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* XPSIM, Vers. 1.07b*          *... extended Process Simulation ...*
* Cust/User "          " *          - INPUT -          * Job "          " *
* Proj/Problem "          " *          * Date          OCT 08, 2008 *

--- Simulation Input File ---
*-STMT-*
*XPSIM> ...generated by XpsimWin v.1.06 ...
*EXE-0PT> PAGELEN=66
*
100  RUN ID=DEV CUSTOMER=STAFF PROJECT='NITROGEN DIST'
200  DESC PIPE NETWORK
300  DESC EXAMPLE 1 - NITROGEN DISTRIBUTION SYSTEM
400  DESC IDEAL GAS EQUATION
500  DIMENSION ENG
*
*
600  System Data
*
*
700  CHEMCOMP N2
800  THERMSET UID=M1
900  METHODS K=SRK HS=SRK CP=SRK DV=SRK DL=IDEAL VIS=IDEAL THC=IDEAL +
    SURT=IDEAL
*
*
1000 Default Data
*
*
1100 PIPE
1200 PARA ROUGH(ABS)=0.0018
*
*
1300 Flowsheet Data
*
*
*
1400 STREAM=S1 TEMP=70. PRES=40.0 RATE(M)=25
1500 COMP 1.000
*
1600 PIPE IN S1 OUT L10 UID=L1
1700 LINE DIAM=3 LENGTH(M)=20 ECH(M)=-10
1800 FITTING GLOBE 6.0
*
1900 NODE IN L10 OUT L2I L3I UID=NODE2
2000 ESTIMATE STR=L2I RATE=0.5 RATIO
*
2100 PIPE IN L2I OUT L20 UID=L2
2200 LINE DIAM=2 LENGTH(M)=20
2300 FITTING GLOBE 2.7
*
2400 PIPE IN L3I OUT L30 UID=L3
2500 LINE DIAM=1 LENGTH(M)=30
*
2600 NODE IN L30 OUT L5I L4I UID=NODE3
2700 ESTIMATE STR=L5I RATE=0.5 RATIO
*
2800 PIPE IN L4I OUT L40 UID=L4
2900 LINE DIAM=1 LENGTH(M)=30
3000 FITTING GLOBE 6.75
*
3100 PIPE IN L5I OUT L50 UID=L5
3200 LINE DIAM=1.5 LENGTH(M)=20 ECH(M)=-10
3300 FITTING GLOBE 6.75
*
3400 NODE IN L40 L50 OUT L6I UID=NODE4
*
```

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* XPSIM, Vers. 1.07b*
* Cust/User " " *
* Proj/Problem " " *
* Date OCT 08, 2008 *
* Job " " *
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extended Process Simulation ...*
- INPUT -

- Simulation input - Continuation -
*-STMT-*
3500 PIPE IN L6I OUT S5 UID=L6
3600 LINE DIAM=2.0 LENGTH(M)=50
3700 FITTING GLOBE 30.
*
3800 NODE IN L20 OUT L8I L7I UID=NODE6
3900 ESTIMATE STR=L8I RATE=0.5 RATIO
*
4000 PIPE IN L7I OUT S7 UID=L7
4100 LINE DIAM=1 LENGTH(M)=10 ECH(M)=-6
*
4200 PIPE IN L8I OUT S8 UID=L8
4300 LINE DIAM=1 LENGTH(M)=10 ECH(M)=-6
*
*
4400 Network Data
*
*
4500 PIPENET NITER=10
4600 SPEC PRES=28. STR=S5
4700 SPEC RATE(G)=2550 STR=S7
4800 SPEC RATE(G)=2550 STR=S8
*
*
4900 Output Data
*
*
5000 PRINT FORMAT=2
*
*
5100 END
--- End of Simulation Input File ---
```

I) * PROBLEM GENERAL DATA *

- 1) * PROBLEM/PROJECT *
- ' PIPE NETWORK'
- ' EXAMPLE 1 - NITROGEN DISTRIBUTION SYSTEM'
- ' IDEAL GAS EQUATION'

- 2) * UNITS OF MEASURE *
- Input system BRITISH - Output system BRITISH

- INPUT AND OUTPUT UNITS -			
Time	- HR	Weight	- LB
Temperature	- FAR	Pressure	- PSIA
Energy/Duty	- M-BTU	Work	- HP
Liq volums	- CUFT	Vap Volume	- CUFT
Viscosity	- CP	Thermal cond	- BTU/HFTF
Surface tens	- DYCM	Std Vap Vol	- S-CUFT

Standard Vapor Volume is 379.48318 FT3/LBM
Reference Status - Temperature 60°F - Pressure 1 atm

Enthalpy is 0.0 for ideal gas at 298.15 K
Std entropy is for ideal gas at 298.15 K and 1 Atm

II) * DEFINED COMPONENTS *

* No of Chemical Components 1
No of Hypothetical/Petroleum Components 0

No	1
CAS Registry no.	7727-37-9
Name	NITROGEN
Component	Key
	Type
	Class
	Formula
	N2
Molecular weight	28.010
Boiling point,FAR	-320.44
Std spec. gravity	0.64315
Critical temp,FAR	-232.51
Critical pres,PSIA	493.129
Critical vol,CUFT	1.433473
Critical Z	0.289987
Acentric factor	0.037000
Lat. heat, BTU/LBM	2387.039
H form, BTU/LBM	0.000
G form, BTU/LBM	-24533.825
Std entr, BT/LBM-F	45.71492

III) * PVT/THERMO/TRANSPORT PROPERTIES CALCULATION METHODS *

* CALCULATION SET 1 - M1 *

VLE K-values	SRK	- REDLICH-KWONG-SOAVE
ENTHALPY - Vapor	SRK	- REDLICH-KWONG-SOAVE
ENTHALPY - Liquid	SRK	- REDLICH-KWONG-SOAVE
ENTROPY - Vapor	SRK	- REDLICH-KWONG-SOAVE
ENTROPY - Liquid	SRK	- REDLICH-KWONG-SOAVE
DENSITY - Vapor	SRK	- REDLICH-KWONG-SOAVE
DENSITY - Liquid	IDEAL	- IDEAL/LIBRARY
VISCOSITY - Vapor	IDEAL	- IDEAL/LIBRARY
VISCOSITY - Liquid	IDEAL	- IDEAL/LIBRARY
HEAT CAPACITY - Vapor	SRK	- REDLICH-KWONG-SOAVE
HEAT CAPACITY - Liquid	SRK	- REDLICH-KWONG-SOAVE
CONDUCTIVITY - Vapor	IDEAL	- IDEAL/LIBRARY
CONDUCTIVITY - Liquid	IDEAL	- IDEAL/LIBRARY
SURFACE TENSION	IDEAL	- IDEAL/LIBRARY

- LIMITS AND OPTIONS -
Temperature - Min -359.67 FAR - Max 2240.33 FAR
Pressure - Min 0.100000E-04 PSIA - Max 15000.0 PSIA

Lowest significant composition 0.10000000E-19

Water K-values are calculated based on
'Vapor Pressure curve'
Water thermo-props are calculated based on
'Saturated conditions'
Water solubility in hydr phases calculated based on
'API solubility in HC mixtures'

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... extended Process Simulation ...

* Job "DEV" *
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*** DEFAULT DATA FOR GATHERING/NETWORK NODE UNITS ***

1) * GENERAL DATA & OPTIONS *

Automatic feed/product naming not specified

Default fluid velocity in outlet pipes
- Vapor 27.000 FT/S
- Liquid 15.000 FT/S
- Mixed 18.000 FT/S

*** DEFAULT DATA FOR PIPE UNITS ***

1) * OPERATING DATA *

System phase MIXED
Pressure drop correlation 'BEG2'
Flow efficiency 100.000
Calculation model 1
Absolute roughness 0.002 IN
Horizontal step 100.000 FT
Vertical step 10.000 FT
Max pressure change (RELATIVE) 0.0500
Max temperature change 18.000 FAR

Automatic feed/product naming NOT specified

2) * FITTING DATA *

* Fitting Id * Head loss *
90BEND 0.750
180BEND 1.500
TBRANCH 0.400
TPIPE 1.000
GATE 0.170
DIAPH 2.300
GLOBE 6.000

*** STREAM 'S1' ***									
- Temperature		70.000 FAR		- Pressure		40.0000 PSIA			
----- GLOBAL STREAM -----									
* No *	Component		*	-	Mols	- Mol fr-	-	Weight	- Wt fr-
1	NITROGEN			-	25.000	1.000000		700.250	1.000000

		* TOTAL *			25.000	1.000000		700.250	1.000000
					LBM			LB	

*** UNIT 1 - 'L1' - 'PIPE' ***
--- Feed Streams ---
'S1' 'L10' Streams -
to unit 2 - NODE2

1) * OPERATING DATA *

System Phase 'MIXED'
Pressure Drop Correlation 'BEG2'
Flow Efficiency 100.000
Calculation Model 1
Calculation Step 88.846 FT
Maximum Pressure Chaneg (Relative) 0.0500
Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 3.00000 IN
Length 20.0000 M
Elevation change -10.0000 M
Absolute roughness 1.800000E-03 IN

3) * FITTING DATA *

* FITTING ID. *	HEAD LOSS *	DISTANCE, *
GLOBE	6.000	6.000

*** UNIT 2 - 'NODE2' - 'GATHERING/NETWORK' NODE ***
--- Feed Streams ---
from unit 1 - L1 'L10' 'L2I' 'L3I' Streams -
to unit 3 - L2
to unit 4 - L3

1) * PRESSURE SPECIFICATION *

Product streams pressure set at lowest feed pressure

3) * PRODUCT STREAM ESTIMATES *

Estimate 1
Product stream 'L2I' is calculated so that
its MOLAR flowrate RATIO
respect to sum of MOLAR flowrates of all inlet streams
is equal to 0.50000

