方案一（初期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 75.7 0.25 128.2 297.9V -1.0815

0.0W

2 89.2 0.30 126.0 426.1

3 93.7 0.30 119.9 423.9

4 96.8 0.31 115.0 417.8

5 99.3 0.31 110.8 412.9

6 101.4 0.31 106.7 408.7

7 103.4 0.31 102.2 404.6

8 105.6 0.32 96.3 400.1

9 108.4 0.32 87.4 394.2

10 112.6 0.32 74.0 385.3 105.6V

11 120.8 0.32 904.7 266.3 783.2L

12 124.2 0.33 929.5 313.8

13 126.2 0.33 943.8 338.6

14 127.8 0.33 953.5 352.9

15 129.2 0.33 961.7 362.6

16 130.7 0.34 969.6 370.8

17 132.4 0.34 977.8 378.7

18 134.7 0.34 986.7 386.9

19 137.9 0.34 995.8 395.7

20 143.3 0.35 1004.0 404.9

21 153.2 0.35 1008.6 413.1

22 172.5 0.35 417.6 1607.9P 1607.9P 4.5492

590.9L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 66.401 8.74164 0.92020 19.782 6.677 2.263

2 69.074 10.10031 0.91089 29.434 9.551 2.914

3 70.005 10.16984 0.91129 29.673 9.501 2.918

4 70.523 10.21675 0.91176 29.467 9.365 2.884

5 70.876 10.25858 0.91217 29.266 9.255 2.853

6 71.141 10.29742 0.91254 29.074 9.160 2.823

7 71.354 10.33121 0.91296 28.872 9.069 2.795

8 71.541 10.35403 0.91358 28.626 8.969 2.765

9 71.720 10.35307 0.91468 28.273 8.836 2.731

10 71.900 10.30352 0.91678 27.705 8.637 2.689

11 73.700 10.39598 0.91731 19.625 5.968 1.888

12 75.926 10.72918 0.91323 23.827 7.034 2.221

13 77.097 10.92837 0.91103 26.105 7.589 2.389

14 77.871 11.07784 0.90956 27.477 7.909 2.480

15 78.527 11.21158 0.90835 28.476 8.128 2.540

16 79.200 11.34514 0.90718 29.366 8.311 2.588

17 79.975 11.48751 0.90596 30.284 8.488 2.636

18 80.953 11.64692 0.90462 31.322 8.672 2.689

19 82.316 11.83628 0.90310 32.576 8.870 2.752

20 84.482 12.08396 0.90128 34.206 9.075 2.831

21 88.482 12.46513 0.89876 36.553 9.259 2.932

22 96.852 13.19948 0.89377 40.449 9.361 3.064

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

---- -------- ------------ -------- ----------- ----------- -----------

1 75.284 588.720 0.01549 9.653 14.800 16.396

2 78.528 585.274 0.01787 9.891 14.931 16.899

3 80.763 588.333 0.01817 9.685 14.476 16.462

4 82.468 590.769 0.01844 9.485 14.077 16.055

5 83.887 592.699 0.01869 9.292 13.716 15.678

6 85.181 594.352 0.01893 9.090 13.356 15.294

7 86.521 596.017 0.01919 8.844 12.938 14.838

8 88.174 598.116 0.01949 8.492 12.360 14.197

9 90.641 601.383 0.01990 7.923 11.454 13.175

10 94.848 607.009 0.02053 7.020 10.038 11.566

11 101.491 613.265 0.02141 91.822 129.235 149.727

12 101.235 609.329 0.02144 94.100 132.458 154.433

13 101.160 607.105 0.02152 95.472 134.377 157.258

14 101.171 605.573 0.02162 96.471 135.757 159.305

15 101.238 604.283 0.02173 97.361 136.972 161.118

16 101.362 603.029 0.02184 98.279 138.208 162.976

17 101.568 601.710 0.02197 99.317 139.583 165.058

18 101.931 600.262 0.02210 100.571 141.201 167.546

19 102.631 598.633 0.02226 102.201 143.217 170.724

20 104.129 596.746 0.02249 104.548 145.939 175.197

21 107.524 594.314 0.02291 108.444 150.168 182.470

22 115.067 590.136 0.02375 67.995 92.738 115.219

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.5169E-02 1.7125E-02 1.7862E-01 8.6238E-03 1.1148E+01

