初期

COLUMN SUMMARY

---------- NET FLOW RATES ----------- HEATER

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

DEG C MPAG KG-MOL/HR M\*WATT

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1C\* 55.0 0.05 702.2 641.0L -23.9899

213.0W

2 155.2 0.10 920.9 1556.2

3 172.3 0.10 944.2 1775.0

4 178.9 0.10 939.3 1798.2

5 182.7 0.11 929.6 1793.3

6 185.3 0.11 917.8 1783.6

7 187.5 0.11 902.6 1771.8

8 189.7 0.11 880.4 1756.6

9 192.5 0.11 844.0 1734.4

10 196.6 0.11 782.4 1698.0 74.5V

11 202.9 0.11 933.6 1561.9 327.6P 249.4L -2.1172

12 212.8 0.12 522.5 1634.9 327.6P

13 225.4 0.12 454.5 1551.5

14 235.6 0.12 409.1 1483.4

15 243.2 0.12 376.4 1438.0

16 248.9 0.12 350.5 1405.3

17 253.4 0.12 328.8 1379.4

18 257.0 0.13 309.3 1357.7 31.9V

19 260.3 0.13 230.9 1306.3 62.7L

20 263.1 0.13 740.8 1290.5 341.4P -4.7597

21 275.5 0.13 425.9 1459.1 341.4P

22 282.8 0.13 421.5 1485.6

23 286.3 0.13 410.0 1481.2

24 288.8 0.14 394.2 1469.7

25 291.1 0.14 371.0 1453.9

26 294.1 0.14 330.3 1430.7

27 298.9 0.14 252.0 1390.0

28 308.8 0.14 113.1 1311.7 959.6V

29 299.1 0.14 93.0 213.2

30 293.3 0.15 85.6 193.1

31 287.5 0.15 79.4 185.7

32 280.3 0.15 179.5 166.5V 66.4L

TRAY NET VAPOR RATES AND DENSITIES

--------------- RATES ---------------

TRAY MW ACTUAL DENS Z FROM NORMAL ACTUAL

KG/M3 DENSITY K\*KG/HR K\*M3/HR K\*M3/HR

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2 95.805 5.68433 0.95263 149.092 34.881 26.229

3 107.309 6.21449 0.94639 190.468 39.784 30.649

4 110.935 6.39300 0.94477 199.484 40.305 31.204

5 112.547 6.48965 0.94415 201.833 40.196 31.101

6 113.468 6.56042 0.94380 202.379 39.977 30.849

7 114.099 6.61929 0.94360 202.161 39.713 30.541

8 114.618 6.67000 0.94354 201.340 39.373 30.186

9 115.136 6.71135 0.94372 199.696 38.875 29.755

10 115.761 6.73657 0.94435 196.561 38.059 29.178

11 115.665 6.67737 0.94667 180.653 35.008 27.055

12 119.606 6.81993 0.94620 195.549 36.645 28.673

13 122.382 6.83970 0.94811 189.870 34.774 27.760

14 124.472 6.85745 0.94969 184.645 33.250 26.926

15 125.907 6.87747 0.95084 181.054 32.231 26.326

16 126.769 6.89366 0.95175 178.146 31.498 25.842

17 127.230 6.90553 0.95254 175.505 30.919 25.415

18 127.435 6.91437 0.95325 173.023 30.432 25.024

19 128.426 6.97670 0.95311 167.757 29.279 24.045

20 128.383 6.98389 0.95371 165.684 28.926 23.724

21 139.325 7.49822 0.94898 203.288 32.704 27.112

22 144.094 7.71995 0.94751 214.061 33.297 27.728

23 145.421 7.79842 0.94737 215.399 33.200 27.621

24 145.704 7.83216 0.94765 214.140 32.942 27.341

25 145.522 7.83950 0.94823 211.573 32.588 26.988

26 144.854 7.80749 0.94936 207.240 32.067 26.544

27 143.122 7.68139 0.95183 198.938 31.155 25.899

28 138.597 7.31999 0.95740 181.797 29.400 24.836

29 67.803 3.54695 0.98967 14.453 4.778 4.075

30 53.579 2.84417 0.99196 10.344 4.327 3.637

31 45.682 2.46476 0.99266 8.482 4.162 3.441

32 37.866 2.08282 0.99298 6.796 4.023 3.263

TRAY NET LIQUID RATES AND DENSITIES

--------------- RATES ---------------

TRAY MW ACTUAL DENS Z FROM DRY STD LIQ ACTUAL

KG/M3 DENSITY K\*KG/HR M3/HR M3/HR

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1 108.142 691.623 0.00867 75.935 105.038 109.792

