816	81.421
40.0000	88.334	109.64	24.351	1.9372	1.4514	90.421	88.019	82.149
40.5000	87.524	110.36	23.627	1.8797	1.4421	89.844	89.217	82.873
41.0000	86.733	111.08	22.908	1.8225	1.4330	89.275	90.411	83.592
41.5000	85.958	111.79	22.194	1.7656	1.4240	88.715	91.600	84.306
42.0000	85.199	112.50	21.484	1.7092	1.4151	88.164	92.785	85.016
42.5000	84.457	113.21	20.779	1.6531	1.4064	87.620	93.965	85.721
43.0000	83.730	113.91	20.078	1.5973	1.3978	87.084	95.141	86.422
43.5000	83.018	114.61	19.381	1.5418	1.3893	86.555	96.313	87.119
44.0000	82.321	115.30	18.688	1.4867	1.3810	86.034	97.480	87.812
44.5000	81.638	115.99	18.000	1.4320	1.3727	85.520	98.644	88.500
45.0000	80.968	116.67	17.315	1.3775	1.3646	85.014	99.803	89.185
45.5000	80.312	117.35	16.635	1.3234	1.3566	84.513	100.96	89.865
46.0000	79.668	118.03	15.959	1.2696	1.3486	84.020	102.11	90.541
46.5000	79.037	118.70	15.286	1.2161	1.3408	83.533	103.26	91.214
47.0000	78.418	119.37	14.618	1.1629	1.3331	83.053	104.40	91.882
47.5000	77.811	120.03	13.953	1.1100	1.3255	82.578	105.54	92.547
48.0000	77.215	120.69	13.292	1.0575	1.3180	82.110	106.68	93.208
48.5000	76.630	121.35	12.635	1.0052	1.3105	81.647	107.81	93.865
49.0000	76.056	122.00	11.982	0.95320	1.3032	81.190	108.94	94.518
49.5000	75.492	122.65	11.332	0.90150	1.2960	80.739	110.06	95.168
50.0000	74.939	123.30	10.686	0.85010	1.2888	80.294	111.18	95.814
50.5000	74.395	123.94	10.043	0.79897	1.2818	79.853	112.30	96.457
51.0000	73.862	124.58	9.4039	0.74813	1.2748	79.418	113.41	97.096
51.5000	73.337	125.22	8.7683	0.69756	1.2679	78.988	114.52	97.732
52.0000	72.822	125.85	8.1360	0.64726	1.2610	78.563	115.63	98.364
52.5000	72.315	126.48	7.5072	0.59723	1.2543	78.143	116.73	98.993
53.0000	71.818	127.10	6.8817	0.54747	1.2476	77.727	117.84	99.618
53.5000	71.328	127.73	6.2596	0.49798	1.2410	77.316	118.93	100.24

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LR115 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 27.500

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
54.0000	70.847	128.35	5.5407	0.44874	1.2345	76.910	120.03	100.86
54.5000	70.374	128.90	5.0250	0.39976	1.2281	76.508	121.12	101.47
55.0000	69.909	129.57	4.4126	0.35104	1.2217	76.111	122.20	102.09
55.5000	69.451	130.18	3.8033	0.30257	1.2154	75.718	123.29	102.70
56.0000	69.001	130.79	3.1972	0.25435	1.2091	75.329	124.37	103.30
56.5000	68.558	131.39	2.5942	0.20638	1.2030	74.944	125.45	103.91
57.0000	68.122	131.99	1.9942	0.15865	1.1968	74.563	126.52	104.51
57.5000	67.693	132.59	1.3973	0.11116	1.1908	74.186	127.59	105.10
58.0000	67.270	133.18	0.80341	6.39147E-02	1.1848	73.813	128.66	105.70
58.5000	66.855	133.77	0.21249	1.59044E-02	1.1789	73.444	129.73	106.29
58.6000	66.772	133.89	9.46593E-02	7.53057E-03	1.1777	73.371	129.94	106.41

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LR1350.4

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

7.53557E-03

B-77

LIBRARY 50-1

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT 3612.5PSIA

VGO = 20.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
0.0	612.50	20.000	114.00	9.0692	5.6680E-04	3.53121E-02	0.0	0.0
0.50000	612.49	20.000	114.00	9.0692	5.6680E-04	3.53121E-02	0.0	3.05176E-04
1.00000	612.48	20.000	114.00	9.0692	5.6680E-04	3.53121E-02	0.0	6.10352E-04
1.50000	612.46	20.000	114.00	9.0691	5.6680E-04	3.53121E-02	0.0	9.15527E-04
2.00000	585.80	20.647	113.35	9.0177	2.3785	148.18	0.0	0.64717
2.50000	536.22	21.993	112.01	8.9106	2.9803	185.67	0.0	1.9935
3.00000	487.27	23.549	110.45	8.7868	3.2436	202.07	0.0	3.5496
3.50000	443.44	25.184	108.81	8.6563	3.3224	206.98	0.0	5.1900
4.00000	406.12	26.821	107.18	8.5264	3.2124	200.13	0.0	6.8225
4.50000	374.90	28.398	105.60	8.4010	3.0998	193.12	0.0	8.3997
5.00000	348.40	29.923	104.07	8.2796	3.0084	187.42	0.0	9.9260
5.50000	325.56	31.409	102.59	8.1614	2.9342	182.80	0.0	11.411
6.00000	305.60	32.861	101.14	8.0459	2.8743	179.07	0.0	12.863
6.50000	287.97	34.286	99.712	7.9326	2.8263	176.08	0.0	14.288
7.00000	272.25	35.689	98.309	7.8209	2.7885	173.72	0.0	15.691
7.50000	258.11	37.074	96.924	7.7107	2.7546	171.61	0.0	17.076
8.00000	245.39	38.437	95.561	7.6023	2.6891	167.33	0.0	18.439
8.50000	234.00	39.764	94.234	7.4967	2.6149	163.22	0.0	19.766
9.00000	223.74	41.057	92.940	7.3938	2.5559	159.23	0.0	21.060
9.50000	214.45	42.320	91.677	7.2933	2.4966	155.54	0.71262	22.323
10.0000	205.99	43.554	90.443	7.1951	2.4412	152.09	2.4219	23.557
10.5000	198.22	44.762	89.235	7.0991	2.3895	148.87	4.1044	24.765
11.0000	191.15	45.944	88.053	7.0050	2.3410	145.84	5.7619	25.947
11.5000	184.60	47.103	86.894	6.9128	2.2953	143.00	7.3959	27.106
12.0000	178.54	48.240	85.757	6.8223	2.2522	140.31	9.0076	28.243
12.5000	172.91	49.356	84.641	6.7336	2.2114	137.77	10.598	29.359
13.0000	167.67	50.451	83.545	6.6464	2.1728	135.36	12.169	30.455
13.5000	162.79	51.528	82.468	6.5607	2.1361	133.08	13.722	31.532
14.0000	158.22	52.588	81.408	6.4764	2.1011	130.90	15.256	32.592
14.5000	153.93	53.630	80.366	6.3935	2.0678	128.82	16.773	33.634
15.0000	149.90	54.656	79.340	6.3119	2.0360	126.84	18.274	34.660
15.5000	146.10	55.666	78.330	6.2315	2.0055	124.94	19.759	35.670
16.0000	142.52	56.661	77.334	6.1523	1.9764	123.13	21.230	36.666
16.5000	139.14	57.642	76.353	6.0742	1.9484	121.38	22.686	37.647
17.0000	135.93	58.610	75.385	5.9972	1.9215	119.71	24.128	38.615
17.5000	132.89	59.564	74.431	5.9213	1.8956	118.10	25.557	39.569
18.0000	130.01	60.505	73.489	5.8464	1.8708	116.55	26.974	40.511
18.5000	127.26	61.435	72.560	5.7725	1.8468	115.05	28.378	41.440
19.0000	124.65	62.352	71.642	5.6995	1.8236	113.61	29.770	42.358
19.5000	122.16	63.258	70.736	5.6274	1.8012	112.22	31.152	43.264
20.0000	119.78	64.153	69.841	5.5562	1.7796	110.87	32.522	44.159
20.5000	117.50	65.038	68.956	5.4858	1.7587	109.57	33.881	45.044
21.0000	115.33	65.912	68.082	5.4162	1.7384	108.30	35.230	45.918
21.5000	113.24	66.776	67.218	5.3475	1.7188	107.08	36.569	46.782
22.0000	111.24	67.631	66.363	5.2795	1.6997	105.89	37.899	47.637
22.5000	109.33	68.476	65.518	5.2122	1.6812	104.74	39.219	48.482
23.0000	107.48	69.312	64.682	5.1457	1.6632	103.62	40.530	49.318
23.5000	105.71	70.139	63.854	5.0799	1.6458	102.53	41.832	50.146
24.0000	104.01	70.957	63.036	5.0148	1.6288	101.47	43.126	50.964
24.5000	102.37	71.768	62.225	4.9503	1.6122	100.44	44.411	51.775
25.0000	100.79	72.570	61.423	4.8865	1.5961	99.439	45.688	52.577
25.5000	99.264	73.364	60.629	4.8233	1.5804	98.461	46.957	53.371
26.0000	97.794	74.150	59.843	4.7607	1.5651	97.508	48.218	54.157
26.5000	96.374	74.929	59.064	4.6988	1.5502	96.579	49.472	54.936

18.0 Sec

B-78

11115 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO 20.000

TIME	PG	VG	VL	ZL	Q	VFIL	VLD
27.0000	95.001	75.700	58.292	4.6374	1.5357	50.716	55.708
27.5000	93.674	76.464	57.528	4.5766	1.5214	51.958	56.472
28.0000	92.391	77.221	56.771	4.5163	1.5075	53.190	57.229
28.5000	91.148	77.972	56.020	4.4566	1.4940	54.415	57.980
29.0000	89.945	78.715	55.276	4.3975	1.4807	55.634	58.724
29.5000	88.779	79.452	54.539	4.3388	1.4677	56.846	59.461
30.0000	87.648	80.183	53.808	4.2807	1.4550	58.051	60.192
30.5000	86.552	80.907	53.084	4.2231	1.4426	59.251	60.916
31.0000	85.487	81.625	52.366	4.1659	1.4304	60.444	61.634
31.5000	84.454	82.337	51.653	4.1093	1.4185	61.631	62.347
32.0000	83.450	83.044	50.947	4.0531	1.4068	62.812	63.053
32.5000	82.474	83.744	50.247	3.9973	1.3953	63.988	63.753
33.0000	81.525	84.439	49.552	3.9421	1.3841	65.157	64.448
33.5000	80.603	85.128	48.862	3.8872	1.3730	66.321	65.138
34.0000	79.705	85.812	48.178	3.8328	1.3622	67.480	65.822
34.5000	78.831	86.490	47.500	3.7788	1.3516	68.634	66.500
35.0000	77.980	87.163	46.827	3.7253	1.3412	69.782	67.173
35.5000	77.151	87.831	46.159	3.6721	1.3309	70.925	67.841
36.0000	76.343	88.494	45.496	3.6194	1.3209	72.062	68.504
36.5000	75.555	89.152	44.838	3.5670	1.3110	73.195	69.162
37.0000	74.787	89.805	44.184	3.5151	1.3012	74.323	69.816
37.5000	74.038	90.453	43.536	3.4635	1.2917	75.446	70.464
38.0000	73.306	91.096	42.893	3.4123	1.2823	76.565	71.107
38.5000	72.593	91.733	42.254	3.3615	1.2730	77.679	71.746
39.0000	71.896	92.369	41.620	3.3110	1.2639	78.788	72.380
39.5000	71.215	92.999	40.990	3.2609	1.2550	79.892	73.010
40.0000	70.550	93.624	40.364	3.2112	1.2461	80.993	73.636
40.5000	69.900	94.245	39.743	3.1618	1.2375	82.088	74.257
41.0000	69.265	94.862	39.127	3.1127	1.2289	83.180	74.873
41.5000	68.644	95.474	38.514	3.0640	1.2205	84.267	75.486
42.0000	68.036	96.082	37.906	3.0156	1.2122	85.350	76.094
42.5000	67.442	96.686	37.302	2.9675	1.2040	86.429	76.698
43.0000	66.860	97.286	36.702	2.9198	1.1959	87.504	77.298
43.5000	66.291	97.882	36.106	2.8724	1.1880	88.575	77.894
44.0000	65.733	98.474	35.514	2.8253	1.1802	89.642	78.486
44.5000	65.188	99.062	34.926	2.7785	1.1724	90.705	79.074
45.0000	64.653	99.646	34.341	2.7320	1.1648	91.764	79.659
45.5000	64.129	100.23	33.761	2.6858	1.1573	92.820	80.239
46.0000	63.616	100.80	33.184	2.6399	1.1499	93.871	80.816
46.5000	63.113	101.38	32.611	2.5943	1.1425	94.920	81.389
47.0000	62.620	101.95	32.041	2.5490	1.1353	95.964	81.959
47.5000	62.136	102.51	31.475	2.5040	1.1282	97.005	82.525
48.0000	61.662	103.07	30.913	2.4593	1.1211	98.042	83.087
48.5000	61.197	103.63	30.354	2.4148	1.1142	99.076	83.646
49.0000	60.741	104.19	29.799	2.3706	1.1073	100.11	84.201
49.5000	60.293	104.74	29.247	2.3267	1.1005	101.13	84.753
50.0000	59.854	105.29	28.698	2.2830	1.0938	102.16	85.302
50.5000	59.423	105.83	28.153	2.2397	1.0871	103.18	85.847
51.0000	58.999	106.37	27.611	2.1965	1.0806	104.19	86.389
51.5000	58.583	106.91	27.072	2.1537	1.0741	105.21	86.928
52.0000	58.175	107.45	26.536	2.1111	1.0677	106.22	87.464
52.5000	57.774	107.98	26.004	2.0687	1.0614	107.22	87.996
53.0000	57.380	108.51	25.475	2.0266	1.0551	108.23	88.525
53.5000	56.993	109.04	24.949	1.9848	1.0489	109.23	89.051

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ATRI 13 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 20.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
54.0000	56.612	109.56	24.426	1.9432	1.0428	64.967	110.23	89.574
54.5000	56.238	110.08	23.906	1.9018	1.0368	64.590	111.22	90.094
55.0000	55.870	110.60	23.389	1.8607	1.0308	64.217	112.21	90.611
55.5000	55.509	111.11	22.875	1.8196	1.0248	63.848	113.20	91.125
56.0000	55.153	111.62	22.364	1.7791	1.0190	63.482	114.19	91.636
56.5000	54.804	112.13	21.856	1.7387	1.0132	63.121	115.17	92.144
57.0000	54.460	112.63	21.350	1.6985	1.0074	62.763	116.15	92.650
57.5000	54.122	113.14	20.848	1.6586	1.0017	62.409	117.13	93.152
58.0000	53.789	113.63	20.348	1.6188	0.99612	62.058	118.10	93.652
58.5000	53.461	114.13	19.852	1.5793	0.99055	61.711	119.07	94.148
59.0000	53.139	114.63	19.358	1.5400	0.98503	61.367	120.04	94.642
59.5000	52.822	115.12	18.867	1.5009	0.97957	61.027	121.01	95.133
60.0000	52.510	115.60	18.378	1.4621	0.97416	60.690	121.97	95.622
60.5000	52.202	116.09	17.892	1.4234	0.96880	60.356	122.93	96.108
61.0000	51.900	116.57	17.409	1.3850	0.96349	60.025	123.89	96.591
61.5000	51.601	117.05	16.929	1.3468	0.95823	59.698	124.85	97.071
62.0000	51.308	117.53	16.451	1.3087	0.95302	59.373	125.80	97.549
62.5000	51.019	118.01	15.976	1.2709	0.94785	59.051	126.75	98.024
63.0000	50.734	118.48	15.503	1.2333	0.94274	58.733	127.70	98.497
63.5000	50.454	118.95	15.033	1.1959	0.93767	58.417	128.64	98.967
64.0000	50.177	119.42	14.565	1.1587	0.93264	58.104	129.59	99.435
64.5000	49.905	119.88	14.100	1.1217	0.92766	57.793	130.53	99.900
65.0000	49.636	120.34	13.637	1.0849	0.92273	57.486	131.46	100.36
65.5000	49.372	120.80	13.177	1.0483	0.91783	57.181	132.40	100.82
66.0000	49.111	121.26	12.720	1.0119	0.91298	56.879	133.33	101.28
66.5000	48.854	121.72	12.264	0.97569	0.90817	56.579	134.26	101.74
67.0000	48.600	122.17	11.811	0.93966	0.90340	56.282	135.19	102.19
67.5000	48.351	122.62	11.361	0.90381	0.89867	55.987	136.11	102.64
68.0000	48.104	123.07	10.913	0.86816	0.89397	55.695	137.04	103.09
68.5000	47.861	123.51	10.467	0.83269	0.88932	55.405	137.96	103.53
69.0000	47.622	123.96	10.023	0.79741	0.88471	55.117	138.88	103.98
69.5000	47.385	124.40	9.5822	0.76231	0.88013	54.832	139.79	104.42
70.0000	47.152	124.84	9.1433	0.72739	0.87558	54.549	140.71	104.86
70.5000	46.922	125.27	8.7066	0.69265	0.87108	54.268	141.62	105.29
71.0000	46.695	125.71	8.2722	0.65809	0.86661	53.989	142.53	105.73
71.5000	46.471	126.14	7.8400	0.62371	0.86217	53.713	143.43	106.16
72.0000	46.250	126.57	7.4100	0.58950	0.85776	53.439	144.34	106.59
72.5000	46.032	127.00	6.9822	0.55547	0.85340	53.166	145.24	107.02
73.0000	45.817	127.42	6.5566	0.52161	0.84906	52.896	146.14	107.44
73.5000	45.605	127.85	6.1332	0.48792	0.84475	52.628	147.04	107.87
74.0000	45.395	128.27	5.7119	0.45440	0.84048	52.362	147.94	108.29
74.5000	45.188	128.69	5.2927	0.42106	0.83624	52.098	148.83	108.71
75.0000	44.984	129.10	4.8756	0.38788	0.83203	51.835	149.72	109.12

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LR113 50

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 75.000

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LR11 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VG0=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @12.5PSIA

VG0 = 16.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
0.0	612.50	16.000	118.00	9.3874	5.66808E-04	3.53121E-02	0.0	0.0
0.50000	612.48	16.000	118.00	9.3874	5.66808E-04	3.53121E-02	0.0	3.05176E-04
1.00000	612.47	16.000	118.00	9.3874	5.66808E-04	3.53121E-02	0.0	6.10352E-04
1.50000	612.45	16.000	118.00	9.3874	5.66808E-04	3.53121E-02	0.0	9.15527E-04
2.00000	579.80	16.639	117.36	9.3366	2.3386	145.70	0.0	0.63945
2.50000	521.24	17.954	116.05	9.2319	2.8992	180.62	0.0	1.9544
3.00000	465.58	19.461	114.54	9.1120	3.1350	195.31	0.0	3.4624
3.50000	417.36	21.042	112.96	8.9862	3.1945	199.02	0.0	5.0432
4.00000	377.51	22.606	111.39	8.8618	3.0667	191.06	0.0	6.6070
4.50000	345.02	24.107	109.89	8.7424	2.9417	183.27	0.0	8.1080
5.00000	318.01	25.552	108.45	8.6274	2.8424	177.08	0.0	9.5531
5.50000	295.12	26.952	107.05	8.5160	2.7634	172.16	0.0	10.954
6.00000	275.39	28.318	105.68	8.4074	2.7010	168.28	0.0	12.319
6.50000	258.15	29.655	104.34	8.3009	2.6524	165.24	0.0	13.657
7.00000	242.92	30.972	103.03	8.1962	2.6151	162.92	0.0	14.974
7.50000	229.34	32.271	101.73	8.0928	2.5824	160.88	0.0	16.273
8.00000	217.22	33.547	100.45	7.9913	2.5162	158.76	0.0	17.549
8.50000	206.46	34.787	99.210	7.8926	2.4463	152.40	0.0	18.790
9.00000	196.83	35.994	98.003	7.7966	2.3819	148.39	0.0	19.997
9.50000	188.17	37.170	96.827	7.7030	2.3225	144.69	0.67636	21.173
10.0000	180.33	38.317	95.680	7.6118	2.2673	141.26	2.2988	22.320
10.5000	173.19	39.438	94.559	7.5226	2.2160	138.05	3.8943	23.441
11.0000	166.67	40.534	93.463	7.4354	2.1679	135.06	5.4652	24.537
11.5000	160.69	41.606	92.391	7.3501	2.1228	132.25	7.0127	25.609
12.0000	155.18	42.657	91.340	7.2665	2.0804	129.61	8.5384	26.660
12.5000	150.08	43.687	90.310	7.1845	2.0404	127.11	10.043	27.690
13.0000	145.35	44.697	89.299	7.1041	2.0025	124.76	11.529	28.701
13.5000	140.95	45.689	88.307	7.0252	1.9666	122.52	12.996	29.693
14.0000	136.84	46.664	87.332	6.9477	1.9323	120.40	14.446	30.668
14.5000	133.01	47.622	86.374	6.8714	1.9001	118.37	15.879	31.626
15.0000	129.41	48.564	85.432	6.7965	1.8691	116.45	17.296	32.568
15.5000	126.03	49.491	84.504	6.7227	1.8396	114.60	18.698	33.496
16.0000	122.84	50.404	83.592	6.6501	1.8113	112.83	20.086	34.408
16.5000	119.84	51.302	82.693	6.5786	1.7842	111.15	21.460	35.307
17.0000	117.00	52.188	81.807	6.5081	1.7582	109.53	22.820	36.193
17.5000	114.32	53.061	80.934	6.4387	1.7332	107.98	24.168	37.066
18.0000	111.77	53.921	80.074	6.3702	1.7091	106.48	25.504	37.926
18.5000	109.35	54.770	79.225	6.3027	1.6860	105.04	26.827	38.775
19.0000	107.06	55.607	78.387	6.2361	1.6636	103.65	28.140	39.613
19.5000	104.87	56.433	77.561	6.1703	1.6421	102.30	29.441	40.439
20.0000	102.78	57.249	76.745	6.1054	1.6213	101.01	30.732	41.255
20.5000	100.79	58.055	75.939	6.0413	1.6012	99.752	32.012	42.061
21.0000	98.887	58.850	75.144	5.9780	1.5817	98.539	33.283	42.856
21.5000	97.067	59.636	74.358	5.9155	1.5628	97.363	34.544	43.642
22.0000	95.324	60.413	73.581	5.8537	1.5445	96.223	35.792	44.419
22.5000	93.653	61.181	72.813	5.7926	1.5268	95.117	37.038	45.187
23.0000	92.050	61.940	72.054	5.7322	1.5095	94.043	38.272	45.946
23.5000	90.511	62.690	71.303	5.6725	1.4928	93.000	39.498	46.697
24.0000	89.032	63.432	70.561	5.6134	1.4765	91.985	40.715	47.439
24.5000	87.608	64.167	69.826	5.5550	1.4606	90.998	41.924	48.174
25.0000	86.238	64.893	69.100	5.4972	1.4452	90.037	43.126	48.900
25.5000	84.918	65.612	68.381	5.4400	1.4302	89.101	44.319	49.619
26.0000	83.646	66.323	67.669	5.3834	1.4156	88.189	45.506	50.331
26.5000	82.418	67.027	66.965	5.3274	1.4013	87.299	46.685	51.035

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APPENDIX 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 16.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
27.0000	81.233	67.724	66.268	5.2719	1.3873	86.432	47.857	51.732
27.5000	80.088	68.414	65.573	5.2170	1.3737	85.584	49.022	52.422
28.0000	78.981	69.098	64.894	5.1626	1.3605	84.757	50.180	53.106
28.5000	77.910	69.775	64.217	5.1088	1.3475	83.946	51.332	53.783
29.0000	76.873	70.445	63.546	5.0554	1.3348	83.157	52.478	54.454
29.5000	75.870	71.110	62.882	5.0026	1.3224	82.384	53.617	55.118
30.0000	74.898	71.768	62.224	4.9502	1.3102	81.628	54.750	55.776
30.5000	73.955	72.420	61.572	4.8983	1.2984	80.887	55.877	56.428
31.0000	73.041	73.066	60.925	4.8469	1.2867	80.162	56.998	57.075
31.5000	72.154	73.706	60.285	4.7959	1.2753	79.452	58.114	57.715
32.0000	71.292	74.341	59.650	4.7454	1.2641	78.756	59.224	58.350
32.5000	70.456	74.970	59.020	4.6953	1.2532	78.074	60.328	58.980
33.0000	69.643	75.594	58.396	4.6457	1.2424	77.404	61.427	59.604
33.5000	68.853	76.213	57.778	4.5965	1.2319	76.748	62.520	60.222
34.0000	68.084	76.826	57.164	4.5477	1.2216	76.104	63.608	60.836
34.5000	67.337	77.434	56.556	4.4993	1.2114	75.472	64.692	61.444
35.0000	66.609	78.037	55.953	4.4513	1.2015	74.851	65.770	62.047
35.5000	65.901	78.635	55.354	4.4037	1.1917	74.241	66.843	62.646
36.0000	65.211	79.229	54.761	4.3565	1.1821	73.642	67.911	63.239
36.5000	64.538	79.817	54.172	4.3096	1.1726	73.053	68.975	63.828
37.0000	63.883	80.401	53.588	4.2632	1.1633	72.475	70.034	64.412
37.5000	63.244	80.981	53.009	4.2171	1.1542	71.905	71.088	64.991
38.0000	62.621	81.555	52.434	4.1713	1.1452	71.346	72.138	65.566
38.5000	62.013	82.126	51.863	4.1260	1.1364	70.795	73.183	66.137
39.0000	61.419	82.692	51.297	4.0809	1.1277	70.253	74.224	66.703
39.5000	60.840	83.253	50.736	4.0362	1.1191	69.720	75.261	67.264
40.0000	60.274	83.811	50.178	3.9919	1.1107	69.195	76.293	67.822
40.5000	59.721	84.364	49.625	3.9479	1.1024	68.677	77.321	68.375
41.0000	59.181	84.913	49.076	3.9042	1.0942	68.168	78.345	68.924
41.5000	58.653	85.458	48.530	3.8608	1.0861	67.666	79.365	69.470
42.0000	58.137	85.999	47.989	3.8178	1.0782	67.172	80.381	70.011
42.5000	57.633	86.536	47.452	3.7750	1.0704	66.685	81.393	70.548
43.0000	57.139	87.069	46.919	3.7326	1.0627	66.204	82.402	71.081
43.5000	56.656	87.598	46.389	3.6905	1.0551	65.731	83.406	71.611
44.0000	56.183	88.124	45.864	3.6486	1.0476	65.263	84.406	72.136
44.5000	55.721	88.646	45.342	3.6071	1.0402	64.803	85.403	72.658
45.0000	55.268	89.164	44.823	3.5659	1.0329	64.348	86.396	73.177
45.5000	54.824	89.679	44.309	3.5249	1.0257	63.900	87.386	73.691
46.0000	54.390	90.190	43.797	3.4843	1.0186	63.457	88.372	74.203
46.5000	53.964	90.697	43.290	3.4439	1.0116	63.020	89.354	74.710
47.0000	53.547	91.201	42.788	3.4038	1.0046	62.589	90.333	75.214
47.5000	53.138	91.701	42.285	3.3640	0.99780	62.163	91.309	75.715
48.0000	52.737	92.199	41.788	3.3244	0.99105	61.742	92.281	76.212
48.5000	52.344	92.692	41.294	3.2851	0.98438	61.327	93.250	76.706
49.0000	51.959	93.183	40.803	3.2461	0.97779	60.916	94.215	77.197
49.5000	51.581	93.670	40.316	3.2073	0.97128	60.511	95.178	77.684
50.0000	51.210	94.154	39.832	3.1688	0.96485	60.110	96.136	78.168
50.5000	50.846	94.635	39.351	3.1305	0.95850	59.714	97.092	78.649
51.0000	50.489	95.112	38.873	3.0925	0.95221	59.323	98.045	79.127
51.5000	50.138	95.587	38.399	3.0548	0.94600	58.936	98.994	79.601
52.0000	49.794	96.058	37.927	3.0173	0.93986	58.553	99.941	80.073
52.5000	49.456	96.526	37.459	2.9800	0.93379	58.175	100.888	80.541
53.0000	49.124	96.992	36.993	2.9430	0.92778	57.801	101.832	81.007
53.5000	48.798	97.454	36.531	2.9062	0.92184	57.431	102.76	81.469

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LTR 11350

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT 2612.5PSIA

VGO = 16.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
54.0000	48.477	97.913	36.071	2.8696	0.91597	57.065	103.70	81.929
54.5000	48.163	98.370	35.615	2.8333	0.91015	56.703	104.63	82.385
55.0000	47.853	98.823	35.161	2.7972	0.90440	56.344	105.56	82.839
55.5000	47.549	99.274	34.710	2.7613	0.89871	55.990	106.48	83.290
56.0000	47.250	99.722	34.262	2.7257	0.89307	55.638	107.40	83.738
56.5000	46.957	100.17	33.817	2.6903	0.88750	55.291	108.32	84.183
57.0000	46.668	100.61	33.374	2.6551	0.88198	54.947	109.24	84.626
57.5000	46.384	101.05	32.935	2.6201	0.87651	54.607	110.16	85.065
58.0000	46.104	101.49	32.498	2.5853	0.87110	54.269	111.07	85.502
58.5000	45.830	101.92	32.063	2.5508	0.86574	53.935	111.98	85.937
59.0000	45.559	102.35	31.632	2.5165	0.86043	53.605	112.88	86.368
59.5000	45.293	102.78	31.203	2.4823	0.85517	53.277	113.79	86.797
60.0000	45.031	103.21	30.777	2.4484	0.84996	52.953	114.69	87.223
60.5000	44.774	103.63	30.353	2.4147	0.84480	52.631	115.59	87.647
61.0000	44.520	104.05	29.932	2.3812	0.83969	52.313	116.48	88.068
61.5000	44.271	104.47	29.513	2.3479	0.83462	51.997	117.38	88.487
62.0000	44.025	104.89	29.097	2.3148	0.82960	51.684	118.27	88.903
62.5000	43.783	105.30	28.683	2.2819	0.82463	51.374	119.16	89.317
63.0000	43.545	105.71	28.272	2.2492	0.81970	51.067	120.04	89.728
63.5000	43.310	106.12	27.863	2.2167	0.81481	50.763	120.93	90.137
64.0000	43.079	106.52	27.457	2.1843	0.80996	50.461	121.81	90.543
64.5000	42.851	106.93	27.053	2.1522	0.80516	50.161	122.69	90.947
65.0000	42.627	107.33	26.652	2.1203	0.80040	49.865	123.56	91.348
65.5000	42.406	107.73	26.253	2.0885	0.79567	49.570	124.44	91.747
66.0000	42.189	108.13	25.856	2.0570	0.79099	49.279	125.31	92.144
66.5000	41.974	108.52	25.462	2.0256	0.78634	48.989	126.18	92.538
67.0000	41.763	108.91	25.070	1.9944	0.78173	48.702	127.04	92.930
67.5000	41.554	109.30	24.680	1.9634	0.77716	48.417	127.91	93.320
68.0000	41.349	109.69	24.292	1.9326	0.77263	48.135	128.77	93.708
68.5000	41.146	110.07	23.907	1.9019	0.76813	47.854	129.63	94.093
69.0000	40.947	110.46	23.524	1.8714	0.76366	47.576	130.49	94.476
69.5000	40.750	110.84	23.143	1.8411	0.75923	47.300	131.34	94.857
70.0000	40.556	111.22	22.765	1.8110	0.75484	47.026	132.20	95.235
70.5000	40.364	111.59	22.388	1.7811	0.75048	46.755	133.05	95.612
71.0000	40.175	111.97	22.014	1.7513	0.74615	46.485	133.90	95.986
71.5000	39.989	112.34	21.642	1.7217	0.74185	46.217	134.75	96.358
72.0000	39.806	112.71	21.272	1.6923	0.73759	45.952	135.59	96.728
72.5000	39.624	113.08	20.904	1.6630	0.73335	45.688	136.43	97.096
73.0000	39.446	113.44	20.539	1.6339	0.72915	45.426	137.27	97.461
73.5000	39.269	113.80	20.175	1.6050	0.72498	45.166	138.11	97.825
74.0000	39.095	114.17	19.813	1.5762	0.72083	44.908	138.95	98.187
74.5000	38.924	114.52	19.454	1.5477	0.71672	44.652	139.78	98.546
75.0000	38.754	114.88	19.097	1.5192	0.71263	44.397	140.61	98.903

