**Problem – B (General) 🡪 DATA**

**Test Instance-1:** TGS1C1D1 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6623.0911

// Quality Incumbent solution:

// MILP objective 6.6230911000e+003

// MILP solution norm |x| (Total, Max) 7.48120e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 1.95399e-013 5.68434e-014

// MILP x bound error (Total, Max) 1.13687e-013 1.13687e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 4.08562e-013 1.13687e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-2:** TGS1C1D2 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6624.4343

// Quality Incumbent solution:

// MILP objective 6.6244343000e+003

// MILP solution norm |x| (Total, Max) 7.58921e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 1.48468e-011 1.59162e-012

// MILP x bound error (Total, Max) 1.70886e-012 4.44089e-013

// MILP x integrality error (Total, Max) 5.11591e-013 1.27898e-013

// MILP slack bound error (Total, Max) 1.03479e-010 4.83169e-011

//

productionquantity = [[[0

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Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-3:** TGS1C1D3 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_3)

// solution (optimal) with objective 6627.5042

// Quality Incumbent solution:

// MILP objective 6.6275042000e+003

// MILP solution norm |x| (Total, Max) 7.82695e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 7.88170e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.48894e-013 2.22045e-013

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**Test Instance-4:** TGS1C1D4 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6623.4951

// Quality Incumbent solution:

// MILP objective 6.6234951000e+003

// MILP solution norm |x| (Total, Max) 7.49056e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 2.09359e-012 4.97380e-013

// MILP x bound error (Total, Max) 3.83693e-013 2.13163e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.43042e-012 4.99606e-013

//

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[79.765 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 10 10 5 10 10 5 0 0 5 0 0]

[10 10 10 10 15 15 15 10 15 10 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 5 5 10 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-5:** TGS1C1D5 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6630.55500000001

// Quality Incumbent solution:

// MILP objective 6.6305550000e+003

// MILP solution norm |x| (Total, Max) 7.73852e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 4.25618e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.24090e-012 5.79654e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.397 0 0 140.01 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 5.7965e-13 50.202 50.005 0 0 0 0 50]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 100.02 100 0 2.1316e-13]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 100.47 0 1.8874e-13 100.01 0 0 100]

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inventory = [[87.64 0 1.8654e-13 70 0]

[32.24 7.9796e-13 30.002 0 0]

[59 0 0 0 0]

[236.81 100.81 0 0 0]

[120.88 0 0 1.8874e-13 0]

[91.24 0 0 0 0]

[195 0 0 0 0]

[220.35 100.47 0 0 0]

[753.88 540.76 360.02 180 0]

[978.56 691.32 460.03 230 0]];

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 10 10 5 10 10 0 0 5 5 0 0]

[10 10 10 10 15 15 10 15 15 10 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 5 10 5 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-6:** TGS1C1D6 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_6)

// solution (optimal) with objective 6646.1374

// Quality Incumbent solution:

// MILP objective 6.6461374000e+003

// MILP solution norm |x| (Total, Max) 8.28411e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 2.78888e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.71783e-013 9.94760e-014

//

productionquantity = [[[0

0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 71.216 0 0 140.03 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 60.228 0 0 0 0 0 30 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 50.62 0 0 50.014 50 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 100.06 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 101.44 0 0 100.03 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 80.843 0 0 80.019 0 80 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 153.1 0 0 150.07 0 0 0 0 150]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[1 0 0 0 0 0 0 100.03 0 0 100 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[124.02 0 0 70.001 0]

[38.922 0 30.005 0 0]

[77.563 0 0 0 0]

[312.73 102.48 0 0 0]

[163.94 0 0 0 0]

[116.49 0 0 0 0]

[287.81 0 0 0 0]

[264.38 101.44 0 0 0]

[823.76 542.33 360.05 180 0]

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**Test Instance-7:** TGS1C1D7 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_7)

// solution (optimal) with objective 6624.5234

// Quality Incumbent solution:

// MILP objective 6.6245234000e+003

// MILP solution norm |x| (Total, Max) 7.50423e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 1.32339e-013 5.68434e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.26246e-013 1.98952e-013

//

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**Test Instance-8:** TGS1C1D8 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_8)

// solution (integer optimal, tolerance) with objective 6647.3755

// Quality Incumbent solution:

// MILP objective 6.6473755000e+003

// MILP solution norm |x| (Total, Max) 7.95769e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 7.75742e-012 3.63798e-012

// MILP x bound error (Total, Max) 6.43929e-015 2.44249e-015

// MILP x integrality error (Total, Max) 2.23155e-014 1.42109e-014

// MILP slack bound error (Total, Max) 1.15215e-011 1.09139e-011

//

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**Test Instance-9:** TGS1C1D9 (Test General Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6697.6495

// Quality Incumbent solution:

// MILP objective 6.6976495000e+003

// MILP solution norm |x| (Total, Max) 8.95531e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 3.77298e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.31450e-013 5.68434e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 10 10 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-10:** TGS1C2D1 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6536.6624

// Quality Incumbent solution:

// MILP objective 6.5366624000e+003

// MILP solution norm |x| (Total, Max) 7.27049e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 4.35114e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.19887e-012 9.71494e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.51262e-012 9.14650e-013

//

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 70.005 0 0 0 0 140 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[70.49 0 0 70 0]

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[50.25 0 0 0 0]

[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[199.59 100.01 0 42.143 0]

[636.64 455.72 275.71 95.714 0]

[921.61 690.02 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 0 5 5 0]

[0 10 10 5 10 5 0 0 0 0 10 0]