3) * OTHER STREAMS *

Remaining product streams are estimated
on the basis of fluid velocity default values

*** UNIT 3 - 'L2' - ' PIPE ***

--- Feed Streams ---

from unit 2 - NODE2 'L2I' - Product Streams - 'L2O' to unit 10 - NODE6

1) * OPERATING DATA *

System Phase 'MIXED'
Pressure Drop Correlation 'BEG2'
Flow Efficiency 100.000
Calculation Model 1
Calculation Step 100.000 FT
Maximum Pressure Chaneg (Relative) 0.0500
Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 2.00000 IN
Length 20.0000 M
Elevation change 0.00000 FT
Absolute roughness 1.800000E-03 IN

3) * FITTING DATA *

* FITTING ID. *	HEAD LOSS *	DISTANCE, *
GLOBE	6.000	2.700

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*** UNIT 4 - 'L3' - ' PIPE ***

--- Feed Streams ---

from unit 2 - NODE2 'L3I' to unit 5 - NODE3

Product Streams -

'L30'

1) * OPERATING DATA *

System Phase 'MIXED'

Pressure Drop Correlation 'BEG2'

Flow Efficiency 100.000

Calculation Model 1

Calculation Step 100.000 FT

Maximum Pressure Chaneg (Relative) 0.0500

Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 1.00000 IN

Length 30.0000 M

Elevation change 0.00000 FT

Absolute roughness 1.800000E-03 IN

*** UNIT 5 - 'NODE3' - ' GATHERING/NETWORK NODE ***

--- Feed Streams ---

from unit 4 - L3 'L30' to unit 7 - L5

Product Streams -

'L5I'

'L4I'

to unit 6 - L4

1) * PRESSURE SPECIFICATION *

Product streams pressure set at lowest feed pressure

3) * PRODUCT STREAM ESTIMATES *

Estimate 1

Product stream 'L5I' is calculated so that

its MOLAR flowrate RATIO

respect to sum of MOLAR flowrates of all inlet streams

is equal to 0.50000

3) * OTHER STREAMS *

Remaining product streams are estimated

on the basis of fluid velocity default values

*** UNIT 6 - 'L4' - ' PIPE ***

--- Feed Streams ---

from unit 5 - NODE3 'L4I' to unit 8 - NODE4

- Product Streams - 'L40'

1) * OPERATING DATA *

System Phase 'MIXED'
Pressure Drop Correlation 'BEG2'
Flow Efficiency 100.000
Calculation Model 1
Calculation Step 100.000 FT
Maximum Pressure Chaneg (Relative) 0.0500
Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 1.00000 IN
Length 30.0000 M
Elevation change 0.00000 FT
Absolute roughness 1.800000E-03 IN

3) * FITTING DATA *

* FITTING ID. *	HEAD LOSS	* DISTANCE, *
GLOBE	6.000	6.750

*** UNIT 7 - 'L5' - ' PIPE ***

--- Feed Streams ---

from unit 5 - NODE3 'L5I' - Product Streams - 'L50' to unit 8 - NODE4

1) * OPERATING DATA *

System Phase 'MIXED'

Pressure Drop Correlation 'BEG2'

Flow Efficiency 100.000

Calculation Model 1

Calculation Step 88.846 FT

Maximum Pressure Chaneg (Relative) 0.0500

Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 1.50000 IN

Length 20.0000 M

Elevation change -10.0000 M

Absolute roughness 1.800000E-03 IN

3) * FITTING DATA *

* FITTING ID. *	HEAD LOSS *	DISTANCE, *
GLOBE	6.000	6.750

*** UNIT 8 - 'NODE4' - ' GATHERING/NETWORK NODE ***

--- Feed Streams ---

from unit 6 - L4 'L40' - Product Streams - 'L6I' to unit 9 - L6

from unit 7 - L5 'L50'

1) * PRESSURE SPECIFICATION *

Product streams pressure set at lowest feed pressure

3) * OTHER STREAMS *

Remaining product streams are estimated on the basis of fluid velocity default values

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- INPUT -

- UNIT 9 - L6 -

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*** UNIT 9 - 'L6' - ' PIPE ***

--- Feed Streams ---

from unit 8 - NODE4 'L6I' - Product Streams - 'S5'

1) * OPERATING DATA *

System Phase 'MIXED'

Pressure Drop Correlation 'BEG2'

Flow Efficiency 100.000

Calculation Model 1

Calculation Step 100.000 FT

Maximum Pressure Chaneg (Relative) 0.0500

Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 2.00000 IN

Length 50.0000 M

Elevation change 0.00000 FT

Absolute roughness 1.800000E-03 IN

3) * FITTING DATA *

* FITTING ID. * HEAD LOSS * DISTANCE, *

GLOBE 6.000 30.000

*** UNIT 10 - 'NODE6' - ' GATHERING/NETWORK NODE ***

--- Feed Streams ---

from unit 3 - L2 'L20' - Product Streams - 'L8I' to unit 12 - L8

'L7I' to unit 11 - L7

1) * PRESSURE SPECIFICATION *

Product streams pressure set at lowest feed pressure

3) * PRODUCT STREAM ESTIMATES *

Estimate 1

Product stream 'L8I' is calculated so that

its MOLAR flowrate RATIO

respect to sum of MOLAR flowrates of all inlet streams

is equal to 0.50000

3) * OTHER STREAMS *

Remaining product streams are estimated on the basis of fluid velocity default values

*** UNIT 11 - 'L7' - ' PIPE ***

--- Feed Streams --- - Product Streams -

from unit 10 - NODE6 'L7I' 'S7'

1) * OPERATING DATA *

System Phase 'MIXED' '
Pressure Drop Correlation 'BEG2' '
Flow Efficiency 100.000
Calculation Model 1
Calculation Step 84.647 FT
Maximum Pressure Chaneg (Relative) 0.0500
Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 1.00000 IN
Length 10.0000 M
Elevation change -6.00000 M
Absolute roughness 1.800000E-03 IN

*** UNIT 12 - 'L8' - ' PIPE ***

--- Feed Streams --- - Product Streams -

from unit 10 - NODE6 'L8I' 'S8'

1) * OPERATING DATA *

System Phase 'MIXED'

Pressure Drop Correlation 'BEG2'

Flow Efficiency 100.000

Calculation Model 1

Calculation Step 84.647 FT

Maximum Pressure Chaneg (Relative) 0.0500

Maximum Temperature Change 18.000 FAR

2) * LINE GENERAL DATA *

Internal Diameter 1.00000 IN

Length 10.0000 M

Elevation change -6.00000 M

Absolute roughness 1.800000E-03 IN

V) **** STREAM / UNITS DICTIONARY ****

1) STREAMS-UNITS CROSS-REFERENCE TABLE

No	Stream Id	Description/Service	Product of Unit	Feed of Unit(s)
1	S1	.....		1 L1
2	L10	.....	1 L1	2 NODE2
3	L2I	.....	2 NODE2	3 L2
4	L3I	.....	2 NODE2	4 L3
5	L20	.....	3 L2	10 NODE6
6	L30	.....	4 L3	5 NODE3
7	L5I	.....	5 NODE3	7 L5
8	L4I	.....	5 NODE3	6 L4
9	L40	.....	6 L4	8 NODE4
10	L50	.....	7 L5	8 NODE4
11	L6I	.....	8 NODE4	9 L6
12	S5	.....	9 L6	
13	L8I	.....	10 NODE6	12 L8
14	L7I	.....	10 NODE6	11 L7
15	S7	.....	11 L7	
16	S8	.....	12 L8	

2) UNITS-STREAMS CROSS-REFERENCE TABLE

No	Unit	Unit Description	Feed Streams	Product Streams
1	L1	.....	1 S1	2 L10
2	NODE2	.....	2 L10	3 L2I 4 L3I
3	L2	.....	3 L2I	5 L20
4	L3	.....	4 L3I	6 L30
5	NODE3	.....	6 L30	7 L5I 8 L4I
6	L4	.....	8 L4I	9 L40
7	L5	.....	7 L5I	10 L50
8	NODE4	.....	9 L40 10 L50	11 L6I

2) UNITS-STREAMS CROSS-REFERENCE TABLE

No	Stream Id	Description/Service	Product of Unit	Feed of Unit(s)
No	Unit	Unit Description	Feed Streams	Product Streams
9	L6	.....	11 L6I	12 S5
10	NODE6	.....	5 L20	13 L8I 14 L7I
11	L7	.....	14 L7I	15 S7
12	L8	.....	13 L8I	16 S8

VI) **** RUN STATISTICS ****

* No of streams	16
process operations	12
topping structures	0
control operations	0
set operations	0

* The calculation is a NETWORK SIMULATION

1) * GENERAL DATA *

Solution method MPBALANCE applied

No of Links	8
Inlet Links	1
Outlet Links	3
Nodes	4

Maximum no of iterations 10
 Pressure tolerance (RELATIVE) 0.00200
 Material balance tol (RELATIVE) 0.00100
 Maximum changes per trial
 - Pressure (RELATIVE) 0.5000
 - Flowrate (RELATIVE) 0.6000
 Calculation sequence defined by input sequence

2) * LINK DATA *

- Link 1) type ' INLET '
 Inlet stream S1 - Outlet stream L10
 Outlet Node is unit 2) 'NODE2 '

- Link 2) type 'INTERNAL'
 Inlet stream L2I - Outlet stream L20
 Inlet Node is unit 2) 'NODE2 '
 Outlet Node is unit 10) 'NODE6 '

- Link 3) type 'INTERNAL'
 Inlet stream L3I - Outlet stream L30
 Inlet Node is unit 2) 'NODE2 '
 Outlet Node is unit 5) 'NODE3 '

- Link 4) type 'INTERNAL'
 Inlet stream L5I - Outlet stream L50
 Inlet Node is unit 5) 'NODE3 '
 Outlet Node is unit 8) 'NODE4 '

- Link 5) type 'INTERNAL'
 Inlet stream L4I - Outlet stream L40
 Inlet Node is unit 5) 'NODE3 '
 Outlet Node is unit 8) 'NODE4 '

- Link 6) type ' OUTLET '
 Inlet stream L6I - Outlet stream S5
 Inlet Node is unit 8) 'NODE4 '

- Link 7) type ' OUTLET '
 Inlet stream L8I - Outlet stream S8
 Inlet Node is unit 10) 'NODE6 '

- Link 8) type ' OUTLET '
 Inlet stream L7I - Outlet stream S7
 Inlet Node is unit 10) 'NODE6 '

3) * SPECIFICATIONS *

- SPEC 1) -
 - Hold pressure of STREAM S5
 - at 28.0000 PSIA
 - Tolerance (RELATIVE) 0.010000
- SPEC 2) -
 - Hold sum of STD GAS flowrate of stream(s)
 - 'S7',
 - at 2550.00 S-CUFT
 - Tolerance (RELATIVE) 0.010000
- SPEC 3) -
 - Hold sum of STD GAS flowrate of stream(s)
 - 'S8',
 - at 2550.00 S-CUFT
 - Tolerance (RELATIVE) 0.010000

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*** SIMULATION TRACE FOLLOWS ***

... New/output binary file 'DEV' initialized ...