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113 50

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 75.000

B-85

1111350

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT 3612.5PSIA

VGO = 12.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
0.0	612.50	12.000	122.00	9.7056	5.66808E-04	3.53121E-02	0.0	0.0
0.50000	612.48	12.000	122.00	9.7056	5.66808E-04	3.53121E-02	0.0	3.05176E-04
1.00000	612.46	12.001	122.00	9.7056	5.66808E-04	3.53121E-02	0.0	6.10352E-04
1.50000	612.43	12.001	122.00	9.7056	5.66808E-04	3.53121E-02	0.0	9.15527E-04
2.00000	570.40	12.626	121.37	9.6558	2.2741	141.68	0.0	0.62625
2.50000	499.00	13.892	120.11	9.5551	2.7740	172.82	0.0	1.8919
3.00000	434.83	15.327	118.67	9.4410	2.9740	185.28	0.0	3.3271
3.50000	381.75	16.820	117.18	9.3221	3.0109	187.58	0.0	4.8209
4.00000	339.59	18.287	115.71	9.2055	2.8621	178.31	0.0	6.2872
4.50000	306.38	19.681	114.32	9.0945	2.7235	169.67	0.0	7.6821
5.00000	279.51	21.015	112.98	8.9884	2.6167	163.02	0.0	9.0181
5.50000	257.19	22.302	111.70	8.8860	2.5344	157.89	0.0	10.303
6.00000	238.27	23.553	110.45	8.7865	2.4715	153.98	0.0	11.554
6.50000	221.97	24.776	109.22	8.6892	2.4244	151.04	0.0	12.777
7.00000	207.71	25.979	108.02	8.5934	2.3902	148.91	0.0	13.981
7.50000	195.11	27.166	106.83	8.4990	2.3611	147.09	0.0	15.168
8.00000	183.96	28.332	105.67	8.4062	2.2954	143.00	0.0	16.334
8.50000	174.16	29.462	104.54	8.3163	2.2254	138.64	0.0	17.464
9.00000	165.48	30.559	103.44	8.2291	2.1615	134.66	0.0	18.561
9.50000	157.72	31.625	102.37	8.1443	2.1028	131.01	0.63056	19.627
10.0000	150.75	32.662	101.34	8.0617	2.0486	127.63	2.1433	20.664
10.5000	144.45	33.674	100.32	7.9812	1.9983	124.50	3.6298	21.676
11.0000	138.72	34.661	99.337	7.9027	1.9515	121.58	5.0921	22.663
11.5000	133.49	35.625	98.372	7.8259	1.9076	118.85	6.5318	23.628
12.0000	128.69	36.569	97.428	7.7509	1.8665	116.29	7.9502	24.572
12.5000	124.28	37.492	96.505	7.6774	1.8279	113.88	9.3487	25.495
13.0000	120.20	38.397	95.600	7.6054	1.7914	111.60	10.728	26.400
13.5000	116.42	39.284	94.713	7.5348	1.7568	109.45	12.090	27.287
14.0000	112.90	40.154	93.843	7.4656	1.7241	107.41	13.436	28.157
14.5000	109.62	41.008	92.988	7.3976	1.6930	105.47	14.765	29.012
15.0000	106.56	41.847	92.149	7.3309	1.6634	103.63	16.079	29.851
15.5000	103.68	42.671	91.325	7.2653	1.6351	101.87	17.378	30.675
16.0000	100.99	43.482	90.514	7.2008	1.6082	100.19	18.664	31.486
16.5000	98.449	44.280	89.716	7.1373	1.5823	98.579	19.937	32.284
17.0000	96.057	45.064	88.931	7.0749	1.5576	97.037	21.197	33.069
17.5000	93.797	45.837	88.158	7.0134	1.5338	95.557	22.444	33.842
18.0000	91.659	46.598	87.397	6.9528	1.5110	94.134	23.681	34.603
18.5000	89.633	47.348	86.647	6.8932	1.4890	92.765	24.906	35.353
19.0000	87.710	48.087	85.908	6.8344	1.4678	91.446	26.120	36.092
19.5000	85.882	48.816	85.179	6.7764	1.4474	90.174	27.323	36.821
20.0000	84.143	49.535	84.460	6.7192	1.4277	88.946	28.517	37.540
20.5000	82.485	50.244	83.751	6.6628	1.4086	87.759	29.701	38.249
21.0000	80.903	50.943	83.051	6.6071	1.3902	86.610	30.876	38.949
21.5000	79.392	51.634	82.361	6.5522	1.3724	85.498	32.041	39.639
22.0000	77.947	52.316	81.679	6.4979	1.3551	84.421	33.198	40.321
22.5000	76.564	52.989	81.005	6.4443	1.3383	83.376	34.346	40.995
23.0000	75.239	53.654	80.340	6.3914	1.3220	82.361	35.486	41.660
23.5000	73.968	54.311	79.683	6.3391	1.3062	81.376	36.618	42.317
24.0000	72.747	54.960	79.034	6.2875	1.2908	80.418	37.742	42.965
24.5000	71.574	55.601	78.392	6.2364	1.2759	79.486	38.859	43.608
25.0000	70.447	56.236	77.758	6.1860	1.2613	78.580	39.968	44.242
25.5000	69.361	56.863	77.131	6.1361	1.2471	77.696	41.070	44.869
26.0000	68.316	57.483	76.510	6.0867	1.2333	76.836	42.165	45.490
26.5000	67.308	58.096	75.897	6.0379	1.2198	75.996	43.253	46.103

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18.05a

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 12.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
27.0000	66.337	58.703	75.290	5.9897	1.2067	75.178	44.335	46.710
27.5000	65.399	59.303	74.690	5.9419	1.1939	74.378	45.410	47.310
28.0000	64.493	59.896	74.096	5.8947	1.1813	73.598	46.479	47.904
28.5000	63.617	60.484	73.509	5.8479	1.1691	72.835	47.541	48.491
29.0000	62.771	61.065	72.927	5.8017	1.1571	72.089	48.598	49.073
29.5000	61.951	61.641	72.351	5.7559	1.1454	71.360	49.648	49.649
30.0000	61.158	62.211	71.781	5.7105	1.1340	70.646	50.693	50.219
30.5000	60.390	62.775	71.217	5.6656	1.1228	69.948	51.732	50.783
31.0000	59.646	63.333	70.659	5.6212	1.1118	69.264	52.766	51.341
31.5000	58.924	63.886	70.105	5.5772	1.1010	68.594	53.794	51.895
32.0000	58.224	64.434	69.557	5.5336	1.0905	67.937	54.816	52.443
32.5000	57.544	64.977	69.015	5.4904	1.0801	67.293	55.834	52.985
33.0000	56.884	65.514	68.477	5.4477	1.0700	66.661	56.846	53.523
33.5000	56.243	66.047	67.944	5.4053	1.0601	66.042	57.854	54.056
34.0000	55.620	66.574	67.417	5.3633	1.0503	65.433	58.856	54.583
34.5000	55.014	67.097	66.894	5.3217	1.0407	64.836	59.854	55.106
35.0000	54.425	67.615	66.376	5.2805	1.0313	64.250	60.847	55.624
35.5000	53.851	68.128	65.863	5.2397	1.0221	63.674	61.835	56.137
36.0000	53.293	68.637	65.354	5.1992	1.0130	63.108	62.819	56.646
36.5000	52.750	69.141	64.849	5.1591	1.0040	62.551	63.798	57.151
37.0000	52.221	69.640	64.350	5.1193	0.99525	62.004	64.773	57.650
37.5000	51.705	70.136	63.854	5.0799	0.98661	61.466	65.743	58.146
38.0000	51.202	70.627	63.363	5.0408	0.97812	60.937	66.709	58.637
38.5000	50.712	71.114	62.876	5.0020	0.96975	60.416	67.671	59.124
39.0000	50.234	71.597	62.393	4.9636	0.96152	59.903	68.629	59.607
39.5000	49.767	72.075	61.914	4.9255	0.95342	59.398	69.583	60.086
40.0000	49.312	72.550	61.439	4.8878	0.94544	58.901	70.532	60.561
40.5000	48.867	73.021	60.968	4.8503	0.93758	58.411	71.478	61.032
41.0000	48.433	73.487	60.502	4.8132	0.92983	57.928	72.420	61.498
41.5000	48.009	73.950	60.038	4.7763	0.92220	57.453	73.358	61.962
42.0000	47.595	74.409	59.579	4.7398	0.91468	56.984	74.292	62.421
42.5000	47.190	74.865	59.124	4.7035	0.90726	56.522	75.222	62.876
43.0000	46.794	75.316	58.672	4.6676	0.89994	56.066	76.149	63.328
43.5000	46.407	75.765	58.223	4.6319	0.89273	55.617	77.072	63.777
44.0000	46.028	76.209	57.779	4.5966	0.88561	55.174	77.991	64.221
44.5000	45.658	76.650	57.338	4.5615	0.87859	54.736	78.907	64.662
45.0000	45.295	77.088	56.900	4.5267	0.87166	54.304	79.820	65.100
45.5000	44.940	77.522	56.466	4.4921	0.86482	53.878	80.729	65.534
46.0000	44.593	77.952	56.035	4.4578	0.85807	53.458	81.635	65.965
46.5000	44.253	78.380	55.608	4.4238	0.85140	53.042	82.537	66.392
47.0000	43.920	78.803	55.184	4.3901	0.84481	52.632	83.436	66.816
47.5000	43.593	79.224	54.763	4.3566	0.83831	52.227	84.332	67.237
48.0000	43.274	79.642	54.343	4.3234	0.83188	51.826	85.224	67.655
48.5000	42.960	80.056	53.931	4.2904	0.82553	51.431	86.113	68.069
49.0000	42.653	80.467	53.519	4.2577	0.81926	51.040	86.999	68.481
49.5000	42.352	80.875	53.111	4.2252	0.81305	50.653	87.882	68.889
50.0000	42.057	81.280	52.706	4.1930	0.80692	50.271	88.762	69.294
50.5000	41.767	81.682	52.304	4.1610	0.80086	49.894	89.639	69.696
51.0000	41.484	82.081	51.905	4.1293	0.79487	49.520	90.513	70.095
51.5000	41.205	82.477	51.509	4.0978	0.78894	49.151	91.384	70.491
52.0000	40.932	82.870	51.116	4.0665	0.78308	48.786	92.252	70.884
52.5000	40.663	83.260	50.726	4.0355	0.77727	48.424	93.117	71.274
53.0000	40.400	83.647	50.339	4.0047	0.77154	48.067	93.979	71.661
53.5000	40.141	84.031	49.954	3.9741	0.76586	47.713	94.838	72.046

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00115 50.0

ACCUM M GAS VOL: PARAMET CALCS FOR LUCA FLOOD REQMTS. HFR-040C77
 PARAMS: VGO=50, 40, 34.2, 27.5, 20, 16, 12 CU FT @612.5PSIA

VGO = 12.000

TIME	PG	VG	VL	ZL	Q	W	VFIL	VLD
54.0000	39.888	84.412	49.573	3.9437	0.76024	47.363	95.695	72.427
54.5000	39.638	84.791	49.194	3.9136	0.75467	47.016	96.548	72.806
55.0000	39.393	85.167	48.818	3.8837	0.74917	46.673	97.399	73.182
55.5000	39.153	85.540	48.444	3.8540	0.74372	46.334	98.247	73.556
56.0000	38.917	85.911	48.074	3.8245	0.73832	45.997	99.093	73.926
56.5000	38.685	86.278	47.706	3.7952	0.73297	45.664	99.936	74.294
57.0000	38.456	86.643	47.341	3.7662	0.72768	45.334	100.78	74.659
57.5000	38.232	87.006	46.978	3.7373	0.72243	45.008	101.61	75.022
58.0000	38.012	87.366	46.618	3.7087	0.71724	44.684	102.45	75.382
58.5000	37.795	87.723	46.261	3.6803	0.71209	44.363	103.28	75.739
59.0000	37.582	88.078	45.906	3.6520	0.70699	44.046	104.11	76.094
59.5000	37.373	88.430	45.554	3.6240	0.70194	43.731	104.94	76.446
60.0000	37.167	88.779	45.204	3.5962	0.69693	43.419	105.76	76.796
60.5000	36.964	89.127	44.857	3.5685	0.69197	43.110	106.58	77.143
61.0000	36.765	89.471	44.512	3.5411	0.68705	42.803	107.40	77.488
61.5000	36.569	89.813	44.169	3.5139	0.68217	42.499	108.22	77.831
62.0000	36.376	90.153	43.829	3.4868	0.67734	42.198	109.04	78.171
62.5000	36.186	90.491	43.492	3.4600	0.67254	41.899	109.85	78.508
63.0000	35.999	90.826	43.157	3.4333	0.66779	41.603	110.66	78.843
63.5000	35.815	91.158	42.824	3.4068	0.66307	41.309	111.47	79.176
64.0000	35.634	91.489	42.494	3.3806	0.65840	41.016	112.27	79.506
64.5000	35.456	91.817	42.165	3.3545	0.65376	40.729	113.07	79.835
65.0000	35.281	92.142	41.840	3.3285	0.64916	40.442	113.87	80.160
65.5000	35.108	92.465	41.516	3.3028	0.64459	40.158	114.67	80.484
66.0000	34.938	92.787	41.195	3.2772	0.64006	39.876	115.47	80.805
66.5000	34.770	93.105	40.876	3.2519	0.63557	39.596	116.26	81.124
67.0000	34.605	93.422	40.559	3.2267	0.63111	39.318	117.05	81.441
67.5000	34.443	93.736	40.245	3.2017	0.62668	39.042	117.84	81.755
68.0000	34.283	94.049	39.932	3.1768	0.62229	38.768	118.63	82.068
68.5000	34.125	94.358	39.622	3.1521	0.61792	38.497	119.42	82.378
69.0000	33.970	94.666	39.314	3.1276	0.61360	38.227	120.20	82.686
69.5000	33.817	94.972	39.009	3.1033	0.60930	37.959	120.98	82.991
70.0000	33.666	95.275	38.705	3.0792	0.60503	37.693	121.76	83.296
70.5000	33.517	95.577	38.403	3.0552	0.60079	37.429	122.53	83.597
71.0000	33.371	95.876	38.104	3.0313	0.59659	37.167	123.31	83.896
71.5000	33.226	96.173	37.807	3.0077	0.59241	36.907	124.08	84.193
72.0000	33.084	96.468	37.511	2.9842	0.58826	36.649	124.85	84.489
72.5000	32.944	96.761	37.218	2.9609	0.58414	36.392	125.62	84.782
73.0000	32.806	97.052	36.927	2.9377	0.58005	36.137	126.38	85.073
73.5000	32.669	97.341	36.638	2.9147	0.57598	35.884	127.15	85.362
74.0000	32.535	97.628	36.351	2.8919	0.57194	35.632	127.91	85.649
74.5000	32.402	97.913	36.066	2.8692	0.56793	35.382	128.67	85.934
75.0000	32.272	98.196	35.783	2.8467	0.56394	35.134	129.43	86.217

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DEPT 50

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 75.000

OUTPUT VARIABLE RANGES FOR ALL RUNS IN CASE

VARIABLE	MINIMUM	MAXIMUM	VARIABLE	MINIMUM	MAXIMUM
TIME	0.0	75.0000	PG	32.2715	612.500
VG	12.0000	133.957	VL	3.448653E-02	122.000
ZL	2.743558E-03	9.70565	Q	3.668076E-04	3.70440
W	3.531210E-02	230.784	VLD	0.0	109.124
TGAS	-231.382	70.0000	VFIL	0.0	149.723

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LTR 113-50

\$\$\$ CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 EXECUTION OUTPUT \$\$\$

B-90

40113 50

IEF1421 - STEP WAS EXECUTED - COND CODE 0000
 IEF2851 SYS2.CSMP LIB3
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.SYSIN
 IEF2851 VOL SER NOS= DSK005.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000122
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000123
 IEF2851 VOL SER NOS= DSK004.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000124
 IEF2851 VOL SER NOS= DSK002.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000125
 IEF2851 VOL SER NOS= DSK006.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000126
 IEF2851 VOL SER NOS= DSK001.
 IEF2851 LDFTACC.N2MINVOL
 IEF2851 VOL SER NOS= T9G021.
 IEF2851 SYS2.CSMP L0D3
 IEF2851 VOL SER NOS= SYSIPL.
 IEF2851 SYS2.CSMP L0D3
 IEF2851 VOL SER NOS= SYSIPL.
 IEF2851 SYS1.FORT LIB
 IEF2851 VOL SER NOS= DSKIPL.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000127
 IEF2851 VOL SER NOS= DSK005.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000127
 IEF2851 VOL SER NOS= DSK005.
 IEF2851 SYS2.CSMP DCK3
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.NDSET
 IEF2851 VOL SER NOS= DSK004.
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000128
 IEF2851 VOL SER NOS= DSK002.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000129
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000130
 IEF2851 VOL SER NOS= SPOL01.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000131
 IEF2851 VOL SER NOS= SPOL04.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000132
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS77312.T134328.SV000.HFRN38FA.R0000133
 IEF2851 VOL SER NOS= SPOL01.
 IEF2851 SYS77312.T123456.10007.HFRN38FA.S0000038
 IEF2851 VOL SER NOS= SPOL02.
 IEF2851 SYS77312.T123456.10007.HFRN38FA.S0000038
 IEF2851 VOL SER NOS= SPOL02.

KEPT

DELETED

DELETED

DELETED

DELETED

DELETED

DELETED

KEPT

KEPT

KEPT

KEPT

DELETED

PASSED

KEPT

DELETED

DELETED

DELETED

SYSOUT

SYSOUT

SYSOUT

SYSOUT

SYSIN

DELETED

OUTPUT TAPE
OF CALC. RESULTS

IEF3731 STEP /X / START 77312.1758
 IEF3741 STEP /X / STOP 77312.1811 CPU 1MIN 40.00SEC MAIN 126K LCS OK
 WAIT 0001MIN 25.26SEC SYSIN 00049REC UNUSED CORE 002K EXCPS 003831 SYSHRS .054868
 237 000000X;231 000012X;354 000000X;131 000026X;230 000150X;331 001669X;130 000064X;000 000842X;356 000066X;356 000179X
 137 000101X;231 000005X;231 000006X;237 000043X;131 000290X;230 000178X;354 000000X;135 000008X;236 000089X;354 000005X
 135 000093X;235 000005X
 IEF2851 SYS77312.T134328.RV000.HFRN38FA.R0000127 KEPT
 IEF2851 VOL SER NOS= DSK005.
 IEF3751 JOB /HFRN38FA/ START 77312.1758
 IEF3761 JOB /HFRN38FA/ STOP 77312.1811 CPU 1MIN 40.00SEC EXCPS 003831 SYSHRS .054868 DPSU .0548 REL 21.8
 WAIT 0001MIN 25.26SEC SYSIN 00049REC

IR115
50
4

B-71

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO-50.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-92

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO=50.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-93

LOFT ACCUM MIN NITROGEN VOL. REQMT STUDY VGO=40.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-94

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO-40.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-95

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO=40.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-96

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO=34.2 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-97

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO=34.2 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-98

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO-27.5 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-99

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO-27.5 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-100

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO-20.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-101

LOFT ACCUM MIN NITROGEN VOL REQMT STUDY VGO=20.0 CU FT COLD LEG LOCA USING MEASURED FLOW DATA

B-102

APPENDIX C

LOFT REFLOOD AS A FUNCTION OF
ACCUMULATOR GAS VOLUME

CSMP Output Listing and Plots for Hot Leg LOCA


```

//HFNDBFA J79 (D,52191-200-200,3510,X06740,N2BUBD),H.F.RHODES,
// TIME=003,CLASS=L,PRTY=03 CGR=150,CPU=003,WT=000
//CMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCDS,
// PREDECK='SYS2.',
// PRELOAD='SYS2.',STEPLIB=CSMPLD03,SYSLIB=CSMPLD03,
// SYSLINK=CSMPDCK3,VSYS=DSKRES
//X EXEC PGM=DEJCSMP2,REGION=128K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
//CSMPLIB DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR,DSN=&LIBRARY 00000050
//FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=&&SYSIN, 00000060
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=800) 00000070
//FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
//FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
//FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
//FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
// DCB=(RECFM=VS,BLKSIZE=444) 00000140
//FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
//GO.FT15F001 DD DSN=LQFTACCU.N2MINVOL.HOTLLOCA,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=(SHR,PASS), 00000170
// DSN=&PRELOAD&STEPLIB 00000180
//SYSLIB DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR,DSN=&PRELOAD&SYSLIB 00000190
// DD DISP=SHR,DSN=SYS1.FORTLIB 00000200
//SYSLIN DD UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800 00000210
//SYSLINK DD UNIT=SYSDA,VOL=PEF=*,SYSLIN,DISP=(OLD,PASS),DSN=*,SYSLIN 00000220
// DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR, 00000230
// DSN=&PREDECK&SYSLINK,(&LINKMEM) 00000240
//SYSLMOD DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=&&NOSET(DEJEXE) 00000250
//SYSUT1 DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(40,10)) 00000270
//FT03F001 DD SYSOUT=A 00000280
//FT08F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000290
//COMPRINT DD SYSOUT=A 00000300
//SYSPRINT DD SYSOUT=A 00000310
//FT06F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330) 00000320
// PEND CSMPX 00000330
// EXEC CSMPX
//CSMPX PROC DSYS=2314,LIBRARY='SYS2.CSMPLIB3',LINKMEM=CTLCDS,
// PREDECK='SYS2.',
// PRELOAD='SYS2.',STEPLIB=CSMPLD03,SYSLIB=CSMPLD03,
// SYSLINK=CSMPDCK3,VSYS=DSKRES
//X EXEC PGM=DEJCSMP2,REGION=128K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
//CSMPLIB DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR,DSN=&LIBRARY 00000050
//IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLIB3
//FT01F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DSN=&&SYSIN, 00000060
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=800) 00000070
//FT02F001 DD SYSOUT=B,DCB=(RECFM=F,BLKSIZE=80) 00000080
//FT05F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000090
//FT07F001 DD UNIT=SYSDA,SPACE=(3500,(20,20)),DCB=(RECFM=F,BLKSIZE=80) 00000110
//FT13F001 DD UNIT=SYSDA,SPACE=(3500,(40,40)), 00000130
// DCB=(RECFM=VS,BLKSIZE=444) 00000140
//FT14F001 DD UNIT=SYSDA,SPACE=(3500,(10,10)),DCB=(RECFM=F,BLKSIZE=80) 00000150
//GO.FT15F001 DD DSN=LQFTACCU.N2MINVOL.HOTLLOCA,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD DSN=SYS2.CSMPLD03,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL
//STEPLIB DD UNIT=&DSYS,VOL=SER=&VSYS,DISP=(SHR,PASS), 00000170
//IEF653I-SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=(SHR,PASS),
// DSN=&PRELOAD&STEPLIB. 00000180
//IEF653I-SUBSTITUTION JCL - DSN=SYS2.CSMPLD03
//SYSLIB DSN=SYS2.CSMPLD03,DISP=SHR,UNIT=3330,VOL=SER=SYSIPL
//SYSLIN UNIT=&DSYS,VOL=SER=&VSYS,DISP=SHR,DSN=&PRELOAD&SYSLIB

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C-2

11/13/50

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**          DD DISP=SHR,DSN=SYS1.FOOTLIB          00000200
**SYSLINK   ) UNIT=SYSDA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800          00000210
**SYSLINK   ) UNIT=SYSDA,VOL=REF=*.SYSLIN,DISP=(OLD,PASS),DSN=*.SYSLIN  00000220
**          DD UNIT=SDSYS,VOL=SER=SVSYS,DISP=SHR,          00000230
IEF653I SUBSTITUTION JCL - UNIT=2314,VOL=SER=DSKRES,DISP=SHR.
**          DSN=ERRDECK&SYSLINK.(CLINKMEM)          00000240
IEF653I SUBSTITUTION JCL - DSN=SYS2.CSMPDCK3(CTLCD3)
**SYSLMOD   DD UNIT=SYSDA,SPACE=(3500,(050,20,1)),DSN=ERRDECK(DEFEXE)  00000250
**SYSUT1    DD UNIT=(SYSDA,SEP=(SYSLMOD;SYSLINK)),SPACE=(3500,(40,10))  00000270
**FT03F001  DD SYSOUT=A          00000280
**FT08F001  DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)          00000290
**COMPRINT  DD SYSOUT=A          00000300
**SYSPRINT  DD SYSOUT=A          00000310
**FT06F001  DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)          00000320
//X.SYSIN--          DD DSN=SYS77343,T123456,10007,HERNDBFA:SO000143,
// VOL=SER=(SPOL31),DISP=(OLD,DELETE),UNIT=DKSPOL
//

```

```

IEF236I-ALLOD. FOR HERNDBFA-X---
IEF237I 237 ALLOCATED TO CSMPDIR
IEF237I 330 ALLOCATED TO FT01F001
IEF237I 354 ALLOCATED TO FT02F001
IEF237I 331 ALLOCATED TO FT05F001
IEF237I 335 ALLOCATED TO FT07F001
IEF237I 336 ALLOCATED TO FT13F001
IEF237I 337 ALLOCATED TO FT14F001
IEF237I 002- ALLOCATED TO FT15F001
IEF237I 354- ALLOCATED TO STEPLIB
IEF237I 356 ALLOCATED TO SYSLIB
IEF237I 137 ALLOCATED TO
IEF237I 330- ALLOCATED TO SYSIN
IEF237I 330 ALLOCATED TO SYSLINK
IEF237I 237 ALLOCATED TO
IEF237I 335 ALLOCATED TO SYSLMOD
IEF237I 336 ALLOCATED TO SYSUT1
IEF237I 354 ALLOCATED TO FT03F001
IEF237I 354 ALLOCATED TO FT08F001
IEF237I 354 ALLOCATED TO COMPRINT
IEF237I 354 ALLOCATED TO SYSPRINT
IEF237I 354- ALLOCATED TO FT06F001
IEF237I 354 ALLOCATED TO SYSIN

```


*****OPTIONS IN EFFECT*****NOIO,ESCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP

OPTIONS IN EFFECT NAME = BLK DATA, LINECNT = 58

STATISTICS NO DIAGNOSTICS GENERATED

0001	SURFLOUTIME UPDATE	
0002	COMMON- TIME	CSMPDECK
	1,ZZ0000,DELT ,ZZDELT,DFLMIN,ZZDELN,FINTIM,ZZFINT,PPDFL ,ZZPRDE	CSMPDECK
	1,CHITDEL,ZZGOTD,DELMAX,ZZDELX,VG ,PG ,VL ,DVG ,DPG	CSMPDECK
	1,DVL ,VGO ,PGO ,VLO ,FTABL,PCLTAB,AVES ,DELTAP,FLINEK	CSMPDECK
	1,FLOA ,FLDIA,FLDIA ,FLDIA ,FLDIA ,FLOVD ,FLOVOL,GASCON,GASK ,PCL	CSMPDECK
	1,P2 ,Q ,RENUM ,RHOL ,TGAS ,TO ,VELL ,VFIL ,VFIL0	CSMPDECK
	1,VLO ,VLOM ,VVES ,W ,ZL	CSMPDECK
	COMMON/ZZHIST/KEEP,NALAPM,I20000,I20001	CSMPDECK
0003	REAL LIMIT	CSMPDECK
0004	IFAL=8 ZZTIME	CSMPDECK
0005	EQUIVALENC(ZZTIME,TIME)	CSMPDECK
0006	GO TO (39995,39996,39997,39998),I20000	CSMPDECK
0007	C SYSTEM SEGMENT OF MODEL	CSMPDECK
0008	39995 CONTINUE	CSMPDECK
0009	GO TO 39999	CSMPDECK
	C INITIAL SEGMENT OF MODEL	CSMPDECK
0010	39996 CONTINUE	CSMPDECK
0011	VES=12.57	CSMPDECK
0012	PGO=612.5	CSMPDECK
0013	RHOL=62.3	CSMPDECK
0014	TO=70.0+460.0	CSMPDECK
0015	GASK=1.4	CSMPDECK
0016	GASCON=0.3832	CSMPDECK
0017	FLINEK=14.94	CSMPDECK
0018	FLOM=1.0E-5	CSMPDECK
0019	FLOVOL=1.2349	CSMPDECK
0020	FLOA=0.0668	CSMPDECK
0021	FLDIA=FLDIA/FLDIA	CSMPDECK
0022	FLOVD=2.0*(FLOA/3.1416)**0.5	CSMPDECK
0023	FLOVD=FLDIA/FLDIA	CSMPDECK
0024	VVES=126.0	CSMPDECK
0025	VLO=VVES-VGO	CSMPDECK
0026	VFIL=0.0	CSMPDECK
0027	VFIL0=0.0	CSMPDECK
0028	GO TO 39999	CSMPDECK
	C DYNAMIC SEGMENT OF MODEL	CSMPDECK
0029	39997 CONTINUE	CSMPDECK
0030	ZL=VL/AVES	CSMPDECK
0031	PCL=AFGEN(1,PCLTAB,TIME)	CSMPDECK
0032	P2=PG+((ZL-8.33)*RHOL/144.7)-PCL	CSMPDECK
0033	DELTAP=LIMIT(1.0E-5,10000.,P2)	CSMPDECK
0034	F10=0.01	CSMPDECK
0035	10 FLOK=4.*F10*FLOVD	CSMPDECK
0036	FLOR=(FLINEK+FLOK)/(FLOA**2*288.*32.2)	CSMPDECK
0037	Q=SQRT(DELTAP/FLOR/RHOL)	CSMPDECK
0038	RENUM=FLODIA*Q/FLDIA/FLOM	CSMPDECK
0039	RENO=LIMIT(1.0E+5,3.0E+6,RENUM)	CSMPDECK
0040	F1=AFGEN(6,FTABL,RENO)	CSMPDECK
0041	IF(RENUM.LE.1.E+5)GO TO 20	CSMPDECK
0042	IF(ABS((F10-F1)/F10).LE.1.E-3)GO TO 20	CSMPDECK
0043	F10=F1	CSMPDECK
0044	GO TO 10	CSMPDECK
0045	20 FLOK=4.*F1*FLOVD	CSMPDECK
0046	FLOR=(FLINEK+FLOK)/(FLOA**2*288.0*32.2)	CSMPDECK
0047	Q=SQRT(DELTAP/FLOR/RHOL)	CSMPDECK

0048		DVL=-0					CSMPDECK
0049		DVG=-DVL					CSMPDECK
	C	VG	=INTGRL	(VGO	,DVG	)	CSMPDECK
0050		DPG=-PG*GASK*DVG/VG					CSMPDECK
	C	PG	=INTGRL	(PGO	,DPG	)	CSMPDECK
	C	VL	=INTGRL	(VLO	,DVL	)	CSMPDECK
0051		VELL=Q/FLQA					CSMPDECK
0052		W=Q*RHOL					CSMPDECK
0053		TGAS=TO*(VGO/VG)**(GASK-1.0)-460.0					CSMPDECK
0054		VLD=VLO-VL					CSMPDECK
0055		VLDH=VLD*RHOL					CSMPDECK
0056		GO TO 39999					CSMPDECK
	C	TERMINAL SEGMENT OF MODEL					CSMPDECK
0057		39998 CONTINUE					CSMPDECK
0058		39999 CONTINUE					CSMPDECK
0059		RETURN					CSMPDECK
0060		END					CSMPDECK

OPTIONS IN EFFECT NOID, ERCDIC, SOURCE, NOLIST, NODECK, LOAD, NO MAP

OPTIONS IN EFFECT NAME = UPDATE , LINECNT = 58

STATISTICS SOURCE STATEMENTS = 60, PROGRAM SIZE = 1276

STATISTICS NO DIAGNOSTICS GENERATED

STATISTICS NO DIAGNOSTICS THIS STEP

F88-LEVEL KAGE EDITOR OPTIONS SPECIFIED OVLY,SIZE=(120K,12K)
VARIABLE OPTIONS USED - SIZE=(122880,12288)
***DEJEXE DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SFT

11/13/50

C-9

TITLE ACCUM GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMS. HFC-060E77

TITLE ~~LEG BRK: VGO=50 TH 12 CUFT AT 612.5 PSIA; DUPL = SAF RUNS~~

~~FUNCTION~~ POLTAB = 0., 2.250., 1.5, 6.25., 1.6, 5.70., 2., 300., ...

2.25, 180., 2.5, 120., 2.75, 70., 3., 50., 4.5, 20., 1000., 20.00

FUNCTION FTAB = 1.E5, 4.5E-3, 2.E5, 3.91E-3, 4.E5, 3.43E-3, ...

6.E5, 3.19E-3, 8.E5, 3.03E-3, 1.E6, 2.91E-3, 2.E6, 2.59E-3, ...

3.E6, 2.43E-3

PRINT VL, Q, W, VLD, VLDM, VELL, DELTAP, RENUM

METHOD SIMP

TIMER DELT = 0.05, FINTIM = 40., PPDEL = 0.25

PARAMETER VGO = (50.0, 40.0, 34.2, 27.5, 20.0, 16.0, 12.0)

PREPARE PG, VG, VL, ZL, Q, W, VLD, VLDM, DELTAP, TGIS, ...

RENUM, VELL, PCL, FLOK

*SYMBOLIC NAME NOT DEFINED IN MODEL, FLOK

FINISH ZL = 0.01

END

NOT NEEDED FOR PLOTS ETC

TIMER VARIABLES	SIMP	INTEGRATION	START TIME = 0.0
DELT	DELIM	FINTIM	PPDEL
5.000000D-02	4.000000D-06	40.000	0.25000
			OUTDEL
			DELMAX
			0.25000

ACCUM M VCL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-06DE77
 GOLD LES BRK: VGO=50 TO 12 CUFT AT 612.5PSIA: DUPL FSAP PUNS + .

