**Supplier 6 Analysis**

**Change Supplier 6 lead time to 1**

Lambda=15;

Lr=1;

Lw=[1,2,3,3,4,6];

Ow=[4800,1500,1000,2000,800,4000];

Pw=[82.5,84,85,83,83.5,82.8];

%Pw=[84.0,84.5,83.2,83.5,82.8,82.5];

Or=500;

BigM=[210,180,160,150,190,180];

qw=[0.945,0.970,0.975,0.945,0.955,0.950]; %Perfect Rate

qr=0.950; %Target Perfect Rate

Node Left Iinf Objective Best Relaxatn Best Incumbent

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

1 0 13 -1.712477e+003 -1.712477e+003 1.015339e+005

10 9 10 -1.712037e+003 -1.712331e+003 -5.493813e+002

20 19 9 -1.711155e+003 -1.711824e+003 -5.926569e+002

30 29 10 -1.710337e+003 -1.711228e+003 -7.368222e+002

40 35 8 -1.641753e+003 -1.710679e+003 -9.148389e+002

50 41 8 -1.657510e+003 -1.710282e+003 -9.148389e+002

\* 50 41 r -1.318283e+003

60 49 7 -1.657365e+003 -1.657510e+003 -1.548341e+003

70 47 -1.533589e+003 pr -1.645171e+003 -1.548341e+003

80 47 8 -1.559114e+003 -1.642400e+003 -1.548341e+003

90 49 -1.472229e+003 pr -1.638549e+003 -1.548341e+003

100 49 INFEASIBLE pr -1.575429e+003 -1.554148e+003

110 51 -1.554645e+003 pr -1.561577e+003 -1.560045e+003

EXIT: Optimal solution found.

Final Statistics for MIP

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

Final objective value = -1.56075704484047e+003

Final integrality gap (abs / rel) = 4.55e-004 / 2.91e-007 ( 0.00)

# of nodes processed = 117

# of subproblems processed = 117

Total program time (secs) = 458.757 ( 460.515 CPU time)

Time spent in evaluations (secs) = 460.018

===========================================================================

>> x

x =

0 7 0 0 9 0 0 1 0 0 1 0 3 124 -4

**Change Supplier 6 lead time to 0.5**

Lambda=15;

Lr=1;

Lw=[0.5,2,3,3,4,6];

Ow=[4800,1500,1000,2000,800,4000];

Pw=[82.5,84,85,83,83.5,82.8];

%Pw=[84.0,84.5,83.2,83.5,82.8,82.5];

Or=500;

BigM=[210,180,160,150,190,180];

qw=[0.945,0.970,0.975,0.945,0.955,0.950]; %Perfect Rate

qr=0.950; %Target Perfect Rate

Node Left Iinf Objective Best Relaxatn Best Incumbent

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

1 0 12 -1.750634e+003 -1.750634e+003 1.011611e+005

10 9 10 -1.749631e+003 -1.750084e+003 -6.065663e+002

20 19 9 -1.749615e+003 -1.749753e+003 -1.427987e+003

30 29 8 -1.662353e+003 -1.749627e+003 -1.427987e+003

40 37 7 -1.721510e+003 -1.722856e+003 -1.435018e+003

50 41 7 -1.639113e+003 -1.721510e+003 -1.435018e+003

60 43 -1.533867e+003 pr -1.661983e+003 -1.559896e+003

70 39 -1.504338e+003 pr -1.658348e+003 -1.559896e+003

80 39 INFEASIBLE pr -1.649769e+003 -1.559896e+003

90 29 -1.527440e+003 pr -1.640661e+003 -1.559896e+003

100 21 -1.525866e+003 pr -1.631431e+003 -1.559896e+003

110 21 -1.555812e+003 pr -1.561818e+003 -1.560045e+003

EXIT: Optimal solution found.

Final Statistics for MIP

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

Final objective value = -1.56075704484047e+003

Final integrality gap (abs / rel) =-4.31e-008 / -2.76e-011 (-0.00)

# of nodes processed = 119

# of subproblems processed = 119

Total program time (secs) = 448.553 ( 451.810 CPU time)

Time spent in evaluations (secs) = 449.078

===========================================================================

>> x

x =

0 7 0 0 9 0 0 1 0 0 1 0 3 124 -4

**Change supplier 5 lead time to be 0.1**

Lr=1;

Lw=[0.1,2,3,3,4,7];

Ow=[4000,1500,1000,2000,800,4800];

Pw=[82.8,84,85,83,83.5,82.5];

%Pw=[84.0,84.5,83.2,83.5,82.8,82.5];

Or=500;

BigM=[180,180,160,150,190,210];

qw=[0.950,0.970,0.975,0.945,0.955,0.945]; %Perfect Rate

qr=0.950; %Target Perfect Rate

Node Left Iinf Objective Best Relaxatn Best Incumbent

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

1 0 12 -1.753020e+003 -1.753020e+003 1.297966e+005

10 9 9 -1.664676e+003 -1.751099e+003 -9.659210e+002

20 15 7 -1.692623e+003 -1.714897e+003 -9.971477e+002

30 25 9 -1.496875e+003 -1.659906e+003 -1.076737e+003

40 35 6 -1.530118e+003 -1.538539e+003 -1.528328e+003

50 43 2 -1.533109e+003 -1.534265e+003 -1.528328e+003

60 37 -1.432230e+003 pr -1.530884e+003 -1.528328e+003

70 37 -1.527217e+003 pr -1.530118e+003 -1.528539e+003

80 29 1 -1.528890e+003 -1.529424e+003 -1.528539e+003

\* 80 29 r -1.528818e+003

90 25 -1.528818e+003 pr -1.528839e+003 -1.528818e+003

EXIT: Optimal solution found.