2 9.1412E-02 1.8042E-02 1.6738E-01 8.8500E-03 1.0562E+01

3 9.0429E-02 1.8356E-02 1.6700E-01 8.9181E-03 1.0620E+01

4 8.9763E-02 1.8600E-02 1.6732E-01 8.9725E-03 1.0678E+01

5 8.9237E-02 1.8812E-02 1.6782E-01 9.0184E-03 1.0726E+01

6 8.8781E-02 1.9012E-02 1.6843E-01 9.0597E-03 1.0768E+01

7 8.8346E-02 1.9205E-02 1.6925E-01 9.1003E-03 1.0814E+01

8 8.7874E-02 1.9419E-02 1.7055E-01 9.1460E-03 1.0883E+01

9 8.7272E-02 1.9701E-02 1.7296E-01 9.2067E-03 1.1003E+01

10 8.6385E-02 2.0132E-02 1.7777E-01 9.3003E-03 1.1228E+01

11 8.4595E-02 2.0778E-02 1.8347E-01 9.4041E-03 1.1385E+01

12 8.3737E-02 2.0834E-02 1.7888E-01 9.3689E-03 1.1065E+01

13 8.3227E-02 2.0892E-02 1.7640E-01 9.3582E-03 1.0885E+01

14 8.2854E-02 2.0957E-02 1.7474E-01 9.3573E-03 1.0761E+01

15 8.2519E-02 2.1032E-02 1.7337E-01 9.3608E-03 1.0656E+01

16 8.2171E-02 2.1119E-02 1.7207E-01 9.3666E-03 1.0552E+01

17 8.1772E-02 2.1225E-02 1.7071E-01 9.3746E-03 1.0441E+01

18 8.1276E-02 2.1365E-02 1.6922E-01 9.3859E-03 1.0314E+01

19 8.0587E-02 2.1573E-02 1.6754E-01 9.4048E-03 1.0159E+01

20 7.9497E-02 2.1928E-02 1.6555E-01 9.4411E-03 9.9523E+00

21 7.7549E-02 2.2601E-02 1.6303E-01 9.5138E-03 9.6360E+00

22 7.3940E-02 2.3835E-02 1.5926E-01 9.6399E-03 9.0803E+00

方案一（末期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 73.2 0.25 135.8 321.3V -1.1306

0.0W

2 86.7 0.30 133.6 457.1

3 90.9 0.30 127.3 454.9

4 93.9 0.31 121.9 448.6

5 96.3 0.31 117.2 443.3

6 98.5 0.31 112.6 438.5

7 100.6 0.31 107.6 434.0

8 102.9 0.32 101.1 428.9

9 105.8 0.32 91.6 422.4

10 110.1 0.32 77.5 412.9 130.9V

11 119.1 0.32 935.7 267.9 807.2L

12 123.0 0.33 962.6 318.8

13 125.3 0.33 977.7 345.8

14 127.1 0.33 987.7 360.8

15 128.6 0.33 996.1 370.9

16 130.3 0.34 1004.2 379.3

17 132.1 0.34 1012.5 387.4

18 134.5 0.34 1021.2 395.7

19 137.7 0.34 1029.6 404.4

20 143.0 0.35 1036.4 412.8

21 152.8 0.35 1038.2 419.6

22 172.1 0.35 421.4 1620.9P 1620.9P 4.4807

616.8L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 65.319 8.64996 0.92113 20.989 7.202 2.426