HOT
 VGO = 50.000

TIME	VCL	Q	W	VLD	VLDM	VELL	DELTAP	PENIUM
0.0	76.000	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.25000	76.000	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.50000	76.000	6.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.75000	75.999	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.00000	75.999	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.25000	75.999	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.50000	75.999	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.75000	75.649	2.4076	149.99	0.35089	21.861	36.042	136.78	1.05112E 06
2.00000	74.898	3.5286	219.83	1.1023	68.673	52.823	293.06	1.54051E 06
2.25000	73.940	4.1137	256.28	2.0596	128.32	61.583	397.79	1.79597E 06
2.50000	72.884	4.3359	270.13	3.1161	194.14	64.909	441.70	1.89298E 06
2.75000	71.779	4.5004	280.38	4.2208	262.96	67.372	475.67	1.96480E 06
3.00000	70.651	4.5214	281.68	5.3485	333.21	67.686	480.10	1.97397E 06
3.25000	69.527	4.4749	278.78	6.4730	403.27	66.989	470.31	1.95364E 06
3.50000	68.414	4.4318	276.10	7.5863	472.63	66.344	461.34	1.93484E 06
3.75000	67.311	4.3920	273.62	8.6892	541.34	65.748	453.13	1.91745E 06
4.00000	66.217	4.3552	271.33	9.7826	609.46	65.197	445.61	1.90139E 06
4.25000	65.133	4.3212	269.21	10.867	677.02	64.689	438.72	1.88655E 06
4.50000	64.057	4.2898	267.26	11.943	744.78	64.219	432.40	1.87287E 06
4.75000	62.991	4.2359	263.90	13.009	810.47	63.412	421.66	1.84933E 06
5.00000	61.938	4.1842	260.67	14.062	876.04	62.637	411.46	1.82673E 06
5.25000	60.898	4.1344	257.57	15.102	940.82	61.892	401.78	1.80500E 06
5.50000	59.871	4.0865	254.59	16.129	1004.8	61.175	392.56	1.78408E 06
5.75000	58.855	4.0403	251.71	17.145	1068.1	60.484	383.78	1.76393E 06
6.00000	57.851	3.9958	248.94	18.149	1130.7	59.817	375.41	1.74449E 06
6.25000	56.857	3.9528	246.26	19.143	1192.6	59.174	367.41	1.72572E 06
6.50000	55.874	3.9113	243.67	20.126	1253.9	58.552	359.76	1.70758E 06
6.75000	54.901	3.8711	241.17	21.099	1314.5	57.950	352.44	1.69004E 06
7.00000	53.938	3.8322	238.75	22.062	1374.4	57.368	345.42	1.67307E 06
7.25000	52.985	3.7945	236.40	23.015	1433.8	56.804	338.70	1.65662E 06
7.50000	52.041	3.7580	234.12	23.959	1492.7	56.258	332.24	1.64068E 06
7.75000	51.106	3.7226	231.92	24.894	1550.9	55.728	326.03	1.62522E 06
8.00000	50.179	3.6882	229.78	25.821	1608.6	55.213	320.06	1.61022E 06
8.25000	49.261	3.6548	227.70	26.739	1665.8	54.713	314.32	1.59564E 06
8.50000	48.352	3.6224	225.68	27.648	1722.5	54.228	308.79	1.58147E 06
8.75000	47.450	3.5908	223.71	28.550	1778.7	53.755	303.45	1.56770E 06
9.00000	46.556	3.5601	221.80	29.444	1834.3	53.296	298.31	1.55430E 06
9.25000	45.670	3.5303	219.93	30.330	1889.6	52.848	293.34	1.54125E 06
9.50000	44.791	3.5011	218.12	31.209	1944.3	52.412	288.54	1.52854E 06
9.75000	43.919	3.4728	216.35	32.081	1998.6	51.988	283.90	1.51615E 06
10.0000	43.054	3.4451	214.63	32.946	2052.5	51.574	279.41	1.50407E 06
10.2500	42.197	3.4181	212.95	33.803	2106.0	51.170	275.07	1.49230E 06
10.5000	41.345	3.3918	211.31	34.655	2159.0	50.775	270.86	1.48080E 06
10.7500	40.501	3.3661	209.71	35.499	2211.6	50.391	266.79	1.46958E 06
11.0000	39.662	3.3410	208.14	36.338	2263.8	50.015	262.84	1.45861E 06
11.2500	38.830	3.3164	206.61	37.170	2315.7	49.647	259.01	1.44790E 06
11.5000	38.004	3.2925	205.12	37.996	2367.2	49.288	255.29	1.43743E 06
11.7500	37.184	3.2690	203.66	38.816	2418.3	48.937	251.68	1.42719E 06
12.0000	36.369	3.2461	202.23	39.631	2469.0	48.594	248.17	1.41717E 06
12.2500	35.560	3.2236	200.83	40.440	2519.4	48.257	244.76	1.40737E 06
12.5000	34.757	3.2016	199.46	41.243	2569.4	47.928	241.44	1.39777E 06
12.7500	33.960	3.1801	198.12	42.040	2619.1	47.606	238.22	1.38837E 06
13.0000	33.167	3.1590	196.81	42.833	2668.5	47.290	235.08	1.37917E 06
13.2500	32.380	3.1383	195.52	43.620	2717.5	46.981	232.03	1.37015E 06

C-11

ACCUM M GAS VOL: PARAMET CALCS FOR LOCAL FLOOD REQMTS. HFF-06DE77

COLD LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSAR RUNS + .

Hot

VGO = 50.000

TIME	VL	Q	W	VLD	VLDM	VELL	DELTAP	RENUM
13.5000	31.596	3.1181	194.26	44.402	2766.3	46.678	229.05	1.36130E 06
13.7500	30.821	3.0982	193.02	45.179	2814.7	46.381	226.16	1.35264E 06
14.0000	30.049	3.0788	191.81	45.951	2862.8	46.089	223.33	1.34414E 06
14.2500	29.281	3.0597	190.62	46.719	2910.6	45.803	220.58	1.33580E 06
14.5000	28.519	3.0409	189.45	47.481	2958.1	45.523	217.89	1.32761E 06
14.7500	27.761	3.0225	188.30	48.239	3005.3	45.247	215.27	1.31958E 06
15.0000	27.007	3.0045	187.18	48.993	3052.2	44.977	212.72	1.31169E 06
15.2500	26.253	2.9867	186.07	49.742	3098.9	44.711	210.22	1.30394E 06
15.5000	25.514	2.9693	184.99	50.486	3145.3	44.450	207.78	1.29633E 06
15.7500	24.774	2.9522	183.92	51.226	3191.4	44.194	205.40	1.28886E 06
16.0000	24.038	2.9353	182.87	51.962	3237.2	43.942	203.07	1.28151E 06
16.2500	23.306	2.9188	181.84	52.694	3282.8	43.694	200.80	1.27429E 06
16.5000	22.578	2.9025	180.83	53.422	3328.2	43.451	198.57	1.26719E 06
16.7500	21.855	2.8865	179.83	54.145	3373.3	43.211	196.40	1.26020E 06
17.0000	21.135	2.8708	178.85	54.865	3418.1	42.976	194.27	1.25333E 06
17.2500	20.419	2.8553	177.89	55.581	3462.7	42.744	192.19	1.24657E 06
17.5000	19.707	2.8401	176.94	56.293	3507.0	42.516	190.15	1.23992E 06
17.7500	18.999	2.8251	176.00	57.001	3551.2	42.291	188.15	1.23338E 06
18.0000	18.295	2.8103	175.08	57.705	3595.1	42.071	186.20	1.22693E 06
18.2500	17.594	2.7958	174.18	58.406	3638.7	41.853	184.28	1.22059E 06
18.5000	16.897	2.7815	173.29	59.103	3682.1	41.639	182.41	1.21434E 06
18.7500	16.203	2.7674	172.41	59.797	3725.4	41.428	180.57	1.20818E 06
19.0000	15.513	2.7535	171.54	60.487	3768.4	41.220	178.77	1.20212E 06
19.2500	14.826	2.7398	170.69	61.174	3811.1	41.015	177.00	1.19615E 06
19.5000	14.143	2.7263	169.85	61.857	3853.7	40.813	175.27	1.19026E 06
19.7500	13.463	2.7130	169.02	62.537	3896.1	40.614	173.57	1.18446E 06
20.0000	12.786	2.6999	168.21	63.214	3938.2	40.418	171.90	1.17874E 06
20.2500	12.113	2.6870	167.40	63.887	3980.2	40.225	170.26	1.17310E 06
20.5000	11.443	2.6743	166.61	64.557	4021.9	40.034	168.66	1.16754E 06
20.7500	10.776	2.6617	165.82	65.224	4063.5	39.846	167.08	1.16205E 06
21.0000	10.112	2.6493	165.05	65.888	4104.8	39.660	165.53	1.15664E 06
21.2500	9.4512	2.6371	164.29	66.549	4146.0	39.477	164.01	1.15130E 06
21.5000	8.7934	2.6250	163.54	67.207	4187.0	39.297	162.52	1.14604E 06
21.7500	8.1387	2.6131	162.80	67.861	4227.8	39.119	161.06	1.14084E 06
22.0000	7.4868	2.6014	162.07	68.513	4268.4	38.943	159.61	1.13571E 06
22.2500	6.8380	2.5898	161.34	69.162	4308.8	38.769	158.20	1.13065E 06
22.5000	6.1919	2.5783	160.63	69.808	4349.0	38.598	156.81	1.12565E 06
22.7500	5.5488	2.5670	159.93	70.451	4389.1	38.428	155.44	1.12072E 06
23.0000	4.9084	2.5559	159.23	71.092	4429.0	38.261	154.09	1.11584E 06
23.2500	4.2708	2.5448	158.54	71.729	4468.7	38.096	152.77	1.11103E 06
23.5000	3.6360	2.5340	157.87	72.364	4508.3	37.933	151.47	1.10628E 06
23.7500	3.0038	2.5232	157.20	72.996	4547.7	37.772	150.19	1.10158E 06
24.0000	2.3744	2.5126	156.53	73.626	4586.9	37.613	148.93	1.09694E 06
24.2500	1.7475	2.5021	155.88	74.252	4625.9	37.456	147.70	1.09236E 06
24.5000	1.1233	2.4917	155.23	74.877	4664.8	37.301	146.48	1.08783E 06
24.7500	0.50168	2.4814	154.59	75.498	4703.5	37.147	145.28	1.08336E 06
24.9500	6.19966E-03	2.4733	154.09	75.994	4734.4	37.026	144.33	1.07981E 06

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

4.9321E-04

C-72

ACCUM 4 (VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-06DE77
 COLD LEG BRK; VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSAR RUNS + .

HOT

VGO 40.000

TIME	VL	Q	W	VLD	VLDM	VELL	DELTAP	RNUM
0.0	86.000	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	86.000	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	86.000	6.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.750000	85.999	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	85.999	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	85.999	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	85.999	6.42688E-04	4.00394E-02	1.27329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	85.648	2.3974	149.36	0.35222	21.943	35.889	135.63	1.04667E 06
2.000000	84.901	3.5040	218.30	1.0992	68.482	52.456	289.01	1.52980E 06
2.250000	83.951	4.0753	253.89	2.0487	127.63	61.007	390.42	1.77920E 06
2.500000	82.906	4.2833	266.85	3.0937	192.74	64.121	431.09	1.87001E 06
2.750000	81.816	4.4354	276.32	4.1836	260.64	66.398	462.09	1.93641E 06
3.000000	80.707	4.4439	276.86	5.2935	329.78	66.526	463.86	1.94014E 06
3.250000	79.603	4.3853	273.20	6.3970	398.54	65.648	451.77	1.91455E 06
3.500000	78.513	4.3316	269.86	7.4866	466.41	64.844	440.82	1.89109E 06
3.750000	77.437	4.2823	266.79	8.5633	533.49	64.106	430.89	1.86958E 06
4.000000	76.372	4.2371	263.97	9.6281	599.83	63.430	421.89	1.84986E 06
4.250000	75.318	4.1957	261.39	10.682	665.50	62.810	413.73	1.83177E 06
4.500000	74.274	4.1578	259.03	11.726	730.55	62.242	406.31	1.81521E 06
4.750000	73.242	4.0972	255.26	12.758	794.84	61.336	394.62	1.78878E 06
5.000000	72.225	4.0395	251.66	13.775	858.20	60.471	383.62	1.76356E 06
5.250000	71.222	3.9842	248.22	14.778	920.68	59.644	373.25	1.73945E 06
5.500000	70.232	3.9314	244.92	15.768	982.33	58.853	363.45	1.71637E 06
5.750000	69.256	3.8807	241.77	16.744	1043.2	58.094	354.18	1.69424E 06
6.000000	68.292	3.8321	238.74	17.708	1103.2	57.366	345.40	1.67301E 06
6.250000	67.340	3.7853	235.83	18.660	1162.5	56.666	337.06	1.65260E 06
6.500000	66.399	3.7404	233.02	19.601	1221.1	55.993	329.14	1.63297E 06
6.750000	65.469	3.6971	230.33	20.531	1279.1	55.345	321.59	1.61407E 06
7.000000	64.550	3.6553	227.73	21.450	1336.3	54.720	314.40	1.59584E 06
7.250000	63.641	3.6150	225.22	22.359	1392.9	54.117	307.54	1.57826E 06
7.500000	62.743	3.5761	222.79	23.257	1448.9	53.535	300.98	1.56127E 06
7.750000	61.853	3.5385	220.45	24.147	1504.3	52.972	294.71	1.54486E 06
8.000000	60.973	3.5021	218.18	25.027	1559.2	52.427	288.70	1.52897E 06
8.250000	60.102	3.4669	215.99	25.898	1613.4	51.900	282.95	1.51359E 06
8.500000	59.239	3.4328	213.86	26.761	1667.2	51.389	277.42	1.49869E 06
8.750000	58.385	3.3997	211.80	27.615	1720.4	50.893	272.12	1.48424E 06
9.000000	57.540	3.3676	209.80	28.460	1773.1	50.413	267.02	1.47022E 06
9.250000	56.702	3.3364	207.86	29.298	1825.3	49.946	262.12	1.45660E 06
9.500000	55.871	3.3061	205.97	30.129	1877.0	49.492	257.40	1.44337E 06
9.750000	55.048	3.2766	204.13	30.952	1928.3	49.051	252.85	1.43051E 06
10.000000	54.233	3.2480	202.35	31.767	1979.1	48.622	248.46	1.41800E 06
10.250000	53.424	3.2201	200.61	32.576	2029.5	48.205	244.23	1.40583E 06
10.500000	52.623	3.1929	198.92	33.377	2079.4	47.798	240.14	1.39397E 06
10.750000	51.828	3.1665	197.27	34.172	2128.9	47.402	236.19	1.38242E 06
11.000000	51.039	3.1407	195.66	34.961	2178.1	47.016	232.37	1.37116E 06
11.250000	50.257	3.1155	194.10	35.743	2226.8	46.639	228.68	1.36018E 06
11.500000	49.481	3.0910	192.57	36.519	2275.1	46.272	225.10	1.34946E 06
11.750000	48.712	3.0670	191.07	37.288	2323.1	45.913	221.64	1.33900E 06
12.000000	47.948	3.0436	189.62	38.052	2370.7	45.563	218.28	1.32879E 06
12.250000	47.190	3.0208	188.19	38.810	2417.9	45.221	215.03	1.31881E 06
12.500000	46.437	2.9984	186.80	39.563	2464.8	44.887	211.87	1.30906E 06
12.750000	45.690	2.9766	185.44	40.310	2511.2	44.560	208.80	1.29952E 06
13.000000	44.949	2.9552	184.11	41.051	2557.9	44.240	205.83	1.29019E 06
13.250000	44.213	2.9343	182.81	41.787	2603.3	43.927	202.93	1.28107E 06

C-13

Hot

$$V(5.0) = 42.000$$

TIME	VL	W	VL0	VL00	VELL	DELTA P	PNUM	
13.5000	43.442	2.9138	181.53	42.518	2646.9	43.620	200.12	1.27214F 06
13.7500	42.750	2.8928	180.28	43.244	2694.1	43.321	197.39	1.26339F 06
14.0000	42.035	2.8742	179.06	43.965	2739.0	43.027	194.73	1.25482E 06
14.2500	41.312	2.8550	177.86	44.682	2785.7	42.739	192.14	1.24643E 06
14.5000	40.597	2.8361	176.69	45.393	2824.0	42.457	189.62	1.23820F 06
14.7500	39.900	2.8175	175.54	46.100	2872.0	42.190	187.17	1.23013F 06
15.0000	39.199	2.7995	174.41	46.802	2915.8	41.909	184.77	1.22222E 06
15.2500	38.500	2.7817	173.30	47.500	2959.2	41.643	182.44	1.21446E 06
15.5000	37.807	2.7643	172.22	48.193	3002.4	41.382	180.17	1.20685E 06
15.7500	37.118	2.7472	171.15	48.882	3045.3	41.126	177.95	1.19938E 06
16.0000	36.433	2.7304	170.10	49.567	3088.0	40.874	175.79	1.19204E 06
16.2500	35.752	2.7139	159.07	50.247	3130.4	40.627	173.68	1.18483E 06
16.5000	35.076	2.6977	158.06	50.924	3172.5	40.384	171.61	1.17776F 06
16.7500	34.405	2.6817	157.07	51.596	3214.4	40.146	169.60	1.17080F 06
17.0000	33.735	2.6661	156.10	52.265	3256.1	39.912	167.63	1.16397F 06
17.2500	33.071	2.6507	155.14	52.929	3297.5	39.681	165.71	1.15725E 06
17.5000	32.410	2.6356	154.20	53.590	3338.7	39.455	163.83	1.15065E 06
17.7500	31.753	2.6207	153.27	54.247	3379.6	39.232	161.99	1.14415E 06
18.0000	31.103	2.6061	152.36	54.900	3420.3	39.013	160.19	1.13777E 06
18.2500	30.459	2.5917	151.46	55.550	3460.8	38.798	158.43	1.13148F 06
18.5000	29.809	2.5775	150.58	56.196	3501.0	38.586	156.71	1.12530E 06
18.7500	29.161	2.5636	149.71	56.839	3541.1	38.377	155.02	1.11921E 06
19.0000	28.522	2.5499	158.86	57.478	3580.9	38.171	153.37	1.11322F 06
19.2500	27.886	2.5363	158.01	58.114	3620.5	37.969	151.76	1.10732E 06
19.5000	27.254	2.5230	157.18	58.746	3659.9	37.770	150.17	1.10151F 06
19.7500	26.624	2.5099	156.37	59.376	3699.1	37.574	148.62	1.09579F 06
20.0000	25.999	2.4970	155.56	60.001	3738.1	37.380	147.10	1.09015E 06
20.2500	25.376	2.4843	154.77	60.624	3776.9	37.190	145.61	1.08460E 06
20.5000	24.756	2.4718	153.99	61.244	3815.5	37.002	144.15	1.07913E 06
20.7500	24.140	2.4594	153.22	61.860	3853.9	36.817	142.71	1.07373E 06
21.0000	23.527	2.4472	152.46	62.473	3892.1	36.635	141.31	1.06841E 06
21.2500	22.916	2.4352	151.71	63.084	3930.1	36.455	139.93	1.06317E 06
21.5000	22.309	2.4234	150.98	63.691	3968.0	36.278	138.57	1.05800F 06
21.7500	21.704	2.4117	150.25	64.296	4005.6	36.103	137.25	1.05290F 06
22.0000	21.103	2.4002	149.53	64.897	4043.1	35.931	135.94	1.04787E 06
22.2500	20.504	2.3886	148.82	65.496	4080.4	35.761	134.66	1.04291E 06
22.5000	19.908	2.3776	148.12	66.092	4117.5	35.593	133.40	1.03801E 06
22.7500	19.315	2.3665	147.43	66.685	4154.4	35.427	132.17	1.03318E 06
23.0000	18.725	2.3556	146.75	67.275	4191.2	35.263	130.95	1.02841E 06
23.2500	18.138	2.3448	146.08	67.862	4227.8	35.102	129.76	1.02371E 06
23.5000	17.553	2.3342	145.42	68.447	4264.3	34.943	128.59	1.01906E 06
23.7500	16.970	2.3237	144.76	69.030	4300.5	34.785	127.44	1.01447E 06
24.0000	16.391	2.3133	144.12	69.609	4336.7	34.630	126.30	1.00994E 06
24.2500	15.814	2.3030	143.48	70.186	4372.6	34.477	125.19	1.00547E 06
24.5000	15.239	2.2929	142.85	70.751	4408.4	34.325	124.09	1.00105E 06
24.7500	14.667	2.2829	142.22	71.333	4444.0	34.175	123.02	9.96674E 05
25.0000	14.098	2.2730	141.61	71.902	4479.5	34.027	121.96	9.92352E 05
25.2500	13.531	2.2632	141.00	72.469	4514.8	33.881	120.91	9.88080E 05
25.5000	12.966	2.2536	140.40	73.034	4550.0	33.736	119.89	9.83859E 05
25.7500	12.404	2.2440	139.80	73.596	4585.0	33.593	118.88	9.79688E 05
26.0000	11.844	2.2346	139.21	74.156	4619.9	33.451	117.88	9.75566E 05
26.2500	11.287	2.2252	138.63	74.713	4654.6	33.312	116.91	9.71491E 05
26.5000	10.731	2.2160	138.06	75.269	4689.2	33.173	115.94	9.67462E 05
26.7500	10.179	2.2069	137.49	75.821	4723.7	33.037	115.00	9.63479E 05

C-14

1815 50

ACCOUNT 1 GAS 1: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFS-060E77
 LES LEG PRK: VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSAR RUNS + .

HOT

VGO = 40.000

TIME	VL	U	W	VLD	VLDW	VELL	DELTAP	PFNUM
27.0000	9.6280	2.1478	136.93	76.372	4758.0	32.902	114.06	9.59540E 05
27.2500	9.0797	2.1889	136.37	76.930	4792.1	32.766	113.14	9.55645E 05
27.5000	8.5335	2.1801	135.82	77.466	4826.2	32.636	112.24	9.51793E 05
27.7500	7.9895	2.1714	135.28	78.010	4860.0	32.506	111.34	9.47983E 05
28.0000	7.4478	2.1627	134.74	78.552	4893.8	32.376	110.46	9.44214E 05
28.2500	6.9082	2.1542	134.21	79.092	4927.4	32.249	109.60	9.40485E 05
28.5000	6.3707	2.1458	133.68	79.629	4960.9	32.122	108.74	9.36797E 05
28.7500	5.8352	2.1374	133.16	80.165	4994.3	31.997	107.90	9.33147E 05
29.0000	5.3020	2.1291	132.64	80.698	5027.5	31.873	107.07	9.29534E 05
29.2500	4.7708	2.1209	132.13	81.229	5060.6	31.750	106.25	9.25960E 05
29.5000	4.2415	2.1128	131.63	81.758	5093.5	31.629	105.45	9.22422E 05
29.7500	3.7143	2.1048	131.13	82.286	5126.4	31.509	104.65	9.18920E 05
30.0000	3.1891	2.0969	130.63	82.811	5159.1	31.390	103.87	9.15453E 05
30.2500	2.6659	2.0890	130.14	83.334	5191.7	31.272	103.09	9.12021E 05
30.5000	2.1446	2.0812	129.66	83.855	5224.2	31.156	102.33	9.08623E 05
30.7500	1.6253	2.0735	129.18	84.375	5256.5	31.041	101.57	9.05259E 05
31.0000	1.1078	2.0659	128.70	84.892	5288.8	30.926	100.83	9.01927E 05
31.2500	0.59232	2.0583	128.23	85.408	5320.9	30.813	100.10	8.98628E 05
31.5000	7.86752E-02	2.0508	127.77	85.921	5352.9	30.701	99.375	8.95360E 05

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL 6.25896E-03

C-15

17113 50

ACCU M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-060E77

6000 LES 9PK: VGO=50 TO 12 CURT AT 612.5PSIA: DUPL FSAP RUNS + .

HOT

VGO = 34.200

TIME	VL	V	V	VLD	VLDM	VFL	DFLTAP	°ENUM
0.0	91.800	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	91.800	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	91.800	6.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.750000	91.799	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	91.799	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	91.799	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	91.799	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	91.443	2.3380	148.77	0.35225	21.945	35.749	134.57	1.04257E 06
2.000000	90.705	3.4830	216.99	1.0954	68.246	52.141	285.57	1.52064E 06
2.250000	89.762	4.0431	251.89	2.0382	126.98	60.526	384.31	1.76515E 06
2.500000	88.726	4.2398	264.14	3.0737	191.49	63.470	422.43	1.85103E 06
2.750000	87.648	4.3823	273.02	4.1515	258.64	65.603	451.15	1.91323E 06
3.000000	86.553	4.3813	272.95	5.2469	326.98	65.588	450.94	1.91279E 06
3.250000	85.466	4.3136	268.74	6.2336	394.59	64.574	437.18	1.88323E 06
3.500000	84.396	4.2519	264.90	7.4043	461.28	63.652	424.84	1.85632E 06
3.750000	83.340	4.1758	261.40	8.4601	527.07	62.812	413.75	1.83182E 06
4.000000	82.297	4.1447	258.21	9.5026	592.01	62.046	403.77	1.80950E 06
4.250000	81.267	4.0981	255.31	10.533	656.20	61.349	394.79	1.78916E 06
4.500000	80.248	4.0557	252.67	11.552	719.70	60.714	386.70	1.77064E 06
4.750000	79.247	3.9906	248.62	12.558	782.36	59.740	374.44	1.74223E 06
5.000000	78.252	3.9288	244.76	13.548	844.03	58.814	362.98	1.71524E 06
5.250000	77.277	3.8700	241.10	14.523	904.76	57.934	352.24	1.68956E 06
5.500000	76.317	3.8139	237.60	15.483	964.59	57.094	342.14	1.66507E 06
5.750000	75.370	3.7603	234.27	16.430	1023.6	56.292	332.64	1.64168E 06
6.000000	74.437	3.7091	231.07	17.363	1081.7	55.525	323.67	1.61931E 06
6.250000	73.515	3.6600	228.02	18.285	1139.1	54.790	315.20	1.59789E 06
6.500000	72.606	3.6129	225.09	19.194	1195.8	54.086	307.18	1.57734E 06
6.750000	71.709	3.5678	222.27	20.091	1251.7	53.410	299.58	1.55762E 06
7.000000	70.822	3.5243	219.56	20.978	1306.9	52.759	292.36	1.53865E 06
7.250000	69.946	3.4825	216.96	21.854	1361.5	52.133	285.49	1.52040E 06
7.500000	69.081	3.4422	214.45	22.719	1415.4	51.531	278.95	1.50282E 06
7.750000	68.225	3.4034	212.03	23.575	1468.7	50.949	272.71	1.48586E 06
8.000000	67.379	3.3659	209.70	24.421	1521.4	50.388	266.76	1.46949E 06
8.250000	66.542	3.3297	207.44	25.258	1573.6	49.845	261.07	1.45368E 06
8.500000	65.714	3.2946	205.26	26.086	1625.2	49.321	255.63	1.43838E 06
8.750000	64.895	3.2607	203.14	26.905	1676.2	48.813	250.41	1.42358E 06
9.000000	64.083	3.2279	201.10	27.717	1726.7	48.322	245.41	1.40925E 06
9.250000	63.280	3.1961	199.12	28.520	1776.8	47.845	240.61	1.39535E 06
9.500000	62.485	3.1652	197.19	29.315	1826.3	47.383	236.00	1.38187E 06
9.750000	61.698	3.1352	195.33	30.102	1875.4	46.935	231.57	1.36879E 06
10.000000	60.917	3.1061	193.51	30.883	1924.0	46.499	227.31	1.35609E 06
10.250000	60.144	3.0779	191.75	31.656	1972.1	46.076	223.20	1.34374E 06
10.500000	59.378	3.0504	190.04	32.422	2019.9	45.664	219.25	1.33174E 06
10.750000	58.619	3.0236	188.37	33.181	2067.2	45.264	215.43	1.32005E 06
11.000000	57.866	2.9976	186.75	33.934	2114.1	44.874	211.75	1.30868E 06
11.250000	57.120	2.9722	185.17	34.680	2160.5	44.494	208.19	1.29761E 06
11.500000	56.380	2.9475	183.63	35.420	2206.6	44.124	204.75	1.28681E 06
11.750000	55.646	2.9234	182.12	36.154	2252.4	43.763	201.43	1.27628E 06
12.000000	54.918	2.8998	180.66	36.882	2297.7	43.411	198.21	1.26602E 06
12.250000	54.196	2.8769	179.23	37.604	2342.7	43.067	195.09	1.25600E 06
12.500000	53.480	2.8545	177.83	38.320	2387.3	42.732	192.08	1.24621E 06
12.750000	52.769	2.8326	176.47	39.031	2431.6	42.404	189.15	1.23666E 06
13.000000	52.064	2.8112	175.14	39.736	2475.6	42.084	186.31	1.22732E 06
13.250000	51.363	2.7903	173.83	40.437	2519.2	41.771	183.56	1.21819E 06

C-16

13115 50

ACCOUNT NO. VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-06DE77
 6-10 LFG BOK; VGO=50 TO 12 CUF AT 612.5PSIA; DUPL FSAR RUNS +.

HOT

VGO = 34.200

TIME	VL	C	A	VLO	VLOM	VELL	DELTA P	PENUM
13.5000	50.658	2.7698	172.56	41.132	2562.5	41.465	180.89	1.20926E 06
13.7500	49.976	2.7495	171.31	41.822	2605.5	41.165	178.29	1.20053E 06
14.0000	49.293	2.7303	170.09	42.507	2648.2	40.872	175.77	1.19198E 06
14.2500	48.613	2.7111	168.90	43.187	2690.5	40.585	173.32	1.18361E 06
14.5000	47.933	2.6923	167.73	43.862	2732.6	40.304	170.94	1.17542E 06
14.7500	47.257	2.6739	166.59	44.533	2774.4	40.029	168.62	1.16739E 06
15.0000	46.581	2.6559	165.46	45.199	2815.9	39.759	166.36	1.15952E 06
15.2500	45.939	2.6382	164.36	45.861	2857.2	39.495	164.16	1.15181E 06
15.5000	45.281	2.6209	163.28	46.519	2898.1	39.235	162.02	1.14425E 06
15.7500	44.628	2.6039	162.23	47.172	2938.8	38.981	159.93	1.13683E 06
16.0000	43.979	2.5873	161.19	47.821	2979.2	38.732	157.89	1.12955E 06
16.2500	43.334	2.5709	160.17	48.466	3019.4	38.487	155.91	1.12241E 06
16.5000	42.694	2.5548	159.17	49.106	3059.3	38.246	153.97	1.11540E 06
16.7500	42.057	2.5391	158.18	49.743	3099.0	38.010	152.08	1.10852E 06
17.0000	41.424	2.5236	157.22	50.376	3138.4	37.778	150.24	1.10176E 06
17.2500	40.795	2.5084	156.27	51.005	3177.6	37.551	148.44	1.09511E 06
17.5000	40.170	2.4934	155.34	51.630	3216.6	37.327	146.68	1.08859E 06
17.7500	39.548	2.4787	154.42	52.252	3255.3	37.107	144.96	1.08217E 06
18.0000	38.930	2.4643	153.52	52.870	3293.8	36.890	143.28	1.07586E 06
18.2500	38.316	2.4501	152.64	53.484	3332.1	36.678	141.64	1.06966E 06
18.5000	37.705	2.4361	151.77	54.095	3370.1	36.469	140.03	1.06356E 06
18.7500	37.098	2.4224	150.91	54.702	3407.9	36.263	138.46	1.05756E 06
19.0000	36.494	2.4088	150.07	55.306	3445.6	36.060	136.92	1.05165E 06
19.2500	35.893	2.3955	149.24	55.907	3483.0	35.861	135.42	1.04584E 06
19.5000	35.296	2.3824	148.42	56.504	3520.2	35.665	133.94	1.04012E 06
19.7500	34.702	2.3695	147.62	57.098	3557.2	35.472	132.50	1.03449E 06
20.0000	34.111	2.3568	146.83	57.689	3594.0	35.282	131.09	1.02895E 06
20.2500	33.524	2.3443	146.05	58.278	3630.6	35.094	129.70	1.02348E 06
20.5000	32.939	2.3320	145.28	58.861	3667.0	34.910	128.35	1.01810E 06
20.7500	32.357	2.3198	144.53	59.443	3703.3	34.728	127.02	1.01280E 06
21.0000	31.779	2.3079	143.78	60.021	3739.3	34.549	125.71	1.00758E 06
21.2500	31.203	2.2961	143.05	60.597	3775.2	34.373	124.44	1.00243E 06
21.5000	30.631	2.2844	142.32	61.169	3810.8	34.198	123.18	9.97348E 05
21.7500	30.061	2.2730	141.61	61.739	3846.3	34.026	121.95	9.92333E 05
22.0000	29.494	2.2616	140.90	62.306	3881.6	33.857	120.75	9.87388E 05
22.2500	28.930	2.2505	140.20	62.870	3916.8	33.690	119.56	9.82512E 05
22.5000	28.369	2.2394	139.52	63.431	3951.8	33.525	118.40	9.77701E 05
22.7500	27.810	2.2286	138.84	63.990	3986.5	33.362	117.26	9.72956E 05
23.0000	27.255	2.2179	138.17	64.545	4021.2	33.201	116.14	9.68274E 05
23.2500	26.701	2.2073	137.51	65.099	4055.6	33.043	115.04	9.63655E 05
23.5000	26.151	2.1968	136.86	65.649	4089.9	32.887	113.96	9.59095E 05
23.7500	25.603	2.1865	136.22	66.197	4124.1	32.732	112.89	9.54596E 05
24.0000	25.058	2.1763	135.59	66.742	4158.1	32.580	111.85	9.50153E 05
24.2500	24.515	2.1663	134.96	67.285	4191.9	32.430	110.83	9.45767E 05
24.5000	23.974	2.1564	134.34	67.826	4225.5	32.281	109.82	9.41436E 05
24.7500	23.436	2.1466	133.73	68.364	4259.0	32.134	108.83	9.37158E 05
25.0000	22.901	2.1369	133.13	68.899	4292.4	31.990	107.85	9.32933E 05
25.2500	22.368	2.1273	132.53	69.432	4325.6	31.846	106.89	9.28760E 05
25.5000	21.837	2.1179	131.95	69.963	4358.7	31.705	105.95	9.24637E 05
25.7500	21.309	2.1086	131.36	70.491	4391.6	31.565	105.02	9.20564E 05
26.0000	20.783	2.0993	130.79	71.017	4424.4	31.427	104.11	9.16538E 05
26.2500	20.259	2.0902	130.22	71.541	4457.0	31.291	103.21	9.12560E 05
26.5000	19.738	2.0812	129.66	72.062	4489.5	31.156	102.33	9.08628E 05
26.7500	19.218	2.0723	129.11	72.582	4521.8	31.023	101.46	9.04741E 05

C-17

LR13 50

ACCUM M GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-060F77
 C-18 LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSDR RUNS + .