. Stream 'S1' flashed .
. Feed/Recycle streams processed .
Unit op 1 - 'L1' calculated
Unit op 2 - 'NODE2' calculated
Unit op 3 - 'L2' calculated
Unit op 4 - 'L3' calculated
Unit op 5 - 'NODE3' calculated
Unit op 7 - 'L5' calculated
Unit op 6 - 'L4' calculated

* WARNING, OUTLET PRESSURE IS GREATER THAN LOWEST FEED PRESSURE *
Unit op 8 - 'NODE4' calculated
Unit op 10 - 'NODE6' calculated
Unit op 9 - 'L6' calculated
Unit op 12 - 'L8' calculated
Unit op 11 - 'L7' calculated

... NETWORK CALCULATION - ITERATION 1 ...

- SPEC 1
Pressure of STREAM S5 checked
Value 38.9581 PSIA
- Specified value 28.0000 PSIA
Error value 0.391360

- SPEC 2
MOLAR flow-rate value checked
Value 1406.12 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.448582

- SPEC 3
MOLAR flow-rate value checked
Value 2371.77 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.069894

*** MAXIMUM EQUATION ERRORS ***
MAX DP ERROR -0.56527738E+00
MAX MAT BAL ERROR -0.91561123E+01
MAX SPEC ERROR -0.11438844E+04
... NETWORK CALCULATION - ITERATION 1 COMPLETED ...

Unit op 1 - 'L1' calculated
Unit op 2 - 'NODE2' calculated
Unit op 3 - 'L2' calculated
Unit op 4 - 'L3' calculated
Unit op 5 - 'NODE3' calculated
Unit op 7 - 'L5' calculated
Unit op 6 - 'L4' calculated

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Proj/Problem "NITROGEN DIST" " *
Unit op 8 - 'NODE4' ' calculated
Unit op 10 - 'NODE6' ' calculated
Unit op 9 - 'L6' ' calculated
Unit op 12 - 'L8' ' calculated
Unit op 11 - 'L7' ' calculated

... NETWORK CALCULATION - ITERATION 2 ...

- SPEC 1
Pressure of STREAM S5 checked
Value 36.8525 PSIA
- Specified value 28.0000 PSIA
Error value 0.316160

- SPEC 2
MOLAR flow-rate value checked
Value 1620.06 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.364682

- SPEC 3
MOLAR flow-rate value checked
Value 2405.10 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.056822

*** MAXIMUM EQUATION ERRORS ***
MAX DP ERROR -0.12359052E+01
MAX MAT BAL ERROR -0.74436105E+01
MAX SPEC ERROR -0.92993941E+03

... NETWORK CALCULATION - ITERATION 2 COMPLETED ...

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Unit op 1 - 'L1' ' calculated
Unit op 2 - 'NODE2' ' calculated
Unit op 3 - 'L2' ' calculated
Unit op 4 - 'L3' ' calculated
Unit op 5 - 'NODE3' ' calculated
Unit op 7 - 'L5' ' calculated
Unit op 6 - 'L4' ' calculated
Unit op 8 - 'NODE4' ' calculated
Unit op 10 - 'NODE6' ' calculated
Unit op 9 - 'L6' ' calculated
Unit op 12 - 'L8' ' calculated
Unit op 11 - 'L7' ' calculated

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... NETWORK CALCULATION - ITERATION 3 ...

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- SPEC 1
Pressure of STREAM S5 checked
Value 30.2276 PSIA
- Specified value 28.0000 PSIA
Error value 0.079557

- SPEC 2
MOLAR flow-rate value checked
Value 2298.95 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.098451

- SPEC 3
MOLAR flow-rate value checked
Value 2510.88 S-CUFT
- Specified value 2550.00 S-CUFT
Error value -0.015340

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*** MAXIMUM EQUATION ERRORS ***
MAX DP ERROR -0.38346208E+01
MAX MAT BAL ERROR -0.20095121E+01
MAX SPEC ERROR -0.25105082E+03
... NETWORK CALCULATION - ITERATION 3 COMPLETED ...

Unit op 1 - 'L1' ' calculated
Unit op 2 - 'NODE2' ' calculated
Unit op 3 - 'L2' ' calculated
Unit op 4 - 'L3' ' calculated
Unit op 5 - 'NODE3' ' calculated
Unit op 7 - 'L5' ' calculated
Unit op 6 - 'L4' ' calculated
Unit op 8 - 'NODE4' ' calculated
Unit op 10 - 'NODE6' ' calculated
Unit op 9 - 'L6' ' calculated
Unit op 12 - 'L8' ' calculated
Unit op 11 - 'L7' ' calculated

... NETWORK CALCULATION - ITERATION 4 ...

- SPEC 1
Pressure of STREAM S5 checked
Value 27.9021 PSIA
- Specified value 28.0000 PSIA
Error value -0.003497

- SPEC 2
MOLAR flow-rate value checked
Value 2550.00 S-CUFT
- Specified value 2550.00 S-CUFT
Error value 0.000000

- SPEC 3
MOLAR flow-rate value checked
Value 2550.00 S-CUFT
- Specified value 2550.00 S-CUFT
Error value 0.000000

*** MAXIMUM EQUATION ERRORS ***
MAX DP ERROR 0.16728728E+00
MAX MAT BAL ERROR 0.35527137E-14
MAX SPEC ERROR -0.97914417E-01
... NETWORK CALCULATION - ITERATION 4 COMPLETED ...

Unit op 1 - 'L1' ' calculated
Unit op 2 - 'NODE2' ' calculated
Unit op 3 - 'L2' ' calculated
Unit op 4 - 'L3' ' calculated
Unit op 5 - 'NODE3' ' calculated
Unit op 7 - 'L5' ' calculated
Unit op 6 - 'L4' ' calculated
Unit op 8 - 'NODE4' ' calculated
Unit op 10 - 'NODE6' ' calculated
Unit op 9 - 'L6' ' calculated

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... NETWORK CALCULATION - ITERATION 5 ...

- SPEC 1
Pressure of STREAM S5 checked
Value 28.0028 PSIA
- Specified value 28.0000 PSIA
Error value 0.000101

- SPEC 2
MOLAR flow-rate value checked
Value 2550.00 S-CUFT
- Specified value 2550.00 S-CUFT
Error value 0.000000

- SPEC 3
MOLAR flow-rate value checked
Value 2550.00 S-CUFT
- Specified value 2550.00 S-CUFT
Error value 0.000000

*** MAXIMUM EQUATION ERRORS ***
MAX DP ERROR 0.60690148E-02
MAX MAT BAL ERROR 0.17763568E-14
MAX SPEC ERROR 0.28154668E-02

*** NETWORK CALCULATION RESOLVED ***

*** SOLUTION OBTAINED ***

... Base case results loaded on binary file 'DEV' ...

*** NETWORK/GATHERING SOLUTION SUMMARY ***

1) * NODES INLET/OUTLET STREAMS *

* Node 1 - Unit 'NODE2'

- Inlet Streams

Stream	L10
Temperature, °F	70.165
Pressure, psia	39.860
Total Rate, lbm/h	29.917
lb/h	837.98
Act Vol Rate ft3/h	4267.2
Std Gas Rate S-ft3/h	11353.
Std Liq Rate ft3/h	0.0000

- Outlet Streams

Stream	L2I	L3I
Temperature, °F	70.164	70.164
Pressure, psia	39.860	39.860
Total Rate, lbm/h	13.439	16.478
lb/h	376.44	461.54
Act Vol Rate ft3/h	1916.9	2350.3
Std Gas Rate S-ft3/h	5100.0	6253.0
Std Liq Rate ft3/h	0.0000	0.0000

* Node 2 - Unit 'NODE3'

- Inlet Streams

Stream	L30
Temperature, °F	68.952
Pressure, psia	29.613
Total Rate, lbm/h	16.478
lb/h	461.54
Act Vol Rate ft3/h	3156.5
Std Gas Rate S-ft3/h	6253.0
Std Liq Rate ft3/h	0.0000

- Outlet Streams

Stream	L5I	L4I
Temperature, °F	68.962	68.962
Pressure, psia	29.614	29.614
Total Rate, lbm/h	12.590	3.8879
lb/h	352.64	108.90
Act Vol Rate ft3/h	2411.6	744.75
Std Gas Rate S-ft3/h	4777.6	1475.4
Std Liq Rate ft3/h	0.0000	0.0000

* Node 3 - Unit 'NODE4'