2 67.780 9.96647 0.91229 30.981 10.245 3.109

3 68.571 10.02073 0.91288 31.193 10.196 3.113

4 69.004 10.05720 0.91350 30.956 10.055 3.078

5 69.309 10.09075 0.91405 30.723 9.936 3.045

6 69.548 10.12269 0.91455 30.499 9.829 3.013

7 69.750 10.15065 0.91508 30.268 9.727 2.982

8 69.934 10.16856 0.91580 29.996 9.614 2.950

9 70.115 10.16366 0.91697 29.619 9.468 2.914

10 70.299 10.11195 0.91909 29.027 9.255 2.871

11 72.361 10.23022 0.91925 19.386 6.005 1.895

12 74.680 10.56068 0.91525 23.812 7.147 2.255

13 75.860 10.75170 0.91319 26.233 7.751 2.440

14 76.614 10.89087 0.91187 27.646 8.088 2.538

15 77.240 11.01331 0.91081 28.652 8.314 2.602

16 77.871 11.13392 0.90982 29.539 8.502 2.653

17 78.584 11.26023 0.90881 30.443 8.683 2.704

18 79.460 11.39820 0.90775 31.443 8.869 2.759

19 80.652 11.55661 0.90664 32.612 9.063 2.822

20 82.516 11.75503 0.90549 34.066 9.253 2.898

21 85.967 12.04963 0.90418 36.068 9.404 2.993

22 93.386 12.62855 0.90144 39.355 9.446 3.116

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

---- -------- ------------ -------- ----------- ----------- -----------

1 73.604 603.449 0.01488 9.992 15.037 16.559

2 76.395 604.580 0.01695 10.204 15.021 16.878

3 78.308 611.154 0.01709 9.967 14.460 16.308

4 79.820 616.426 0.01724 9.734 13.970 15.791

5 81.140 620.711 0.01740 9.510 13.532 15.322

6 82.392 624.362 0.01757 9.280 13.107 14.862

7 83.718 627.805 0.01776 9.007 12.636 14.347

8 85.357 631.651 0.01799 8.630 12.017 13.663

9 87.772 636.841 0.01832 8.038 11.088 12.622

10 91.826 644.588 0.01883 7.117 9.686 11.041

11 98.121 651.349 0.01958 91.807 122.849 140.949

12 97.888 646.584 0.01959 94.228 126.144 145.732

13 97.827 644.091 0.01966 95.641 128.021 148.490

14 97.846 642.516 0.01974 96.647 129.318 150.420

15 97.912 641.282 0.01983 97.534 130.431 152.092

16 98.026 640.160 0.01992 98.438 131.538 153.771

17 98.209 639.070 0.02001 99.438 132.729 155.598

18 98.522 638.029 0.02011 100.607 134.063 157.683

19 99.122 637.170 0.02021 102.061 135.600 160.178

20 100.412 636.800 0.02034 104.063 137.469 163.415

21 103.398 637.152 0.02057 107.350 140.212 168.484

22 110.238 636.367 0.02112 67.995 87.120 106.849

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.6748E-02 1.6977E-02 1.8039E-01 8.6291E-03 1.1784E+01

2 9.3256E-02 1.7870E-02 1.6977E-01 8.8704E-03 1.1347E+01

3 9.2480E-02 1.8167E-02 1.7026E-01 8.9468E-03 1.1539E+01

4 9.1954E-02 1.8405E-02 1.7141E-01 9.0086E-03 1.1707E+01

5 9.1516E-02 1.8611E-02 1.7269E-01 9.0617E-03 1.1846E+01

6 9.1110E-02 1.8802E-02 1.7405E-01 9.1099E-03 1.1965E+01

7 9.0704E-02 1.8992E-02 1.7563E-01 9.1569E-03 1.2080E+01

8 9.0250E-02 1.9206E-02 1.7784E-01 9.2086E-03 1.2216E+01

9 8.9661E-02 1.9488E-02 1.8149E-01 9.2750E-03 1.2414E+01

10 8.8778E-02 1.9917E-02 1.8818E-01 9.3736E-03 1.2727E+01

11 8.6803E-02 2.0567E-02 1.9497E-01 9.4817E-03 1.2869E+01

12 8.5817E-02 2.0655E-02 1.8906E-01 9.4564E-03 1.2470E+01

13 8.5248E-02 2.0729E-02 1.8599E-01 9.4532E-03 1.2256E+01

14 8.4839E-02 2.0805E-02 1.8402E-01 9.4592E-03 1.2115E+01

15 8.4476E-02 2.0888E-02 1.8242E-01 9.4696E-03 1.1998E+01

16 8.4104E-02 2.0982E-02 1.8093E-01 9.4829E-03 1.1885E+01

17 8.3687E-02 2.1095E-02 1.7943E-01 9.4995E-03 1.1768E+01

18 8.3185E-02 2.1239E-02 1.7787E-01 9.5216E-03 1.1641E+01

19 8.2514E-02 2.1451E-02 1.7626E-01 9.5555E-03 1.1499E+01

20 8.1482E-02 2.1815E-02 1.7467E-01 9.6165E-03 1.1327E+01

21 7.9637E-02 2.2518E-02 1.7320E-01 9.7366E-03 1.1080E+01

22 7.6091E-02 2.3866E-02 1.7138E-01 9.9540E-03 1.0582E+01

方案二（初期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 72.8 0.25 150.7 296.5V -1.2076

0.0W

2 85.3 0.30 151.4 447.2

3 89.0 0.30 146.4 447.9

4 91.6 0.31 141.7 442.9

5 93.8 0.31 137.1 438.2

6 95.9 0.31 132.0 433.6

7 98.2 0.31 126.0 428.5

8 100.9 0.32 117.9 422.5

9 104.5 0.32 105.7 414.4

10 110.0 0.32 87.4 402.2 110.3V

11 120.2 0.32 915.0 273.6 779.6L

12 123.6 0.33 940.1 321.6

13 125.7 0.33 954.5 346.8

14 127.3 0.33 964.4 361.2

15 128.7 0.33 972.6 371.0

16 130.2 0.34 980.5 379.2

17 132.0 0.34 988.8 387.2

18 134.2 0.34 997.6 395.4

19 137.5 0.34 1006.6 404.2

20 142.7 0.35 1014.5 413.3

21 152.5 0.35 1017.9 421.1

22 171.7 0.35 424.6 1631.4P 1631.4P 4.5860

593.4L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 65.809 8.74149 0.91964 19.512 6.646 2.232