HOT
 VGO = 34.200

TIME	VL			VL0	VL0M	VELI	DELTA P	PENUM
27.0000	18.701	2.0035	128.56	73.099	4554.0	30.891	100.60	9.07899F 05
27.2500	18.187	2.0545	128.02	73.613	4586.1	30.761	99.760	8.97100E 05
27.5000	17.674	2.0462	127.48	74.126	4618.1	30.632	98.930	8.93344E 05
27.7500	17.163	2.0377	126.95	74.637	4649.9	30.505	98.113	8.89629E 05
28.0000	16.655	2.0293	126.43	75.145	4681.5	30.379	97.307	8.85955E 05
28.2500	16.144	2.0210	125.91	75.651	4713.1	30.254	96.514	8.82321E 05
28.5000	15.644	2.0127	125.39	76.156	4744.5	30.131	95.732	8.78726E 05
28.7500	15.142	2.0044	124.89	76.653	4775.8	30.009	94.962	8.75170E 05
29.0000	14.642	1.9965	124.38	77.158	4806.9	29.888	94.204	8.71651E 05
29.2500	14.144	1.9886	123.89	77.656	4838.0	29.769	93.456	8.68169E 05
29.5000	13.648	1.9807	123.40	78.152	4868.9	29.651	92.718	8.64724E 05
29.7500	13.154	1.9729	122.91	78.646	4899.7	29.534	91.992	8.61314E 05
30.0000	12.661	1.9651	122.43	79.139	4930.3	29.418	91.275	8.57939E 05
30.2500	12.171	1.9575	121.95	79.629	4960.9	29.303	90.569	8.54598E 05
30.5000	11.683	1.9499	121.48	80.117	4991.3	29.190	89.872	8.51291E 05
30.7500	11.196	1.9424	121.01	80.604	5021.6	29.078	89.185	8.48017E 05
31.0000	10.711	1.9350	120.55	81.089	5051.8	28.967	88.507	8.44775E 05
31.2500	10.229	1.9276	120.09	81.571	5081.9	28.857	87.838	8.41565E 05
31.5000	9.7476	1.9203	119.64	82.052	5111.9	28.748	87.179	8.38386E 05
31.7500	9.2684	1.9131	119.19	82.532	5141.7	28.640	86.528	8.35238E 05
32.0000	8.7911	1.9060	118.74	83.009	5171.5	28.533	85.886	8.32121E 05
32.2500	8.3154	1.8989	118.30	83.485	5201.1	28.427	85.252	8.29033E 05
32.5000	7.8416	1.8919	117.87	83.958	5230.6	28.322	84.627	8.25974E 05
32.7500	7.3695	1.8850	117.43	84.431	5260.0	28.218	84.009	8.22943E 05
33.0000	6.8991	1.8781	117.01	84.901	5289.3	28.115	83.400	8.19941E 05
33.2500	6.4304	1.8713	116.58	85.370	5318.5	28.013	82.798	8.16967E 05
33.5000	5.9634	1.8645	116.16	85.837	5347.6	27.912	82.204	8.14020E 05
33.7500	5.4981	1.8578	115.74	86.302	5376.6	27.812	81.618	8.11099E 05
34.0000	5.0345	1.8512	115.33	86.765	5405.5	27.713	81.039	8.08204E 05
34.2500	4.5725	1.8446	114.92	87.227	5434.3	27.614	80.467	8.05336E 05
34.5000	4.1122	1.8381	114.52	87.688	5462.9	27.517	79.902	8.02493E 05
34.7500	3.6535	1.8317	114.11	88.147	5491.5	27.420	79.344	7.99674E 05
35.0000	3.1963	1.8253	113.71	88.604	5520.0	27.324	78.792	7.96877E 05
35.2500	2.7403	1.8189	113.32	89.059	5548.4	27.229	78.248	7.94104E 05
35.5000	2.2869	1.8126	112.93	89.513	5576.7	27.135	77.710	7.91355E 05
35.7500	1.8345	1.8064	112.54	89.965	5604.8	27.042	77.178	7.88630E 05
36.0000	1.3837	1.8002	112.15	90.416	5632.9	26.949	76.653	7.85927E 05
36.2500	0.93441	1.7940	111.77	90.866	5660.9	26.857	76.134	7.83248E 05
36.5000	0.48666	1.7880	111.39	91.313	5688.8	26.766	75.621	7.80591E 05
36.7500	4.04260E-02	1.7819	111.01	91.760	5716.6	26.675	75.113	7.77956E 05

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL 3.21607E-03

C-18

LR113 50

ACCU 4 C VOL: PARAMET CALCO FOR LOGA FLOOD REQMTS. HFP-060E77

LEG PRK: VGO=50 TO 12 CFT AT 612.5PSIA; DUPL FSAP RUNS + .

HOT

VGO = 27.500

TIME	VL	O	F	VL0	VL0M	VEIL	DELTA0	PENIUM
0.0	98.500	3.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	98.500	3.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	98.500	3.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.750000	98.499	3.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	98.499	3.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	98.499	3.42688E-04	4.00394E-02	1.14441E-03	7.12956E-02	9.62107E-03	1.00000E-05	269.16
1.500000	98.499	3.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	98.143	2.3716	147.75	0.35156	21.902	35.503	132.73	1.03540E 06
2.000000	97.412	3.4479	214.80	1.0882	67.796	51.615	279.86	1.50529E 06
2.250000	96.480	3.9902	248.59	2.0199	125.84	59.734	374.36	1.74205E 06
2.500000	95.460	4.1694	259.75	3.0399	189.39	62.415	408.57	1.82026E 06
2.750000	94.402	4.2973	267.72	4.0982	255.32	64.331	433.90	1.87612E 06
3.000000	93.330	4.2821	266.77	5.1705	322.12	64.103	430.84	1.86947E 06
3.250000	92.269	4.2010	261.72	6.2307	388.17	62.889	414.76	1.83408E 06
3.500000	91.228	4.1281	257.18	7.2717	453.03	61.798	400.56	1.80224E 06
3.750000	90.205	4.0624	253.09	8.2954	516.80	60.814	387.96	1.77356E 06
4.000000	89.197	4.0031	249.39	9.3035	579.61	59.927	376.78	1.74769E 06
4.250000	88.203	3.9497	246.06	10.297	641.53	59.127	366.83	1.72435E 06
4.500000	87.221	3.9014	242.06	11.279	702.67	58.405	357.96	1.70329E 06
4.750000	86.255	3.8304	238.63	12.245	762.88	57.341	345.10	1.67229E 06
5.000000	85.306	3.7634	234.46	13.194	822.01	56.338	333.18	1.64303E 06
5.250000	84.373	3.7000	230.51	14.127	880.13	55.389	322.10	1.61535E 06
5.500000	83.455	3.6399	226.77	15.045	937.29	54.489	311.76	1.58911E 06
5.750000	82.552	3.5828	223.21	15.948	993.54	53.635	302.10	1.56419E 06
6.000000	81.654	3.5285	219.82	16.836	1048.9	52.821	293.04	1.54047E 06
6.250000	80.788	3.4767	216.60	17.712	1103.5	52.046	284.54	1.51786E 06
6.500000	79.925	3.4272	213.52	18.575	1157.2	51.306	276.53	1.49626E 06
6.750000	79.074	3.3799	210.57	19.426	1210.2	50.598	268.98	1.47561E 06
7.000000	78.235	3.3346	207.75	20.265	1262.5	49.919	261.84	1.45583E 06
7.250000	77.406	3.2912	205.04	21.094	1314.1	49.269	255.09	1.43687E 06
7.500000	76.589	3.2495	202.44	21.911	1365.1	48.645	248.69	1.41866E 06
7.750000	75.782	3.2094	199.94	22.718	1415.4	48.044	242.61	1.40115E 06
8.000000	74.984	3.1708	197.54	23.516	1465.0	47.467	236.83	1.38430E 06
8.250000	74.196	3.1336	195.22	24.304	1514.1	46.910	231.33	1.36807E 06
8.500000	73.417	3.0977	192.99	25.083	1562.7	46.373	226.08	1.35242E 06
8.750000	72.647	3.0631	190.83	25.853	1610.6	45.855	221.08	1.33730E 06
9.000000	71.885	3.0297	188.75	26.615	1658.1	45.354	216.29	1.32270E 06
9.250000	71.132	2.9973	186.73	27.368	1705.0	44.870	211.71	1.30859E 06
9.500000	70.386	2.9660	184.78	28.114	1751.5	44.402	207.33	1.29492E 06
9.750000	69.649	2.9357	182.90	28.851	1797.4	43.948	203.13	1.28169E 06
10.000000	68.918	2.9063	181.06	29.582	1842.9	43.508	199.10	1.26886E 06
10.250000	68.195	2.8778	179.29	30.305	1888.0	43.081	195.22	1.25641E 06
10.500000	67.479	2.8502	177.57	31.021	1932.6	42.667	191.50	1.24433E 06
10.750000	66.770	2.8233	175.89	31.730	1976.8	42.265	187.92	1.23260E 06
11.000000	66.068	2.7972	174.26	32.432	2020.5	41.874	184.47	1.22120E 06
11.250000	65.372	2.7718	172.68	33.128	2063.9	41.494	181.14	1.21011E 06
11.500000	64.682	2.7471	171.14	33.818	2106.9	41.124	177.93	1.19932E 06
11.750000	63.998	2.7230	169.64	34.502	2149.5	40.763	174.84	1.18881E 06
12.000000	63.320	2.6996	168.18	35.180	2191.7	40.413	171.85	1.17858E 06
12.250000	62.648	2.6767	166.76	35.852	2233.6	40.071	168.97	1.16860E 06
12.500000	61.982	2.6544	165.37	36.518	2275.1	39.737	166.17	1.15888E 06
12.750000	61.321	2.6327	164.02	37.179	2316.3	39.412	163.47	1.14939E 06
13.000000	60.665	2.6115	162.70	37.835	2357.1	39.094	160.86	1.14013E 06
13.250000	60.015	2.5908	161.41	38.485	2397.6	38.784	158.32	1.13109E 06

LTR 113 50

C-19

ACCOUNT GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-060277
 620 LEG PRK: VSO=50 TO 12 CWT AT 612.5PSIA; DUPL FSAR RUNS + .

H&T

VSO = 27.500

TIME	VL	F	W	VLD	VLOM	VELL	DELTA P	PENUM
11.5000	59.310	2.5706	160.15	39.130	2437.8	38.481	155.87	1.12226E 06
13.7500	58.729	2.5506	158.91	39.771	2477.7	38.185	153.48	1.11363E 06
14.0000	58.094	2.5315	157.71	40.406	2517.3	37.896	151.17	1.10519E 06
14.2500	57.464	2.5126	156.53	41.036	2556.6	37.613	148.93	1.09694E 06
14.5000	56.839	2.4941	155.38	41.662	2595.6	37.336	146.75	1.08886E 06
14.7500	56.216	2.4760	154.25	42.284	2634.3	37.065	144.64	1.08096E 06
15.0000	55.600	2.4582	153.15	42.900	2672.7	36.800	142.58	1.07322E 06
15.2500	54.987	2.4409	152.07	43.513	2710.8	36.540	140.58	1.06564E 06
15.5000	54.379	2.4239	151.01	44.121	2748.7	36.285	138.63	1.05822E 06
15.7500	53.775	2.4072	149.97	44.725	2786.4	36.036	136.74	1.05094E 06
16.0000	53.175	2.3909	148.95	45.325	2823.7	35.791	134.89	1.04381E 06
16.2500	52.580	2.3748	147.95	45.920	2860.8	35.551	133.09	1.03681E 06
16.5000	51.988	2.3591	146.97	46.512	2897.7	35.316	131.34	1.02995E 06
16.7500	51.400	2.3437	146.01	47.100	2934.3	35.085	129.63	1.02321E 06
17.0000	50.815	2.3285	145.07	47.634	2970.7	34.859	127.97	1.01660E 06
17.2500	50.236	2.3137	144.14	48.264	3006.9	34.636	126.35	1.01011E 06
17.5000	49.659	2.2991	143.23	48.841	3042.8	34.418	124.76	1.00374E 06
17.7500	49.086	2.2847	142.34	49.414	3078.5	34.203	123.21	9.97477E 05
18.0000	48.517	2.2706	141.46	49.983	3114.0	33.991	121.70	9.91314E 05
18.2500	47.951	2.2568	140.60	50.549	3149.2	33.784	120.23	9.85257E 05
18.5000	47.388	2.2431	139.75	51.112	3184.3	33.580	118.79	9.79303E 05
18.7500	46.829	2.2297	138.91	51.671	3219.1	33.379	117.38	9.73450E 05
19.0000	46.273	2.2165	138.09	52.227	3253.7	33.181	116.00	9.67694E 05
19.2500	45.721	2.2036	137.28	52.779	3288.1	32.987	114.65	9.62032E 05
19.5000	45.171	2.1908	136.49	53.329	3322.4	32.796	113.33	9.56463E 05
19.7500	44.625	2.1782	135.70	53.875	3356.4	32.608	112.05	9.50982E 05
20.0000	44.082	2.1659	134.93	54.418	3390.2	32.423	110.78	9.45587E 05
20.2500	43.542	2.1537	134.18	54.958	3423.9	32.241	109.55	9.40277E 05
20.5000	43.005	2.1417	133.43	55.495	3457.3	32.062	108.34	9.35048E 05
20.7500	42.471	2.1300	132.70	56.029	3490.6	31.886	107.15	9.29899E 05
21.0000	41.940	2.1183	131.97	56.560	3523.7	31.712	105.99	9.24828E 05
21.2500	41.412	2.1069	131.26	57.088	3556.6	31.540	104.86	9.19831E 05
21.5000	40.887	2.0956	130.56	57.613	3589.3	31.371	103.74	9.14908E 05
21.7500	40.364	2.0845	129.86	58.136	3621.9	31.205	102.65	9.10056E 05
22.0000	39.844	2.0735	129.18	58.656	3654.2	31.041	101.58	9.05273E 05
22.2500	39.327	2.0627	128.51	59.173	3686.5	30.879	100.53	9.00559E 05
22.5000	38.813	2.0521	127.85	59.687	3718.5	30.720	99.497	8.95910E 05
22.7500	38.301	2.0416	127.19	60.199	3750.4	30.563	98.486	8.91326E 05
23.0000	37.792	2.0312	126.55	60.708	3782.1	30.408	97.493	8.86805E 05
23.2500	37.285	2.0210	125.91	61.215	3813.7	30.255	96.519	8.82345E 05
23.5000	36.781	2.0109	125.28	61.719	3845.1	30.104	95.563	8.77945E 05
23.7500	36.280	2.0010	124.66	62.220	3876.3	29.955	94.624	8.73602E 05
24.0000	35.781	1.9912	124.05	62.719	3907.4	29.808	93.702	8.69317E 05
24.2500	35.284	1.9815	123.45	63.216	3938.3	29.663	92.796	8.65088E 05
24.5000	34.790	1.9719	122.85	63.710	3969.1	29.520	91.906	8.60913E 05
24.7500	34.298	1.9625	122.26	64.202	3999.8	29.379	91.032	8.56790E 05
25.0000	33.809	1.9532	121.68	64.691	4030.3	29.239	90.173	8.52720E 05
25.2500	33.322	1.9440	121.11	65.178	4060.6	29.101	89.328	8.48700E 05
25.5000	32.837	1.9349	120.54	65.663	4090.8	28.965	88.497	8.44730E 05
25.7500	32.354	1.9259	119.98	66.146	4120.9	28.831	87.681	8.40808E 05
26.0000	31.874	1.9170	119.43	66.626	4150.8	28.698	86.878	8.36933E 05
26.2500	31.395	1.9082	118.88	67.105	4180.6	28.567	86.088	8.33105E 05
26.5000	30.919	1.8996	118.34	67.584	4210.3	28.437	85.311	8.29322E 05
26.7500	30.446	1.8910	117.81	68.054	4239.8	28.309	84.547	8.25588E 05

C-20

ACCU M VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFP-06DE77
 COLA LEG SFC, VGO=50 TO 12 FEET AT 612.5PSIA; DUPL FSAP PUNS + .

HOT
 VGO = 27.500

TIME	VL	L	W	VLD	VLDH	VELL	DELTAP	PENUM
27.0000	29.974	1.8426	117.28	65.526	4269.2	28.182	83.795	8.21888E 05
27.2500	29.504	1.8742	116.76	63.996	4298.4	28.057	83.055	8.18236E 05
27.5000	29.037	1.8059	116.25	69.463	4327.6	27.933	82.326	8.14624E 05
27.7500	28.571	1.8577	115.74	69.929	4356.6	27.810	81.609	8.11054E 05
28.0000	28.104	1.8496	115.23	70.392	4385.4	27.689	80.903	8.07523E 05
28.2500	27.646	1.8417	114.73	70.854	4414.2	27.570	80.207	8.04032E 05
28.5000	27.187	1.8337	114.24	71.313	4442.8	27.451	79.522	8.00579E 05
28.7500	26.727	1.8259	113.75	71.771	4471.3	27.334	78.848	7.97159E 05
29.0000	26.274	1.8132	113.27	72.226	4499.7	27.218	78.183	7.93776E 05
29.2500	25.820	1.8105	112.79	72.690	4527.9	27.103	77.529	7.90429E 05
29.5000	25.368	1.8029	112.32	73.132	4556.1	26.990	76.884	7.87117E 05
29.7500	24.919	1.7954	111.85	73.581	4584.1	26.877	76.248	7.83841E 05
30.0000	24.471	1.7880	111.39	74.029	4612.0	26.766	75.622	7.80598E 05
30.2500	24.025	1.7806	110.93	74.475	4639.8	26.656	75.004	7.77389E 05
30.5000	23.580	1.7733	110.48	74.920	4667.5	26.547	74.396	7.74212E 05
30.7500	23.138	1.7661	110.03	75.362	4695.1	26.439	73.796	7.71068E 05
31.0000	22.697	1.7590	109.59	75.803	4722.5	26.333	73.204	7.67956E 05
31.2500	22.258	1.7520	109.15	76.242	4749.9	26.227	72.621	7.64874E 05
31.5000	21.821	1.7450	108.71	76.679	4777.1	26.122	72.045	7.61823E 05
31.7500	21.386	1.7381	108.28	77.114	4804.2	26.019	71.478	7.58802E 05
32.0000	20.952	1.7312	107.85	77.548	4831.2	25.916	70.918	7.55810E 05
32.2500	20.520	1.7244	107.43	77.980	4858.2	25.815	70.366	7.52847E 05
32.5000	20.090	1.7177	107.01	78.410	4885.0	25.714	69.821	7.49912E 05
32.7500	19.661	1.7110	106.60	78.839	4911.7	25.614	69.283	7.47005E 05
33.0000	19.234	1.7044	106.19	79.266	4938.3	25.515	68.753	7.44125E 05
33.2500	18.809	1.6979	105.78	79.691	4964.8	25.418	68.229	7.41273E 05
33.5000	18.385	1.6914	105.38	80.115	4991.2	25.321	67.712	7.38446E 05
33.7500	17.963	1.6850	104.98	80.537	5017.5	25.225	67.202	7.35646E 05
34.0000	17.543	1.6787	104.58	80.957	5043.6	25.130	66.698	7.32871E 05
34.2500	17.124	1.6724	104.19	81.376	5069.7	25.035	66.201	7.30120E 05
34.5000	16.706	1.6661	103.80	81.794	5095.7	24.942	65.710	7.27395E 05
34.7500	16.290	1.6599	103.41	82.210	5121.6	24.849	65.225	7.24694E 05
35.0000	15.876	1.6538	103.03	82.624	5147.5	24.757	64.746	7.22017E 05
35.2500	15.464	1.6477	102.65	83.036	5173.2	24.666	64.274	7.19363E 05
35.5000	15.052	1.6417	102.28	83.448	5198.8	24.576	63.806	7.16733E 05
35.7500	14.643	1.6357	101.91	83.857	5224.3	24.487	63.345	7.14125E 05
36.0000	14.234	1.6298	101.54	84.266	5249.7	24.398	62.889	7.11539E 05
36.2500	13.828	1.6239	101.17	84.672	5275.1	24.310	62.439	7.08975E 05
36.5000	13.423	1.6181	100.81	85.077	5300.3	24.223	61.994	7.06433E 05
36.7500	13.019	1.6123	100.45	85.481	5325.5	24.137	61.554	7.03912E 05
37.0000	12.616	1.6066	100.09	85.884	5350.5	24.051	61.120	7.01412E 05
37.2500	12.215	1.6009	99.737	86.285	5375.5	23.966	60.691	6.98933E 05
37.5000	11.816	1.5953	99.386	86.684	5400.4	23.882	60.266	6.96474E 05
37.7500	11.418	1.5897	99.038	87.082	5425.2	23.798	59.847	6.94035E 05
38.0000	11.021	1.5842	98.693	87.479	5449.9	23.715	59.432	6.91615E 05
38.2500	10.626	1.5787	98.351	87.874	5474.6	23.633	59.022	6.89215E 05
38.5000	10.232	1.5732	98.011	88.268	5499.1	23.551	58.617	6.86835E 05
38.7500	9.8391	1.5678	97.674	88.661	5523.6	23.470	58.216	6.84472E 05
39.0000	9.4478	1.5624	97.339	89.052	5547.9	23.390	57.820	6.82129E 05
39.2500	9.0578	1.5571	97.008	89.442	5572.2	23.310	57.428	6.79803E 05
39.5000	8.6692	1.5518	96.678	89.831	5596.5	23.231	57.041	6.77496E 05
39.7500	8.2819	1.5466	96.352	90.218	5620.6	23.152	56.657	6.75206E 05
40.0000	7.8959	1.5414	96.027	90.605	5644.6	23.074	56.278	6.72934E 05

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

C-21

ACCUM * GAS VOL: PARAMET CALC FOR LUCA FLOOD REQMTS. HEP-060E77
 C-2 LEG BRK: VGO=50 TO 12 LUFT AT 112.5PSIA: DUPL FSAE PUMS + .

ROT

VGO = 20.000

TIME	VL	Q	W	VLQ	VLDM	VELL	DELTA P	RNUM
0.0	106.00	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	106.00	6.42688E-04	4.00394E-02	2.28982E-04	1.42543E-02	9.62107E-03	1.00000E-05	269.16
0.500000	106.00	6.42688E-04	4.00394E-02	4.57764E-04	2.85137E-02	9.62107E-03	1.00000E-05	269.16
0.750000	106.00	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	106.00	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	106.00	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	106.00	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	105.63	2.3392	145.73	0.34901	21.744	35.018	129.14	1.02126E 06
2.000000	104.93	3.3320	210.70	1.0732	66.863	50.628	269.30	1.47650E 06
2.250000	104.02	3.8935	242.56	1.9843	123.62	58.286	356.51	1.69983E 06
2.500000	103.02	4.0432	251.89	2.9763	185.42	60.527	384.33	1.76520E 06
2.750000	102.00	4.1481	258.43	4.0001	249.20	62.097	404.43	1.81099E 06
3.000000	100.97	4.1108	256.11	5.0322	313.50	61.540	397.23	1.79472E 06
3.250000	99.953	4.0096	249.80	6.0470	376.73	60.023	377.99	1.75050E 06
3.500000	98.962	3.9202	244.23	7.0380	438.47	58.686	361.40	1.71149E 06
3.750000	97.992	3.8411	239.30	8.0080	493.90	57.502	347.03	1.67697E 06
4.000000	97.041	3.7710	234.94	8.9594	558.17	56.453	334.53	1.64636E 06
4.250000	96.106	3.7088	231.06	9.8942	616.41	55.521	323.63	1.61920E 06
4.500000	95.186	3.6535	227.62	10.814	673.74	54.694	314.10	1.59507E 06
4.750000	94.282	3.5751	222.73	11.718	730.03	53.519	300.80	1.56082E 06
5.000000	93.398	3.5018	218.16	12.602	785.13	52.422	288.64	1.52881E 06
5.250000	92.531	3.4330	213.88	13.469	839.13	51.393	277.46	1.49880E 06
5.500000	91.681	3.3684	209.85	14.319	892.10	50.425	267.16	1.47059E 06
5.750000	90.846	3.3075	206.06	15.154	944.08	49.513	257.61	1.44399E 06
6.000000	90.027	3.2499	202.47	15.973	995.15	48.651	248.76	1.41885E 06
6.250000	89.221	3.1954	199.07	16.779	1045.3	47.835	240.51	1.39504E 06
6.500000	88.429	3.1436	195.85	17.571	1094.7	47.060	232.80	1.37244E 06
6.750000	87.649	3.0944	192.78	18.351	1143.3	46.323	225.59	1.35095E 06
7.000000	86.881	3.0475	189.86	19.119	1191.1	45.621	218.83	1.33047E 06
7.250000	86.125	3.0027	187.07	19.875	1238.2	44.951	212.47	1.31093E 06
7.500000	85.380	2.9599	184.40	20.620	1284.7	44.310	206.48	1.29225E 06
7.750000	84.645	2.9190	181.85	21.355	1330.4	43.697	200.82	1.27437E 06
8.000000	83.920	2.8797	179.41	22.080	1375.6	43.109	195.48	1.25723E 06
8.250000	83.205	2.8420	177.06	22.795	1420.1	42.545	190.41	1.24078E 06
8.500000	82.499	2.8058	174.80	23.501	1464.1	42.003	185.60	1.22497E 06
8.750000	81.802	2.7710	172.63	24.198	1507.6	41.482	181.04	1.20976E 06
9.000000	81.113	2.7374	170.54	24.887	1550.5	40.979	176.69	1.19511E 06
9.250000	80.433	2.7051	168.53	25.567	1592.8	40.495	172.55	1.18098E 06
9.500000	79.760	2.6738	166.58	26.240	1634.7	40.028	168.60	1.16735E 06
9.750000	79.096	2.6437	164.70	26.904	1676.1	39.576	164.83	1.15418E 06
10.000000	78.438	2.6145	162.88	27.562	1717.1	39.139	161.23	1.14145E 06
10.250000	77.788	2.5863	161.13	28.212	1757.6	38.717	157.78	1.12913E 06
10.500000	77.145	2.5590	159.42	28.855	1797.7	38.308	154.47	1.11720E 06
10.750000	76.509	2.5325	157.77	29.491	1837.3	37.911	151.30	1.10564E 06
11.000000	75.879	2.5068	156.17	30.121	1876.6	37.527	148.25	1.09442E 06
11.250000	75.255	2.4819	154.62	30.745	1915.4	37.154	145.32	1.08354E 06
11.500000	74.638	2.4576	153.11	31.362	1953.9	36.791	142.51	1.07296E 06
11.750000	74.026	2.4341	151.65	31.974	1992.0	36.439	139.80	1.06269E 06
12.000000	73.420	2.4112	150.22	32.580	2029.7	36.096	137.19	1.05270E 06
12.250000	72.820	2.3890	148.83	33.180	2067.1	35.763	134.68	1.04298E 06
12.500000	72.226	2.3673	147.48	33.774	2104.1	35.438	132.25	1.03352E 06
12.750000	71.637	2.3462	146.17	34.363	2140.8	35.122	129.91	1.02430E 06
13.000000	71.053	2.3256	144.88	34.947	2177.2	34.814	127.65	1.01521E 06
13.250000	70.474	2.3055	143.63	35.526	2213.3	34.514	125.46	1.00655E 06

C-2 2

ACCUM M VOL: PARAMET CALCS FOR LOCA FLOOD REQMS. HFR-06DE77
 LEG BKK; VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSAR RUNS + .

HFR
 VGO = 20.000

TIME	VL			VLD	VLDM	VELL	DELTA P	PERNUM
13.5000	69.930	2.2359	142.41	36.100	2249.0	34.221	123.34	9.98003F 05
13.7500	69.331	2.2663	141.22	36.669	2284.5	33.934	121.30	9.89644F 05
14.0000	68.766	2.2481	140.06	37.234	2319.7	33.654	119.31	9.81482E 05
14.2500	68.207	2.2298	138.92	37.793	2354.5	33.381	117.39	9.73509F 05
14.5000	67.651	2.2120	137.81	38.349	2389.1	33.114	115.53	9.65718F 05
14.7500	67.100	2.1945	136.72	38.900	2423.4	32.853	113.72	9.58100E 05
15.0000	66.554	2.1775	135.66	39.446	2457.5	32.597	111.97	9.50651E 05
15.2500	66.012	2.1608	134.62	39.983	2491.3	32.347	110.26	9.43362E 05
15.5000	65.473	2.1445	133.60	40.521	2524.8	32.103	108.61	9.36229F 05
15.7500	64.934	2.1285	132.60	41.061	2558.1	31.863	107.00	9.29244E 05
16.0000	64.409	2.1128	131.63	41.591	2591.1	31.628	105.44	9.22403E 05
16.2500	63.893	2.0974	130.67	42.117	2623.9	31.399	103.92	9.15701E 05
16.5000	63.360	2.0824	129.73	42.640	2656.5	31.173	102.44	9.09132E 05
16.7500	62.842	2.0676	128.81	43.153	2688.8	30.953	101.00	9.02691F 05
17.0000	62.324	2.0532	127.91	43.674	2720.9	30.736	99.600	8.96375E 05
17.2500	61.815	2.0390	127.03	44.185	2752.7	30.524	98.233	8.90180E 05
17.5000	61.307	2.0250	126.16	44.693	2784.4	30.315	96.902	8.84100E 05
17.7500	60.802	2.0114	125.31	45.198	2815.8	30.110	95.604	8.78132F 05
18.0000	60.301	1.9980	124.47	45.699	2847.0	29.910	94.337	8.72273E 05
18.2500	59.805	1.9848	123.65	46.197	2878.1	29.712	93.102	8.66518E 05
18.5000	59.309	1.9718	122.85	46.691	2908.9	29.518	91.896	8.60866F 05
18.7500	58.817	1.9591	122.05	47.183	2939.5	29.328	90.719	8.55312F 05
19.0000	58.329	1.9466	121.27	47.671	2969.9	29.141	89.570	8.49853E 05
19.2500	57.844	1.9343	120.51	48.156	3000.1	28.957	88.447	8.44487E 05
19.5000	57.362	1.9222	119.75	48.638	3030.2	28.776	87.349	8.39210F 05
19.7500	56.883	1.9103	119.01	49.117	3060.0	28.598	86.277	8.34021E 05
20.0000	56.406	1.8986	118.29	49.594	3089.7	28.423	85.228	8.28916E 05
20.2500	55.933	1.8871	117.57	50.067	3119.2	28.251	84.202	8.23892E 05
20.5000	55.463	1.8758	116.86	50.537	3148.5	28.081	83.199	8.18949E 05
20.7500	54.995	1.8647	116.17	51.005	3177.6	27.914	82.217	8.14083E 05
21.0000	54.530	1.8537	115.49	51.470	3206.6	27.750	81.256	8.09292E 05
21.2500	54.068	1.8429	114.81	51.932	3235.3	27.588	80.315	8.04574E 05
21.5000	53.609	1.8322	114.15	52.391	3264.0	27.429	79.393	7.99926E 05
21.7500	53.152	1.8217	113.49	52.848	3292.4	27.272	78.491	7.95343E 05
22.0000	52.698	1.8114	112.85	53.302	3320.7	27.117	77.606	7.90826E 05
22.2500	52.246	1.8012	112.22	53.754	3348.9	26.964	76.740	7.86376E 05
22.5000	51.797	1.7912	111.59	54.203	3376.8	26.814	75.890	7.81989E 05
22.7500	51.351	1.7813	110.97	54.649	3404.7	26.666	75.058	7.77665E 05
23.0000	50.906	1.7715	110.36	55.094	3432.3	26.519	74.241	7.73402E 05
23.2500	50.465	1.7619	109.76	55.535	3459.8	26.375	73.440	7.69198E 05
23.5000	50.025	1.7524	109.17	55.975	3487.2	26.233	72.654	7.65051E 05
23.7500	49.589	1.7430	108.59	56.411	3514.4	26.093	71.883	7.60961E 05
24.0000	49.154	1.7338	108.01	56.846	3541.5	25.954	71.126	7.56925E 05
24.2500	48.722	1.7246	107.44	57.278	3568.4	25.818	70.384	7.52943E 05
24.5000	48.291	1.7156	106.88	57.709	3595.2	25.683	69.654	7.49013E 05
24.7500	47.864	1.7067	106.33	58.136	3621.9	25.550	68.938	7.45134E 05
25.0000	47.438	1.6980	105.78	58.562	3648.4	25.419	68.235	7.41305E 05
25.2500	47.015	1.6893	105.24	58.985	3674.8	25.289	67.544	7.37524E 05
25.5000	46.593	1.6808	104.71	59.407	3701.0	25.161	66.865	7.33791E 05
25.7500	46.174	1.6723	104.19	59.826	3727.2	25.035	66.198	7.30104E 05
26.0000	45.757	1.6640	103.67	60.243	3753.1	24.910	65.542	7.26462E 05
26.2500	45.342	1.6557	103.15	60.658	3779.0	24.786	64.898	7.22865E 05
26.5000	44.929	1.6476	102.65	61.071	3804.7	24.665	64.264	7.19310E 05
26.7500	44.518	1.6396	102.14	61.482	3830.3	24.544	63.641	7.15800E 05

ACCUM W GAS VOL: PARAMET CALC FOR LOCA FLOOD REQTS. HFR-060E77

LEG 04K: VGO=50 TO 12 CUFT AT 612.5PSIA: DUPL FSAR RUNS + .