- Inlet Streams

Stream	L40	L50
Temperature, °F	68.962	69.093
Pressure, psia	28.751	28.750
Total Rate, lbm/h	3.8879	12.590
lb/h	108.90	352.64
Act Vol Rate ft3/h	767.13	2484.8
Std Gas Rate S-ft3/h	1475.4	4777.6
Std Liq Rate ft3/h	0.0000	0.0000

- Outlet Streams

Stream	L6I
Temperature, °F	69.055
Pressure, psia	28.744
Total Rate, lbm/h	16.478
lb/h	461.54
Act Vol Rate ft3/h	3252.5
Std Gas Rate S-ft3/h	6253.0
Std Liq Rate ft3/h	0.0000

* Node 4 - Unit 'NODE6'

- Inlet Streams

Stream	L20
Temperature, °F	70.164
Pressure, psia	39.671
Total Rate, lbm/h	13.439
lb/h	376.44
Act Vol Rate ft3/h	1926.0
Std Gas Rate S-ft3/h	5100.0
Std Liq Rate ft3/h	0.0000

- Outlet Streams

Stream	L8I	L7I
Temperature, °F	70.160	70.160
Pressure, psia	39.671	39.671
Total Rate, lbm/h	6.7197	6.7197
lb/h	188.22	188.22
Act Vol Rate ft3/h	963.02	963.02
Std Gas Rate S-ft3/h	2550.0	2550.0
Std Liq Rate ft3/h	0.0000	0.0000

2) * FEEDS / SOURCES TABLE *

- Stream 'S1'

Temperature 70.00 °F

- Pressure 40.0000 psia

Flowrate - molar 29.9171 lbm/h

- weight 837.9768 lb/h

Act Volume Rate 4251. ft3/h

Std Gas Vol Rate 0.1135E+05 S-ft3/h

3) * PRODUCTS / SALES TABLE *

- Stream 'S5'

Temperature 69.05 °F

- Pressure 28.0028 psia

Flowrate - molar 16.4777 lbm/h

- weight 461.5411 lb/h

Act Volume Rate 3339. ft3/h

Std Gas Vol Rate 6253. S-ft3/h

- Stream 'S7'

Temperature 70.16 °F

- Pressure 39.1618 psia

Flowrate - molar 6.7197 lbm/h

- weight 188.2178 lb/h

Act Volume Rate 975.5 ft3/h

Std Gas Vol Rate 2550. S-ft3/h

- Stream 'S8'

Temperature 70.16 °F

- Pressure 39.1618 psia

Flowrate - molar 6.7197 lbm/h

- weight 188.2178 lb/h

Act Volume Rate 975.5 ft3/h

Std Gas Vol Rate 2550. S-ft3/h

4) * TABLE OF PRESSURE DROPS IN LINKS *

- Link 1) is an 'INLET' link

Inlet stream 'S1' - Outlet stream 'L10'

OUTLET Node 'NODE2'

Temperature - inlet 70.00 °F - outlet 70.17 °F

Pressure - inlet 40.0000 psia - outlet 39.8604 psia

Pressure - drop 0.139640 psia

Flowrate - molar 29.92 lbm/h - weight 838.0 lb/h

Act Volume Rate - Inlet 4251. ft3/h - Outlet 4267. ft3/h

Std Gas Vol Rate 0.1135E+05 S-ft3/h

- Link 2) is an 'INTERNAL' link

Inlet stream 'L2I' - Outlet stream 'L20'

INLET Node 'NODE2' OUTLET Node 'NODE6'

Temperature - inlet 70.16 °F - outlet 70.16 °F

Pressure - inlet 39.8604 psia - outlet 39.6710 psia

Pressure - drop 0.189377 psia

Flowrate - molar 13.44 lbm/h - weight 376.4 lb/h

Act Volume Rate - Inlet 1917. ft3/h - Outlet 1926. ft3/h

Std Gas Vol Rate 5100. S-ft3/h

- Link 3) is an 'INTERNAL' link

Inlet stream 'L3I' - Outlet stream 'L30'

INLET Node 'NODE2' OUTLET Node 'NODE3'

Temperature - inlet 70.16 °F - outlet 68.95 °F

Pressure - inlet 39.8604 psia - outlet 29.6131 psia

Pressure - drop 10.2473 psia

Flowrate - molar 16.48 lbm/h - weight 461.5 lb/h

Act Volume Rate - Inlet 2350. ft3/h - Outlet 3156. ft3/h

Std Gas Vol Rate 6253. S-ft3/h

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* XPSIM, Vers. 1.07b*
* Cust/User "STAFF"
* Proj/Problem "NITROGEN DIST"
* ... extended Process SIMulation ...
* Job "DEV"
* Date OCT 08, 2008
* Page 0027
* "
*
NETWORK SOLUTION SUMMARY

- Link 4) is an 'INTERNAL' link
Inlet stream 'L5I' - Outlet stream 'L50'
INLET Node 'NODE3' OUTLET Node 'NODE4'
Temperature - inlet 68.96 °F - outlet 69.09 °F
Pressure - inlet 29.6143 psia - outlet 28.7499 psia
Pressure - drop 0.864353 psia
Flowrate - molar 12.59 lbm/h - weight 352.6 lb/h
Act Volume Rate - Inlet 2412. ft3/h - Outlet 2485. ft3/h
Std Gas Vol Rate 4778. S-ft3/h

- Link 5) is an 'INTERNAL' link
Inlet stream 'L4I' - Outlet stream 'L40'
INLET Node 'NODE3' OUTLET Node 'NODE4'
Temperature - inlet 68.96 °F - outlet 68.96 °F
Pressure - inlet 29.6143 psia - outlet 28.7505 psia
Pressure - drop 0.863765 psia
Flowrate - molar 3.888 lbm/h - weight 108.9 lb/h
Act Volume Rate - Inlet 744.8 ft3/h - Outlet 767.1 ft3/h
Std Gas Vol Rate 1475. S-ft3/h

- Link 6) is an 'OUTLET' link
Inlet stream 'L6I' - Outlet stream 'S5'
INLET Node 'NODE4'
Temperature - inlet 69.05 °F - outlet 69.05 °F
Pressure - inlet 28.7445 psia - outlet 28.0028 psia
Pressure - drop 0.741641 psia
Flowrate - molar 16.48 lbm/h - weight 461.5 lb/h
Act Volume Rate - Inlet 3252. ft3/h - Outlet 3339. ft3/h
Std Gas Vol Rate 6253. S-ft3/h

- Link 7) is an 'OUTLET' link
Inlet stream 'L8I' - Outlet stream 'S8'
INLET Node 'NODE6'
Temperature - inlet 70.16 °F - outlet 70.16 °F
Pressure - inlet 39.6710 psia - outlet 39.1618 psia
Pressure - drop 0.509210 psia
Flowrate - molar 6.720 lbm/h - weight 188.2 lb/h
Act Volume Rate - Inlet 963.0 ft3/h - Outlet 975.5 ft3/h
Std Gas Vol Rate 2550. S-ft3/h

- Link 8) is an 'OUTLET' link
Inlet stream 'L7I' - Outlet stream 'S7'
INLET Node 'NODE6'
Temperature - inlet 70.16 °F - outlet 70.16 °F
Pressure - inlet 39.6710 psia - outlet 39.1618 psia
Pressure - drop 0.509210 psia
Flowrate - molar 6.720 lbm/h - weight 188.2 lb/h
Act Volume Rate - Inlet 963.0 ft3/h - Outlet 975.5 ft3/h
Std Gas Vol Rate 2550. S-ft3/h

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* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...* * Page 0028 *

* Cust/User "STAFF" * - SOLUTION - * Job "DEV" *

* Proj/Problem "NITROGEN DIST" * - UNIT 1 - L1 - * Date OCT 08, 2008 *

*** UNIT 1 - 'L1' - ' PIPE ***

--- Feed Streams --- - Product Streams -

'S1 'L10 to unit 2 - NODE2

1) * OUTLET CONDITIONS *

Temperature 70.165 °F

Pressure 39.860 psia

2) * CALCULATION RESULTS *

Internal Diameter 3.00000 IN

Node	Distance	Elevation Change	Calculated Pressure	Calculated Temperature	Liquid Holdup	Liquid Mass Rate	Gas Mass Rate	Flow Pattern
	ft	ft	psia	°F		lb /SEC	lb /SEC	
1	0.000	0.000	40.000	70.000	0.000000	0.000000	0.2327713	
2	65.617	-32.808	39.860	70.165	0.000000	0.000000	0.2327713	

3) * FLUIDS VELOCITY AND FLOW RATES *

Node	Distance	Volume Flow Rate	GAS Velocity	Surface Velocity	Volume Flow Rate	LIQUID Velocity	Surface Velocity	Mixture Velocity
	ft	ft3 /SEC	ft /SEC	ft /SEC	ft3 /SEC	ft /SEC	ft /SEC	ft /SEC
1	0.000	1.180816	24.0554	24.0554	0.000000	0.0000	0.0000	24.0554
2	65.617	1.185326	24.1473	24.1473	0.000000	0.0000	0.0000	24.1473

4) * GAS HOLDUP *

Node	Distance	Elevation Change	Volume Fraction	Volume Holdup	Weight Holdup	Volume Holdup	Weight Holdup
	ft	ft		per unit length	per unit length	per segment	per segment
				ft3	lb	ft3	lb
1	0.000	0.000	1.000000	4.9087387E-02	9.6764732E-03	0.000000	0.000000
2	65.617	-32.808	1.000000	4.9087387E-02	9.6396603E-03	3.220957	0.6325237

Pipe Volume 3.221 ft3

Total Volume Holdup 3.220957 ft3 - Average Holdup 1.000000

Total Weight Holdup 0.6325237 lb

5) * PRESSURE LOSSES *

Node	Total	Friction	Elevation	Kinetic	Fitting
	psia	psia	psia	psia	psia
1	0.000000	0.000000	0.000000	0.000000	0.000000
2	-0.1396403	-6.7101658E-02	1.3928018E-03	-9.3992935E-05	-7.3837649E-02