2 68.410 10.12681 0.90957 30.590 10.023 3.021

3 69.252 10.21161 0.90952 31.015 10.038 3.037

4 69.712 10.26841 0.90971 30.874 9.927 3.007

5 70.047 10.31596 0.90998 30.697 9.823 2.976

6 70.335 10.35719 0.91033 30.495 9.718 2.944

7 70.612 10.39088 0.91084 30.258 9.604 2.912

8 70.900 10.41145 0.91163 29.953 9.469 2.877

9 71.216 10.40451 0.91303 29.510 9.288 2.836

10 71.577 10.33927 0.91568 28.785 9.014 2.784

11 73.634 10.40533 0.91705 20.146 6.132 1.936

12 75.867 10.73851 0.91297 24.400 7.209 2.272

13 77.041 10.93766 0.91078 26.714 7.772 2.442

14 77.819 11.08722 0.90931 28.105 8.095 2.535

15 78.479 11.22116 0.90809 29.117 8.316 2.595

16 79.155 11.35492 0.90693 30.019 8.500 2.644

17 79.933 11.49732 0.90571 30.948 8.678 2.692

18 80.909 11.65641 0.90438 31.995 8.863 2.745

19 82.263 11.84470 0.90287 33.254 9.061 2.807

20 84.399 12.08951 0.90108 34.878 9.263 2.885

21 88.320 12.46298 0.89863 37.193 9.439 2.984

22 96.528 13.17828 0.89386 40.983 9.516 3.110

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

---- -------- ------------ -------- ----------- ----------- -----------

1 73.528 585.569 0.01534 11.078 17.127 18.918

2 75.996 580.545 0.01763 11.503 17.562 19.814

3 77.616 582.612 0.01787 11.363 17.212 19.503

4 78.911 584.632 0.01809 11.185 16.841 19.132

5 80.126 586.621 0.01830 10.983 16.447 18.723

6 81.401 588.679 0.01854 10.746 16.005 18.254

7 82.881 590.975 0.01880 10.442 15.463 17.668

8 84.817 593.875 0.01912 9.998 14.706 16.836

9 87.765 598.179 0.01957 9.273 13.512 15.502

10 92.872 605.310 0.02029 8.116 11.658 13.408

11 100.980 613.272 0.02134 92.395 130.098 150.659

12 100.741 609.324 0.02137 94.709 133.366 155.433

13 100.678 607.101 0.02144 96.100 135.307 158.293

14 100.698 605.569 0.02154 97.112 136.703 160.365

15 100.774 604.281 0.02165 98.014 137.931 162.199

16 100.906 603.030 0.02177 98.943 139.180 164.076

17 101.121 601.718 0.02189 99.990 140.563 166.174

18 101.491 600.285 0.02203 101.249 142.183 168.667

19 102.196 598.687 0.02219 102.873 144.187 171.831

20 103.686 596.862 0.02242 105.188 146.858 176.235

21 107.057 594.566 0.02283 108.978 150.931 183.291

22 114.591 590.669 0.02367 67.995 92.740 115.115

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.5837E-02 1.6935E-02 1.8024E-01 8.5819E-03 1.1040E+01

2 9.2217E-02 1.7748E-02 1.6731E-01 8.7855E-03 1.0393E+01

3 9.1388E-02 1.7984E-02 1.6599E-01 8.8364E-03 1.0416E+01

4 9.0831E-02 1.8175E-02 1.6565E-01 8.8797E-03 1.0461E+01

5 9.0359E-02 1.8351E-02 1.6570E-01 8.9203E-03 1.0513E+01

6 8.9900E-02 1.8530E-02 1.6603E-01 8.9617E-03 1.0572E+01

7 8.9410E-02 1.8727E-02 1.6671E-01 9.0071E-03 1.0642E+01

8 8.8835E-02 1.8975E-02 1.6800E-01 9.0616E-03 1.0738E+01

9 8.8069E-02 1.9326E-02 1.7058E-01 9.1361E-03 1.0895E+01

10 8.6918E-02 1.9875E-02 1.7607E-01 9.2530E-03 1.1174E+01

11 8.4722E-02 2.0715E-02 1.8310E-01 9.3942E-03 1.1386E+01

12 8.3853E-02 2.0776E-02 1.7851E-01 9.3601E-03 1.1064E+01

13 8.3337E-02 2.0837E-02 1.7603E-01 9.3499E-03 1.0884E+01

14 8.2959E-02 2.0904E-02 1.7438E-01 9.3495E-03 1.0760E+01

15 8.2619E-02 2.0980E-02 1.7302E-01 9.3533E-03 1.0654E+01

16 8.2267E-02 2.1069E-02 1.7172E-01 9.3594E-03 1.0550E+01

17 8.1865E-02 2.1176E-02 1.7037E-01 9.3676E-03 1.0439E+01

18 8.1367E-02 2.1317E-02 1.6891E-01 9.3791E-03 1.0313E+01

19 8.0680E-02 2.1524E-02 1.6725E-01 9.3982E-03 1.0160E+01

20 7.9600E-02 2.1876E-02 1.6532E-01 9.4345E-03 9.9572E+00

21 7.7678E-02 2.2540E-02 1.6291E-01 9.5072E-03 9.6500E+00

22 7.4100E-02 2.3772E-02 1.5938E-01 9.6354E-03 9.1101E+00

方案二（末期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 73.1 0.25 143.8 323.7V -1.1872