NOT

VGO = 20.000

TIME	VL	C	W	VLD	VLDN	VELL	DELTAP	PENUM
27.0000	44.109	1.6316	101.65	61.891	3855.8	24.425	63.029	7.12330E 05
27.2500	43.707	1.6237	101.16	62.298	3881.1	24.308	62.426	7.08900F 05
27.5000	43.247	1.6160	100.68	62.703	3906.4	24.191	61.833	7.05510E 05
27.7500	42.894	1.6083	100.20	63.106	3931.5	24.076	61.250	7.02159E 05
28.0000	42.493	1.6007	99.725	63.507	3956.5	23.963	60.676	6.98846E 05
28.2500	42.094	1.5932	99.257	63.906	3981.4	23.851	60.111	6.95570E 05
28.5000	41.696	1.5858	98.795	64.304	4006.1	23.739	59.554	6.92330E 05
28.7500	41.301	1.5785	98.338	64.699	4030.8	23.630	59.007	6.89127E 05
29.0000	40.907	1.5712	97.386	65.093	4055.3	23.521	58.468	6.85957E 05
29.2500	40.515	1.5640	97.438	65.485	4079.7	23.413	57.937	6.82823E 05
29.5000	40.125	1.5569	96.996	65.875	4104.0	23.307	57.414	6.79722E 05
29.7500	39.737	1.5499	96.558	66.263	4128.2	23.202	56.899	6.76653E 05
30.0000	39.350	1.5429	96.125	66.650	4152.3	23.098	56.392	6.73617E 05
30.2500	38.965	1.5361	95.696	67.035	4176.3	22.995	55.892	6.70613E 05
30.5000	38.582	1.5292	95.272	67.418	4200.1	22.893	55.400	6.67639E 05
30.7500	38.200	1.5225	94.852	67.800	4223.9	22.792	54.915	6.64696E 05
31.0000	37.821	1.5158	94.436	68.179	4247.6	22.692	54.436	6.61783E 05
31.2500	37.442	1.5092	94.024	68.558	4271.1	22.593	53.965	6.58899E 05
31.5000	37.064	1.5027	93.617	68.934	4294.6	22.495	53.500	6.56044E 05
31.7500	36.691	1.4962	93.214	69.309	4317.9	22.398	53.042	6.53216E 05
32.0000	36.318	1.4898	92.814	69.682	4341.2	22.302	52.590	6.50417E 05
32.2500	35.944	1.4834	92.418	70.054	4364.4	22.207	52.145	6.47645E 05
32.5000	35.576	1.4772	92.027	70.424	4387.4	22.113	51.705	6.44899E 05
32.7500	35.207	1.4709	91.639	70.793	4410.4	22.020	51.272	6.42179E 05
33.0000	34.840	1.4648	91.254	71.160	4433.2	21.927	50.844	6.39485E 05
33.2500	34.475	1.4586	90.873	71.525	4456.0	21.836	50.423	6.36816E 05
33.5000	34.111	1.4526	90.496	71.889	4478.7	21.745	50.007	6.34172E 05
33.7500	33.749	1.4466	90.122	72.251	4501.3	21.655	49.596	6.31552E 05
34.0000	33.388	1.4406	89.752	72.612	4523.7	21.566	49.191	6.28957E 05
34.2500	33.028	1.4347	89.385	72.972	4546.1	21.478	48.791	6.26385E 05
34.5000	32.670	1.4289	89.021	73.330	4568.4	21.391	48.396	6.23835E 05
34.7500	32.314	1.4231	88.660	73.686	4590.7	21.304	48.006	6.21309E 05
35.0000	31.959	1.4174	88.303	74.041	4612.8	21.218	47.622	6.18805E 05
35.2500	31.605	1.4117	87.949	74.395	4634.8	21.133	47.242	6.16322E 05
35.5000	31.253	1.4061	87.598	74.747	4656.8	21.049	46.867	6.13862E 05
35.7500	30.902	1.4005	87.250	75.098	4678.6	20.965	46.497	6.11423E 05
36.0000	30.552	1.3949	86.904	75.448	4700.4	20.882	46.131	6.09004E 05
36.2500	30.204	1.3894	86.562	75.796	4722.1	20.800	45.770	6.06606E 05
36.5000	29.858	1.3840	86.223	76.142	4743.7	20.719	45.413	6.04228E 05
36.7500	29.512	1.3786	85.887	76.488	4765.2	20.638	45.061	6.01870E 05
37.0000	29.168	1.3732	85.553	76.832	4786.6	20.557	44.713	5.99531E 05
37.2500	28.825	1.3679	85.221	77.175	4808.0	20.478	44.369	5.97207E 05
37.5000	28.484	1.3626	84.892	77.516	4829.2	20.399	44.029	5.94903E 05
37.7500	28.144	1.3574	84.566	77.856	4850.4	20.320	43.693	5.92617E 05
38.0000	27.805	1.3522	84.243	78.195	4871.5	20.243	43.361	5.90350E 05
38.2500	27.468	1.3471	83.922	78.532	4892.5	20.166	43.034	5.88100E 05
38.5000	27.132	1.3419	83.603	78.868	4913.5	20.089	42.709	5.85869E 05
38.7500	26.797	1.3369	83.287	79.203	4934.4	20.013	42.389	5.83655E 05
39.0000	26.463	1.3318	82.974	79.537	4955.1	19.938	42.072	5.81459E 05
39.2500	26.131	1.3269	82.663	79.869	4975.8	19.863	41.759	5.79280E 05
39.5000	25.800	1.3219	82.354	30.200	4996.5	19.789	41.450	5.77117E 05
39.7500	25.470	1.3170	82.048	30.590	5017.0	19.715	41.144	5.74971E 05
40.0000	25.141	1.3121	81.744	30.982	5037.2	19.642	40.841	5.72841E 05

*** SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

C-24

ACCOUNT VOL: PARAMET CALCS FOR LOCA FLOOD REQMS. HEP-060E77
 2019 LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FSAP RUNS + .

HOT

VGO = 16.000

TIME	VL	Q	W	VLD	VLDM	VELL	DELTA P	PENUM
0.0	110.00	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	110.00	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	110.00	6.42688E-04	4.00394E-02	4.57764E-04	2.85157E-02	9.62107E-03	1.00000E-05	269.16
0.750000	110.00	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	110.00	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	110.00	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	110.00	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	109.65	2.2093	143.87	0.34603	21.561	34.570	125.86	1.00818E 06
2.000000	108.94	3.3235	207.05	1.0591	65.983	49.752	260.10	1.45096E 06
2.250000	108.05	3.8100	237.36	1.9523	121.63	57.036	341.46	1.66339E 06
2.500000	107.08	3.9369	245.27	2.9204	181.94	58.935	364.46	1.71876E 06
2.750000	106.08	4.0250	250.76	3.9153	243.92	60.255	380.89	1.75725E 06
3.000000	105.09	3.9721	247.46	4.9146	306.18	59.463	370.99	1.73415E 06
3.250000	104.11	3.8568	240.28	5.8929	367.13	57.737	349.86	1.68382E 06
3.500000	103.16	3.7566	234.04	6.8443	426.40	56.237	331.99	1.64008E 06
3.750000	102.23	3.6692	228.59	7.7723	484.22	54.929	316.79	1.60192E 06
4.000000	101.32	3.5928	223.83	8.6799	540.76	53.784	303.77	1.56854E 06
4.250000	100.43	3.5258	219.65	9.5695	596.18	52.781	292.59	1.53928E 06
4.500000	99.557	3.4670	215.99	10.443	650.63	51.901	282.96	1.51362E 06
4.750000	98.700	3.3845	210.85	11.300	703.98	50.666	269.70	1.47760E 06
5.000000	97.864	3.3079	206.08	12.136	756.09	49.519	257.68	1.44416E 06
5.250000	97.046	3.2365	201.64	12.954	807.05	48.451	246.72	1.41301E 06
5.500000	96.245	3.1698	197.48	13.755	856.94	47.452	236.69	1.38388E 06
5.750000	95.460	3.1072	193.58	14.540	905.81	46.515	227.46	1.35655E 06
6.000000	94.691	3.0483	189.91	15.309	953.75	45.634	218.95	1.33085E 06
6.250000	93.936	2.9928	186.45	16.064	1000.8	44.802	211.08	1.30660E 06
6.500000	93.194	2.9403	183.18	16.806	1047.0	44.016	203.76	1.28368E 06
6.750000	92.465	2.8905	180.08	17.535	1092.4	43.271	196.94	1.26196E 06
7.000000	91.749	2.8433	177.14	18.251	1137.1	42.564	190.58	1.24133E 06
7.250000	91.044	2.7983	174.34	18.956	1181.0	41.891	184.62	1.22170E 06
7.500000	90.349	2.7555	171.67	19.651	1224.2	41.250	179.02	1.20299E 06
7.750000	89.666	2.7146	169.12	20.334	1266.8	40.637	173.76	1.18513E 06
8.000000	88.992	2.6755	166.68	21.008	1308.8	40.052	168.81	1.16805E 06
8.250000	88.328	2.6380	164.35	21.672	1350.2	39.491	164.13	1.15170E 06
8.500000	87.673	2.6021	162.11	22.327	1391.0	38.953	159.70	1.13602E 06
8.750000	87.026	2.5676	159.96	22.974	1431.3	38.437	155.51	1.12096E 06
9.000000	86.389	2.5344	157.89	23.611	1471.0	37.940	151.53	1.10649E 06
9.250000	85.759	2.5025	155.91	24.241	1510.2	37.463	147.75	1.09255E 06
9.500000	85.137	2.4718	153.99	24.863	1548.9	37.003	144.15	1.07913E 06
9.750000	84.523	2.4421	152.14	25.477	1587.2	36.559	140.72	1.06619E 06
10.000000	83.916	2.4135	150.36	26.084	1625.0	36.130	137.45	1.05369E 06
10.250000	83.316	2.3858	148.64	26.684	1662.4	35.716	134.33	1.04161E 06
10.500000	82.723	2.3591	146.97	27.277	1699.4	35.316	131.34	1.02993E 06
10.750000	82.137	2.3332	145.36	27.863	1735.9	34.928	128.48	1.01863E 06
11.000000	81.556	2.3081	143.79	28.444	1772.0	34.552	125.74	1.00767E 06
11.250000	80.982	2.2838	142.28	29.018	1807.8	34.188	123.11	9.97050E 05
11.500000	80.414	2.2601	140.81	29.586	1843.2	33.834	120.58	9.86727E 05
11.750000	79.852	2.2372	139.38	30.148	1878.2	33.490	118.16	9.76706E 05
12.000000	79.296	2.2149	137.99	30.704	1912.9	33.157	115.83	9.66971E 05
12.250000	78.745	2.1932	136.64	31.255	1947.2	32.832	113.58	9.57508E 05
12.500000	78.199	2.1721	135.32	31.801	1981.2	32.517	111.42	9.48304E 05
12.750000	77.658	2.1516	134.04	32.342	2014.9	32.209	109.33	9.39346E 05
13.000000	77.123	2.1316	132.80	32.877	2048.2	31.910	107.32	9.30625E 05
13.250000	76.592	2.1122	131.59	33.408	2081.3	31.619	105.38	9.22127E 05

ACCUM M GAS VOL: PARABOL CALCS FOR LOCA FLOOD REQTS. HFR-060E77

LEG 3RK: VGO=50 TO 12 CUFT AT 612.5PSI: DUPL FCAP RUNS + .

HOT

VGO = 16.000

TIME	VL			VLO	VLOW	VELL	DELTAP	PERNUM
13.5000	76.067	2.0932	130.40	33.933	2114.0	31.335	103.50	9.13844E 05
13.7500	75.546	2.0747	129.25	34.454	2146.5	31.058	101.69	9.05765E 05
14.0000	75.029	2.0566	128.13	34.971	2178.7	30.788	99.933	8.97882E 05
14.2500	74.517	2.0390	127.03	35.493	2210.6	30.574	98.235	8.90186E 05
14.5000	74.010	2.0214	125.96	35.990	2242.2	30.266	96.590	8.82671E 05
14.7500	73.506	2.0050	124.91	36.494	2273.6	30.014	94.997	8.75328E 05
15.0000	73.007	1.9885	123.88	36.993	2304.7	29.768	93.451	8.68149E 05
15.2500	72.512	1.9724	122.88	37.488	2335.5	29.527	91.953	8.61130E 05
15.5000	72.021	1.9567	121.90	37.979	2366.1	29.292	90.498	8.54263E 05
15.7500	71.534	1.9413	120.94	38.466	2396.5	29.062	89.086	8.47543E 05
16.0000	71.050	1.9262	120.01	38.950	2426.6	28.836	87.714	8.40965E 05
16.2500	70.570	1.9115	119.09	39.430	2456.5	28.615	86.380	8.34521E 05
16.5000	70.094	1.8970	118.18	39.906	2486.1	28.399	85.083	8.28209E 05
16.7500	69.622	1.8829	117.30	40.378	2515.6	28.187	83.827	8.22024E 05
17.0000	69.153	1.8690	116.44	40.847	2544.8	27.979	82.595	8.15959E 05
17.2500	68.687	1.8553	115.59	41.313	2573.8	27.775	81.400	8.10012E 05
17.5000	68.225	1.8420	114.76	41.775	2602.6	27.575	80.236	8.04179E 05
17.7500	67.766	1.8289	113.94	42.234	2631.2	27.378	79.103	7.98453E 05
18.0000	67.310	1.8160	113.14	42.690	2659.6	27.185	77.998	7.92828E 05
18.2500	66.858	1.8033	112.35	43.142	2687.7	26.996	76.920	7.87305E 05
18.5000	66.409	1.7909	111.57	43.591	2715.7	26.810	75.870	7.81882E 05
18.7500	65.962	1.7787	110.81	44.038	2743.5	26.627	74.844	7.76554E 05
19.0000	65.519	1.7667	110.07	44.481	2771.2	26.448	73.844	7.71320E 05
19.2500	65.079	1.7549	109.33	44.921	2798.6	26.272	72.867	7.66176E 05
19.5000	64.642	1.7434	108.61	45.358	2825.8	26.098	71.913	7.61119E 05
19.7500	64.207	1.7320	107.90	45.793	2852.9	25.928	70.981	7.56147E 05
20.0000	63.776	1.7208	107.20	46.224	2879.8	25.760	70.070	7.51257E 05
20.2500	63.347	1.7098	106.52	46.653	2906.5	25.595	69.180	7.46446E 05
20.5000	62.921	1.6987	105.84	47.079	2933.0	25.433	68.310	7.41713E 05
20.7500	62.497	1.6882	105.18	47.503	2959.4	25.273	67.458	7.37055E 05
21.0000	62.076	1.6777	104.52	47.924	2985.6	25.116	66.626	7.32469E 05
21.2500	61.658	1.6674	103.88	48.342	3011.7	24.961	65.811	7.27954E 05
21.5000	61.243	1.6572	103.24	48.757	3037.6	24.809	65.013	7.23508E 05
21.7500	60.830	1.6472	102.62	49.170	3063.3	24.658	64.232	7.19129E 05
22.0000	60.419	1.6373	102.00	49.581	3088.9	24.510	63.467	7.14816E 05
22.2500	60.011	1.6276	101.40	49.989	3114.3	24.365	62.718	7.10565E 05
22.5000	59.605	1.6180	100.80	50.395	3139.6	24.221	61.984	7.06376E 05
22.7500	59.202	1.6085	100.21	50.798	3164.7	24.080	61.265	7.02247E 05
23.0000	58.801	1.5992	99.629	51.199	3189.7	23.940	60.560	6.98177E 05
23.2500	58.402	1.5900	99.057	51.598	3214.5	23.802	59.869	6.94163E 05
23.5000	58.006	1.5809	98.492	51.994	3239.2	23.667	59.191	6.90205E 05
23.7500	57.612	1.5720	97.935	52.388	3263.8	23.533	58.526	6.86301E 05
24.0000	57.220	1.5632	97.385	52.780	3288.2	23.401	57.874	6.82449E 05
24.2500	56.830	1.5545	96.843	53.170	3312.5	23.270	57.234	6.78649E 05
24.5000	56.442	1.5459	96.308	53.558	3336.6	23.142	56.606	6.74899E 05
24.7500	56.057	1.5374	95.780	53.943	3360.7	23.015	55.990	6.71198E 05
25.0000	55.674	1.5290	95.258	54.326	3384.5	22.890	55.384	6.67545E 05
25.2500	55.292	1.5208	94.744	54.708	3408.3	22.766	54.790	6.63928E 05
25.5000	54.913	1.5126	94.235	55.087	3431.9	22.644	54.206	6.60376E 05
25.7500	54.536	1.5045	93.733	55.464	3455.4	22.523	53.633	6.56860E 05
26.0000	54.161	1.4966	93.238	55.839	3478.8	22.404	53.069	6.53386E 05
26.2500	53.788	1.4887	92.748	56.212	3502.0	22.286	52.516	6.49955E 05
26.5000	53.416	1.4810	92.264	56.584	3525.2	22.170	51.972	6.46565E 05
26.7500	53.047	1.4733	91.786	56.953	3548.2	22.055	51.437	6.43215E 05

ACCOUNT VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. WFF-J06DE77

LEG BPK: VGO=50 TO 12 INCH AT 612.5PSIA; DUPL PSAP PUNS + .

Hot

VGO = 16.000

TIME	VL	Q	W	VLD	VLDV	VELL	DELTAP	PENUM
27.0000	52.680	1.4657	91.314	57.320	2571.1	21.942	50.911	6.39906E 05
27.2500	52.314	1.4582	90.347	57.686	3593.8	21.830	50.394	6.36635E 05
27.5000	51.950	1.4509	90.386	58.050	3616.5	21.719	49.886	6.33402E 05
27.7500	51.529	1.4435	89.930	58.411	3639.0	21.609	49.386	6.30206E 05
28.0000	51.229	1.4363	89.479	58.771	3661.5	21.501	48.894	6.27046E 05
28.2500	50.870	1.4291	89.033	59.130	3683.8	21.394	48.410	6.23922E 05
28.5000	50.514	1.4220	88.592	59.486	3706.0	21.288	47.933	6.20832E 05
28.7500	50.159	1.4150	88.156	59.841	3728.1	21.183	47.464	6.17777E 05
29.0000	49.806	1.4081	87.725	60.194	3750.1	21.079	47.003	6.14755E 05
29.2500	49.455	1.4013	87.298	60.545	3771.9	20.977	46.549	6.11765E 05
29.5000	49.106	1.3945	86.876	60.894	3793.7	20.876	46.101	6.08808E 05
29.7500	48.758	1.3878	86.459	61.242	3815.4	20.775	45.661	6.05881E 05
30.0000	48.412	1.3812	86.046	61.588	3837.0	20.676	45.227	6.02986E 05
30.2500	48.067	1.3746	85.637	61.933	3858.4	20.578	44.800	6.00120E 05
30.5000	47.724	1.3681	85.231	62.276	3879.8	20.480	44.379	5.97279E 05
30.7500	47.383	1.3616	84.830	62.617	3901.0	20.384	43.965	5.94466E 05
31.0000	47.043	1.3553	84.433	62.957	3922.2	20.288	43.556	5.91682E 05
31.2500	46.705	1.3489	84.039	63.295	3943.3	20.194	43.154	5.88926E 05
31.5000	46.369	1.3427	83.650	63.631	3964.2	20.100	42.757	5.86197E 05
31.7500	46.034	1.3365	83.265	63.966	3985.1	20.008	42.366	5.83496E 05
32.0000	45.701	1.3304	82.883	64.299	4005.9	19.916	41.981	5.80820E 05
32.2500	45.369	1.3243	82.505	64.631	4026.5	19.825	41.601	5.78171E 05
32.5000	45.038	1.3183	82.130	64.962	4047.1	19.735	41.226	5.75547E 05
32.7500	44.709	1.3123	81.759	65.291	4067.6	19.646	40.856	5.72948E 05
33.0000	44.382	1.3065	81.392	65.618	4088.0	19.558	40.492	5.70373E 05
33.2500	44.056	1.3006	81.028	65.944	4108.3	19.470	40.133	5.67822E 05
33.5000	43.732	1.2948	80.667	66.268	4128.5	19.384	39.778	5.65295E 05
33.7500	43.409	1.2891	80.310	66.591	4148.6	19.298	39.429	5.62791E 05
34.0000	43.087	1.2834	79.956	66.913	4168.7	19.213	39.084	5.60310E 05
34.2500	42.767	1.2778	79.605	67.233	4188.6	19.128	38.743	5.57852E 05
34.5000	42.448	1.2722	79.257	67.552	4208.5	19.045	38.407	5.55415E 05
34.7500	42.131	1.2667	78.913	67.869	4228.3	18.962	38.076	5.53000E 05
35.0000	41.815	1.2612	78.571	68.185	4247.9	18.880	37.749	5.50606E 05
35.2500	41.500	1.2557	78.233	68.500	4267.5	18.798	37.426	5.48233E 05
35.5000	41.187	1.2504	77.897	68.813	4287.1	18.718	37.107	5.45881E 05
35.7500	40.875	1.2450	77.564	69.125	4306.5	18.638	36.792	5.43548E 05
36.0000	40.564	1.2397	77.234	69.436	4325.8	18.559	36.481	5.41236E 05
36.2500	40.255	1.2345	76.907	69.745	4345.1	18.480	36.174	5.38943E 05
36.5000	39.947	1.2293	76.582	70.053	4364.3	18.402	35.871	5.36669E 05
36.7500	39.640	1.2241	76.261	70.360	4383.4	18.325	35.572	5.34414E 05
37.0000	39.335	1.2190	75.941	70.665	4402.4	18.248	35.277	5.32178E 05
37.2500	39.031	1.2139	75.625	70.969	4421.4	18.172	34.985	5.29960E 05
37.5000	38.728	1.2088	75.311	71.272	4440.3	18.096	34.696	5.27760E 05
37.7500	38.426	1.2038	75.000	71.574	4459.0	18.022	34.411	5.25577E 05
38.0000	38.126	1.1989	74.691	71.874	4477.8	17.947	34.130	5.23412E 05
38.2500	37.827	1.1940	74.384	72.173	4496.4	17.874	33.852	5.21264E 05
38.5000	37.529	1.1891	74.080	72.471	4515.0	17.801	33.577	5.19133E 05
38.7500	37.232	1.1842	73.778	72.768	4533.4	17.728	33.305	5.17019E 05
39.0000	36.937	1.1794	73.479	73.063	4551.8	17.656	33.037	5.14921E 05
39.2500	36.642	1.1747	73.182	73.358	4570.2	17.585	32.772	5.12839E 05
39.5000	36.349	1.1699	72.887	73.651	4588.4	17.514	32.509	5.10772E 05
39.7500	36.057	1.1652	72.594	73.943	4606.6	17.444	32.250	5.08722E 05
40.0000	35.767	1.1606	72.306	74.233	4624.7	17.374	31.994	5.06687E 05

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION TIME 40.000

C-27

ACCUM * GAS VOL: PARAMET CALCS FOR LOCA FLOOD REQMTS. HFR-060E77

LEG BRK: VGO=50 TO 12 CUFT AT 612.5PSIA; DUPL FRAP PUMS + .

HOT

VGO = 12.000

TIME	VL	H	W	VLO	VLOM	VFLI	DELTAP	PENIUM
0.0	114.00	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	114.00	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	114.00	6.42688E-04	4.00394E-02	4.57764E-04	2.85137E-02	9.62107E-03	1.00000E-05	269.16
0.750000	114.00	6.42688E-04	4.00394E-02	6.86646E-04	4.27730E-02	9.62107E-03	1.00000E-05	269.16
1.000000	114.00	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	114.00	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	114.00	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	113.66	2.2597	140.78	0.34074	21.228	33.928	120.54	9.86536E 05
2.000000	112.96	3.2304	201.25	1.0356	64.521	48.359	245.78	1.41032E 06
2.250000	112.10	3.6811	229.33	1.9007	118.41	55.106	318.83	1.60709E 06
2.500000	111.17	3.7766	235.26	2.8323	176.45	56.535	335.51	1.64878E 06
2.750000	110.22	3.8438	239.47	3.7843	235.76	57.541	347.50	1.67811E 06
3.000000	109.26	3.7716	234.97	4.7357	295.03	56.462	334.64	1.64662E 06
3.250000	108.34	3.6394	226.74	5.6617	352.72	54.483	311.68	1.58891E 06
3.500000	107.44	3.5270	219.73	6.5571	408.51	52.799	292.80	1.53983E 06
3.750000	106.57	3.4308	213.74	7.4266	462.67	51.360	277.11	1.49784E 06
4.000000	105.73	3.3483	208.60	8.2737	515.45	50.124	263.98	1.46179E 06
4.250000	104.90	3.2772	204.17	9.1017	567.03	49.059	252.93	1.43075E 06
4.500000	104.09	3.2159	200.35	9.9132	617.59	48.143	243.60	1.40402E 06
4.750000	103.29	3.1293	194.99	10.706	667.00	46.853	230.77	1.36642E 06
5.000000	102.52	3.0505	190.05	11.479	715.12	45.667	219.27	1.33181E 06
5.250000	101.77	2.9772	185.48	12.232	762.06	44.569	208.89	1.29980E 06
5.500000	101.03	2.9091	181.24	12.968	807.89	43.550	199.48	1.27007E 06
5.750000	100.31	2.8456	177.28	13.687	852.71	42.599	190.89	1.24235E 06
6.000000	99.609	2.7862	173.58	14.391	896.56	41.710	183.03	1.21641E 06
6.250000	98.919	2.7305	170.11	15.081	939.52	40.875	175.80	1.19207E 06
6.500000	98.243	2.6780	166.84	15.757	981.63	40.089	169.12	1.16915E 06
6.750000	97.580	2.6284	163.75	16.420	1023.0	39.348	162.94	1.14753E 06
7.000000	96.929	2.5816	160.83	17.071	1063.5	38.646	157.20	1.12707E 06
7.250000	96.289	2.5371	158.06	17.711	1103.4	37.981	151.85	1.10767E 06
7.500000	95.660	2.4949	155.43	18.340	1142.6	37.349	146.85	1.08924E 06
7.750000	95.041	2.4547	152.93	18.959	1181.1	36.748	142.17	1.07169E 06
8.000000	94.433	2.4164	150.54	19.567	1219.1	36.174	137.78	1.05496E 06
8.250000	93.833	2.3798	148.26	20.167	1256.4	35.626	133.65	1.03898E 06
8.500000	93.242	2.3448	146.08	20.758	1293.2	35.102	129.76	1.02369E 06
8.750000	92.660	2.3112	143.99	21.340	1329.5	34.599	126.08	1.00905E 06
9.000000	92.087	2.2790	141.98	21.913	1365.2	34.117	122.60	9.94985E 05
9.250000	91.521	2.2480	140.05	22.479	1400.5	33.653	119.31	9.81457E 05
9.500000	90.962	2.2183	138.20	23.038	1435.2	33.207	116.18	9.68449E 05
9.750000	90.411	2.1896	136.41	23.589	1469.6	32.778	113.21	9.55924E 05
10.000000	89.867	2.1619	134.69	24.133	1503.5	32.364	110.38	9.43853E 05
10.250000	89.330	2.1352	133.03	24.670	1536.9	31.965	107.68	9.32207E 05
10.500000	88.800	2.1095	131.42	25.200	1570.0	31.579	105.11	9.20960E 05
10.750000	88.275	2.0846	129.87	25.725	1602.6	31.206	102.66	9.10088E 05
11.000000	87.757	2.0605	128.37	26.243	1634.9	30.846	100.31	8.99571E 05
11.250000	87.245	2.0372	126.91	26.755	1666.8	30.496	98.059	8.89386E 05
11.500000	86.739	2.0146	125.51	27.261	1698.4	30.158	95.904	8.79517E 05
11.750000	86.238	1.9926	124.14	27.762	1729.6	29.830	93.837	8.69946E 05
12.000000	85.742	1.9714	122.82	28.258	1760.5	29.511	91.852	8.60658E 05
12.250000	85.252	1.9507	121.53	28.748	1791.0	29.202	89.945	8.51637E 05
12.500000	84.767	1.9306	120.28	29.233	1821.2	28.901	88.110	8.42871E 05
12.750000	84.286	1.9111	119.06	29.714	1851.2	28.609	86.344	8.34346E 05
13.000000	83.811	1.8921	117.88	30.189	1880.3	28.325	84.642	8.26052E 05
13.250000	83.340	1.8736	116.72	30.660	1910.1	28.048	83.002	8.17976E 05

ACCUM M VOL: PARAMET CALC FOR LPGA FLOOD REQMTS. HFF-06DE77
 LEG BRK; V30=50 TO 12 CUFF AT 612.5PSIA; DUPL F5AD RUNS + .