Total Pressure loss -0.1396403 psia

Total Friction DP -6.7101658E-02 psia

Total elevation DP 1.3928018E-03 psia

Total Kinetic DP -9.3992935E-05 psia

Total Fitting DP -7.3837649E-02 psia

6) * FITTING PRESSURE DROP *

N.	Fitting Id	Distance ft	Head Loss	Pressure Drop psia
1	GLOBE	19.685	6.0000	-7.3837649E-02

7) * GAS PROPERTIES *

Node	Pressure psia	Temperature °F	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy Btu/lbm	Density lb/ft3	Z Factor	Viscosity cP
1	40.000	70.000	28.010	1.00000	1.00000	1.00000	-56.272	0.197	0.99976	0.017738
2	39.860	70.165	28.010	1.00000	1.00000	1.00000	-55.093	0.196	0.99976	0.017743

8) * FEEDS *

Stream	S1
Temperature, °F	70.00
Pressure, psia	40.000
Total rate, lbm/h	29.917
Vapor, lbm/h	29.917
Liquid, lbm/h	0.0000

9) * PRODUCTS *

Stream	L10
Temperature, °F	70.17
Pressure, psia	39.860
Total rate, lbm/h	29.917
Vapor, lbm/h	29.917
Liquid, lbm/h	0.0000

*** UNIT 2 - 'NODE2' - ' GATHERING/NETWORK NODE ' ***

from unit 1 - L1 'L10' --- Feed Streams --- 'L2I' 'L3I' - Product Streams - to unit 3 - L2 to unit 4 - L3

1) * OPERATING CONDITIONS *

Outlet temperature	70.16 °F
Outlet pressure	39.8604 psia

2) * FEEDS *

Stream	L10
Temperature, °F	70.17
Pressure, psia	39.860
Total rate, lbm/h	29.917
Vapor, lbm/h	29.917
Liquid, lbm/h	0.0000

3) * PRODUCTS *

Stream	L2I	L3I
Temperature, °F	70.16	70.16
Pressure, psia	39.860	39.860
Total rate, lbm/h	13.439	16.478
Vapor, lbm/h	13.439	16.478
Liquid, lbm/h	0.0000	0.0000

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*** UNIT 3 - 'L2 ' - ' PIPE ' ***
--- Feed Streams --- - Product Streams -
from unit 2 - NODE2 'L2I ' 'L20 ' to unit 10 - NODE6

1) * OUTLET CONDITIONS *
Temperature 70.164 °F
Pressure 39.671 psia

2) * CALCULATION RESULTS *
Internal Diameter 2.00000 IN

Node	Distance	Elevation Change	Calculated Pressure	Calculated Temperature	Liquid Holdup	Liquid Mass Rate	Gas Mass Rate	Flow Pattern
	ft	ft	psia	°F		lb /SEC	lb /SEC	
1	0.000	0.000	39.860	70.164	0.000000	0.000000	0.1045655	
2	65.617	0.000	39.671	70.164	0.000000	0.000000	0.1045655	

3) * FLUIDS VELOCITY AND FLOW RATES *

Node	Distance	Volume Flow Rate	GAS Velocity	Surface Velocity	Volume Flow Rate	LIQUID Velocity	Surface Velocity	Mixture Velocity
	ft	ft3 /SEC	ft /SEC	ft /SEC	ft3 /SEC	ft /SEC	ft /SEC	ft /SEC
1	0.000	0.5324707	24.4067	24.4067	0.000000	0.0000	0.0000	24.4067
2	65.617	0.5350131	24.5232	24.5232	0.000000	0.0000	0.0000	24.5232

4) * GAS HOLDUP *

Node	Distance	Elevation Change	Volume Fraction	Volume Holdup	Weight Holdup	Volume Holdup	Weight Holdup
	ft	ft		per unit length	per unit length	per segment	per segment
				ft3	lb	ft3	lb
1	0.000	0.000	1.000000	2.1816616E-02	4.2843001E-03	0.000000	0.000000
2	65.617	0.000	1.000000	2.1816616E-02	4.2639409E-03	1.431537	0.2797862

Pipe Volume 1.432 ft3
Total Volume Holdup 1.431537 ft3 - Average Holdup 1.000000
Total Weight Holdup 0.2797862 lb

5) * PRESSURE LOSSES *

Node	Total	Friction	Elevation	Kinetic	Fitting
	psia	psia	psia	psia	psia
1	0.000000	0.000000	0.000000	0.000000	0.000000
2	-0.1893769	-0.1136930	0.000000	-1.2051558E-04	-7.5720784E-02

Total Pressure loss -0.1893769 psia
Total Friction DP -0.1136930 psia
Total elevation DP 0.000000 psia
Total Kinetic DP -1.2051558E-04 psia
Total Fitting DP -7.5720784E-02 psia

6) * FITTING PRESSURE DROP *

N.	Fitting Id	Distance ft	Head Loss	Pressure Drop psia
1	GLOBE	8.858	6.0000	-7.5720784E-02

7) * GAS PROPERTIES *

Node	Pressure psia	Temperature °F	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy Btu/lbm	Density lb/ft3	Z Factor	Viscosity cP
1	39.860	70.164	28.010	1.00000	1.00000	1.00000	-55.099	0.196	0.99976	0.017743
2	39.671	70.164	28.010	1.00000	1.00000	1.00000	-55.096	0.195	0.99976	0.017743

8) * FEEDS *

Stream		L2I
Temperature, °F		70.16
Pressure, psia		39.860
Total rate, lbm/h		13.439
Vapor, lbm/h		13.439
Liquid, lbm/h		0.0000

9) * PRODUCTS *

Stream		L2O
Temperature, °F		70.16
Pressure, psia		39.671
Total rate, lbm/h		13.439
Vapor, lbm/h		13.439
Liquid, lbm/h		0.0000

* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...*
* Cust/User "STAFF" " * - SOLUTION - * Job "DEV" " *
* Proj/Problem "NITROGEN DIST" " * - UNIT 4 - L3 - * Date OCT 08, 2008 *
*** UNIT 4 - 'L3' - ' PIPE ***
--- Feed Streams --- - Product Streams -
from unit 2 - NODE2 'L3I ' 'L30 ' to unit 5 - NODE3
1) * OUTLET CONDITIONS *
Temperature 68.952 °F
Pressure 29.613 psia
2) * CALCULATION RESULTS *
Internal Diameter 1.00000 IN
Node Distance Elevation Change Calculated Pressure Calculated Temperature Liquid Holdup Liquid Mass Rate Gas Mass Rate Flow Pattern
1 0.000 0.000 39.860 70.165 0.000000 0.000000 0.1282059
2 98.425 0.000 29.613 68.952 0.000000 0.000000 0.1282059
3) * FLUIDS VELOCITY AND FLOW RATES *
Node Distance GAS Velocity Surface Velocity LIQUID Velocity Surface Velocity Mixture Velocity
1 0.000 0.6528540 119.6986 119.6986 0.000000 0.0000 0.0000 119.6986
2 98.425 0.8767951 160.7574 160.7574 0.000000 0.0000 0.0000 160.7574
4) * GAS HOLDUP *
Node Distance Elevation Change Volume Fraction Volume Holdup per unit length Weight Holdup per unit length Volume Holdup per segment Weight Holdup per segment
1 0.000 0.000 1.000000 5.4541541E-03 1.0710734E-03 0.000000 0.000000
2 98.425 0.000 1.000000 5.4541541E-03 7.9751192E-04 0.5368262 7.8495270E-02
Pipe Volume 0.537 ft3
Total Volume Holdup 0.5368262 ft3 - Average Holdup 1.000000
Total Weight Holdup 7.8495270E-02 lb
5) * PRESSURE LOSSES *
Node Total Friction Elevation Kinetic
1 0.000000 0.000000 0.000000 0.000000
2 -10.24729 -10.03859 0.000000 -0.2082436
Total Pressure loss -10.24729 psia
Total Friction DP -10.03859 psia
Total elevation DP 0.000000 psia
Total Kinetic DP -0.2082436 psia

6) * GAS PROPERTIES *

Node	Pressure	Temperature	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy	Density	Z Factor	Viscosity
	psia	°F					Btu/lbm	lb/ft3		cP
1	39.860	70.165	28.010	1.00000	1.00000	1.00000	-55.093	0.196	0.99976	0.017743
2	29.613	68.952	28.010	1.00000	1.00000	1.00000	-61.534	0.146	0.99981	0.017660

7) * FEEDS *

Stream		L3I
Temperature, °F		70.16
Pressure, psia		39.860
Total rate, lbm/h		16.478
Vapor, lbm/h		16.478
Liquid, lbm/h		0.0000

8) * PRODUCTS *

Stream		L3O
Temperature, °F		68.95
Pressure, psia		29.613
Total rate, lbm/h		16.478
Vapor, lbm/h		16.478
Liquid, lbm/h		0.0000

*** UNIT 5 - 'NODE3' - ' GATHERING/NETWORK NODE ' ***

from unit 4 - L3 'L30' ' --- Feed Streams --- 'L5I' ' - Product Streams - 'L4I' ' to unit 7 - L5

to unit 6 - L4

1) * OPERATING CONDITIONS *

Outlet temperature	68.96 °F
Outlet pressure	29.6143 psia

2) * FEEDS *

Stream	L30
Temperature, °F	68.95
Pressure, psia	29.613
Total rate, lbm/h	16.478
Vapor, lbm/h	16.478
Liquid, lbm/h	0.0000

3) * PRODUCTS *

Stream	L5I	L4I
Temperature, °F	68.96	68.96
Pressure, psia	29.614	29.614
Total rate, lbm/h	12.590	3.8879
Vapor, lbm/h	12.590	3.8879
Liquid, lbm/h	0.0000	0.0000

* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...*
* Cust/User "STAFF" " * - SOLUTION - * Job "DEV" " *
* Proj/Problem "NITROGEN DIST" " * - UNIT 7 - L5 - * Date OCT 08, 2008 *
*** UNIT 7 - 'L5 ' - ' PIPE ' ***
--- Feed Streams --- - Product Streams -
from unit 5 - NODE3 'L5I ' 'L50 ' to unit 8 - NODE4
1) * OUTLET CONDITIONS *
Temperature 69.093 °F
Pressure 28.750 psia
2) * CALCULATION RESULTS *
Internal Diameter 1.50000 IN
Node Distance Elevation Change Calculated Pressure Calculated Temperature Liquid Holdup Liquid Mass Rate Gas Mass Rate Flow Pattern
1 0.000 0.000 29.614 68.962 0.000000 0.000000 9.7955608E-02
2 65.617 -32.808 28.750 69.093 0.000000 0.000000 9.7955608E-02
3) * FLUIDS VELOCITY AND FLOW RATES *
Node Distance Volume Flow Rate Surface Velocity Volume Flow Rate Surface Velocity Mixture Velocity
1 0.000 0.6698999 54.5884 54.5884 0.000000 0.0000 0.0000 54.5884
2 65.617 0.6902160 56.2439 56.2439 0.000000 0.0000 0.0000 56.2439
4) * GAS HOLDUP *
Node Distance Elevation Change Volume Fraction Volume Holdup per unit length Weight Holdup per unit length Volume Holdup per segment Weight Holdup per segment
1 0.000 0.000 1.000000 1.2271847E-02 1.7944415E-03 0.000000 0.000000
2 65.617 -32.808 1.000000 1.2271847E-02 1.7416232E-03 0.8052393 0.1142797
Pipe Volume 0.805 ft3
Total Volume Holdup 0.8052393 ft3 - Average Holdup 1.000000
Total Weight Holdup 0.1142797 lb
5) * PRESSURE LOSSES *
Node Total Friction Elevation Kinetic Fitting
1 0.000000 0.000000 0.000000 0.000000 0.000000
2 -0.8643535 -0.5805273 1.0198805E-03 -2.8512448E-03 -0.2820495
Total Pressure loss -0.8643535 psia
Total Friction DP -0.5805273 psia
Total elevation DP 1.0198805E-03 psia
Total Kinetic DP -2.8512448E-03 psia
Total Fitting DP -0.2820495 psia

6) * FITTING PRESSURE DROP *

N.	Fitting Id	Distance ft	Head Loss	Pressure Drop psia
1	GLOBE	22.146	6.0000	-0.2820495

7) * GAS PROPERTIES *

Node	Pressure psia	Temperature °F	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy Btu/lbm	Density lb/ft3	Z Factor	Viscosity cP
1	29.614	68.962	28.010	1.00000	1.00000	1.00000	-61.534	0.146	0.99981	0.017660
2	28.750	69.093	28.010	1.00000	1.00000	1.00000	-60.453	0.142	0.99981	0.017663

8) * FEEDS *

Stream	L5I
Temperature, °F	68.96
Pressure, psia	29.614
Total rate, lbm/h	12.590
Vapor, lbm/h	12.590
Liquid, lbm/h	0.0000

9) * PRODUCTS *

Stream	L5O
Temperature, °F	69.09
Pressure, psia	28.750
Total rate, lbm/h	12.590
Vapor, lbm/h	12.590
Liquid, lbm/h	0.0000

* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...*
* Cust/User "STAFF" " * - SOLUTION - * Job "DEV" " *
* Proj/Problem "NITROGEN DIST" " * - UNIT 6 - L4 - * Date OCT 08, 2008 *
*** UNIT 6 - 'L4' ' - ' PIPE ' ***
--- Feed Streams --- - Product Streams -
from unit 5 - NODE3 'L4I' 'L4O' to unit 8 - NODE4
1) * OUTLET CONDITIONS *
Temperature 68.962 °F
Pressure 28.751 psia
2) * CALCULATION RESULTS *
Internal Diameter 1.00000 IN
Node Distance Elevation Change Calculated Pressure Calculated Temperature Liquid Holdup Liquid Mass Rate Gas Mass Rate Flow Pattern
1 0.000 0.000 29.614 68.962 0.000000 0.000000 3.0250255E-02
2 98.425 0.000 28.751 68.962 0.000000 0.000000 3.0250255E-02
3) * FLUIDS VELOCITY AND FLOW RATES *
Node Distance Volume Flow Rate Surface Velocity Volume Flow Rate Surface Velocity Mixture Velocity
1 0.000 0.2068758 37.9300 37.9300 0.000000 0.0000 0.0000 37.9300
2 98.425 0.2130922 39.0697 39.0697 0.000000 0.0000 0.0000 39.0697
4) * GAS HOLDUP *
Node Distance Elevation Change Volume Fraction Volume Holdup per unit length Weight Holdup per unit length Volume Holdup per segment Weight Holdup per segment
1 0.000 0.000 1.000000 5.4541541E-03 7.9752954E-04 0.000000 0.000000
2 98.425 0.000 1.000000 5.4541541E-03 7.7426373E-04 0.5368262 7.6207062E-02
Pipe Volume 0.537 ft3
Total Volume Holdup 0.5368262 ft3 - Average Holdup 1.000000
Total Weight Holdup 7.6207062E-02 lb
5) * PRESSURE LOSSES *
Node Total Friction Elevation Kinetic Fitting
1 0.000000 0.000000 0.000000 0.000000 0.000000
2 -0.8637655 -0.7283357 0.000000 -1.3639484E-03 -0.1361726
Total Pressure loss -0.8637655 psia
Total Friction DP -0.7283357 psia
Total elevation DP 0.000000 psia
Total Kinetic DP -1.3639484E-03 psia
Total Fitting DP -0.1361726 psia

6) * FITTING PRESSURE DROP *

N.	Fitting Id	Distance ft	Head Loss	Pressure Drop psia
1	GLOBE	22.146	6.0000	-0.1361726

7) * GAS PROPERTIES *

Node	Pressure psia	Temperature °F	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy Btu/lbm	Density lb/ft3	Z Factor	Viscosity cP
1	29.614	68.962	28.010	1.00000	1.00000	1.00000	-61.534	0.146	0.99981	0.017660
2	28.751	68.962	28.010	1.00000	1.00000	1.00000	-61.583	0.142	0.99981	0.017660

8) * FEEDS *

Stream		L4I
Temperature, °F		68.96
Pressure, psia		29.614
Total rate, lbm/h		3.8879
Vapor, lbm/h		3.8879
Liquid, lbm/h		0.0000

9) * PRODUCTS *

Stream		L4O
Temperature, °F		68.96
Pressure, psia		28.751
Total rate, lbm/h		3.8879
Vapor, lbm/h		3.8879
Liquid, lbm/h		0.0000

*** UNIT 8 - 'NODE4' - ' GATHERING/NETWORK NODE ' ***

--- Feed Streams --- - Product Streams -

from unit 6 - L4 'L40' 'L6I' to unit 9 - L6

from unit 7 - L5 'L50'

1) * OPERATING CONDITIONS *

Outlet temperature

69.05 °F

Outlet pressure

28.7445 psia

2) * FEEDS *

Stream	L40	L50
Temperature, °F	68.96	69.09
Pressure, psia	28.751	28.750
Total rate, lbm/h	3.8879	12.590
Vapor, lbm/h	3.8879	12.590
Liquid, lbm/h	0.0000	0.0000

3) * PRODUCTS *

Stream	L6I
Temperature, °F	69.05
Pressure, psia	28.744
Total rate, lbm/h	16.478
Vapor, lbm/h	16.478
Liquid, lbm/h	0.0000

*** UNIT 10 - 'NODE6' - ' GATHERING/NETWORK NODE ' ***

from unit 3 - L2 'L20' --- Feed Streams --- 'L8I' 'L7I' - Product Streams - to unit 12 - L8 to unit 11 - L7

1) * OPERATING CONDITIONS *

Outlet temperature	70.16 °F
Outlet pressure	39.6710 psia

2) * FEEDS *

Stream	L20
Temperature, °F	70.16
Pressure, psia	39.671
Total rate, lbm/h	13.439
Vapor, lbm/h	13.439
Liquid, lbm/h	0.0000

3) * PRODUCTS *

Stream	L8I	L7I
Temperature, °F	70.16	70.16
Pressure, psia	39.671	39.671
Total rate, lbm/h	6.7197	6.7197
Vapor, lbm/h	6.7197	6.7197
Liquid, lbm/h	0.0000	0.0000