2 127.385 633.223 0.01137 117.311 156.858 185.261

3 133.797 626.542 0.01170 126.327 167.455 201.625

4 136.993 624.931 0.01194 128.676 169.860 205.904

5 139.016 624.424 0.01212 129.222 170.122 206.946

6 140.563 624.306 0.01229 129.004 169.475 206.636

7 142.018 624.450 0.01245 128.183 168.054 205.274

8 143.729 624.914 0.01263 126.538 165.507 202.489

9 146.221 625.912 0.01285 123.403 160.883 197.158

10 150.513 627.861 0.01317 117.758 152.746 187.554

11 158.471 631.709 0.01371 147.954 190.369 234.211

12 167.351 632.308 0.01428 87.448 111.647 138.299

13 180.903 633.525 0.01513 82.223 104.006 129.786

14 192.218 633.145 0.01588 78.632 98.896 124.192

15 201.199 632.144 0.01653 75.724 94.929 119.789

16 208.504 631.065 0.01710 73.083 91.448 115.809

17 214.711 630.106 0.01762 70.600 88.237 112.045

18 220.168 629.350 0.01809 68.094 85.025 108.197

19 224.894 628.533 0.01853 51.922 64.777 82.608

20 229.375 628.298 0.01894 169.919 211.762 270.443

21 235.504 620.773 0.01938 100.298 124.760 161.570

22 241.106 617.520 0.01982 101.636 126.198 164.588

23 244.814 616.800 0.02016 100.378 124.444 162.739

24 248.111 617.102 0.02048 97.811 121.042 158.500

25 251.954 618.308 0.02082 93.477 115.376 151.182

26 257.862 621.122 0.02124 85.175 104.657 137.132

27 269.951 627.787 0.02197 68.035 82.837 108.372

28 299.673 643.033 0.02356 33.879 40.467 52.686

29 320.257 666.209 0.02489 29.770 35.297 44.686

30 326.155 674.590 0.02546 27.908 33.009 41.370

31 330.378 681.790 0.02595 26.222 30.952 38.460

32 337.660 691.714 0.02666 22.426 26.374 32.420

TRAY TRANSPORT PROPERTIES

TRAY - THERMAL CONDUCTIVITY - ------ VISCOSITY ------- -- SURFACE --

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

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1 1.0144E-01 0.0000E+00 3.5717E-01 0.0000E+00 1.9006E+01