V50 = 12.000

TIME	VL			VLD	VLDM	VELL	DELTAP	PERNUM
13.5000	82.874	1.8558	115.60	31.120	1939.1	27.778	81.420	8.10110E 05
13.7500	82.412	1.8380	114.51	31.598	1967.9	27.515	79.892	8.02443E 05
14.0000	81.955	1.8209	113.44	32.045	1996.4	27.259	78.415	7.94959E 05
14.2500	81.502	1.8041	112.40	32.498	2024.6	27.008	76.988	7.87655E 05
14.5000	81.053	1.7878	111.38	32.947	2052.6	26.764	75.608	7.80526E 05
14.7500	80.608	1.7719	110.39	33.392	2080.3	26.525	74.272	7.73564E 05
15.0000	80.167	1.7563	109.42	33.833	2107.8	26.292	72.978	7.66762E 05
15.2500	79.730	1.7411	108.47	34.270	2135.0	26.064	71.724	7.60114E 05
15.5000	79.296	1.7262	107.54	34.704	2162.0	25.841	70.509	7.53614E 05
15.7500	78.866	1.7116	106.63	35.134	2188.8	25.623	69.329	7.47255E 05
16.0000	78.440	1.6973	105.74	35.560	2215.4	25.409	68.185	7.41032E 05
16.2500	78.018	1.6834	104.88	35.982	2241.7	25.201	67.074	7.34940E 05
16.5000	77.599	1.6697	104.02	36.401	2267.8	24.996	65.994	7.28974E 05
16.7500	77.182	1.6562	103.19	36.817	2293.7	24.796	64.945	7.23129E 05
17.0000	76.770	1.6432	102.37	37.230	2319.4	24.599	63.925	7.17402E 05
17.2500	76.361	1.6304	101.57	37.639	2344.9	24.407	62.933	7.11786E 05
17.5000	75.955	1.6177	100.79	38.045	2370.2	24.218	61.967	7.06279E 05
17.7500	75.552	1.6054	100.01	38.448	2395.3	24.033	61.027	7.00878E 05
18.0000	75.152	1.5932	99.258	38.848	2420.2	23.851	60.112	6.95577E 05
18.2500	74.755	1.5813	98.516	39.245	2444.9	23.672	59.220	6.90374E 05
18.5000	74.362	1.5696	97.787	39.638	2469.5	23.497	58.351	6.85266E 05
18.7500	73.971	1.5581	97.071	40.029	2493.8	23.325	57.503	6.80249E 05
19.0000	73.582	1.5468	96.368	40.418	2518.0	23.156	56.676	6.75320E 05
19.2500	73.197	1.5357	95.677	40.803	2542.0	22.990	55.870	6.70477E 05
19.5000	72.814	1.5248	94.997	41.186	2565.9	22.827	55.083	6.65717E 05
19.7500	72.435	1.5141	94.330	41.565	2589.5	22.666	54.314	6.61037E 05
20.0000	72.057	1.5036	93.673	41.943	2613.0	22.509	53.564	6.56435E 05
20.2500	71.683	1.4932	93.027	42.317	2636.4	22.353	52.831	6.51909E 05
20.5000	71.311	1.4830	92.391	42.689	2659.5	22.201	52.114	6.47455E 05
20.7500	70.941	1.4730	91.766	43.059	2682.6	22.050	51.414	6.43072E 05
21.0000	70.574	1.4631	91.150	43.426	2705.4	21.903	50.729	6.38758E 05
21.2500	70.209	1.4534	90.544	43.791	2728.1	21.757	50.060	6.34511E 05
21.5000	69.847	1.4438	89.948	44.153	2750.7	21.614	49.405	6.30330E 05
21.7500	69.487	1.4343	89.360	44.513	2773.1	21.472	48.764	6.26211E 05
22.0000	69.130	1.4251	88.781	44.870	2795.4	21.333	48.137	6.22153E 05
22.2500	68.775	1.4159	88.210	45.225	2817.5	21.196	47.522	6.18156E 05
22.5000	68.422	1.4069	87.648	45.578	2839.5	21.061	46.921	6.14216E 05
22.7500	68.071	1.3980	87.094	45.929	2861.4	20.928	46.332	6.10333E 05
23.0000	67.723	1.3892	86.548	46.277	2883.1	20.797	45.755	6.06505E 05
23.2500	67.377	1.3806	86.009	46.623	2904.6	20.667	45.189	6.02730E 05
23.5000	67.033	1.3720	85.478	46.967	2926.1	20.539	44.635	5.99005E 05
23.7500	66.691	1.3636	84.953	47.309	2947.4	20.413	44.091	5.95327E 05
24.0000	66.351	1.3552	84.435	47.649	2968.5	20.289	43.559	5.91698E 05
24.2500	66.013	1.3471	83.924	47.987	2989.6	20.166	43.036	5.88117E 05
24.5000	65.677	1.3390	83.420	48.323	3010.5	20.045	42.523	5.84583E 05
24.7500	65.343	1.3310	82.922	48.657	3031.3	19.925	42.020	5.81097E 05
25.0000	65.012	1.3231	82.431	48.988	3052.0	19.807	41.527	5.77654E 05
25.2500	64.682	1.3153	81.946	49.318	3072.5	19.691	41.042	5.74255E 05
25.5000	64.354	1.3077	81.467	49.646	3093.0	19.576	40.567	5.70900E 05
25.7500	64.028	1.3001	80.994	49.972	3113.3	19.462	40.099	5.67585E 05
26.0000	63.704	1.2926	80.527	50.296	3133.5	19.350	39.641	5.64312E 05
26.2500	63.381	1.2852	80.066	50.619	3153.5	19.239	39.190	5.61078E 05
26.5000	63.061	1.2778	79.610	50.939	3173.5	19.129	38.748	5.57884E 05
26.7500	62.742	1.2706	79.159	51.258	3193.3	19.021	38.313	5.54727E 05

ACCU M GAS VOL: PARAMET CALCS FOR LCCA FLOOD REQMTS. HFR-060E17
 COLD LES 3PK: VGO=50 TO 12 CUF AT 612.5PSIA; DUPL FSAP RUNS + .

HOT
 VGO = 12.000

TIME	VL	Q	n	VL0	VL0M	VELL	DELTAP	PFNUM
27.0000	62.426	1.2035	78.714	51.574	3213.1	19.914	37.885	5.51608E 05
27.2500	62.111	1.2564	78.274	51.889	3232.7	18.808	37.465	5.48524E 05
27.5000	61.797	1.2494	77.839	52.203	3252.2	18.704	37.052	5.45477E 05
27.7500	61.486	1.2425	77.409	52.514	3271.6	18.601	36.646	5.42464E 05
28.0000	61.176	1.2257	76.984	52.824	3290.9	18.499	36.247	5.39485E 05
28.2500	60.868	1.2290	76.564	53.132	3310.1	18.398	35.854	5.36539E 05
28.5000	60.561	1.2223	76.148	53.439	3329.2	18.298	35.468	5.33626E 05
28.7500	60.257	1.2157	75.737	52.743	3348.2	18.199	35.088	5.30745E 05
29.0000	59.954	1.2092	75.330	54.046	3367.1	18.101	34.714	5.27894E 05
29.2500	59.652	1.2027	74.928	54.348	3385.9	18.004	34.346	5.25075E 05
29.5000	59.352	1.1963	74.530	54.648	3404.6	17.909	33.984	5.22285E 05
29.7500	59.054	1.1900	74.136	54.946	3423.1	17.814	33.627	5.19524E 05
30.0000	58.757	1.1837	73.746	55.243	3441.6	17.720	33.276	5.16792E 05
30.2500	58.462	1.1775	73.360	55.538	3460.0	17.628	32.931	5.14089E 05
30.5000	58.168	1.1714	72.978	55.832	3478.3	17.536	32.590	5.11412E 05
30.7500	57.875	1.1653	72.600	56.124	3496.5	17.445	32.255	5.08763E 05
31.0000	57.585	1.1593	72.226	56.414	3514.6	17.355	31.925	5.06140E 05
31.2500	57.296	1.1534	71.855	56.704	3532.6	17.266	31.600	5.03542E 05
31.5000	57.009	1.1475	71.488	56.991	3550.6	17.178	31.279	5.00971E 05
31.7500	56.723	1.1417	71.125	57.277	3568.4	17.091	30.964	4.98424E 05
32.0000	56.438	1.1359	70.765	57.562	3586.1	17.004	30.653	4.95902E 05
32.2500	56.155	1.1302	70.408	57.845	3603.8	16.918	30.346	4.93404E 05
32.5000	55.873	1.1245	70.055	58.127	3621.3	16.834	30.044	4.90929E 05
32.7500	55.592	1.1189	69.705	58.408	3638.8	16.750	29.746	4.88478E 05
33.0000	55.313	1.1133	69.359	58.687	3656.2	16.666	29.452	4.86049E 05
33.2500	55.036	1.1078	69.015	58.964	3673.5	16.584	29.163	4.83643E 05
33.5000	54.759	1.1023	68.675	59.241	3690.7	16.502	28.877	4.81258E 05
33.7500	54.484	1.0969	68.338	59.516	3707.8	16.421	28.596	4.78894E 05
34.0000	54.211	1.0916	68.004	59.789	3724.9	16.341	28.318	4.76552E 05
34.2500	53.938	1.0862	67.672	60.062	3741.8	16.261	28.044	4.74231E 05
34.5000	53.668	1.0810	67.344	60.332	3758.7	16.182	27.774	4.71930E 05
34.7500	53.398	1.0757	67.019	60.602	3775.5	16.104	27.507	4.69648E 05
35.0000	53.130	1.0706	66.696	60.870	3792.2	16.026	27.244	4.67387E 05
35.2500	52.863	1.0654	66.376	61.137	3808.9	15.949	26.984	4.65145E 05
35.5000	52.597	1.0603	66.059	61.403	3825.4	15.873	26.728	4.62921E 05
35.7500	52.332	1.0553	65.744	61.668	3841.9	15.798	26.475	4.60717E 05
36.0000	52.069	1.0503	65.432	61.931	3858.3	15.723	26.226	4.58530E 05
36.2500	51.807	1.0453	65.123	62.193	3874.6	15.648	25.979	4.56362E 05
36.5000	51.546	1.0404	64.816	62.454	3890.9	15.575	25.736	4.54212E 05
36.7500	51.287	1.0355	64.511	62.713	3907.0	15.501	25.496	4.52079E 05
37.0000	51.029	1.0306	64.209	62.971	3923.1	15.429	25.259	4.49963E 05
37.2500	50.771	1.0258	63.910	63.229	3939.1	15.357	25.025	4.47864E 05
37.5000	50.516	1.0211	63.613	63.484	3955.1	15.285	24.794	4.45781E 05
37.7500	50.261	1.0163	63.318	63.739	3970.9	15.215	24.565	4.43715E 05
38.0000	50.007	1.0116	63.025	63.993	3986.7	15.144	24.340	4.41665E 05
38.2500	49.755	1.0070	62.735	64.245	4002.5	15.075	24.117	4.39630E 05
38.5000	49.504	1.0024	62.447	64.496	4018.1	15.005	23.897	4.37611E 05
38.7500	49.254	0.99777	62.161	64.746	4033.7	14.937	23.680	4.35608E 05
39.0000	49.005	0.99321	61.877	64.995	4049.2	14.868	23.465	4.33620E 05
39.2500	48.757	0.98869	61.596	65.243	4064.6	14.801	23.252	4.31646E 05
39.5000	48.510	0.98421	61.316	65.490	4080.0	14.734	23.043	4.29687E 05
39.7500	48.265	0.97975	61.039	65.735	4095.3	14.667	22.836	4.27762E 05
40.0000	48.020	0.97533	60.763	65.980	4110.5	14.601	22.631	4.25812E 05

\$\$\$ SIMULA HALTED FOR FINISH CONDITION TIME 40.000

OUTPUT VARIABLE RANGES FOR ALL RUNS IN CASE

VARIABLE	MINIMUM	MAXIMUM	VARIABLE	MINIMUM	MAXIMUM
TIME	0.0	40.0000	PG	44.5818	612.500
VG	12.0000	125.987	VL	6.199658E-03	114.000
ZL	4.932105E-04	9.06921	C	6.426875E-04	4.52143
W	4.003942E-02	281.685	VLD	0.0	91.7596
VLDH	0.0	5710.62	DELTAP	1.000000E-05	480.098
TGAS	-209.284	70.0000	PENUM	269.158	1.973973E 06
VELL	9.621069E-03	67.6861	PCL	20.0000	2250.00

IEF142I - S WAS EXECUTED - COND CODE 0000

IEF285I	SYS2.CSMPLIB3	KEPT
IEF285I	VOL SER NOS= DSKRES.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.SYSIN	DELETED
IEF285I	VOL SER NOS= DSK003.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000763	DELETED
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000764	DELETED
IEF285I	VOL SER NOS= DSK006.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000765	DELETED
IEF285I	VOL SER NOS= DSK010.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000766	DELETED
IEF285I	VOL SER NOS= DSK011.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000767	DELETED
IEF285I	VOL SER NOS= DSK012.	
IEF285I	LOFTACCU.N2MINVOL.HOTLLOCA	KEPT
IEF285I	VOL SER NOS= T93570.	
IEF285I	SYS2.CSMPL003	KEPT
IEF285I	VOL SER NOS= SYSIPL.	
IEF285I	SYS2.CSMPL003	KEPT
IEF285I	VOL SER NOS= SYSIPL.	
IEF285I	SYS1.FORTLIB	KEPT
IEF285I	VOL SER NOS= DSKIPL.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000768	DELETED
IEF285I	VOL SER NOS= DSK003.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000768	PASSED
IEF285I	VOL SER NOS= DSK003.	
IEF285I	SYS2.CSMPL003	KEPT
IEF285I	VOL SER NOS= DSKRES.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.NOSET	DELETED
IEF285I	VOL SER NOS= DSK010.	
IEF285I	SYS77343.T112648.RV000.HFRNDBFA.R0000769	DELETED
IEF285I	VOL SER NOS= DSK011.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000770	DELETED
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000771	SYSOUT
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000772	SYSOUT
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000773	SYSOUT
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T112648.SV000.HFRNDBFA.R0000774	SYSOUT
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T123456.I0007.HFRNDBFA.S0000143	SYSIN
IEF285I	VOL SER NOS= SPOL31.	
IEF285I	SYS77343.T123456.I0007.HFRNDBFA.S0000143	DELETED
IEF285I	VOL SER NOS= SPOL31.	

IEF373I STEP /X / START 77343.2257

IEF374I STEP /X / STOP 77343.2302 CPU 1MIN 19.29SEC MAIN 126K LCS OK

WAIT 0002MIN 18.87SEC SYSIN 00091REC UNUSED CORE 002K EXCPS 004580 SYSHRS .049255

237 000000X;330 000020X;354 000000X;331 000032X;335 000184X;336 000000X;337 000094X;002 001043X;356 000080X;356 000179X
137 000101X;330 000085X;330 000006X;237 000043X;335 000298X;336 000178X;354 000000X;354 000013X;354 000106X;354 000005X
354 000115X;354 000007X

IEF285I SYS77343.T112648.RV000.HFRNDBFA.R0000768 KEPT

IEF285I VOL SER NOS= DSK003.

IEF375I JOB /HFRNDBFA/ START 77343.2257

IEF376I JOB /HFRNDBFA/ STOP 77343.2302 CPU 1MIN 19.29SEC

WAIT 0002MIN 18.87SEC SYSIN 00091REC

EXCPS 004580 SYSHRS .049255 DPSU .0492 REL 21.8

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-50CUFT

C-34

01 5.0

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-50CUFT

C-35

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-40CUFT

C-3.6

ACCU MIN: N2 VOL RELAP INP. DATA HOT LEG BRK VGO-40CUFT

C-37

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-34.2CUFT

C-38

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-34.2CUFT

C-39

HTR13 50.1

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-27.5CUFT

C-40

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-27.5CUFT

C-41

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-20.0CUFT

C-42

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-20.0CUFT

C-43

IR113 50

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-16.0CUFT

C-44

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-16.0CUFT

C-45

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-12.0CUFT

C-46

ACCU MIN N2 VOL RELAP INP. DATA HOT LEG BRK VGO-12.0CUFT

C-47

LTR113 50

HH	HH	FFFFFFFFFFFF	RRRRRRRRRR	NN	NN	HH	HH	8888888888	FFFFFFFFFFFF	AAAAAAAAAA		
HH	HH	FFFFFFFFFFFF	RRRRRRRRRR	NN	NN	HH	HH	8888888888	FFFFFFFFFFFF	AAAAAAAAAA		
HH	HH	FF	RR	RR	NNNN	NN	HH	88	88	FF	AA	AA
HH	HH	FF	RR	RR	NN	NN	HH	88	88	FF	AA	AA
HH	HH	FF	RR	RR	NN	NN	HH	88	88	FF	AA	AA
HHHHHHHHHH	HH	FFFFFFFF	RRRRRRRRRR	NN	NN	NN	HHHHHHHHHH	88888888	FFFFFFFF	AAAAAAAAAA		
HHHHHHHHHH	HH	FFFFFFFF	RRRRRRRRRR	NN	NN	NN	HHHHHHHHHH	88888888	FFFFFFFF	AAAAAAAAAA		
HH	HH	FF	RR	RR	NN	NN	HH	88	88	FF	AA	AA
HH	HH	FF	RR	RR	NN	NNNN	HH	88	88	FF	AA	AA
HH	HH	FF	RR	RR	NN	NN	HH	88	88	FF	AA	AA
HH	HH	FF	RR	RR	NN	NN	HH	88888888	FF	AA	AA	
HH	HH	FF	RR	RR	NN	NN	HH	88888888	FF	AA	AA	

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      ZAAAAA
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      AA      AA
      AA      AA
      AA      AA
      AAAAAA
      AAAAAA
      AA      AA
      AA      AA
      AA      AA
      AA      AA
      AA      AA
  
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LOFT HOT LEG LOCA (CONCO=1.0)
 USING RELAP FLOW PARAMETERS
 [VARYING INITIAL GAS PRESSURE AT
 20 CU.FT INITIAL GAS VOLUME]

C-48

LTR 118-50

```

//HFRNHBFA (D,52191-200-204,3510,X06740,N220PR),H.F.RHODES,
// TIME=005;CLASS=D,PRTY=03 COR=200,CPU=005,WT=001
//CSMPX PRGC
//X EXEC PGM=DEJCSMP2,REGION=200K,
// PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
//CSMPLIB DD UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLIB3
//FT01F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DSN=&&SYSIN,
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
//FT02F001 DD SYSOUT=E,DCB=(RECFM=F,BLKSIZE=80)
//FT05F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DCB=(RECFM=F,BLKSIZE=80)
//FT07F001 DD UNIT=DKSCRA,SPACE=(3500,(100,100)),
// DCB=(RECFM=F,BLKSIZE=80)
//FT13F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),
// DCB=(RECFM=VS,BLKSIZE=444)
//FT14F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DCB=(RECFM=F,BLKSIZE=80)
//GO.FT15F001 DD DSN=L.LOFTACCU,N2VOL=20,PR=525PS,IGTO550,
// DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
// UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
//STEPLIB DD DSN=SYS2.CSMPLD02,DISP=SHR,UNIT=2314,VOL=SER=DSKRES
//SYSLIB DD DSN=SYS2.CSMPLD02,DISP=SHR,UNIT=2314,VOL=SER=DSKRES
// DD DISP=SHR,DSN=SYS1.FORTLIB
//SYSLIN DD UNIT=DKSCRA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800
//SYSLINK DD UNIT=DKSCRA,VOL=REF=*,SYSLIN,DISP=(OLD,PASS),DSN=*,SYSLIN
// DD UNIT=2314,VOL=SER=DSKRES,DSN=SYS2.CSMPDCK3(CTLCD5),
// DISP=SHR
//SYSLMOD DD UNIT=DKSCRA,SPACE=(3500,(050,20,1)),DSN=&&NOSET(DEJEXE)
//SYSUT1 DD UNIT=(DKSCRA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(80,80))
//FT03F001 DD SYSOUT=A
//FT08F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330),
// SPACE=(7000,(200,80))
//COMPRINT DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
//FT06F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330),
// SPACE=(7000,(200,80))
// PEND CSMPX
// EXEC CSMPX
++CSMPX--PRGC
++X EXEC PGM=DEJCSMP2,REGION=200K,
++ PARM='LINKOPT=(OVLY,SIZE=(120K,12K))'
++CSMPLIB DD UNIT=2314,VOL=SER=DSKRES,DISP=SHR,DSN=SYS2.CSMPLIB3
++FT01F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DSN=&&SYSIN,
++ DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
++FT02F001 DD SYSOUT=E,DCB=(RECFM=F,BLKSIZE=80)
++FT05F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DCB=(RECFM=F,BLKSIZE=80)
++FT07F001 DD UNIT=DKSCRA,SPACE=(3500,(100,100)),
++ DCB=(RECFM=F,BLKSIZE=80)
++FT13F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),
++ DCB=(RECFM=VS,BLKSIZE=444)
++FT14F001 DD UNIT=DKSCRA,SPACE=(3500,(80,80)),DCB=(RECFM=F,BLKSIZE=80)
++GO.FT15F001 DD DSN=L.LOFTACCU,N2VOL=20,PR=525PS,IGTO550,
++ DCB=(RECFM=VS,LRECL=255,BLKSIZE=2550),
++ UNIT=(TP9ANY,,DEFER),DISP=(NEW,KEEP)
++STEPLIB DD DSN=SYS2.CSMPLD02,DISP=SHR,UNIT=2314,VOL=SER=DSKRES
++SYSLIB DD DSN=SYS2.CSMPLD02,DISP=SHR,UNIT=2314,VOL=SER=DSKRES
++ DD DISP=SHR,DSN=SYS1.FORTLIB
++SYSLIN DD UNIT=DKSCRA,SPACE=(3500,(20,10)),DCB=BLKSIZE=800
++SYSLINK DD UNIT=DKSCRA,VOL=REF=*,SYSLIN,DISP=(OLD,PASS),DSN=*,SYSLIN
++ DD UNIT=2314,VOL=SER=DSKRES,DSN=SYS2.CSMPDCK3(CTLCD5),
++ DISP=SHR
++SYSLMOD DD UNIT=DKSCRA,SPACE=(3500,(050,20,1)),DSN=&&NOSET(DEJEXE)
++SYSUT1 DD UNIT=(DKSCRA,SEP=(SYSLMOD,SYSLINK)),SPACE=(3500,(80,80))
++FT03F001 DD SYSOUT=A

```

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113-50

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```
++COMPRINT DD SYSOUT=A
++SYSPRINT DD SYSOUT=A
++FT06F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330),
++ SPACE=(7000,(200,80))
//SYSIN DD DSN=SYS78101.T123456.T00C7.HFRNH8FA.S00C0150, GEN DD *
// VOL=SER=(SPOLO1),DISP=(CLD,DELETE),UNIT=OKSPOL GEN DD *
//
```

```
IEF236I ALLCC. FOR HFRNH8FA X
IEF237I 237 ALLOCATED TO CSMP18
IEF237I 335 ALLOCATED TO FT01F001
IEF237I 354 ALLOCATED TO FT02F001
IEF237I 335 ALLOCATED TO FT05F001
IEF237I 335 ALLOCATED TO FT07F001
IEF237I 336 ALLOCATED TO FT13F001
IEF237I 331 ALLOCATED TO FT14F001
IEF237I 000 ALLOCATED TO FT15F001
IEF237I 237 ALLOCATED TO STEPL18
IEF237I 237 ALLOCATED TO SYSL18
IEF237I 137 ALLOCATED TO
IEF237I 335 ALLOCATED TO SYSLIN
IEF237I 335 ALLOCATED TO SYSLINK
IEF237I 237 ALLOCATED TO
IEF237I 337 ALLOCATED TO SYSLMOD
IEF237I 330 ALLOCATED TO SYSUT1
IEF237I 354 ALLOCATED TO FT03F001
IEF237I 354 ALLOCATED TO FT08F001
IEF237I 354 ALLOCATED TO COMPRINT
IEF237I 354 ALLOCATED TO SYSPRINT
IEF237I 354 ALLOCATED TO FT06F001
IEF237I 135 ALLOCATED TO SYSIN
```

C-50

LTR 13-50

\$\$\$ TRANSLATION TABLE CONTENTS \$\$\$

CURRENT	MAXIMUM
40	600
77	1900
13 + 0	300
4 + 2	400
0 + 0/2	50
21	50
6	50
13	125
0	100
2	20
29	600

\$\$\$END OF TRANSLATOR OUTPUT\$\$\$

C-51

LTR 113-50

OPTIONS IN EFFECT NCIG,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
OPTIONS IN EFFECT NAME = BLK DATA, LINECNT = 58
STATISTICS NO DIAGNOSTICS GENERATED

C-53

LTK 113-50

```

0001 SUBROUTINE UPDATE
0002 COMMON TIME
      1,ZZ0000,DELT ,ZZCELT,DELMIN,ZZDELN,FINTIM,ZZFINT,PRDEL ,ZZPRDE
      1,OUTDEL,ZZOUTD,DELMAX,ZZDELX,VG ,PG ,VL ,DVG ,CPG
      1,CVL ,VGO ,PGO ,VLO ,FTABL ,PCLTAB,AVES ,DELTAP,FLINEK
      1,FLOA ,FLODIA,FLOLG ,FLONU ,FLOVD ,FLOVOL,GASCON,GASK ,PCL
      1,P2 ,Q ,RENUM ,RHOL ,TGAS ,TD ,VELL ,VFIL ,VFILO
      1,VLO ,VLDM ,VVES ,W ,ZL
      COMMON/ZZHIST/KEEP,NALARM,IZ0000,IZ0001
      REAL LIMIT
      REAL*8 ZZTIME
      EQUIVALENCE(ZZTIME,TIME )
      GO TO(39995,39996,39997,39998),IZ0000
C     SYSTEM SEGMENT OF MODEL
0008 39995 CONTINUE
0009 GO TO 39999
C     INITIAL SEGMENT OF MODEL
0010 39996 CONTINUE
0011 AVES=12.57
0012 RHOL=62.3
0013 TO=70.0+460.0
0014 GASK=1.4
0015 GASCON=0.3832
0016 FLINEK=14.94
0017 FLONU=1.0E-5
0018 FLOVOL=1.2349
0019 FLOA=0.0668
0020 FLOLG=FLOVOL/FLOA
0021 FLODIA=2.0*(FLOA/3.1416)**0.5
0022 FLOVD=FLOLG/FLODIA
0023 VVES=114.0
0024 VGO=20.0
0025 VLO=VVES-VGO
0026 VFIL=0.0
0027 VFILO=0.0
0028 GO TO 39999
C     DYNAMIC SEGMENT OF MODEL
0029 39997 CONTINUE
0030 ZL=VL/AVES
0031 PCL=AFGEN( 1,PCLTAB,TIME)
0032 P2=PG+((ZL-8.33)*RHOL/144.)-PCL
0033 DELTAP=LIMIT(1.0E-5,10000.,P2)
0034 FIO=0.01
0035 10 FLOK=4.*FIO*FLOVD
0036 FLOR=(FLINEK+FLOK)/(FLOA**2*288.*32.2)
0037 C=SQRT(DELTAP/FLOR/RHOL)
0038 RENUM=FLODIA*Q/FLOA/FLONU
0039 RENO=LIMIT(1.0E+5,3.0E+6,RENUM)
0040 F1=AFGEN( 6,FTABL,RENO)
0041 IF(RENUM.LE.1.E+5)GO TO 20
0042 IF(ABS((FIO-F1)/FIO).LE.1.E-3)GO TO 20
0043 FIO=F1
0044 GO TO 10
0045 20 FLOK=4.*F1*FLOVD
0046 FLOR=(FLINEK+FLOK)/(FLOA**2*288.0*32.2)
0047 Q=SQRT(DELTAP/FLOR/RHOL)

```

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LT8 118-50

```
0048      DVL=-C
0049      DVG=-DVL
0050      C      VG      =INTGRL      (VGO      ,DVG      )
      CPG=-PG*GASK*DVG/VG
      C      PG      =INTGRL      (PGO      ,DPG      )
      C      VL      =INTGRL      (VLO      ,DVL      )
0051      VELL=C/FLGA
0052      W=Q*RHOL
0053      IGAS=10*(VGO/VG)**(GASK-1.0)-460.0
0054      VLD=VLO-VL
0055      VLDH=VLC*RHOL
0056      GO TO 39999
      C  TERMINAL SEGMENT OF MODEL
0057 39998 CONTINUE
0058 39999 CONTINUE
0059      RETURN
0060      END
```