Final Statistics for MIP

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

Final objective value = -1.52881769235806e+003

Final integrality gap (abs / rel) =-4.57e-009 / -2.99e-012 (-0.00)

# of nodes processed = 91

# of subproblems processed = 91

Total program time (secs) = 327.834 ( 328.944 CPU time)

Time spent in evaluations (secs) = 328.947

===========================================================================

>> x

x =

0 7 0 0 11 0 0 1 0 0 1 0 3 121 -3

**Change supplier 5 lead time to be 0.5**

**The same results as the previous example**

Lr=1;

Lw=[0.5,2,3,3,4,7];

Ow=[4000,1500,1000,2000,800,4800];

Pw=[82.8,84,85,83,83.5,82.5];

%Pw=[84.0,84.5,83.2,83.5,82.8,82.5];

Or=500;

BigM=[180,180,160,150,190,210];

qw=[0.950,0.970,0.975,0.945,0.955,0.945]; %Perfect Rate

qr=0.950; %Target Perfect Rate

Node Left Iinf Objective Best Relaxatn Best Incumbent

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

1 0 12 -1.751607e+003 -1.751607e+003 1.299611e+005

10 9 10 -1.631344e+003 -1.715352e+003 -9.752747e+002

20 19 9 -1.631154e+003 -1.631784e+003 -1.096063e+003

30 29 6 -1.627878e+003 -1.630106e+003 -1.139602e+003

40 37 4 -1.532740e+003 -1.538944e+003 -1.528328e+003

50 39 INFEASIBLE pr -1.537737e+003 -1.528328e+003

60 35 -1.527387e+003 pr -1.530328e+003 -1.528328e+003

70 35 -1.525929e+003 pr -1.529252e+003 -1.528818e+003

EXIT: Optimal solution found.

Final Statistics for MIP

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

Final objective value = -1.52881769235806e+003

Final integrality gap (abs / rel) =-1.16e-008 / -7.59e-012 (-0.00)

# of nodes processed = 79

# of subproblems processed = 79

Total program time (secs) = 268.513 ( 269.804 CPU time)

Time spent in evaluations (secs) = 269.827

==========================================================================

>> x

x =

0 7 0 0 11 0 0 1 0 0 1 0 3 121 -3

**Change supplier 5 lead time to be 1**

Lambda=15;

Lr=1;

Lw=[**1**,2,3,3,4,7];

Ow=[4000,1500,1000,2000,800,4800];

Pw=[82.8,84,85,83,83.5,82.5];

%Pw=[84.0,84.5,83.2,83.5,82.8,82.5];

Or=500;

BigM=[180,180,160,150,190,210];

qw=[0.950,0.970,0.975,0.945,0.955,0.945]; %Perfect Rate

qr=0.950; %Target Perfect Rate

Node Left Iinf Objective Best Relaxatn Best Incumbent

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

1 0 13 -1.718338e+003 -1.718338e+003 1.303339e+005

10 9 12 -1.606081e+003 -1.717760e+003 -9.575773e+002

20 19 10 -1.681630e+003 -1.682182e+003 -9.681138e+002

30 25 8 -1.658784e+003 -1.681630e+003 -9.681138e+002

\* 30 25 r -9.796627e+002

40 35 INFEASIBLE pr -1.681196e+003 -1.018244e+003

50 41 7 -1.607256e+003 -1.642265e+003 -1.458174e+003

60 41 -1.448820e+003 pr -1.624282e+003 -1.523592e+003

70 33 7 -1.565038e+003 -1.573814e+003 -1.523592e+003

80 33 -1.443801e+003 pr -1.537929e+003 -1.523592e+003

90 27 -1.525167e+003 pr -1.529220e+003 -1.528328e+003

100 25 -1.528539e+003 pr -1.528841e+003 -1.528818e+003

EXIT: Optimal solution found.

Final Statistics for MIP

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

Final objective value = -1.52881769235806e+003

Final integrality gap (abs / rel) =-4.72e-009 / -3.09e-012 (-0.00)

# of nodes processed = 101

# of subproblems processed = 101

Total program time (secs) = 365.187 ( 366.353 CPU time)

Time spent in evaluations (secs) = 366.637

===========================================================================

>> x

x =

0 7 0 0 11 0 0 1 0 0 1 0 3 121 -3