2 7.9423E-02 2.1147E-02 2.0960E-01 9.0981E-03 1.2222E+01

3 7.6192E-02 2.1712E-02 2.0054E-01 9.0911E-03 1.1476E+01

4 7.5001E-02 2.2021E-02 1.9841E-01 9.1221E-03 1.1254E+01

5 7.4352E-02 2.2238E-02 1.9764E-01 9.1543E-03 1.1152E+01

6 7.3901E-02 2.2412E-02 1.9731E-01 9.1842E-03 1.1091E+01

7 7.3523E-02 2.2574E-02 1.9727E-01 9.2142E-03 1.1052E+01

8 7.3141E-02 2.2752E-02 1.9758E-01 9.2488E-03 1.1028E+01

9 7.2673E-02 2.2984E-02 1.9848E-01 9.2950E-03 1.1022E+01

10 7.1984E-02 2.3343E-02 2.0052E-01 9.3669E-03 1.1042E+01

11 7.0955E-02 2.3965E-02 2.0511E-01 9.5073E-03 1.1135E+01

12 6.9350E-02 2.4685E-02 2.0572E-01 9.6077E-03 1.0988E+01

13 6.7404E-02 2.5785E-02 2.0798E-01 9.8046E-03 1.0866E+01

14 6.5878E-02 2.6721E-02 2.0889E-01 9.9698E-03 1.0716E+01

15 6.4749E-02 2.7455E-02 2.0936E-01 1.0097E-02 1.0580E+01

16 6.3906E-02 2.8037E-02 2.0985E-01 1.0197E-02 1.0472E+01

17 6.3247E-02 2.8520E-02 2.1046E-01 1.0282E-02 1.0386E+01

18 6.2709E-02 2.8938E-02 2.1117E-01 1.0356E-02 1.0320E+01

19 6.2216E-02 2.9338E-02 2.1147E-01 1.0399E-02 1.0245E+01

20 6.1821E-02 2.9684E-02 2.1230E-01 1.0462E-02 1.0207E+01

21 6.0127E-02 3.0200E-02 2.0354E-01 1.0425E-02 9.6390E+00

22 5.9174E-02 3.0648E-02 2.0048E-01 1.0457E-02 9.3797E+00

23 5.8734E-02 3.0958E-02 1.9997E-01 1.0499E-02 9.2955E+00

24 5.8444E-02 3.1235E-02 2.0033E-01 1.0545E-02 9.2706E+00

25 5.8186E-02 3.1540E-02 2.0143E-01 1.0601E-02 9.2839E+00

26 5.7893E-02 3.1962E-02 2.0395E-01 1.0682E-02 9.3545E+00

27 5.7460E-02 3.2712E-02 2.1033E-01 1.0828E-02 9.5598E+00

28 5.6643E-02 3.4331E-02 2.2776E-01 1.1148E-02 1.0076E+01

29 5.9200E-02 3.2468E-02 2.7701E-01 1.4443E-02 1.1736E+01

30 6.0148E-02 3.2682E-02 2.9798E-01 1.5530E-02 1.2360E+01

31 6.0963E-02 3.2878E-02 3.1721E-01 1.6135E-02 1.2903E+01

32 6.1936E-02 3.3052E-02 3.4692E-01 1.6758E-02 1.3641E+01

末期

COLUMN SUMMARY

---------- NET FLOW RATES ----------- HEATER

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

DEG C MPAG KG-MOL/HR M\*WATT

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1C\* 55.0 0.05 723.4 665.1L -25.0137

219.9W

2 157.0 0.10 942.9 1608.4

3 174.7 0.10 969.7 1827.9

4 181.5 0.10 965.0 1854.6

5 185.3 0.11 954.4 1850.0

6 187.9 0.11 941.4 1839.4

7 190.2 0.11 924.8 1826.4

8 192.6 0.11 901.3 1809.8

9 195.5 0.11 864.5 1786.2

10 199.6 0.11 807.6 1749.4 73.3V

11 205.3 0.11 973.5 1619.2 328.6P 247.8L -2.1790

12 214.3 0.12 580.1 1704.3 328.6P

13 224.6 0.12 524.6 1639.5

14 232.7 0.12 483.2 1584.0

15 239.1 0.12 448.6 1542.7

16 244.4 0.12 417.1 1508.1

17 249.1 0.12 387.8 1476.5

18 253.4 0.13 360.2 1447.2 41.1V

19 257.6 0.13 274.0 1378.5 64.5L

20 261.2 0.13 790.9 1356.8 348.9P -4.5716

21 272.8 0.13 462.8 1524.8 348.9P

22 279.9 0.13 456.9 1545.6

23 283.4 0.13 446.2 1539.7

24 285.8 0.14 432.7 1529.0

25 287.9 0.14 413.1 1515.5

26 290.4 0.14 375.7 1495.9

27 294.6 0.14 289.9 1458.5

28 304.5 0.14 118.6 1372.7 984.5V

29 294.1 0.14 96.7 216.9

30 287.9 0.15 88.6 195.0

31 281.9 0.15 81.9 186.9

32 274.8 0.15 180.3 166.5V 68.2L

TRAY NET VAPOR RATES AND DENSITIES

--------------- RATES ---------------

TRAY MW ACTUAL DENS Z FROM NORMAL ACTUAL

KG/M3 DENSITY K\*KG/HR K\*M3/HR K\*M3/HR

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2 96.120 5.67772 0.95295 154.595 36.050 27.228