0.0W

2 86.2 0.30 142.6 467.5

3 90.3 0.30 136.6 466.3

4 93.2 0.31 131.3 460.3

5 95.5 0.31 126.4 455.0

6 97.7 0.31 121.6 450.2

7 99.8 0.31 116.1 445.3

8 102.2 0.32 109.0 439.9

9 105.3 0.32 98.3 432.7

10 109.9 0.32 82.4 422.1 130.4V

11 119.1 0.32 918.8 275.6 786.9L

12 122.8 0.33 945.7 325.2

13 125.0 0.33 961.1 352.1

14 126.7 0.33 971.5 367.5

15 128.1 0.33 980.1 377.9

16 129.7 0.34 988.2 386.5

17 131.5 0.34 996.6 394.6

18 133.8 0.34 1005.5 403.0

19 137.1 0.34 1014.4 411.8

20 142.4 0.35 1021.9 420.8

21 152.4 0.35 1025.0 428.3

22 171.7 0.35 431.4 1657.1P 1657.1P 4.6582

593.6L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 65.649 8.70530 0.92036 21.251 7.256 2.441

2 68.275 10.06798 0.91080 31.919 10.479 3.170

3 69.138 10.14138 0.91103 32.241 10.452 3.179

4 69.611 10.18958 0.91142 32.042 10.317 3.145

5 69.947 10.23108 0.91181 31.827 10.199 3.111

6 70.218 10.26852 0.91222 31.609 10.090 3.078

7 70.452 10.30031 0.91270 31.372 9.981 3.046

8 70.670 10.32064 0.91341 31.085 9.859 3.012

9 70.887 10.31592 0.91464 30.675 9.699 2.974

10 71.111 10.25887 0.91695 30.013 9.460 2.926

11 73.164 10.36279 0.91748 20.167 6.178 1.946

12 75.522 10.70921 0.91324 24.561 7.289 2.293

13 76.775 10.91724 0.91094 27.030 7.891 2.476

14 77.599 11.07176 0.90940 28.518 8.237 2.576

15 78.287 11.20854 0.90815 29.587 8.471 2.640

16 78.981 11.34404 0.90697 30.524 8.662 2.691

17 79.773 11.48758 0.90574 31.479 8.845 2.740

18 80.761 11.64738 0.90441 32.547 9.033 2.794

19 82.126 11.83599 0.90290 33.823 9.231 2.858

20 84.280 12.08087 0.90113 35.463 9.431 2.935

21 88.241 12.45530 0.89870 37.795 9.600 3.034

22 96.524 13.17618 0.89391 41.638 9.669 3.160

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

---- -------- ------------ -------- ----------- ----------- -----------

1 74.186 587.857 0.01540 10.667 16.435 18.146

2 77.056 583.750 0.01773 10.990 16.690 18.826

3 79.001 586.492 0.01800 10.791 16.238 18.398

4 80.543 588.919 0.01825 10.576 15.807 17.958

5 81.913 591.042 0.01848 10.357 15.391 17.524

6 83.239 592.997 0.01873 10.121 14.963 17.068

7 84.665 595.005 0.01899 9.833 14.463 16.526

8 86.441 597.475 0.01930 9.423 13.780 15.772

9 89.088 601.192 0.01972 8.762 12.712 14.574

10 93.615 607.469 0.02039 7.709 11.049 12.691

11 100.732 614.133 0.02131 92.556 130.350 150.709

12 100.483 609.932 0.02133 95.025 133.835 155.796

13 100.417 607.561 0.02141 96.513 135.912 158.853

14 100.440 605.950 0.02151 97.582 137.386 161.039

15 100.521 604.616 0.02162 98.519 138.662 162.945

16 100.659 603.338 0.02173 99.474 139.944 164.873

17 100.883 602.007 0.02186 100.542 141.353 167.011

18 101.265 600.565 0.02199 101.818 142.993 169.537

19 101.990 598.971 0.02216 103.458 145.007 172.726

20 103.520 597.171 0.02239 105.790 147.682 177.152

21 106.960 594.917 0.02281 109.633 151.787 184.283

22 114.544 591.007 0.02365 67.995 92.691 115.049

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.5820E-02 1.7001E-02 1.8055E-01 8.6007E-03 1.1158E+01