```
CSMPDECK
CSMPDECK
CSMPDECK
CSMPDECK
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CSMPDECK
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CSMPDECK
```


OPTIONS IN EFFECT NOID,EBCDIC,SOURCE,NCLIST,NODECK,LOAD,NUMAP
OPTIONS IN EFFECT NAME = UPDATE , LINECNT = 50
STATISTICS SOURCE STATEMENTS = 60, PROGRAM SIZE = 1276
STATISTICS NO DIAGNOSTICS GENERATED
STATISTICS NO DIAGNOSTICS THIS STEP

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L78 113-50

F38-LEVEL (AGE EDITOR OPTIONS SPECIFIED OVLY.SIZE=(120K.12K)

VARIABLE OPTIONS USED - SIZE=(122880.12298)

***DEJEXE DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET

C-57

LT/13-50

\$\$\$ CONTINUOUS SYSTEM MODELING PROGRAM III VIM3 EXECUTION OUTPUT \$\$\$

TITLE LCFT ACC PRESS CALC @ 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.
 TITLE HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78
 FUNCTION PCLTAB = C.,2250., 1.5,625., 1.6,570., 2.,300., ...
 2.25,180., 2.5,120., 2.75,70., 3.,50., 4.5,20., 1000.,20.00
 FUNCTION FTABL = 1.E5,4.5E-3, 2.E5,3.91E-3, 4.E5,3.43E-3, ...
 6.E5,3.19E-3, 8.E5,3.03E-3, 1.E6,2.91E-3, 2.E6,2.59E-3, ...
 3.E6,2.43E-3
 PRINT VL,Q,W,VLD,VLDL,VLL, DELTAP, RENUM
 METHOD SIMP
 TIMER DELT = 0.05, FINTIM = 200., PRDEL = 0.25
 PARAMETER PGO = (562.5, 537.5)
 PREPARE PG, VG, VL, ZL, G, W, VLD,VLDL, DELTAP, TGA, ...
 RENUM, VELL, PCL
 FINISH ZL = 0.01
 END

TIMER VARIABLES		SIMP	INTEGRATION	START TIME = 0.0		
DELT	DELMIN	FINTIM	PRDEL	OUTDEL	DELMAX	
5.00000D-02	2.00000D-05	200.00	0.25000	0.25000	0.25000	

LOFT ACC 1.000S CALC 20CUFT GAS @ 525 & 550PSIG INIT PRESS. HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 562.50

TIME	VL	G	W	VLD	VLDL	VELL	DELTAP	RENUM
0.0	114.00	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	114.00	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	114.00	6.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.750000	114.00	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	114.00	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	114.00	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	114.00	6.42688E-04	4.00394E-02	1.37329E-03	8.55560E-02	9.62107E-03	1.00000E-05	269.16
1.750000	113.82	1.9176	119.47	0.18333	11.422	28.707	86.934	8.37204E C5
2.000000	113.17	3.1362	195.39	0.82892	51.642	46.949	231.71	1.36921E 06
2.250000	112.31	3.7024	230.66	1.6860	105.04	55.425	322.52	1.61640E 06
2.500000	111.37	3.8758	241.46	2.6333	164.05	58.021	353.30	1.69212E C6
2.750000	110.38	3.9984	249.10	3.6174	225.37	59.857	375.90	1.74564E 06
3.000000	109.39	3.9712	247.41	4.6134	287.41	59.449	370.82	1.73376E C6
3.250000	108.41	3.8764	241.50	5.5941	348.51	58.029	353.40	1.69235E C6
3.500000	107.45	3.7928	236.29	6.5526	408.22	56.778	338.38	1.65585E 06
3.750000	106.51	3.7189	231.69	7.4913	466.71	55.672	325.39	1.62361E 06
4.000000	105.59	3.6536	227.62	8.4128	524.12	54.694	314.10	1.59509E 06
4.250000	104.68	3.5958	224.02	9.3188	580.56	53.829	304.28	1.56984E 06
4.500000	103.79	3.5446	220.83	10.211	636.16	53.062	295.71	1.54749E 06
4.750000	102.91	3.4690	216.12	11.088	690.78	51.931	283.29	1.51450E 06
5.000000	102.05	3.3983	211.72	11.946	744.25	50.873	271.91	1.48366E 06
5.250000	101.21	3.3321	207.59	12.788	796.66	49.881	261.44	1.45472E 06
5.500000	100.39	3.2697	203.70	13.613	848.07	48.948	251.78	1.42749E 06
5.750000	99.577	3.2109	200.04	14.423	898.54	48.067	242.84	1.40181E C6
6.000000	98.782	3.1553	196.57	15.218	948.11	47.235	234.53	1.37753E 06
6.250000	97.999	3.1026	193.29	16.001	996.84	46.446	226.79	1.35453E C6
6.500000	97.230	3.0525	190.17	16.770	1044.8	45.697	219.56	1.33268E 06
6.750000	96.473	3.0049	187.21	17.527	1091.9	44.984	212.78	1.31189E 06
7.000000	95.727	2.9595	184.38	18.273	1138.4	44.304	206.43	1.29208E 06
7.250000	94.993	2.9162	181.68	19.007	1184.2	43.656	200.45	1.27317E 06
7.500000	94.269	2.8748	179.10	19.731	1229.2	43.036	194.81	1.25508E 06
7.750000	93.555	2.8351	176.63	20.445	1273.7	42.442	189.49	1.23776E C6
8.000000	92.851	2.7971	174.26	21.149	1317.6	41.873	184.45	1.22116E 06
8.250000	92.156	2.7606	171.99	21.844	1360.9	41.326	179.68	1.20522E C6
8.500000	91.471	2.7255	169.80	22.529	1403.6	40.800	175.16	1.18989E C6
8.750000	90.793	2.6917	167.69	23.207	1445.8	40.295	170.86	1.17515E C6
9.000000	90.125	2.6591	165.66	23.875	1487.4	39.808	166.76	1.16094E 06
9.250000	89.464	2.6278	163.71	24.536	1528.6	39.338	162.86	1.14724E 06
9.500000	88.811	2.5975	161.82	25.189	1569.3	38.884	159.14	1.13401E 06
9.750000	88.165	2.5682	160.00	25.835	1609.5	38.446	155.58	1.12123E 06
10.000000	87.526	2.5399	158.24	26.474	1649.3	38.022	152.18	1.10887E 06
10.250000	86.895	2.5125	156.53	27.105	1688.7	37.612	148.92	1.09691E C6
10.500000	86.270	2.4860	154.88	27.730	1727.6	37.215	145.80	1.08532E 06
10.750000	85.652	2.4602	153.27	28.348	1766.1	36.830	142.81	1.07409E 06
11.000000	85.040	2.4353	151.72	28.960	1804.2	36.456	139.94	1.06320E 06
11.250000	84.434	2.4111	150.21	29.566	1842.0	36.094	137.17	1.05262E 06
11.500000	83.834	2.3875	148.74	30.166	1879.3	35.741	134.52	1.04235E 06
11.750000	83.240	2.3647	147.32	30.760	1916.3	35.399	131.96	1.03237E C6
12.000000	82.652	2.3424	145.93	31.348	1953.0	35.066	129.49	1.02266E 06
12.250000	82.069	2.3208	144.58	31.931	1989.3	34.742	127.12	1.01321E 06
12.500000	81.491	2.2997	143.27	32.509	2025.3	34.426	124.83	1.00400E 06
12.750000	80.919	2.2791	141.99	33.081	2061.0	34.119	122.61	9.95028E 05
13.000000	80.351	2.2591	140.74	33.649	2096.3	33.818	120.47	9.86271E C5
13.250000	79.789	2.2395	139.52	34.211	2131.3	33.526	118.41	9.77731E C5

C-59

LT 11.3-50

LOFT ACC PRESS CALC @ 200LFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VCL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGC = 562.50

TIME	VL	Q	W	VLD	VLDM	VELL	DELTAP	RENUM
13.5000	74.232	2.2204	138.33	34.768	2166.1	33.240	116.41	9.69400E 05
13.7500	78.679	2.2018	137.17	35.321	2200.5	32.961	114.47	9.61269E 05
14.0000	78.121	2.1836	136.04	35.869	2234.7	32.689	112.60	9.53327E 05
14.2500	77.567	2.1658	134.93	36.413	2268.5	32.423	110.78	9.45569E 05
14.5000	77.048	2.1485	133.85	36.952	2302.1	32.163	109.02	9.37987E 05
14.7500	76.513	2.1315	132.79	37.467	2335.5	31.909	107.31	9.30573E 05
15.0000	75.982	2.1145	131.76	38.018	2368.5	31.660	105.65	9.23322E 05
15.2500	75.455	2.0986	130.74	38.545	2401.4	31.417	104.04	9.16227E 05
15.5000	74.932	2.0827	129.75	39.068	2433.5	31.179	102.48	9.09281E 05
15.7500	74.414	2.0671	128.78	39.586	2466.2	30.945	100.96	9.02480E 05
16.0000	73.899	2.0519	127.83	40.101	2498.3	30.717	99.476	8.95818E 05
16.2500	73.388	2.0369	126.90	40.612	2530.2	30.493	98.038	8.89291E 05
16.5000	72.880	2.0223	125.99	41.120	2561.8	30.274	96.639	8.82892E 05
16.7500	72.376	2.0079	125.09	41.624	2593.2	30.059	95.276	8.76619E 05
17.0000	71.876	1.9938	124.21	42.124	2624.3	29.848	93.949	8.70465E 05
17.2500	71.379	1.9800	123.35	42.621	2655.3	29.641	92.655	8.64429E 05
17.5000	70.886	1.9664	122.51	43.114	2686.0	29.437	91.355	8.58504E 05
17.7500	70.396	1.9531	121.68	43.604	2716.5	29.238	90.166	8.52689E 05
18.0000	69.909	1.9400	120.86	44.091	2746.8	29.042	88.967	8.46978E 05
18.2500	69.426	1.9272	120.06	44.574	2777.0	28.850	87.798	8.41370E 05
18.5000	68.946	1.9146	119.28	45.054	2808.5	28.661	86.656	8.35860E 05
18.7500	68.464	1.9022	118.50	45.531	2836.6	28.475	85.542	8.30445E 05
19.0000	67.995	1.8900	117.74	46.005	2866.1	28.293	84.453	8.25123E 05
19.2500	67.524	1.8780	117.00	46.476	2895.5	28.113	83.390	8.19891E 05
19.5000	67.055	1.8662	116.26	46.945	2924.6	27.937	82.350	8.14746E 05
19.7500	66.590	1.8546	115.54	47.410	2953.6	27.763	81.335	8.09685E 05
20.0000	66.128	1.8432	114.83	47.872	2982.4	27.593	80.341	8.04706E 05
20.2500	65.669	1.8320	114.13	48.331	3011.0	27.425	79.370	7.99806E 05
20.5000	65.212	1.8209	113.44	48.788	3039.5	27.259	78.419	7.94978E 05
20.7500	64.758	1.8100	112.76	49.242	3067.8	27.096	77.469	7.90225E 05
21.0000	64.307	1.7993	112.10	49.693	3095.9	26.936	76.578	7.85544E 05
21.2500	63.858	1.7887	111.44	50.142	3123.8	26.778	75.687	7.80936E 05
21.5000	63.412	1.7784	110.79	50.588	3151.6	26.622	74.814	7.76396E 05
21.7500	62.969	1.7681	110.15	51.031	3179.2	26.469	73.959	7.71924E 05
22.0000	62.528	1.7580	109.52	51.472	3206.7	26.318	73.121	7.67517E 05
22.2500	62.090	1.7481	108.90	51.910	3234.0	26.169	72.300	7.63174E 05
22.5000	61.654	1.7383	108.29	52.346	3261.1	26.022	71.495	7.58893E 05
22.7500	61.221	1.7286	107.69	52.779	3288.1	25.877	70.706	7.54672E 05
23.0000	60.790	1.7191	107.10	53.210	3315.0	25.734	69.932	7.50511E 05
23.2500	60.361	1.7097	106.51	53.639	3341.7	25.594	69.173	7.46407E 05
23.5000	59.935	1.7004	105.93	54.065	3368.3	25.455	68.428	7.42359E 05
23.7500	59.511	1.6912	105.36	54.489	3394.7	25.318	67.697	7.38365E 05
24.0000	59.089	1.6822	104.80	54.911	3420.5	25.183	66.980	7.34425E 05
24.2500	58.670	1.6733	104.25	55.330	3447.1	25.050	66.276	7.30536E 05
24.5000	58.253	1.6645	103.70	55.747	3473.1	24.918	65.585	7.26699E 05
24.7500	57.837	1.6558	103.16	55.163	3498.9	24.788	64.906	7.22911E 05
25.0000	57.425	1.6473	102.63	55.575	3524.6	24.660	64.239	7.19171E 05
25.2500	57.014	1.6388	102.10	55.986	3550.2	24.533	63.584	7.15478E 05
25.5000	56.605	1.6305	101.58	57.395	3575.7	24.408	62.941	7.11832E 05
25.7500	56.198	1.6222	101.06	57.802	3601.0	24.285	62.309	7.08231E 05
26.0000	55.794	1.6141	100.56	58.206	3626.2	24.163	61.687	7.04674E 05
26.2500	55.391	1.6060	100.05	58.609	3651.3	24.042	61.076	7.01159E 05
26.5000	54.991	1.5981	99.559	59.009	3676.3	23.923	60.475	6.97687E 05
26.7500	54.592	1.5902	99.070	59.408	3701.1	23.805	59.885	6.94256E 05

LT 113-50

C-60

LOFT ACC SS CALC @ 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 562.50

TIME	VL	C	W	VLD	VLOM	VELL	DELTAP	RENUM
27.0000	54.196	1.5824	98.586	59.804	3725.8	23.689	59.304	6.90865E 05
27.2500	53.801	1.5749	98.109	60.199	3750.4	23.574	58.732	6.87514E 05
27.5000	53.408	1.5672	97.635	60.592	3774.9	23.461	58.170	6.84201E 05
27.7500	53.017	1.5597	97.168	60.983	3799.2	23.348	57.617	6.80926E 05
28.0000	52.628	1.5523	96.706	61.372	3823.5	23.237	57.073	6.77687E 05
28.2500	52.241	1.5449	96.249	61.759	3847.6	23.128	56.537	6.74485E 05
28.5000	51.856	1.5377	95.797	62.144	3871.6	23.019	56.010	6.71319E 05
28.7500	51.472	1.5305	95.350	62.528	3895.5	22.912	55.490	6.68186E 05
29.0000	51.090	1.5234	94.908	62.910	3919.3	22.805	54.979	6.65088E 05
29.2500	50.710	1.5164	94.470	63.290	3942.9	22.700	54.476	6.62023E 05
29.5000	50.332	1.5094	94.038	63.668	3966.5	22.596	53.980	6.58992E 05
29.7500	49.956	1.5026	93.609	64.044	3990.0	22.493	53.492	6.55991E 05
30.0000	49.581	1.4958	93.186	64.419	4013.3	22.392	53.011	6.53022E 05
30.2500	49.208	1.4890	92.767	64.792	4036.6	22.291	52.537	6.50084E 05
30.5000	48.836	1.4824	92.352	65.164	4059.7	22.191	52.070	6.47176E 05
30.7500	48.466	1.4758	91.941	65.534	4082.7	22.092	51.609	6.44298E 05
31.0000	48.098	1.4692	91.534	65.902	4105.7	21.995	51.156	6.41448E 05
31.2500	47.732	1.4628	91.132	66.268	4128.5	21.898	50.709	6.38627E 05
31.5000	47.367	1.4564	90.733	66.633	4151.2	21.802	50.268	6.35833E 05
31.7500	47.004	1.4501	90.338	66.996	4173.9	21.707	49.833	6.33068E 05
32.0000	46.642	1.4438	89.948	67.358	4196.4	21.613	49.405	6.30329E 05
32.2500	46.282	1.4376	89.560	67.718	4218.9	21.520	48.982	6.27617E 05
32.5000	45.923	1.4314	89.177	68.077	4241.2	21.428	48.565	6.24930E 05
32.7500	45.566	1.4253	88.797	68.434	4263.4	21.337	48.154	6.22269E 05
33.0000	45.210	1.4193	88.421	68.790	4285.6	21.247	47.749	6.19632E 05
33.2500	44.856	1.4133	88.048	69.144	4307.7	21.157	47.349	6.17021E 05
33.5000	44.503	1.4074	87.679	69.497	4329.6	21.068	46.954	6.14433E 05
33.7500	44.152	1.4015	87.313	69.848	4351.5	20.981	46.564	6.11870E 05
34.0000	43.803	1.3957	86.951	70.197	4373.3	20.893	46.180	6.09329E 05
34.2500	43.454	1.3899	86.592	70.546	4395.0	20.807	45.801	6.06811E 05
34.5000	43.108	1.3842	86.235	70.892	4416.6	20.722	45.426	6.04315E 05
34.7500	42.762	1.3785	85.883	71.238	4438.1	20.637	45.057	6.01842E 05
35.0000	42.418	1.3729	85.533	71.582	4459.5	20.553	44.692	5.99390E 05
35.2500	42.076	1.3673	85.185	71.924	4480.9	20.469	44.332	5.96955E 05
35.5000	41.735	1.3618	84.841	72.265	4502.1	20.386	43.976	5.94541E 05
35.7500	41.395	1.3563	84.499	72.605	4523.3	20.304	43.625	5.92148E 05
36.0000	41.056	1.3509	84.161	72.944	4544.4	20.223	43.278	5.89776E 05
36.2500	40.719	1.3455	83.825	73.281	4565.4	20.142	42.935	5.87423E 05
36.5000	40.383	1.3402	83.492	73.617	4586.3	20.062	42.597	5.85090E 05
36.7500	40.049	1.3349	83.162	73.951	4607.1	19.983	42.262	5.82777E 05
37.0000	39.716	1.3296	82.835	74.284	4627.9	19.904	41.932	5.80482E 05
37.2500	39.384	1.3244	82.510	74.616	4648.6	19.826	41.606	5.78207E 05
37.5000	39.054	1.3192	82.188	74.946	4669.2	19.749	41.283	5.75950E 05
37.7500	38.725	1.3141	81.868	75.275	4689.7	19.672	40.965	5.73712E 05
38.0000	38.397	1.3090	81.551	75.603	4710.1	19.596	40.650	5.71491E 05
38.2500	38.070	1.3040	81.237	75.930	4730.4	19.520	40.339	5.69288E 05
38.5000	37.745	1.2990	80.925	76.255	4750.7	19.445	40.032	5.67102E 05
38.7500	37.420	1.2940	80.616	76.580	4770.9	19.371	39.728	5.64934E 05
39.0000	37.097	1.2891	80.309	76.903	4791.0	19.297	39.427	5.62782E 05
39.2500	36.776	1.2842	80.004	77.224	4811.1	19.224	39.130	5.60647E 05
39.5000	36.455	1.2793	79.702	77.545	4831.0	19.152	38.837	5.58528E 05
39.7500	36.136	1.2745	79.402	77.864	4850.9	19.079	38.546	5.56426E 05
40.0000	35.818	1.2697	79.104	78.182	4870.7	19.008	38.259	5.54339E 05
40.2500	35.501	1.2650	78.808	78.499	4890.5	18.937	37.976	5.52268E 05

LTR 11350

LOFT ACC PRESS CALC @ 20CLFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

990 = 562.50

TIME	VL	Q	W	VLD	VLDL	VELL	DELTA	RENUM
40.5000	35.185	1.2603	78.515	78.815	4910.1	18.866	37.655	5.50212E C5
40.7500	34.871	1.2556	78.224	79.129	4929.7	18.796	37.417	5.48171E C5
41.0000	34.558	1.2510	77.935	79.442	4949.3	18.727	37.143	5.46146E C5
41.2500	34.245	1.2464	77.648	79.755	4968.7	18.658	36.871	5.44135E C5
41.5000	33.934	1.2418	77.363	80.066	4988.1	18.590	36.602	5.42139E C5
41.7500	33.624	1.2372	77.080	80.376	5007.4	18.522	36.337	5.40157E C5
42.0000	33.316	1.2327	76.799	80.684	5026.6	18.454	36.074	5.38189E C5
42.2500	33.008	1.2283	76.520	80.992	5045.8	18.387	35.814	5.36235E C5
42.5000	32.701	1.2238	76.244	81.299	5064.9	18.321	35.556	5.34295E C5
42.7500	32.396	1.2194	75.969	81.604	5083.9	18.254	35.302	5.32368E C5
43.0000	32.092	1.2150	75.696	81.908	5102.9	18.189	35.050	5.30455E C5
43.2500	31.788	1.2107	75.425	82.212	5121.8	18.124	34.800	5.28556E C5
43.5000	31.486	1.2063	75.155	82.514	5140.6	18.059	34.554	5.26668E C5
43.7500	31.185	1.2021	74.888	82.815	5159.4	17.995	34.309	5.24794E C5
44.0000	30.885	1.1978	74.622	83.115	5178.1	17.931	34.068	5.22932E C5
44.2500	30.586	1.1936	74.358	83.414	5196.7	17.868	33.828	5.21083E C5
44.5000	30.288	1.1893	74.096	83.712	5215.2	17.805	33.591	5.19247E C5
44.7500	29.991	1.1852	73.836	84.009	5233.7	17.742	33.357	5.17422E C5
45.0000	29.696	1.1810	73.577	84.304	5252.2	17.680	33.125	5.15609E C5
45.2500	29.401	1.1769	73.320	84.599	5270.5	17.618	32.895	5.13809E C5
45.5000	29.107	1.1728	73.065	84.893	5288.8	17.557	32.667	5.12019E C5
45.7500	28.814	1.1687	72.811	85.186	5307.1	17.496	32.442	5.10242E C5
46.0000	28.523	1.1647	72.559	85.477	5325.2	17.435	32.219	5.08475E C5
46.2500	28.232	1.1607	72.309	85.768	5343.3	17.375	31.998	5.06720E C5
46.5000	27.942	1.1567	72.060	86.058	5361.4	17.315	31.779	5.04976E C5
46.7500	27.654	1.1527	71.813	86.346	5379.4	17.256	31.563	5.03244E C5
47.0000	27.366	1.1487	71.567	86.534	5397.3	17.197	31.348	5.01521E C5
47.2500	27.079	1.1448	71.323	86.921	5415.2	17.138	31.135	4.99810E C5
47.5000	26.793	1.1409	71.080	87.207	5433.0	17.080	30.925	4.98108E C5
47.7500	26.509	1.1371	70.839	87.491	5450.7	17.022	30.716	4.96418E C5
48.0000	26.225	1.1332	70.599	87.775	5468.4	16.964	30.510	4.94738E C5
48.2500	25.942	1.1294	70.360	88.058	5486.0	16.907	30.305	4.93068E C5
48.5000	25.660	1.1256	70.124	88.340	5503.6	16.850	30.102	4.91408E C5
48.7500	25.379	1.1218	69.888	88.621	5521.1	16.793	29.901	4.89757E C5
49.0000	25.099	1.1180	69.554	88.901	5538.5	16.737	29.702	4.88117E C5
49.2500	24.820	1.1143	69.421	89.180	5555.9	16.681	29.505	4.86486E C5
49.5000	24.542	1.1106	69.190	89.458	5573.2	16.626	29.310	4.84865E C5
49.7500	24.265	1.1069	68.960	89.735	5590.5	16.570	29.116	4.83253E C5
50.0000	23.988	1.1032	68.731	90.012	5607.7	16.515	28.924	4.81650E C5
50.2500	23.713	1.0996	68.504	90.287	5624.9	16.461	28.734	4.80057E C5
50.5000	23.439	1.0960	68.278	90.561	5642.0	16.406	28.545	4.78473E C5
50.7500	23.165	1.0923	68.053	90.835	5659.0	16.352	28.359	4.76898E C5
51.0000	22.892	1.0888	67.830	91.108	5676.0	16.299	28.174	4.75331E C5
51.2500	22.620	1.0852	67.607	91.380	5692.9	16.245	27.990	4.73774E C5
51.5000	22.350	1.0816	67.386	91.650	5709.8	16.192	27.808	4.72225E C5
51.7500	22.080	1.0781	67.166	91.920	5726.6	16.139	27.628	4.70685E C5
52.0000	21.810	1.0746	66.948	92.190	5743.4	16.087	27.449	4.69153E C5
52.2500	21.542	1.0711	66.730	92.458	5760.1	16.035	27.272	4.67630E C5
52.5000	21.275	1.0676	66.514	92.725	5776.8	15.983	27.096	4.66115E C5
52.7500	21.008	1.0642	66.299	92.992	5793.4	15.931	26.922	4.64608E C5
53.0000	20.743	1.0608	66.085	93.257	5809.9	15.880	26.750	4.63110E C5
53.2500	20.478	1.0573	65.873	93.522	5826.4	15.829	26.578	4.61619E C5
53.5000	20.214	1.0540	65.661	93.786	5842.9	15.778	26.409	4.60136E C5
53.7500	19.951	1.0506	65.451	94.049	5859.3	15.727	26.240	4.58661E C5

C-62

LT 113-50

LOFT ACC PRESS CALC @ 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.
 FRT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 562.50

TIME	VL	Q	W	VLD	VLDM	VELL	DEL TAP	RENUM
54.0000	19.689	1.0472	65.241	94.311	5875.6	15.677	26.074	4.57193E 05
54.2500	19.427	1.0439	65.033	94.573	5891.9	15.627	25.908	4.55734E 05
54.5000	19.167	1.0405	64.826	94.833	5908.1	15.577	25.744	4.54282E 05
54.7500	18.907	1.0372	64.620	95.093	5924.3	15.527	25.581	4.52838E 05
55.0000	18.648	1.0339	64.415	95.352	5940.4	15.478	25.420	4.51401E 05
55.2500	18.390	1.0307	64.211	95.610	5956.5	15.429	25.260	4.49971E 05
55.5000	18.133	1.0274	64.008	95.867	5972.5	15.380	25.101	4.48549E 05
55.7500	17.876	1.0242	63.806	96.124	5988.5	15.332	24.944	4.47133E 05
56.0000	17.620	1.0209	63.605	96.380	6004.4	15.284	24.787	4.45725E 05
56.2500	17.366	1.0177	63.405	96.634	6020.3	15.236	24.632	4.44324E 05
56.5000	17.111	1.0145	63.206	96.889	6036.2	15.188	24.479	4.42930E 05
56.7500	16.858	1.0114	63.008	97.142	6051.9	15.140	24.326	4.41543E 05
57.0000	16.606	1.0082	62.811	97.394	6067.7	15.093	24.175	4.40162E 05
57.2500	16.354	1.0051	62.615	97.646	6083.3	15.046	24.025	4.38788E 05
57.5000	16.103	1.0019	62.420	97.897	6099.0	14.999	23.876	4.37421E 05
57.7500	15.853	0.99880	62.226	98.147	6114.6	14.952	23.729	4.36060E 05
58.0000	15.604	0.99570	62.032	98.396	6130.1	14.906	23.582	4.34706E 05
58.2500	15.355	0.99262	61.840	98.645	6145.6	14.860	23.437	4.33359E 05
58.5000	15.107	0.98955	61.649	98.893	6161.0	14.814	23.292	4.32018E 05
58.7500	14.860	0.98649	61.458	99.140	6176.4	14.768	23.149	4.30683E 05
59.0000	14.614	0.98345	61.269	99.386	6191.7	14.722	23.007	4.29355E 05
59.2500	14.369	0.98042	61.080	99.631	6207.0	14.677	22.866	4.28032E 05
59.5000	14.124	0.97740	60.892	99.876	6222.3	14.632	22.727	4.26716E 05
59.7500	13.880	0.97440	60.705	100.12	6237.5	14.587	22.588	4.25406E 05
60.0000	13.637	0.97141	60.519	100.36	6252.6	14.542	22.450	4.24102E 05
60.2500	13.394	0.96844	60.334	100.61	6267.7	14.498	22.313	4.22804E 05
60.5000	13.152	0.96548	60.150	100.85	6282.8	14.453	22.178	4.21512E 05
60.7500	12.911	0.96254	59.966	101.09	6297.8	14.409	22.043	4.20226E 05
61.0000	12.671	0.95960	59.783	101.33	6312.8	14.365	21.910	4.18946E 05
61.2500	12.432	0.95668	59.601	101.57	6327.7	14.322	21.777	4.17671E 05
61.5000	12.193	0.95378	59.420	101.81	6342.6	14.278	21.645	4.16402E 05
61.7500	11.955	0.95088	59.240	102.05	6357.4	14.235	21.515	4.15138E 05
62.0000	11.717	0.94800	59.060	102.28	6372.2	14.192	21.385	4.13880E 05
62.2500	11.481	0.94513	58.882	102.52	6386.9	14.149	21.256	4.12628E 05
62.5000	11.245	0.94228	58.704	102.76	6401.6	14.106	21.129	4.11381E 05
62.7500	11.010	0.93943	58.527	102.99	6416.3	14.063	21.002	4.10140E 05
63.0000	10.775	0.93660	58.350	103.22	6430.9	14.021	20.876	4.08903E 05
63.2500	10.541	0.93378	58.175	103.46	6445.5	13.979	20.751	4.07672E 05
63.5000	10.308	0.93097	58.000	103.69	6460.0	13.937	20.627	4.06447E 05
63.7500	10.076	0.92818	57.826	103.92	6474.5	13.895	20.504	4.05227E 05
64.0000	9.8441	0.92540	57.652	104.16	6488.9	13.853	20.381	4.04011E 05
64.2500	9.6131	0.92262	57.479	104.39	6503.3	13.812	20.260	4.02801E 05
64.5000	9.3828	0.91986	57.308	104.62	6517.6	13.770	20.139	4.01596E 05
64.7500	9.1532	0.91712	57.136	104.85	6532.0	13.729	20.020	4.00396E 05
65.0000	8.9242	0.91437	56.965	105.08	6546.2	13.688	19.901	3.99197E 05
65.2500	8.6960	0.91164	56.795	105.30	6560.4	13.647	19.783	3.98003E 05
65.5000	8.4684	0.90891	56.625	105.53	6574.6	13.606	19.666	3.96813E 05
65.7500	8.2415	0.90620	56.456	105.76	6588.8	13.566	19.549	3.95628E 05
66.0000	8.0153	0.90349	56.288	105.98	6602.8	13.525	19.434	3.94448E 05
66.2500	7.7898	0.90080	56.120	106.21	6616.9	13.485	19.319	3.93273E 05
66.5000	7.5649	0.89812	55.953	106.44	6630.9	13.445	19.205	3.92103E 05
66.7500	7.3407	0.89545	55.787	106.66	6644.9	13.405	19.092	3.90937E 05
67.0000	7.1172	0.89279	55.621	106.88	6658.8	13.365	18.979	3.89776E 05
67.2500	6.8943	0.89014	55.456	107.11	6672.7	13.326	18.868	3.88620E 05

ATR1350

LOFT ACC PRESS CALC @ 20CLFT GAS @ 525 @ 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT @ OTHER PARAMS AS RELAP 10AP78

PGO = 56250

TIME	VL	Q	M	VLO	VLOM	VELL	DELTAP	RENUM
67.5000	6.3721	0.88751	55.292	107.33	6686.5	13.286	18.757	3.87468E 05
67.7500	6.4505	0.88488	55.128	107.55	6700.3	13.247	18.647	3.86321E 05
68.0000	6.2296	0.88226	54.965	107.77	6714.1	13.207	18.538	3.85178E 05
68.2500	6.0094	0.87965	54.802	107.99	6727.8	13.168	18.429	3.84040E 05
68.5000	5.7898	0.87706	54.641	108.21	6741.5	13.130	18.321	3.82906E 05
68.7500	5.5709	0.87447	54.479	108.43	6755.1	13.091	18.214	3.81777E 05
69.0000	5.3526	0.87189	54.319	108.65	6768.7	13.052	18.108	3.80652E 05
69.2500	5.1349	0.86932	54.159	108.87	6782.3	13.014	18.002	3.79531E 05
69.5000	4.9179	0.86677	54.000	109.08	6795.8	12.976	17.897	3.78414E 05
69.7500	4.7015	0.86422	53.841	109.30	6809.3	12.937	17.793	3.77302E 05
70.0000	4.4858	0.86168	53.683	109.51	6822.7	12.899	17.689	3.76194E 05
70.2500	4.2707	0.85915	53.525	109.73	6836.1	12.862	17.586	3.75090E 05
70.5000	4.0562	0.85663	53.368	109.94	6849.5	12.824	17.484	3.73990E 05
70.7500	3.8424	0.85412	53.212	110.16	6862.8	12.786	17.382	3.72895E 05
71.0000	3.6291	0.85162	53.056	110.37	6876.1	12.749	17.281	3.71803E 05
71.2500	3.4165	0.84913	52.901	110.58	6889.3	12.712	17.181	3.70715E 05
71.5000	3.2046	0.84665	52.746	110.80	6902.6	12.674	17.081	3.69632E 05
71.7500	2.9932	0.84418	52.592	111.01	6915.7	12.637	16.983	3.68552E 05
72.0000	2.7825	0.84171	52.439	111.22	6928.8	12.600	16.884	3.67476E 05
72.2500	2.5723	0.83926	52.286	111.43	6941.9	12.564	16.787	3.66405E 05
72.5000	2.3628	0.83681	52.133	111.64	6955.0	12.527	16.690	3.65337E 05
72.7500	2.1539	0.83437	51.982	111.85	6968.0	12.491	16.593	3.64272E 05
73.0000	1.9456	0.83195	51.830	112.05	6981.0	12.454	16.497	3.63212E 05
73.2500	1.7380	0.82953	51.679	112.26	6993.9	12.418	16.402	3.62155E 05
73.5000	1.5309	0.82711	51.529	112.47	7006.8	12.382	16.308	3.61103E 05
73.7500	1.3244	0.82471	51.379	112.68	7019.7	12.346	16.214	3.60053E 05
74.0000	1.1185	0.82232	51.230	112.88	7032.5	12.310	16.120	3.59008E 05
74.2500	0.91324	0.81993	51.082	113.09	7045.3	12.274	16.028	3.57966E 05
74.5000	0.70855	0.81755	50.933	113.29	7058.1	12.239	15.935	3.56928E 05
74.7500	0.50446	0.81518	50.786	113.50	7070.8	12.203	15.844	3.55893E 05
75.0000	0.30096	0.81282	50.639	113.70	7083.4	12.168	15.753	3.54862E 05
75.2500	9.80500E-02	0.81047	50.492	113.90	7096.1	12.133	15.662	3.53835E 05

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL 7.80031E-03

C-64

LTRE-30

LCFT ACC PRESS CALC 2 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PG0 = 537.50

TIME	VL	G	W	VLD	VLOM	VELL	DELTAP	RENUM
0.0	114.00	6.42688E-04	4.00394E-02	0.0	0.0	9.62107E-03	1.00000E-05	269.16
0.250000	114.00	6.42688E-04	4.00394E-02	2.28882E-04	1.42593E-02	9.62107E-03	1.00000E-05	269.16
0.500000	114.00	6.42688E-04	4.00394E-02	4.57764E-04	2.85187E-02	9.62107E-03	1.00000E-05	269.16
0.750000	114.00	6.42688E-04	4.00394E-02	6.86646E-04	4.27780E-02	9.62107E-03	1.00000E-05	269.16
1.000000	114.00	6.42688E-04	4.00394E-02	9.15527E-04	5.70373E-02	9.62107E-03	1.00000E-05	269.16
1.250000	114.00	6.42688E-04	4.00394E-02	1.14441E-03	7.12966E-02	9.62107E-03	1.00000E-05	269.16
1.500000	114.00	6.42688E-04	4.00394E-02	1.37329E-03	8.5556CE-02	9.62107E-03	1.00000E-05	269.16
1.750000	113.88	1.6537	103.03	0.11621	7.2399	24.756	64.739	7.21976E 05
2.000000	113.28	2.9993	186.85	0.71596	44.604	44.899	211.98	1.30942E 06
2.250000	112.46	3.5980	224.16	1.5432	96.142	53.863	304.66	1.57083E 06
2.500000	111.53	3.7850	235.80	2.4662	153.64	56.661	337.00	1.65245E 06
2.750000	110.57	3.9175	244.06	3.4289	213.62	58.645	360.91	1.71031E 06
3.000000	109.59	3.8958	242.71	4.4053	274.45	58.321	356.94	1.70085E 06
3.250000	108.63	3.8045	237.02	5.3676	334.40	56.954	340.47	1.66097E 06
3.500000	107.69	3.7240	232.01	6.3085	393.02	55.749	326.28	1.62585E 06
3.750000	106.77	3.6530	227.58	7.2305	450.46	54.686	314.01	1.59485E 06
4.000000	105.86	3.5903	223.68	8.1358	506.86	53.747	303.36	1.56747E 06
4.250000	104.97	3.5349	220.22	9.0264	562.34	52.917	294.10	1.54326E 06
4.500000	104.10	3.4859	217.17	9.9039	617.01	52.184	286.04	1.52188E 06