3 108.128 6.22742 0.94651 197.642 40.970 31.737

4 111.885 6.41125 0.94484 207.502 41.569 32.365

5 113.524 6.50847 0.94422 210.017 41.466 32.268

6 114.457 6.57879 0.94389 210.532 41.228 32.002

7 115.107 6.63721 0.94372 210.227 40.936 31.674

8 115.649 6.68764 0.94368 209.299 40.564 31.296

9 116.193 6.72910 0.94388 207.544 40.036 30.843

10 116.844 6.75658 0.94447 204.407 39.211 30.253

11 116.800 6.71028 0.94651 189.122 36.293 28.184

12 120.779 6.86951 0.94566 205.843 38.200 29.965

13 123.382 6.91629 0.94687 202.287 36.748 29.248

14 125.250 6.95257 0.94792 198.397 35.504 28.536

15 126.528 6.98166 0.94880 195.190 34.577 27.957

16 127.333 7.00006 0.94966 192.025 33.802 27.432

17 127.822 7.00912 0.95055 188.730 33.095 26.926

18 128.112 7.01229 0.95145 185.405 32.438 26.440

19 129.547 7.08773 0.95125 178.579 30.898 25.196

20 129.688 7.09281 0.95201 175.967 30.412 24.809

21 139.673 7.56537 0.94766 212.973 34.177 28.151

22 144.064 7.76827 0.94641 222.664 34.643 28.663

23 145.454 7.85002 0.94625 223.960 34.512 28.530

24 145.896 7.89451 0.94639 223.074 34.271 28.257

25 145.910 7.91786 0.94675 221.127 33.969 27.928

26 145.507 7.90927 0.94756 217.665 33.529 27.520

27 144.137 7.81337 0.94963 210.225 32.691 26.906

28 139.686 7.44824 0.95542 191.750 30.768 25.744

29 69.392 3.66477 0.98896 15.053 4.862 4.108

30 54.507 2.92235 0.99155 10.632 4.372 3.638

31 46.267 2.52224 0.99234 8.649 4.190 3.429

32 38.235 2.12487 0.99271 6.893 4.041 3.244

TRAY NET LIQUID RATES AND DENSITIES

--------------- RATES ---------------

TRAY MW ACTUAL DENS Z FROM DRY STD LIQ ACTUAL

KG/M3 DENSITY K\*KG/HR M3/HR M3/HR

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1 108.489 692.194 0.00869 78.482 108.479 113.381