2 9.2109E-02 1.7872E-02 1.6809E-01 8.8180E-03 1.0544E+01

3 9.1205E-02 1.8149E-02 1.6722E-01 8.8785E-03 1.0593E+01

4 9.0591E-02 1.8371E-02 1.6726E-01 8.9288E-03 1.0654E+01

5 9.0082E-02 1.8566E-02 1.6760E-01 8.9738E-03 1.0711E+01

6 8.9616E-02 1.8752E-02 1.6815E-01 9.0164E-03 1.0766E+01

7 8.9151E-02 1.8942E-02 1.6896E-01 9.0601E-03 1.0826E+01

8 8.8634E-02 1.9159E-02 1.7030E-01 9.1098E-03 1.0908E+01

9 8.7971E-02 1.9460E-02 1.7283E-01 9.1760E-03 1.1047E+01

10 8.6991E-02 1.9929E-02 1.7798E-01 9.2781E-03 1.1298E+01

11 8.4979E-02 2.0652E-02 1.8386E-01 9.3928E-03 1.1455E+01

12 8.4048E-02 2.0724E-02 1.7895E-01 9.3575E-03 1.1110E+01

13 8.3496E-02 2.0788E-02 1.7630E-01 9.3465E-03 1.0918E+01

14 8.3097E-02 2.0859E-02 1.7455E-01 9.3457E-03 1.0787E+01

15 8.2745E-02 2.0938E-02 1.7314E-01 9.3494E-03 1.0677E+01

16 8.2383E-02 2.1028E-02 1.7181E-01 9.3555E-03 1.0571E+01

17 8.1973E-02 2.1138E-02 1.7045E-01 9.3639E-03 1.0458E+01

18 8.1467E-02 2.1282E-02 1.6897E-01 9.3758E-03 1.0331E+01

19 8.0770E-02 2.1493E-02 1.6732E-01 9.3955E-03 1.0177E+01

20 7.9673E-02 2.1853E-02 1.6540E-01 9.4330E-03 9.9736E+00

21 7.7722E-02 2.2531E-02 1.6300E-01 9.5079E-03 9.6648E+00

22 7.4110E-02 2.3776E-02 1.5944E-01 9.6379E-03 9.1196E+00

方案三（初期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 67.7 0.25 203.8 287.3V -1.5411

0.0W

2 79.9 0.30 208.8 491.1

3 83.0 0.30 205.5 496.1

4 85.0 0.31 202.5 492.8

5 86.5 0.31 199.5 489.8

6 87.9 0.31 195.8 486.8

7 89.5 0.31 190.2 483.1

8 91.7 0.32 180.4 477.6

9 95.5 0.32 160.9 467.7

10 103.0 0.32 127.2 448.2 119.1V

11 118.5 0.32 942.8 295.4 767.5L

12 122.1 0.33 968.9 343.5

13 124.2 0.33 983.9 369.6

14 125.8 0.33 994.0 384.6

15 127.3 0.33 1002.5 394.7

16 128.9 0.34 1010.6 403.2

17 130.7 0.34 1018.9 411.3

18 132.9 0.34 1027.5 419.6

19 136.0 0.34 1036.0 428.2

20 141.0 0.35 1042.4 436.7

21 150.5 0.35 1041.9 443.1

22 169.3 0.35 442.6 1687.9P 1687.9P 4.6936

599.3L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 64.532 8.70304 0.91934 18.541 6.440 2.130

2 67.267 10.12618 0.90833 33.035 11.008 3.262

3 68.114 10.23254 0.90777 33.794 11.120 3.303

4 68.545 10.30705 0.90752 33.781 11.046 3.277

5 68.832 10.37156 0.90735 33.715 10.979 3.251

6 69.062 10.42953 0.90727 33.617 10.910 3.223

7 69.286 10.47949 0.90736 33.470 10.827 3.194

8 69.556 10.51427 0.90784 33.217 10.704 3.159

9 69.954 10.51276 0.90926 32.718 10.483 3.112

10 70.627 10.42285 0.91285 31.656 10.046 3.037

11 73.430 10.43034 0.91630 21.694 6.622 2.080

12 75.684 10.76394 0.91223 25.996 7.699 2.415

13 76.876 10.96415 0.91004 28.417 8.285 2.592

14 77.670 11.11477 0.90856 29.870 8.620 2.687

15 78.343 11.24959 0.90734 30.926 8.848 2.749

16 79.026 11.38374 0.90617 31.863 9.037 2.799

17 79.801 11.52559 0.90497 32.820 9.218 2.848

18 80.757 11.68244 0.90366 33.883 9.404 2.900

19 82.052 11.86519 0.90220 35.138 9.598 2.961

20 84.058 12.09734 0.90053 36.712 9.789 3.035

21 87.717 12.44245 0.89838 38.867 9.931 3.124

22 95.536 13.10599 0.89426 42.283 9.920 3.226

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

---- -------- ------------ -------- ----------- ----------- -----------

1 71.123 581.853 0.01516 14.495 22.696 24.911

2 73.041 575.147 0.01737 15.254 23.637 26.521

3 74.155 575.736 0.01756 15.241 23.489 26.472

4 74.933 576.393 0.01774 15.174 23.300 26.326

5 75.587 577.135 0.01791 15.076 23.077 26.123

6 76.263 578.136 0.01807 14.929 22.776 25.823

7 77.143 579.720 0.01826 14.676 22.295 25.316

8 78.589 582.567 0.01851 14.178 21.395 24.336

9 81.509 588.238 0.01893 13.115 19.557 22.296

10 88.057 599.507 0.01979 11.205 16.334 18.690

11 99.696 612.490 0.02119 93.991 132.678 153.457

12 99.502 608.502 0.02121 96.412 136.087 158.441

13 99.469 606.262 0.02129 97.865 138.110 161.423

14 99.513 604.725 0.02140 98.921 139.561 163.580

15 99.610 603.437 0.02151 99.858 140.831 165.481

16 99.761 602.197 0.02162 100.815 142.112 167.411

17 99.992 600.912 0.02175 101.878 143.512 169.539

18 100.369 599.531 0.02189 103.133 145.121 172.022

19 101.064 598.033 0.02205 104.707 147.050 175.085

20 102.516 596.416 0.02228 106.862 149.495 179.173

21 105.845 594.566 0.02269 110.278 153.022 185.476

22 113.458 591.395 0.02354 67.995 92.863 114.974

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.7056E-02 1.6653E-02 1.8605E-01 8.5201E-03 1.0956E+01