* XPSIM, Vers. 1.07b*
* Cust/User "STAFF
* Proj/Problem "NITROGEN DIST
*** UNIT 9 - 'L6
--- Feed Streams ---
- Product Streams -
1) * OUTLET CONDITIONS *
Temperature 69.055 °F
Pressure 28.003 psia
2) * CALCULATION RESULTS *
Internal Diameter 2.00000 IN
Node Distance Elevation Change Calculated Pressure Calculated Temperature Liquid Holdup Liquid Mass Rate Gas Mass Rate Flow Pattern
1 0.000 0.000 28.744 69.055 0.000000 0.000000 0.1282059
2 82.021 0.000 28.455 69.055 0.000000 0.000000 0.1282059
3 164.042 0.000 28.003 69.055 0.000000 0.000000 0.1282059
3) * FLUIDS VELOCITY AND FLOW RATES *
Node Distance Volume Flow Rate Surface Velocity Volume Flow Rate Surface Velocity Mixture Velocity
1 0.000 0.9034717 41.4121 41.4121 0.000000 0.0000 0.0000 41.4121
2 82.021 0.9126735 41.8339 41.8339 0.000000 0.0000 0.0000 41.8339
3 164.042 0.9274039 42.5091 42.5091 0.000000 0.0000 0.0000 42.5091
4) * GAS HOLDUP *
Node Distance Elevation Change Volume Fraction Volume Holdup per unit length Weight Holdup per unit length Volume Holdup per segment Weight Holdup per segment
1 0.000 0.000 1.000000 2.1816616E-02 3.0958558E-03 0.000000 0.000000
2 82.021 0.000 1.000000 2.1816616E-02 3.0646426E-03 1.789421 0.2513650
3 164.042 0.000 1.000000 2.1816616E-02 3.0159653E-03 1.789421 0.2473725
Pipe Volume 3.579 ft3
Total Volume Holdup 3.578841 ft3 - Average Holdup 1.000000
Total Weight Holdup 0.4987375 lb
5) * PRESSURE LOSSES *
Node Total Friction Elevation Kinetic Fitting
1 0.000000 0.000000 0.000000 0.000000 0.000000
2 -0.2897589 -0.2892379 0.000000 -5.3480054E-04 0.000000
3 -0.4518824 -0.2930493 0.000000 -8.5611694E-04 -0.1591309
Total Pressure loss -0.7416413 psia
Total Friction DP -0.5822872 psia
Total elevation DP 0.000000 psia
Total Kinetic DP -1.3909175E-03 psia
Total Fitting DP -0.1591309 psia

6) * FITTING PRESSURE DROP *

N.	Fitting Id	Distance ft	Head Loss	Pressure Drop psia
1	GLOBE	98.425	6.0000	-0.1591309

7) * GAS PROPERTIES *

Node	Pressure psia	Temperature °F	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy Btu/lbm	Density lb/ft3	Z Factor	Viscosity cP
1	28.744	69.055	28.010	1.00000	1.00000	1.00000	-60.721	0.142	0.99981	0.017662
2	28.455	69.055	28.010	1.00000	1.00000	1.00000	-60.741	0.140	0.99982	0.017662
3	28.003	69.055	28.010	1.00000	1.00000	1.00000	-60.773	0.138	0.99982	0.017662

8) * FEEDS *

Stream		L6I
Temperature, °F		69.05
Pressure, psia		28.744
Total rate, lbm/h		16.478
Vapor, lbm/h		16.478
Liquid, lbm/h		0.0000

9) * PRODUCTS *

Stream		S5
Temperature, °F		69.05
Pressure, psia		28.003
Total rate, lbm/h		16.478
Vapor, lbm/h		16.478
Liquid, lbm/h		0.0000

* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...*
* Cust/User "STAFF " * - SOLUTION - * Job "DEV " *
* Proj/Problem "NITROGEN DIST " * - UNIT 12 - L8 - * Date OCT 08, 2008 *
*** UNIT 12 - 'L8 ' - ' PIPE ' ***
--- Feed Streams --- - Product Streams -
from unit 10 - NODE6 'L8I ' 'S8 '
1) * OUTLET CONDITIONS *
Temperature 70.159 °F
Pressure 39.162 psia
2) * CALCULATION RESULTS *
Internal Diameter 1.00000 IN
Node Distance Elevation Change Calculated Pressure Calculated Temperature Liquid Holdup Liquid Mass Rate Gas Mass Rate Flow Pattern
1 0.000 0.000 39.671 70.159 0.000000 0.000000 5.2282725E-02
2 32.808 -19.685 39.162 70.159 0.000000 0.000000 5.2282725E-02
3) * FLUIDS VELOCITY AND FLOW RATES *
Node Distance Volume Flow Rate Surface Velocity Volume Flow Rate Surface Velocity Mixture Velocity
1 0.000 0.2675038 49.0459 49.0459 0.000000 0.0000 0.0000 49.0459
2 32.808 0.2709828 49.6838 49.6838 0.000000 0.0000 0.0000 49.6838
4) * GAS HOLDUP *
Node Distance Elevation Change Volume Fraction Volume Holdup per unit length Weight Holdup per unit length Volume Holdup per segment Weight Holdup per segment
1 0.000 0.000 1.000000 5.4541541E-03 1.0659964E-03 0.000000 0.000000
2 32.808 -19.685 1.000000 5.4541541E-03 1.0523105E-03 0.1789421 3.4524623E-02
Pipe Volume 0.179 ft3
Total Volume Holdup 0.1789421 ft3 - Average Holdup 1.000000
Total Weight Holdup 3.4524623E-02 lb
5) * PRESSURE LOSSES *
Node Total Friction Elevation Kinetic
1 0.000000 0.000000 0.000000 0.000000
2 -0.5092101 -0.5087569 8.2480588E-04 -1.3193124E-03
Total Pressure loss -0.5092101 psia
Total Friction DP -0.5087569 psia
Total elevation DP 8.2480588E-04 psia
Total Kinetic DP -1.3193124E-03 psia

6) * GAS PROPERTIES *

Node	Pressure	Temperature	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy	Density	Z Factor	Viscosity
	psia	°F					Btu/lbm	lb/ft3		cP
1	39.671	70.159	28.010	1.00000	1.00000	1.00000	-55.101	0.195	0.99976	0.017742
2	39.162	70.159	28.010	1.00000	1.00000	1.00000	-54.423	0.193	0.99977	0.017691

7) * FEEDS *

Stream		L8I
Temperature, °F		70.16
Pressure, psia		39.671
Total rate, lbm/h		6.7197
Vapor, lbm/h		6.7197
Liquid, lbm/h		0.0000

8) * PRODUCTS *

Stream		S8
Temperature, °F		70.16
Pressure, psia		39.162
Total rate, lbm/h		6.7197
Vapor, lbm/h		6.7197
Liquid, lbm/h		0.0000

* XPSIM, Vers. 1.07b* *... extended Process SIMulation ...* * Cust/User "STAFF" * - SOLUTION - * Job "DEV" * * Proj/Problem "NITROGEN DIST" " * - UNIT 11 - L7 - * Date OCT 08, 2008 *

*** UNIT 11 - 'L7' - ' PIPE ***
--- Feed Streams --- - Product Streams -
from unit 10 - NODE6 'L7I 'S7

1) * OUTLET CONDITIONS *
Temperature 70.159 °F
Pressure 39.162 psia

2) * CALCULATION RESULTS *
Internal Diameter 1.00000 IN

Node	Distance	Elevation Change	Calculated Pressure	Calculated Temperature	Liquid Holdup	Liquid Mass Rate	Gas Mass Rate	Flow Pattern
	ft	ft	psia	°F		lb /SEC	lb /SEC	
1	0.000	0.000	39.671	70.159	0.000000	0.000000	5.2282725E-02	
2	32.808	-19.685	39.162	70.159	0.000000	0.000000	5.2282725E-02	

3) * FLUIDS VELOCITY AND FLOW RATES *

Node	Distance	Volume Flow Rate	GAS Velocity	Surface Velocity	Volume Flow Rate	LIQUID Velocity	Surface Velocity	Mixture Velocity
	ft	ft3 /SEC	ft /SEC	ft /SEC	ft3 /SEC	ft /SEC	ft /SEC	ft /SEC
1	0.000	0.2675038	49.0459	49.0459	0.000000	0.0000	0.0000	49.0459
2	32.808	0.2709828	49.6838	49.6838	0.000000	0.0000	0.0000	49.6838

4) * GAS HOLDUP *

Node	Distance	Elevation Change	Volume Fraction	Volume Holdup per unit length	Weight Holdup per unit length	Volume Holdup per segment	Weight Holdup per segment
	ft	ft		ft3	lb	ft3	lb
1	0.000	0.000	1.000000	5.4541541E-03	1.0659964E-03	0.000000	0.000000
2	32.808	-19.685	1.000000	5.4541541E-03	1.0523105E-03	0.1789421	3.4524623E-02

Pipe Volume 0.179 ft3
Total Volume Holdup 0.1789421 ft3 - Average Holdup 1.000000
Total Weight Holdup 3.4524623E-02 lb

5) * PRESSURE LOSSES *

Node	Total	Friction	Elevation	Kinetic
	psia	psia	psia	psia
1	0.000000	0.000000	0.000000	0.000000
2	-0.5092101	-0.5087569	8.2480588E-04	-1.3193124E-03

Total Pressure loss -0.5092101 psia
Total Friction DP -0.5087569 psia
Total elevation DP 8.2480588E-04 psia
Total Kinetic DP -1.3193124E-03 psia

6) * GAS PROPERTIES *

Node	Pressure	Temperature	Molec. Weight	Molar Fract.	Weight Fract.	Volume Fract.	Enthalpy	Density	Z Factor	Viscosity
	psia	°F					Btu/lbm	lb/ft3		cP
1	39.671	70.159	28.010	1.00000	1.00000	1.00000	-55.101	0.195	0.99976	0.017742
2	39.162	70.159	28.010	1.00000	1.00000	1.00000	-54.423	0.193	0.99977	0.017691

7) * FEEDS *

Stream		L7I
Temperature, °F		70.16
Pressure, psia		39.671
Total rate, lbm/h		6.7197
Vapor, lbm/h		6.7197
Liquid, lbm/h		0.0000

8) * PRODUCTS *

Stream		S7
Temperature, °F		70.16
Pressure, psia		39.162
Total rate, lbm/h		6.7197
Vapor, lbm/h		6.7197
Liquid, lbm/h		0.0000