2 128.887 634.141 0.01144 121.529 162.094 191.643

3 135.499 627.146 0.01178 131.389 173.696 209.503

4 138.755 625.526 0.01201 133.904 176.267 214.066

5 140.834 625.087 0.01220 134.419 176.450 215.041

6 142.459 625.046 0.01237 134.113 175.652 214.566

7 144.010 625.257 0.01253 133.185 174.058 213.009

8 145.830 625.762 0.01272 131.431 171.341 210.033

9 148.411 626.743 0.01294 128.294 166.704 204.700

10 152.590 628.482 0.01326 123.226 159.350 196.069

11 159.521 631.606 0.01373 155.296 199.418 245.875

12 166.981 631.617 0.01422 96.864 123.558 153.359

13 177.232 632.377 0.01488 92.974 117.698 147.023

14 185.759 632.294 0.01546 89.767 113.067 141.970

15 193.037 631.874 0.01599 86.602 108.720 137.056

16 199.735 631.323 0.01652 83.307 104.345 131.956

17 206.253 630.665 0.01705 79.982 100.018 126.821

18 212.654 629.929 0.01758 76.595 95.666 121.593

19 218.534 628.762 0.01809 59.883 74.724 95.240

20 224.115 628.109 0.01858 177.248 220.959 282.194

21 230.314 621.220 0.01903 106.581 132.631 171.567

22 236.102 617.929 0.01950 107.876 134.046 174.577

23 239.799 616.834 0.01985 106.991 132.798 173.452

24 242.774 616.642 0.02016 105.044 130.219 170.348

25 245.912 617.202 0.02047 101.582 125.700 164.584

26 250.590 619.137 0.02085 94.142 116.103 152.053

27 261.013 624.939 0.02150 75.667 92.578 121.078

28 291.639 641.522 0.02316 34.587 41.458 53.914

29 311.916 665.326 0.02449 30.165 35.886 45.339

30 318.061 674.189 0.02508 28.183 33.443 41.803

31 322.505 681.721 0.02559 26.427 31.291 38.765

32 330.473 692.109 0.02634 22.534 26.572 32.558

TRAY TRANSPORT PROPERTIES

TRAY - THERMAL CONDUCTIVITY - ------ VISCOSITY ------- -- SURFACE --

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

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1 1.0135E-01 0.0000E+00 3.5853E-01 0.0000E+00 1.9031E+01

2 7.9108E-02 2.1309E-02 2.1065E-01 9.1298E-03 1.2234E+01

3 7.5784E-02 2.1883E-02 2.0102E-01 9.1202E-03 1.1457E+01

4 7.4582E-02 2.2194E-02 1.9880E-01 9.1507E-03 1.1231E+01

5 7.3931E-02 2.2415E-02 1.9805E-01 9.1837E-03 1.1130E+01

6 7.3475E-02 2.2595E-02 1.9776E-01 9.2150E-03 1.1072E+01

7 7.3086E-02 2.2766E-02 1.9776E-01 9.2469E-03 1.1034E+01

8 7.2691E-02 2.2953E-02 1.9809E-01 9.2834E-03 1.1010E+01

9 7.2212E-02 2.3195E-02 1.9896E-01 9.3311E-03 1.1001E+01

10 7.1538E-02 2.3552E-02 2.0075E-01 9.4020E-03 1.1012E+01

11 7.0619E-02 2.4120E-02 2.0439E-01 9.5298E-03 1.1077E+01

12 6.9174E-02 2.4745E-02 2.0414E-01 9.6103E-03 1.0913E+01

13 6.7599E-02 2.5610E-02 2.0531E-01 9.7621E-03 1.0792E+01

14 6.6374E-02 2.6333E-02 2.0586E-01 9.8890E-03 1.0674E+01

15 6.5414E-02 2.6932E-02 2.0634E-01 9.9936E-03 1.0574E+01

16 6.4615E-02 2.7461E-02 2.0700E-01 1.0087E-02 1.0490E+01

17 6.3906E-02 2.7959E-02 2.0783E-01 1.0175E-02 1.0415E+01

18 6.3257E-02 2.8439E-02 2.0876E-01 1.0260E-02 1.0345E+01

19 6.2615E-02 2.8930E-02 2.0904E-01 1.0312E-02 1.0246E+01

20 6.2092E-02 2.9359E-02 2.0987E-01 1.0386E-02 1.0186E+01

21 6.0491E-02 2.9852E-02 2.0222E-01 1.0360E-02 9.6672E+00

22 5.9543E-02 3.0313E-02 1.9946E-01 1.0398E-02 9.4155E+00

23 5.9084E-02 3.0623E-02 1.9881E-01 1.0439E-02 9.3183E+00

24 5.8786E-02 3.0878E-02 1.9886E-01 1.0479E-02 9.2759E+00

25 5.8538E-02 3.1136E-02 1.9948E-01 1.0524E-02 9.2678E+00

26 5.8273E-02 3.1474E-02 2.0126E-01 1.0588E-02 9.3099E+00

27 5.7875E-02 3.2106E-02 2.0674E-01 1.0711E-02 9.4880E+00

28 5.7020E-02 3.3707E-02 2.2497E-01 1.1026E-02 1.0057E+01

29 5.9648E-02 3.1933E-02 2.7397E-01 1.4156E-02 1.1770E+01

30 6.0655E-02 3.2150E-02 2.9577E-01 1.5246E-02 1.2434E+01

31 6.1505E-02 3.2343E-02 3.1569E-01 1.5861E-02 1.3006E+01

32 6.2481E-02 3.2534E-02 3.4644E-01 1.6497E-02 1.3774E+01