2 9.3380E-02 1.7380E-02 1.6981E-01 8.7053E-03 1.0227E+01

3 9.2606E-02 1.7555E-02 1.6727E-01 8.7413E-03 1.0188E+01

4 9.2137E-02 1.7685E-02 1.6603E-01 8.7700E-03 1.0179E+01

5 9.1779E-02 1.7796E-02 1.6524E-01 8.7954E-03 1.0182E+01

6 9.1456E-02 1.7906E-02 1.6470E-01 8.8212E-03 1.0200E+01

7 9.1108E-02 1.8034E-02 1.6440E-01 8.8518E-03 1.0243E+01

8 9.0644E-02 1.8218E-02 1.6457E-01 8.8954E-03 1.0339E+01

9 8.9865E-02 1.8544E-02 1.6616E-01 8.9714E-03 1.0551E+01

10 8.8314E-02 1.9219E-02 1.7216E-01 9.1254E-03 1.0992E+01

11 8.5066E-02 2.0543E-02 1.8207E-01 9.3625E-03 1.1367E+01

12 8.4161E-02 2.0617E-02 1.7748E-01 9.3307E-03 1.1040E+01

13 8.3625E-02 2.0685E-02 1.7501E-01 9.3218E-03 1.0857E+01

14 8.3233E-02 2.0757E-02 1.7336E-01 9.3222E-03 1.0732E+01

15 8.2881E-02 2.0837E-02 1.7201E-01 9.3267E-03 1.0625E+01

16 8.2520E-02 2.0928E-02 1.7073E-01 9.3334E-03 1.0522E+01

17 8.2114E-02 2.1037E-02 1.6941E-01 9.3421E-03 1.0412E+01

18 8.1619E-02 2.1177E-02 1.6800E-01 9.3541E-03 1.0289E+01

19 8.0950E-02 2.1378E-02 1.6645E-01 9.3732E-03 1.0143E+01

20 7.9916E-02 2.1715E-02 1.6471E-01 9.4091E-03 9.9557E+00

21 7.8070E-02 2.2362E-02 1.6266E-01 9.4829E-03 9.6781E+00

22 7.4536E-02 2.3611E-02 1.5969E-01 9.6198E-03 9.1769E+00

方案三（末期）

COLUMN SUMMARY

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

TRAY TEMP PRESSURE LIQUID VAPOR FEED PRODUCT DUTIES

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

------ ------- -------- -------- -------- --------- --------- ------------

1C 71.0 0.25 156.2 326.2V -1.2602

0.0W

2 83.8 0.30 156.7 482.4

3 87.5 0.30 151.4 482.9

4 90.0 0.31 146.5 477.6

5 92.2 0.31 141.6 472.7

6 94.3 0.31 136.2 467.7

7 96.5 0.31 129.8 462.3

8 99.2 0.32 121.3 456.0

9 102.7 0.32 108.6 447.5

10 108.0 0.32 89.5 434.7 138.5V

11 118.5 0.32 922.3 277.1 782.3L

12 122.3 0.33 950.2 327.6

13 124.6 0.33 966.3 355.6

14 126.3 0.33 977.1 371.6

15 127.8 0.33 985.8 382.4

16 129.4 0.34 994.0 391.1

17 131.2 0.34 1002.5 399.4

18 133.5 0.34 1011.3 407.8

19 136.8 0.34 1020.2 416.7

20 142.2 0.35 1027.6 425.6

21 152.1 0.35 1030.0 432.9

22 171.4 0.35 435.4 1670.3P 1670.3P 4.6846

594.7L

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

---- -------- ------------ -------- ----------- ----------- -----------

1 65.088 8.68319 0.92036 21.229 7.310 2.445

2 67.719 10.05782 0.91045 32.667 10.812 3.248

3 68.543 10.13954 0.91044 33.097 10.823 3.264

4 68.979 10.19337 0.91066 32.944 10.705 3.232

5 69.292 10.23829 0.91096 32.752 10.594 3.199

6 69.559 10.27708 0.91133 32.534 10.483 3.166

7 69.813 10.30837 0.91185 32.278 10.363 3.131

8 70.075 10.32648 0.91266 31.953 10.221 3.094

9 70.358 10.31693 0.91407 31.484 10.030 3.052

10 70.672 10.24880 0.91672 30.722 9.743 2.998

11 72.924 10.34334 0.91766 20.209 6.212 1.954

12 75.360 10.69816 0.91332 24.689 7.343 2.308

13 76.663 10.91157 0.91094 27.258 7.970 2.498

14 77.513 11.06900 0.90937 28.807 8.330 2.603

15 78.217 11.20734 0.90811 29.911 8.571 2.669

16 78.920 11.34369 0.90691 30.869 8.767 2.721