*** STREAM DATA CALCULATION AND STORING ***

Stream 'S1	' pvt/thermo/trans props calculated
Stream 'L10	' pvt/thermo/trans props calculated
Stream 'L2I	' pvt/thermo/trans props calculated
Stream 'L3I	' pvt/thermo/trans props calculated
Stream 'L20	' pvt/thermo/trans props calculated
Stream 'L30	' pvt/thermo/trans props calculated
Stream 'L5I	' pvt/thermo/trans props calculated
Stream 'L4I	' pvt/thermo/trans props calculated
Stream 'L40	' pvt/thermo/trans props calculated
Stream 'L50	' pvt/thermo/trans props calculated
Stream 'L6I	' pvt/thermo/trans props calculated
Stream 'S5	' pvt/thermo/trans props calculated
Stream 'L8I	' pvt/thermo/trans props calculated
Stream 'L7I	' pvt/thermo/trans props calculated
Stream 'S7	' pvt/thermo/trans props calculated
Stream 'S8	' pvt/thermo/trans props calculated

*** STREAM COMPONENT Molar Flow Rates - lbm/h ***						
Stream Id	S1	L10	L2I	L3I	L20	L30
Temperature, °F	70.000	70.165	70.164	70.164	70.164	68.952
Pressure, psia	40.0000	39.8604	39.8604	39.8604	39.6710	29.6131
Phase	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
1 NITROGEN	29.917062	29.917062	13.439332	16.477729	13.439332	16.477729
TOTALS, lbm/h	29.917062	29.917062	13.439332	16.477729	13.439332	16.477729
VAPOR fraction	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
LIQUID 1/H fraction	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Enthalpy kBTu/h	-1.683490	-1.648227	-0.740416	-0.907811	-0.740459	-1.013936

Stream Id	L5I	L4I	L40	L50	L6I	S5
Temperature, °F	68.962	68.962	68.962	69.093	69.055	69.055
Pressure, psia	29.6143	29.6143	28.7505	28.7499	28.7445	28.0028
Phase	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
1 NITROGEN	12.589799	3.887931	3.887931	12.589799	16.477729	16.477729
TOTALS, lbm/h	12.589799	3.887931	3.887931	12.589799	16.477729	16.477729
VAPOR fraction	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
LIQUID 1/H fraction	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Enthalpy kBTu/h	-0.774697	-0.239239	-0.239430	-0.761118	-1.000548	-1.001397

Stream Id	L8I	L7I	S7	S8
Temperature, °F	70.160	70.160	70.159	70.159
Pressure, psia	39.6710	39.6710	39.1618	39.1618
Phase	VAPOR	VAPOR	VAPOR	VAPOR
1 NITROGEN	6.719666	6.719666	6.719666	6.719666
TOTALS, lbm/h	6.719666	6.719666	6.719666	6.719666
VAPOR fraction	1.000000	1.000000	1.000000	1.000000
LIQUID 1/H fraction	0.000000	0.000000	0.000000	0.000000
Enthalpy kBTu/h	-0.370229	-0.370229	-0.365704	-0.365704

* XPSIM, Vers. 1.07b*		*... extended Process SIMulation ...*		* Page 0051 *	
* Cust/User "STAFF " *		- SOLUTION -		* Job "DEV " *	
* Proj/Problem "NITROGEN DIST " *				* Date OCT 08, 2008 *	
STREAM SUMMARY					
Stream Id	L30	L5I	L4I	L40	L50
Temperature, °F	68.952	68.962	68.962	68.962	69.093
Pressure, psia	29.6131	29.6143	29.6143	28.7505	28.7499
Phase	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
Flow rate	lbm/h	12.590	3.888	3.888	12.590
	lb/h	461.541	352.640	108.901	352.640
Vapor fract.	1.000000	1.000000	1.000000	1.000000	1.000000
LIQUID 1/H FRACT	0.000000	0.000000	0.000000	0.000000	0.000000
LIQUID 2/W FRACT	0.000000	0.000000	0.000000	0.000000	0.000000
Mol. weight	28.0100	28.009995	28.009995	28.009995	28.009995
Act. Volume rate	ft3/h	3156.462396	2411.639785	744.752845	2484.777733
Enthalpy	kBtu/h	-1.013936	-0.774697	-0.239239	-0.761118
Spec. enthalpy	Btu/lbm	-61.534	-61.534	-61.534	-60.455
	Btu/lb	-2.197	-2.197	-2.199	-2.158
*** VAPOUR ***					
Flow rate	lbm/h	12.590	3.888	3.888	12.590
	lb/h	461.541	352.640	108.901	352.640
Wt. fraction	1.000000	1.000000	1.000000	1.000000	1.000000
Mol. weight	28.0100	28.0100	28.0100	28.0100	28.0100
Std. Volume rate	S-ft3/h	6253.020485	4777.616331	1475.404154	4777.616331
Act. Volume rate	ft3/h	3156.4624	2411.6398	744.7528	2484.7777
Enthalpy	kBtu/h	-1.013936	-0.774697	-0.239239	-0.761091
Spec. enthalpy	Btu/lbm	-61.534	-61.534	-61.534	-60.453
	Btu/lb	-2.197	-2.197	-2.199	-2.158
Spec. Heat cap.	btu/lbm °F	6.974840	6.974840	6.974840	6.974043
	btu/lb °F	0.249013	0.249013	0.249013	0.248985
Spec. Entropy	btu/lbm °F	44.2074	44.2074	44.2074	44.2666
	btu/lb °F	1.5783	1.5783	1.5783	1.5804
Compressibility	0.999807	0.999807	0.999807	0.999813	0.999814
Density	lb/ft3	0.1462	0.1462	0.1420	0.1419
Viscosity	cP	0.1766E-01	0.1766E-01	0.1766E-01	0.1766E-01
Thermal Conduct.	btu/h.ft.°F	0.014591	0.014592	0.014592	0.014594
Reference Gas Status - Temperature 60°F		- Pressure 1 atm			

* XPSIM, Vers. 1.07b*		*... extended Process SIMulation ...*		* Page 0052 *	
* Cust/User "STAFF " *		- SOLUTION -		* Job "DEV " *	
* Proj/Problem "NITROGEN DIST " *				* Date OCT 08, 2008 *	
STREAM SUMMARY					
Stream Id	L6I	S5	L8I	L7I	S7
Temperature, °F	69.055	69.055	70.160	70.160	70.159
Pressure, psia	28.7445	28.0028	39.6710	39.6710	39.1618
Phase	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
Flow rate	lbm/h	16.478	16.478	6.720	6.720
	lb/h	461.541	461.541	188.218	188.218
Vapor fract.	1.000000	1.000000	1.000000	1.000000	1.000000
LIQUID 1/H FRACT	0.000000	0.000000	0.000000	0.000000	0.000000
LIQUID 2/W FRACT	0.000000	0.000000	0.000000	0.000000	0.000000
Mol. weight	28.0100	28.009995	28.009995	28.009995	28.009995
Act. Volume rate	ft3/h	3252.498200	3338.654309	963.016061	975.538114
Enthalpy	kBtu/h	-1.000548	-1.001397	-0.370229	-0.365704
Spec. enthalpy	Btu/lbm	-60.721	-60.773	-55.096	-54.423
	Btu/lb	-2.168	-2.170	-1.967	-1.943
*** VAPOUR ***					
Flow rate	lbm/h	16.478	16.478	6.720	6.720
	lb/h	461.541	461.541	188.218	188.218
Wt. fraction	1.000000	1.000000	1.000000	1.000000	1.000000
Mol. weight	28.0100	28.0100	28.0100	28.0100	28.0100
Std. Volume rate	S-ft3/h	6253.020485	6253.020485	2550.000000	2550.000000
Act. Volume rate	ft3/h	3252.4982	3338.6543	963.0161	975.5381
Enthalpy	kBtu/h	-1.000548	-1.001397	-0.370194	-0.365704
Spec. enthalpy	Btu/lbm	-60.721	-60.773	-55.091	-54.423
	Btu/lb	-2.168	-2.170	-1.967	-1.943
Spec. Heat cap.	btu/lbm °F	6.974044	6.973375	6.983691	6.983235
	btu/lb °F	0.248984	0.248960	0.249329	0.249312
Spec. Entropy	btu/lbm °F	44.2682	44.3204	43.6388	43.6646
	btu/lb °F	1.5804	1.5823	1.5580	1.5589
Compressibility	0.999814	0.999818	0.999763	0.999763	0.999766
Density	lb/ft3	0.1419	0.1382	0.1954	0.1929
Viscosity	cP	0.1766E-01	0.1766E-01	0.1774E-01	0.1769E-01
Thermal Conduct.	btu/h.ft.°F	0.014594	0.014594	0.014617	0.014617
Reference Gas Status - Temperature 60°F		- Pressure 1 atm			

STREAM SUMMARY

Stream Id S8
Temperature, °F 70.159
Pressure, psia 39.1618
Phase VAPOR
Flow rate lbm/h 6.720
lb/h 188.218
Vapor fract. 1.000000
LIQUID 1/H FRACT 0.000000
LIQUID 2/W FRACT 0.000000
Mol. weight 28.0100
Act. Volume rate ft3/h 975.538114
Enthalpy kBtu/h -0.365704
Spec. enthalpy Btu/lbm -54.423
Btu/lb -1.943

*** VAPOUR ***
Flow rate lbm/h 6.720
lb/h 188.218
Wt. fraction 1.000000
Mol. weight 28.0100
Std. Volume rate S-ft3/h 2550.000000
Act. Volume rate ft3/h 975.5381
Enthalpy kBtu/h -0.365704
Spec. enthalpy Btu/lbm -54.423
Btu/lb -1.943
Spec. Heat cap. btu/lbm °F 6.983235
btu/lb °F 0.249312
Spec. Entropy btu/lbm °F 43.6646
btu/lb °F 1.5589
Compressibility 0.999766
Density lb/ft3 0.1929
Viscosity cP 0.1769E-01
Thermal Conduct. btu/h.ft.°F 0.014617
Reference Gas Status - Temperature 60°F

- Pressure 1 atm

- Calculation time 1.34 sec
- Simulation no. 1 - Ended at 14.38.40 on OCT 08, 2008 -

XPSIM, Steady State Process Simulation Software
Version 1.07b
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