4.750000	103.23	3.4119	212.56	10.766	670.72	51.076	274.07	1.48957E 06
5.000000	102.39	3.3427	208.25	11.610	723.32	50.040	263.10	1.45935E 06
5.250000	101.56	3.2777	204.20	12.438	774.87	49.067	253.01	1.43098E 06
5.500000	100.75	3.2165	200.39	13.249	825.44	48.152	243.69	1.40429E 06
5.750000	99.954	3.1589	196.80	14.046	875.09	47.288	235.06	1.37910E 06
6.000000	99.171	3.1043	193.40	14.829	923.86	46.471	227.04	1.35528E 06
6.250000	98.401	3.0526	190.18	15.599	971.81	45.697	219.56	1.33270E 06
6.500000	97.644	3.0034	187.11	16.356	1019.0	44.962	212.58	1.31125E 06
6.750000	96.899	2.9567	184.20	17.101	1065.4	44.262	206.03	1.29084E 06
7.000000	96.166	2.9121	181.43	17.834	1111.1	43.595	199.89	1.27138E 06
7.250000	95.443	2.8696	178.77	18.557	1156.1	42.958	194.11	1.25280E 06
7.500000	94.731	2.8289	176.24	19.269	1200.5	42.348	188.66	1.23503E 06
7.750000	94.028	2.7899	173.81	19.972	1244.2	41.765	183.51	1.21802E 06
8.000000	93.335	2.7525	171.48	20.665	1287.4	41.205	178.64	1.20169E 06
8.250000	92.652	2.7166	169.24	21.348	1330.0	40.668	174.02	1.18602E 06
8.500000	91.977	2.6821	167.09	22.023	1372.0	40.151	169.64	1.17095E 06
8.750000	91.311	2.6489	165.02	22.689	1413.6	39.654	165.48	1.15645E 06
9.000000	90.652	2.6169	163.03	23.348	1454.6	39.174	161.92	1.14247E 06
9.250000	90.002	2.5860	161.11	23.998	1495.1	38.712	157.74	1.12899E 06
9.500000	89.359	2.5562	159.25	24.641	1535.1	38.266	154.13	1.11598E 06
9.750000	88.724	2.5274	157.46	25.276	1574.7	37.835	150.69	1.10341E 06
10.000000	88.095	2.4995	155.72	25.905	1613.9	37.418	147.39	1.09124E 06
10.250000	87.474	2.4725	154.04	26.526	1652.6	37.014	144.24	1.07947E 06
10.500000	86.859	2.4464	152.41	27.141	1690.9	36.623	141.22	1.06807E 06
10.750000	86.251	2.4211	150.83	27.749	1728.8	36.244	138.32	1.05701E 06
11.000000	85.648	2.3965	149.30	28.352	1766.3	35.876	135.53	1.04628E 06
11.250000	85.052	2.3727	147.82	28.948	1803.4	35.519	132.85	1.03587E 06
11.500000	84.462	2.3495	146.37	29.538	1840.2	35.172	130.28	1.02579E 06
11.750000	83.877	2.3270	144.97	30.123	1876.6	34.835	127.80	1.01592E 06
12.000000	83.298	2.3051	143.61	30.702	1912.7	34.507	125.41	1.00635E 06
12.250000	82.725	2.2837	142.28	31.275	1948.5	34.188	123.11	9.97036E 05
12.500000	82.156	2.2629	140.98	31.844	1983.9	33.876	120.88	9.87950E 05
12.750000	81.593	2.2426	139.72	32.407	2019.0	33.573	118.74	9.79099E 05
13.000000	81.035	2.2229	138.49	32.965	2053.7	33.277	116.66	9.70471E 05
13.250000	80.481	2.2036	137.28	33.519	2088.2	32.988	114.66	9.62056E 05

47X11-50

LOFT ACC PRESS CALC @ 20CLFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 537.50

TIME	VL	Q	W	VLD	VLOM	VELL	DELTAP	RENUM
13.5000	79.933	2.1848	136.11	34.067	2122.4	32.707	112.72	9.53846E 05
13.7500	79.389	2.1664	134.97	34.611	2156.3	32.432	110.84	9.45832E 05
14.0000	78.850	2.1485	133.85	35.150	2189.9	32.163	109.02	9.38005E 05
14.2500	78.315	2.1310	132.76	35.685	2223.2	31.901	107.26	9.30358E 05
14.5000	77.784	2.1139	131.69	36.216	2256.3	31.645	105.55	9.22884E 05
14.7500	77.258	2.0971	130.65	36.742	2289.1	31.394	103.89	9.15575E 05
15.0000	76.735	2.0808	129.63	37.265	2321.6	31.149	102.28	9.08426E 05
15.2500	76.217	2.0647	128.63	37.783	2353.9	30.909	100.72	9.01430E 05
15.5000	75.703	2.0491	127.66	38.297	2385.9	30.674	99.203	8.94581E 05
15.7500	75.192	2.0337	126.70	38.808	2417.7	30.445	97.728	8.87875E 05
16.0000	74.686	2.0186	125.76	39.314	2449.3	30.219	96.293	8.81305E 05
16.2500	74.183	2.0039	124.84	39.817	2480.6	29.998	94.897	8.74866E 05
16.5000	73.684	1.9894	123.94	40.316	2511.7	29.782	93.538	8.68556E 05
16.7500	73.188	1.9753	123.06	40.812	2542.6	29.570	92.216	8.62367E 05
17.0000	72.696	1.9614	122.19	41.304	2573.2	29.362	90.928	8.56297E 05
17.2500	72.207	1.9477	121.34	41.793	2603.7	29.158	89.672	8.50342E 05
17.5000	71.722	1.9343	120.51	42.278	2633.9	28.957	88.449	8.44496E 05
17.7500	71.240	1.9212	119.69	42.760	2663.9	28.760	87.256	8.38759E 05
18.0000	70.761	1.9083	118.89	43.239	2693.8	28.567	86.092	8.33124E 05
18.2500	70.286	1.8956	118.10	43.714	2723.4	28.377	84.957	8.27590E 05
18.5000	69.814	1.8832	117.32	44.186	2752.8	28.191	83.848	8.22152E 05
18.7500	69.344	1.8709	116.56	44.656	2782.0	28.008	82.766	8.16809E 05
19.0000	68.878	1.8589	115.81	45.122	2811.1	27.828	81.709	8.11556E 05
19.2500	68.415	1.8471	115.07	45.585	2840.0	27.651	80.677	8.06392E 05
19.5000	67.954	1.8354	114.35	46.046	2868.6	27.476	79.668	8.01313E 05
19.7500	67.497	1.8240	113.63	46.503	2897.1	27.305	78.681	7.96312E 05
20.0000	67.042	1.8127	112.93	46.958	2925.5	27.136	77.717	7.91391E 05
20.2500	66.591	1.8016	112.24	47.409	2953.6	26.970	76.773	7.86548E 05
20.5000	66.141	1.7907	111.56	47.859	2981.6	26.807	75.850	7.81782E 05
20.7500	65.695	1.7799	110.89	48.305	3009.4	26.646	74.947	7.77089E 05
21.0000	65.251	1.7694	110.23	48.749	3037.0	26.487	74.063	7.72469E 05
21.2500	64.810	1.7589	109.58	49.190	3064.5	26.331	73.197	7.67918E 05
21.5000	64.372	1.7487	108.94	49.628	3091.8	26.178	72.349	7.63435E 05
21.7500	63.936	1.7385	108.31	50.064	3119.0	26.026	71.519	7.59019E 05
22.0000	63.503	1.7286	107.69	50.497	3146.0	25.877	70.705	7.54667E 05
22.2500	63.072	1.7188	107.08	50.928	3172.8	25.730	69.907	7.50378E 05
22.5000	62.643	1.7091	106.48	51.357	3199.5	25.585	69.126	7.46150E 05
22.7500	62.217	1.6995	105.88	51.783	3226.1	25.442	68.359	7.41982E 05
23.0000	61.793	1.6901	105.29	52.207	3252.5	25.301	67.607	7.37871E 05
23.2500	61.372	1.6808	104.72	52.628	3278.7	25.162	66.870	7.33818E 05
23.5000	60.953	1.6717	104.14	53.047	3304.8	25.025	66.147	7.29819E 05
23.7500	60.536	1.6626	103.58	53.464	3330.8	24.890	65.437	7.25874E 05
24.0000	60.121	1.6537	103.03	53.879	3356.6	24.756	64.740	7.21982E 05
24.2500	59.709	1.6449	102.48	54.291	3382.3	24.624	64.056	7.18140E 05
24.5000	59.299	1.6362	101.94	54.701	3407.9	24.494	63.385	7.14348E 05
24.7500	58.891	1.6277	101.40	55.109	3433.3	24.366	62.725	7.10606E 05
25.0000	58.485	1.6192	100.88	55.515	3458.6	24.239	62.078	7.06911E 05
25.2500	58.081	1.6108	100.36	55.919	3483.7	24.114	61.441	7.03262E 05
25.5000	57.679	1.6026	99.841	56.321	3508.8	23.991	60.816	6.99659E 05
25.7500	57.280	1.5944	99.333	56.720	3533.7	23.869	60.202	6.96100E 05
26.0000	56.882	1.5864	98.831	57.118	3558.4	23.748	59.598	6.92585E 05
26.2500	56.487	1.5784	98.336	57.513	3583.1	23.629	59.004	6.89111E 05
26.5000	56.093	1.5706	97.846	57.907	3607.6	23.511	58.421	6.85680E 05
26.7500	55.701	1.5628	97.362	58.299	3632.0	23.395	57.847	6.82288E 05

C-66

LTR 11/8/80

LOFT ACC PRESS CALC @ 200LFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 537.50

TIME	VL	Q	W	VLD	VLDL	VELL	DELTAP	RENUM
27.0000	55.311	1.5551	96.884	58.689	3656.3	23.280	57.282	6.78937E 05
27.2500	54.924	1.5475	96.411	59.076	3680.5	23.167	56.727	6.75624E 05
27.5000	54.538	1.5400	95.944	59.462	3704.5	23.054	56.181	6.72349E 05
27.7500	54.153	1.5326	95.482	59.847	3728.4	22.943	55.643	6.69112E 05
28.0000	53.771	1.5253	95.025	60.229	3752.3	22.834	55.115	6.65910E 05
28.2500	53.391	1.5180	94.573	60.609	3776.0	22.725	54.594	6.62744E 05
28.5000	53.012	1.5109	94.126	60.988	3799.5	22.618	54.082	6.59614E 05
28.7500	52.635	1.5038	93.685	61.365	3823.0	22.511	53.577	6.56517E 05
29.0000	52.260	1.4967	93.247	61.740	3846.4	22.406	53.080	6.53454E 05
29.2500	51.887	1.4898	92.815	62.113	3869.7	22.302	52.591	6.50423E 05
29.5000	51.515	1.4829	92.387	62.485	3892.8	22.200	52.109	6.47425E 05
29.7500	51.145	1.4761	91.964	62.855	3915.9	22.098	51.635	6.44458E 05
30.0000	50.777	1.4694	91.545	63.223	3938.8	21.997	51.168	6.41522E 05
30.2500	50.410	1.4628	91.130	63.590	3961.6	21.898	50.707	6.38616E 05
30.5000	50.046	1.4562	90.720	63.954	3984.4	21.799	50.253	6.35740E 05
30.7500	49.682	1.4497	90.313	64.318	4007.0	21.701	49.806	6.32893E 05
31.0000	49.321	1.4432	89.911	64.679	4029.5	21.605	49.365	6.30075E 05
31.2500	48.961	1.4368	89.513	65.039	4052.0	21.509	48.931	6.27284E 05
31.5000	48.602	1.4305	89.119	65.398	4074.3	21.414	48.502	6.24521E 05
31.7500	48.245	1.4242	88.728	65.755	4096.5	21.321	48.080	6.21785E 05
32.0000	47.890	1.4180	88.342	66.110	4118.6	21.228	47.663	6.19076E 05
32.2500	47.536	1.4119	87.959	66.464	4140.7	21.136	47.253	6.16352E 05
32.5000	47.184	1.4058	87.580	66.816	4162.6	21.044	46.848	6.13734E 05
32.7500	46.833	1.3997	87.204	67.167	4184.5	20.954	46.448	6.11102E 05
33.0000	46.484	1.3938	86.832	67.516	4206.2	20.865	46.054	6.08493E 05
33.2500	46.136	1.3878	86.463	67.864	4227.9	20.776	45.665	6.05909E 05
33.5000	45.790	1.3820	86.098	68.210	4249.5	20.688	45.282	6.03349E 05
33.7500	45.445	1.3762	85.735	68.555	4271.0	20.601	44.903	6.00812E 05
34.0000	45.102	1.3704	85.376	68.898	4292.3	20.515	44.530	5.98294E 05
34.2500	44.760	1.3647	85.020	69.240	4313.6	20.429	44.161	5.95798E 05
34.5000	44.420	1.3590	84.667	69.580	4334.9	20.345	43.797	5.93324E 05
34.7500	44.080	1.3534	84.317	69.920	4356.0	20.261	43.438	5.90872E 05
35.0000	43.743	1.3478	83.970	70.257	4377.0	20.177	43.083	5.88441E 05
35.2500	43.406	1.3423	83.626	70.594	4398.0	20.095	42.733	5.86032E 05
35.5000	43.072	1.3368	83.286	70.928	4418.8	20.013	42.387	5.83643E 05
35.7500	42.738	1.3314	82.948	71.262	4439.6	19.931	42.046	5.81275E 05
36.0000	42.406	1.3260	82.613	71.594	4460.3	19.851	41.709	5.78927E 05
36.2500	42.075	1.3207	82.280	71.925	4480.9	19.771	41.376	5.76598E 05
36.5000	41.745	1.3154	81.951	72.255	4501.5	19.692	41.047	5.74290E 05
36.7500	41.417	1.3102	81.624	72.583	4521.9	19.613	40.722	5.72000E 05
37.0000	41.090	1.3050	81.300	72.910	4542.3	19.536	40.401	5.69729E 05
37.2500	40.765	1.2998	80.979	73.235	4562.6	19.458	40.084	5.67477E 05
37.5000	40.440	1.2947	80.660	73.560	4582.8	19.382	39.771	5.65242E 05
37.7500	40.117	1.2896	80.344	73.883	4602.9	19.306	39.461	5.63026E 05
38.0000	39.795	1.2846	80.030	74.205	4622.9	19.230	39.155	5.60828E 05
38.2500	39.475	1.2796	79.719	74.525	4642.9	19.156	38.853	5.58647E 05
38.5000	39.155	1.2746	79.410	74.845	4662.8	19.081	38.554	5.56483E 05
38.7500	38.837	1.2697	79.103	75.163	4682.6	19.008	38.259	5.54336E 05
39.0000	38.520	1.2648	78.799	75.480	4702.4	18.935	37.967	5.52205E 05
39.2500	38.205	1.2600	78.498	75.795	4722.0	18.862	37.678	5.50091E 05
39.5000	37.890	1.2552	78.198	76.110	4741.6	18.790	37.393	5.47993E 05
39.7500	37.577	1.2504	77.901	76.423	4761.1	18.719	37.111	5.45911E 05
40.0000	37.265	1.2457	77.606	76.735	4780.6	18.648	36.832	5.43844E 05
40.2500	36.954	1.2410	77.314	77.046	4799.9	18.578	36.556	5.41794E 05

C-67

LT 1218.0

LOFT ACC PRESS CALC @ 20CUFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 537.50

TIME	VL	Q	W	VLD	VLOM	VELL	DELTAP	RENUM
40.5000	36.645	1.2363	77.023	77.355	4819.2	18.508	36.283	5.39758E 05
40.7500	36.336	1.2317	76.735	77.664	4838.5	18.439	36.014	5.37737E 05
41.0000	36.029	1.2271	76.448	77.971	4857.6	18.370	35.747	5.35730E 05
41.2500	35.722	1.2225	76.164	78.278	4876.7	18.301	35.483	5.33739E 05
41.5000	35.417	1.2180	75.882	78.583	4895.7	18.234	35.222	5.31761E 05
41.7500	35.113	1.2135	75.602	78.887	4914.6	18.166	34.963	5.29798E 05
42.0000	34.811	1.2090	75.324	79.189	4933.5	18.100	34.708	5.27849E 05
42.2500	34.509	1.2046	75.048	79.491	4952.3	18.033	34.455	5.25914E 05
42.5000	34.208	1.2002	74.773	79.792	4971.0	17.967	34.205	5.23991E 05
42.7500	33.909	1.1958	74.501	80.091	4989.7	17.902	33.958	5.22083E 05
43.0000	33.610	1.1915	74.230	80.390	5008.3	17.837	33.713	5.20188E 05
43.2500	33.313	1.1872	73.962	80.687	5026.8	17.772	33.470	5.18305E 05
43.5000	33.017	1.1829	73.695	80.983	5045.3	17.708	33.231	5.16436E 05
43.7500	32.721	1.1787	73.430	81.279	5063.7	17.645	32.993	5.14579E 05
44.0000	32.427	1.1744	73.167	81.573	5082.0	17.581	32.758	5.12734E 05
44.2500	32.134	1.1702	72.905	81.866	5100.2	17.518	32.526	5.10902E 05
44.5000	31.842	1.1661	72.646	82.158	5118.4	17.456	32.295	5.09082E 05
44.7500	31.551	1.1619	72.388	82.449	5136.6	17.394	32.068	5.07274E 05
45.0000	31.261	1.1579	72.131	82.739	5154.6	17.332	31.842	5.05477E 05
45.2500	30.972	1.1537	71.877	83.028	5172.6	17.271	31.619	5.03693E 05
45.5000	30.684	1.1497	71.624	83.316	5190.6	17.210	31.397	5.01920E 05
45.7500	30.397	1.1456	71.372	83.603	5208.5	17.150	31.179	5.00158E 05
46.0000	30.111	1.1416	71.122	83.889	5226.3	17.090	30.962	4.98407E 05
46.2500	29.826	1.1376	70.874	84.174	5244.0	17.030	30.747	4.96668E 05
46.5000	29.542	1.1337	70.627	84.458	5261.7	16.971	30.534	4.94939E 05
46.7500	29.259	1.1297	70.382	84.741	5279.3	16.912	30.324	4.93221E 05
47.0000	28.977	1.1258	70.139	85.023	5296.9	16.854	30.115	4.91514E 05
47.2500	28.696	1.1219	69.897	85.304	5314.4	16.795	29.909	4.89818E 05
47.5000	28.416	1.1181	69.656	85.584	5331.9	16.738	29.704	4.88132E 05
47.7500	28.137	1.1142	69.417	85.863	5349.3	16.680	29.501	4.86456E 05
48.0000	27.859	1.1104	69.179	86.141	5366.6	16.623	29.301	4.84790E 05
48.2500	27.582	1.1066	68.943	86.418	5383.8	16.566	29.102	4.83134E 05
48.5000	27.306	1.1029	68.708	86.694	5401.1	16.510	28.905	4.81488E 05
48.7500	27.030	1.0991	68.475	86.970	5418.2	16.454	28.710	4.79852E 05
49.0000	26.756	1.0954	68.242	87.244	5435.3	16.398	28.516	4.78225E 05
49.2500	26.483	1.0917	68.012	87.517	5452.3	16.343	28.324	4.76609E 05
49.5000	26.210	1.0880	67.782	87.790	5469.3	16.287	28.135	4.75001E 05
49.7500	25.939	1.0843	67.554	88.061	5486.2	16.233	27.946	4.73403E 05
50.0000	25.668	1.0807	67.328	88.332	5503.1	16.178	27.760	4.71814E 05
50.2500	25.398	1.0771	67.102	88.602	5519.9	16.124	27.575	4.70234E 05
50.5000	25.129	1.0735	66.878	88.871	5536.6	16.070	27.392	4.68663E 05
50.7500	24.861	1.0699	66.655	89.139	5553.3	16.017	27.211	4.67101E 05
51.0000	24.594	1.0663	66.433	89.406	5570.0	15.963	27.031	4.65547E 05
51.2500	24.328	1.0628	66.213	89.672	5586.6	15.910	26.852	4.64002E 05
51.5000	24.063	1.0593	65.994	89.937	5603.1	15.858	26.676	4.62466E 05
51.7500	23.798	1.0558	65.776	90.202	5619.6	15.805	26.501	4.60938E 05
52.0000	23.535	1.0523	65.559	90.465	5636.0	15.753	26.327	4.59419E 05
52.2500	23.272	1.0488	65.343	90.728	5652.3	15.701	26.155	4.57908E 05
52.5000	23.010	1.0454	65.129	90.990	5668.6	15.650	25.984	4.56405E 05
52.7500	22.749	1.0420	64.915	91.251	5684.9	15.599	25.815	4.54910E 05
53.0000	22.489	1.0386	64.703	91.511	5701.1	15.548	25.647	4.53423E 05
53.2500	22.230	1.0352	64.492	91.770	5717.3	15.497	25.481	4.51944E 05
53.5000	21.972	1.0318	64.282	92.028	5733.4	15.446	25.316	4.50473E 05
53.7500	21.714	1.0285	64.073	92.286	5749.4	15.396	25.152	4.49010E 05

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17X1850

LOFT ACC PRESS CALC @ 20CLFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HOT LEG BRK USING ACC VUL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 537.50

TIME	VL	C	W	VLD	VLDM	VELL	DELTAP	RENUM
54.0000	21.457	1.0251	63.866	92.543	5765.4	15.346	24.990	4.47554E 05
54.2500	21.201	1.0218	63.659	92.799	5781.3	15.297	24.830	4.46106E 05
54.5000	20.946	1.0185	63.453	93.054	5797.2	15.247	24.670	4.44665E 05
54.7500	20.692	1.0152	63.249	93.308	5813.1	15.198	24.512	4.43232E 05
55.0000	20.439	1.0120	63.045	93.561	5828.9	15.149	24.355	4.41806E 05
55.2500	20.186	1.0087	62.843	93.814	5844.6	15.101	24.200	4.40387E 05
55.5000	19.934	1.0055	62.642	94.066	5860.3	15.052	24.046	4.38976E 05
55.7500	19.683	1.0023	62.441	94.317	5875.9	15.004	23.893	4.37571E 05
56.0000	19.433	0.99906	62.242	94.567	5891.5	14.956	23.741	4.36174E 05
56.2500	19.184	0.99588	62.043	94.816	5907.1	14.908	23.590	4.34783E 05
56.5000	18.935	0.99271	61.846	95.065	5922.5	14.861	23.441	4.33400E 05
56.7500	18.687	0.98956	61.649	95.313	5938.0	14.814	23.293	4.32023E 05
57.0000	18.440	0.98642	61.454	95.560	5953.4	14.767	23.146	4.30653E 05
57.2500	18.194	0.98330	61.259	95.806	5968.7	14.720	23.000	4.29289E 05
57.5000	17.949	0.98019	61.066	96.051	5984.0	14.673	22.856	4.27933E 05
57.7500	17.704	0.97709	60.873	96.296	5999.2	14.627	22.712	4.26582E 05
58.0000	17.460	0.97402	60.681	96.540	6014.4	14.581	22.570	4.25238E 05
58.2500	17.217	0.97095	60.490	96.783	6029.6	14.535	22.429	4.23901E 05
58.5000	16.974	0.96790	60.300	97.026	6044.7	14.490	22.289	4.22569E 05
58.7500	16.733	0.96487	60.111	97.267	6059.7	14.444	22.150	4.21244E 05
59.0000	16.492	0.96185	59.923	97.508	6074.8	14.399	22.012	4.19925E 05
59.2500	16.252	0.95884	59.736	97.748	6089.7	14.354	21.875	4.18613E 05
59.5000	16.012	0.95585	59.549	97.988	6104.6	14.309	21.739	4.17306E 05
59.7500	15.774	0.95287	59.364	98.226	6119.5	14.264	21.604	4.16005E 05
60.0000	15.536	0.94990	59.179	98.464	6134.3	14.220	21.471	4.14711E 05
60.2500	15.299	0.94695	58.995	98.701	6149.1	14.176	21.338	4.13422E 05
60.5000	15.063	0.94401	58.812	98.937	6163.8	14.132	21.206	4.12139E 05
60.7500	14.827	0.94109	58.630	99.173	6178.5	14.088	21.076	4.10861E 05
61.0000	14.592	0.93817	58.448	99.408	6193.1	14.045	20.946	4.09589E 05
61.2500	14.358	0.93527	58.268	99.642	6207.7	14.001	20.817	4.08324E 05
61.5000	14.124	0.93239	58.088	99.876	6222.2	13.958	20.689	4.07063E 05
61.7500	13.892	0.92951	57.909	100.11	6236.7	13.915	20.562	4.05808E 05
62.0000	13.660	0.92665	57.730	100.34	6251.2	13.872	20.436	4.04559E 05
62.2500	13.428	0.92380	57.553	100.57	6265.6	13.829	20.311	4.03315E 05
62.5000	13.198	0.92097	57.376	100.80	6280.0	13.787	20.187	4.02077E 05
62.7500	12.968	0.91814	57.200	101.03	6294.3	13.745	20.064	4.00844E 05
63.0000	12.739	0.91532	57.025	101.26	6308.6	13.702	19.942	3.99614E 05
63.2500	12.510	0.91251	56.850	101.49	6322.8	13.660	19.821	3.98386E 05
63.5000	12.282	0.90971	56.675	101.72	6337.0	13.618	19.700	3.97164E 05
63.7500	12.055	0.90693	56.502	101.94	6351.2	13.577	19.580	3.95948E 05
64.0000	11.829	0.90415	56.329	102.17	6365.3	13.535	19.462	3.94736E 05
64.2500	11.603	0.90139	56.156	102.40	6379.3	13.494	19.344	3.93529E 05
64.5000	11.378	0.89864	55.985	102.62	6393.3	13.453	19.227	3.92328E 05
64.7500	11.154	0.89590	55.814	102.85	6407.3	13.412	19.111	3.91131E 05
65.0000	10.930	0.89317	55.644	103.07	6421.2	13.371	18.995	3.89939E 05
65.2500	10.707	0.89045	55.475	103.29	6435.1	13.330	18.881	3.88753E 05
65.5000	10.485	0.88774	55.306	103.51	6449.0	13.290	18.767	3.87571E 05
65.7500	10.263	0.88504	55.138	103.74	6462.8	13.249	18.654	3.86394E 05
66.0000	10.042	0.88236	54.971	103.96	6476.6	13.209	18.542	3.85221E 05
66.2500	9.822	0.87968	54.804	104.18	6490.3	13.169	18.430	3.84054E 05
66.5000	9.6026	0.87702	54.638	104.40	6504.0	13.129	18.320	3.82891E 05
66.7500	9.3837	0.87437	54.473	104.62	6517.6	13.089	18.210	3.81732E 05
67.0000	9.1655	0.87173	54.308	104.83	6531.2	13.050	18.101	3.80579E 05
67.2500	8.9479	0.86909	54.145	105.05	6544.7	13.010	17.992	3.79430E 05

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LTR 13-50

LOFT ACC PRESS CALC @ 20CLFT GAS @ 525 & 550PSIG INIT PRESS HFR.
HGT LEG BRK USING ACC VOL=134CUFT & OTHER PARAMS AS RELAP 10AP78

PGO = 537.50

TIME	VL	Q	W	VLD	VLDM	VELL	DELTAP	RENUM
67.5000	8.7309	0.86647	53.981	105.27	6558.3	12.971	17.885	3.78286E 05
67.7500	8.5146	0.86386	53.819	105.49	6571.7	12.932	17.778	3.77146E 05
68.0000	8.2990	0.86126	53.656	105.70	6585.2	12.893	17.672	3.7601CE 05
68.2500	8.0840	0.85867	53.495	105.92	6598.6	12.854	17.566	3.74879E 05
68.5000	7.8696	0.85609	53.334	106.13	6611.9	12.816	17.462	3.73752E 05
68.7500	7.6559	0.85352	53.174	106.34	6625.2	12.777	17.358	3.72630E 05
69.0000	7.4429	0.85096	53.015	106.56	6638.5	12.739	17.254	3.71512E 05
69.2500	7.2304	0.84841	52.856	106.77	6651.7	12.701	17.152	3.70398E 05
69.5000	7.0187	0.84586	52.697	106.98	6664.9	12.663	17.050	3.69288E 05
69.7500	6.8075	0.84333	52.540	107.19	6678.1	12.625	16.949	3.68183E 05
70.0000	6.5970	0.84081	52.382	107.40	6691.2	12.587	16.848	3.67082E 05
70.2500	6.3871	0.83830	52.226	107.61	6704.3	12.549	16.748	3.65984E 05
70.5000	6.1778	0.83579	52.070	107.82	6717.3	12.512	16.649	3.64891E 05
70.7500	5.9692	0.83330	51.914	108.03	6730.3	12.474	16.551	3.63802E 05
71.0000	5.7612	0.83081	51.760	108.24	6743.3	12.437	16.453	3.62717E 05
71.2500	5.5538	0.82833	51.605	108.45	6756.2	12.400	16.355	3.61636E 05
71.5000	5.3470	0.82587	51.452	108.65	6769.1	12.363	16.259	3.60558E 05
71.7500	5.1408	0.82341	51.298	108.86	6781.9	12.326	16.163	3.59485E 05
72.0000	4.9353	0.82096	51.146	109.06	6794.7	12.290	16.068	3.58416E 05
72.2500	4.7304	0.81852	50.994	109.27	6807.5	12.253	15.973	3.57350E 05
72.5000	4.5260	0.81609	50.842	109.47	6820.2	12.217	15.879	3.56288E 05
72.7500	4.3223	0.81356	50.691	109.68	6832.9	12.181	15.785	3.55230E 05
73.0000	4.1192	0.81125	50.541	109.88	6845.6	12.144	15.692	3.54176E 05
73.2500	3.9167	0.80884	50.391	110.08	6858.2	12.108	15.600	3.53125E 05
73.5000	3.7148	0.80644	50.241	110.29	6870.8	12.073	15.508	3.52079E 05
73.7500	3.5135	0.80406	50.093	110.49	6883.3	12.037	15.417	3.51036E 05
74.0000	3.3127	0.80167	49.944	110.69	6895.8	12.001	15.326	3.49996E 05
74.2500	3.1126	0.79930	49.796	110.89	6908.3	11.966	15.236	3.48960E 05
74.5000	2.9131	0.79694	49.649	111.09	6920.7	11.930	15.147	3.47928E 05
74.7500	2.7141	0.79458	49.502	111.29	6933.1	11.895	15.058	3.46899E 05
75.0000	2.5158	0.79223	49.356	111.48	6945.5	11.860	14.970	3.45873E 05
75.2500	2.3180	0.78989	49.210	111.68	6957.8	11.825	14.882	3.44851E 05
75.5000	2.1206	0.78756	49.065	111.88	6970.1	11.790	14.795	3.43833E 05
75.7500	1.9242	0.78523	48.920	112.08	6982.3	11.755	14.708	3.42818E 05
76.0000	1.7282	0.78291	48.776	112.27	6994.5	11.720	14.622	3.41806E 05
76.2500	1.5328	0.78060	48.632	112.47	7006.7	11.686	14.537	3.40797E 05
76.5000	1.3379	0.77830	48.488	112.66	7018.8	11.651	14.451	3.39792E 05
76.7500	1.1436	0.77601	48.345	112.86	7030.9	11.617	14.367	3.38790E 05
77.0000	0.94990	0.77372	48.203	113.05	7043.0	11.583	14.283	3.37792E 05
77.2500	0.75675	0.77144	48.061	113.24	7055.1	11.549	14.199	3.36797E 05
77.5000	0.56418	0.76917	47.919	113.44	7067.0	11.515	14.116	3.35805E 05
77.7500	0.37217	0.76690	47.778	113.63	7079.0	11.481	14.034	3.34816E 05
78.0000	0.18072	0.76465	47.537	113.82	7090.9	11.447	13.952	3.33831E 05
78.1000	0.10431	0.76375	47.581	113.90	7095.7	11.433	13.919	3.33437E 05

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LT 11340

\$\$\$ SIMULATION HALTED FOR FINISH CONDITION ZL

8.29794E-03

OUTPUT VARIABLE RANGES FOR ALL RUNS IN CASE

VARIABLE	MINIMUM	MAXIMUM	VARIABLE	MINIMUM	MAXIMUM
TIME	0.0	78.1000	PG	37.5197	562.500
VG	20.0000	133.883	VL	9.805000E-02	114.000
ZL	7.800315E-03	5.06921	Q	6.426875E-04	3.99842
W	4.003942E-02	249.102	VLD	0.0	113.902
VLDM	0.0	7096.09	DELTAP	1.000000E-05	375.900
TGAS	-212.259	70.0000	RENUM	269.158	1.745639E 06
VELL	9.621069E-03	59.8566	PCL	20.0000	2250.00

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LT/11350

C-72

L77211350

IEF1421 - S WAS EXECUTED - CUND CODE 0000
 IEF2851 SYS2.CSMPL1B3 KEPT
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.SYSIN DELETED
 IEF2851 VOL SER NOS= DSK010.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000790 DELETED
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000791 DELETED
 IEF2851 VOL SER NOS= DSK010.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000792 DELETED
 IEF2851 VOL SER NOS= DSK010.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000793 DELETED
 IEF2851 VOL SER NOS= DSKC11.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000794 DELETED
 IEF2851 VOL SER NOS= DSK006.
 IEF2851 { L.LGFTACCU.N2VOL-20.PR-525PS.IGT0550 } KEPT
 IEF2851 VOL SER NOS= A16403.
 IEF2851 SYS2.CSMPL0D2 KEPT
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS2.CSMPL0D2 KEPT
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS1.FORTLIB KEPT
 IEF2851 VOL SER NOS= DSKIPL.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000795 DELETED
 IEF2851 VOL SER NOS= DSKC10.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000795 PASSED
 IEF2851 VOL SER NOS= DSK010.
 IEF2851 SYS2.CSMPOCK3 KEPT
 IEF2851 VOL SER NOS= DSKRES.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.NOSET DELETED
 IEF2851 VOL SER NOS= DSK012.
 IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000796 DELETED
 IEF2851 VOL SER NOS= DSK003.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000797 DELETED
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000798 SYSOUT
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000799 SYSOUT
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000800 SYSOUT
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T084905.SV000.HFRNH8FA.R0000801 SYSOUT
 IEF2851 VOL SER NOS= SPOL31.
 IEF2851 SYS78101.T123456.I0007.HFRNH8FA.S0000150 SYSIN
 IEF2851 VOL SER NOS= SPOL01.
 IEF2851 SYS78101.T123456.I0007.HFRNH8FA.S0000150 DELETED
 IEF2851 VOL SER NOS= SPOL01.

IEF3731 STEP /X / START 78101.1807

IEF3741 STEP /X / STOP 78101.1814 CPU OMIN 50.15SEC MAIN 158K LCS OK

WAIT 0003MIN 18.64SEC SYSIN 00097REC UNUSED CORE 042K EXCPS 003173 SYSHRS .034526

237 000000X:335 000022X:354 000000X:335 000032X:335 000184X:336 001243X:331 000094X:000 000029X:237 000000X:237 000174X
 137 000101X:335 000005X:335 000006X:237 000043X:337 000260X:330 000178X:354 000000X:354 000013X:354 000106X:354 000005X
 354 000071X:135 000007X

IEF2851 SYS78101.T084905.RV000.HFRNH8FA.R0000795 KEPT

IEF2851 VOL SER NOS= DSKC10.

IEF3751 JOB /HFRNH8FA/ START 78101.1807

IEF3761 JOB /HFRNH8FA/ STOP 78101.1814 CPU OMIN 50.15SEC

WAIT 0003MIN 18.64SEC SYSIN 00097REC

EXCPS 003173 SYSHRS .034526 DPSU .0345 REL 21.8

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-550PSIG

LTOR 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-550PSIG

C-7.5

11K 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-550PSIG

C-76

27R 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-550PSIG

C-77

LIR 113-50

LOFT ACCUM PRESS CALC AT 200CUFT INIT VOL PGO-525PSIG

C-78

LTR 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-525PSIG

66-7

LIR 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-525PSIG

C.80

LTR 113-50

LOFT ACCUM PRESS CALC AT 20CUFT INIT VOL PGO-525PSIG

C-81

LIR 113.50