17 79.717 11.48765 0.90568 31.838 8.952 2.771

18 80.708 11.64753 0.90435 32.915 9.141 2.826

19 82.072 11.83578 0.90285 34.198 9.339 2.889

20 84.215 12.07941 0.90109 35.838 9.538 2.967

21 88.145 12.45019 0.89871 38.158 9.703 3.065

22 96.363 13.16209 0.89402 41.952 9.758 3.187

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

---- -------- ------------ -------- ----------- ----------- -----------

1 73.213 586.638 0.01532 11.438 17.706 19.498

2 75.734 581.712 0.01760 11.868 18.132 20.403

3 77.359 583.854 0.01784 11.716 17.757 20.066

4 78.651 585.946 0.01806 11.523 17.359 19.666

5 79.861 588.001 0.01828 11.305 16.936 19.226

6 81.130 590.123 0.01851 11.049 16.463 18.724

7 82.602 592.486 0.01877 10.725 15.887 18.101

8 84.524 595.458 0.01909 10.256 15.088 17.223

9 87.452 599.856 0.01954 9.493 13.836 15.825

10 92.523 607.142 0.02026 8.281 11.897 13.639

11 100.494 614.822 0.02127 92.683 130.501 150.748

12 100.242 610.467 0.02129 95.252 134.122 156.032

13 100.177 608.010 0.02136 96.801 136.281 159.210

14 100.202 606.357 0.02146 97.905 137.802 161.464

15 100.286 605.001 0.02157 98.863 139.104 163.410

16 100.430 603.712 0.02169 99.832 140.403 165.363

17 100.658 602.379 0.02181 100.909 141.822 167.518

18 101.045 600.940 0.02195 102.192 143.467 170.053

19 101.774 599.358 0.02211 103.832 145.478 173.240

20 103.304 597.588 0.02234 106.152 148.128 177.634

21 106.742 595.407 0.02276 109.946 152.153 184.657

22 114.340 591.668 0.02360 67.994 92.633 114.919

TRAY TRANSPORT PROPERTIES

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

KCAL/HR-M-C CP TENSION

LIQUID VAPOR LIQUID VAPOR DYNE/CM

---- ----------- ----------- ----------- ----------- -------------

1 9.6337E-02 1.6894E-02 1.8237E-01 8.5786E-03 1.1140E+01

2 9.2648E-02 1.7721E-02 1.6870E-01 8.7864E-03 1.0489E+01

3 9.1815E-02 1.7959E-02 1.6728E-01 8.8383E-03 1.0515E+01

4 9.1265E-02 1.8150E-02 1.6692E-01 8.8819E-03 1.0564E+01

5 9.0800E-02 1.8325E-02 1.6696E-01 8.9228E-03 1.0620E+01

6 9.0349E-02 1.8502E-02 1.6731E-01 8.9644E-03 1.0683E+01

7 8.9867E-02 1.8698E-02 1.6800E-01 9.0098E-03 1.0757E+01

8 8.9300E-02 1.8934E-02 1.6932E-01 9.0643E-03 1.0858E+01

9 8.8547E-02 1.9260E-02 1.7196E-01 9.1386E-03 1.1022E+01

10 8.7412E-02 1.9776E-02 1.7759E-01 9.2551E-03 1.1312E+01

11 8.5136E-02 2.0611E-02 1.8422E-01 9.3914E-03 1.1497E+01

12 8.4166E-02 2.0689E-02 1.7910E-01 9.3557E-03 1.1139E+01

13 8.3591E-02 2.0757E-02 1.7635E-01 9.3443E-03 1.0939E+01

14 8.3180E-02 2.0829E-02 1.7455E-01 9.3433E-03 1.0805E+01

15 8.2820E-02 2.0909E-02 1.7312E-01 9.3471E-03 1.0693E+01

16 8.2453E-02 2.1001E-02 1.7178E-01 9.3533E-03 1.0586E+01

17 8.2039E-02 2.1112E-02 1.7041E-01 9.3618E-03 1.0472E+01

18 8.1530E-02 2.1257E-02 1.6894E-01 9.3740E-03 1.0344E+01

19 8.0832E-02 2.1469E-02 1.6729E-01 9.3939E-03 1.0191E+01

20 7.9738E-02 2.1828E-02 1.6539E-01 9.4316E-03 9.9890E+00

21 7.7794E-02 2.2505E-02 1.6306E-01 9.5069E-03 9.6841E+00

22 7.4190E-02 2.3753E-02 1.5962E-01 9.6388E-03 9.1465E+00