[10 10 10 15 10 15 15 10 15 10 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 5 0 0]

[0 10 0 0 0 0 0 10 10 10 5 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-11:** TGS1C2D2 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6538.0065

// Quality Incumbent solution:

// MILP objective 6.5380065000e+003

// MILP solution norm |x| (Total, Max) 7.37850e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 1.57565e-012 4.66294e-013

// MILP x bound error (Total, Max) 1.84569e-012 4.66294e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.96200e-012 4.66294e-013

//

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 70.078 140 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 60.014 -1.0663e-13 0 0 0 0 0 30 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 -3.6238e-13 50.004 0 0 0 50 50 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 100 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[1 0 0 0 0 0 0 142.14 0 52.143 0 0]

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inventory = [[77.84 0 4.5076e-13 70 0]

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[216.16 100.16 0 0 0]

[109.28 0 -4.552e-13 0 0]

[84.44 0 0 0 0]

[170 0 0 0 0]

[214.09 105.81 5.7151 47.857 0]

[644.87 450.15 270 90 0]

[945.7 690.26 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-12:** TGS1C2D3 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6541.0783

// Quality Incumbent solution:

// MILP objective 6.5410783000e+003

// MILP solution norm |x| (Total, Max) 7.61624e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 1.38085e-011 3.63798e-012

// MILP x bound error (Total, Max) 8.70415e-013 4.44089e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.30811e-013 3.12639e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-13:** TGS1C2D4 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_4)

// solution (optimal) with objective 6537.0671

// Quality Incumbent solution:

// MILP objective 6.5370671000e+003

// MILP solution norm |x| (Total, Max) 7.27984e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 5.18852e-012 1.85452e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 7.66054e-015 7.10543e-015

// MILP slack bound error (Total, Max) 1.14242e-012 8.10019e-013

//

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[152.81 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

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[10 10 15 10 10 15 10 15 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 0 10 5 10 5 0 0 10 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-14:** TGS1C2D5 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_5)

// solution (optimal) with objective 6544.1373

// Quality Incumbent solution:

// MILP objective 6.5441373000e+003

// MILP solution norm |x| (Total, Max) 7.52783e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 3.95062e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 5.68434e-014

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 70.397 0 140.01 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 0 60.075 0 0 0 0 30 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 100.02 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 100.47 0 0 100.01 100 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[1 0 0 0 0 0 0 142.14 0 0 57.868 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 84.275]

[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[87.64 0 0 70 0]

[32.24 0 30.002 0 0]

[59 0 0 0 0]

[236.81 100.81 0 0 0]

[120.88 0 0 0 0]

[91.24 0 0 0 0]

[195 0 0 0 0]

[220.35 100.47 0 42.132 0]

[669.61 456.49 275.74 95.725 0]

[978.56 691.32 460.03 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 0 0 0 0 10 0 10 10 10 5 0]

[10 10 15 10 10 15 10 15 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 5 10 10 0 5 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-15:** TGS1C2D6 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_6)

// solution (optimal) with objective 6559.7425

// Quality Incumbent solution:

// MILP objective 6.5597425000e+003

// MILP solution norm |x| (Total, Max) 8.07346e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 2.27374e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 5.68434e-014

//

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 71.216 0 0 140.03 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 60.228 0 0 0 0 0 0 30 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 50.62 0 50.014 0 0 50 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 100.06 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 101.44 0 0 100.03 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 80.843 0 0 0 80.019 0 80 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 153.1 0 150.07 0 0 0 150 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[1 0 0 0 0 0 0 142.14 0 0 57.89 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 84.253]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[124.02 0 0 70.001 0]

[38.922 0 30.005 0 0]

[77.563 0 0 0 0]

[312.73 102.48 0 0 0]

[163.94 0 0 0 0]

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[287.81 0 0 0 0]

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**Test Instance-16:** TGS1C2D7 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6538.0986

// Quality Incumbent solution:

// MILP objective 6.5380986000e+003

// MILP solution norm |x| (Total, Max) 7.29352e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 7.83917e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.11111e-012 3.55271e-013

// MILP x integrality error (Total, Max) 1.31006e-014 1.02141e-014

// MILP slack bound error (Total, Max) 1.10523e-012 2.41585e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-17:** TGS1C2D8 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_8)

// solution (optimal) with objective 6561.01099999976

// Quality Incumbent solution:

// MILP objective 6.5610110000e+003

// MILP solution norm |x| (Total, Max) 7.74710e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 4.14368e-011 3.63798e-012

// MILP x bound error (Total, Max) 4.67267e-010 4.18579e-010

// MILP x integrality error (Total, Max) 1.39584e-010 1.24947e-011

// MILP slack bound error (Total, Max) 1.97963e-008 6.06884e-009

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[1026 694.24 460.17 230.01 0]];

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-18:** TGS1C2D9 (Test General Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6611.4173

// Quality Incumbent solution:

// MILP objective 6.6114173000e+003

// MILP solution norm |x| (Total, Max) 8.74498e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 1.46479e-012 2.84217e-013

// MILP x bound error (Total, Max) 3.23568e-012 7.47708e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.05360e-012 7.47708e-013

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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[213.68 0 0 0 0]

[145.64 1.8355e-13 0 0 0]

[395 0 0 0 0]

[317.23 104.55 0 41.961 0]

[823.74 463.42 276.2 95.915 0]

[1244.6 702.98 460.52 230.02 0]];

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 5 10 0 0 0 0 10 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-19:** TGS1C3D1 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6378.0911

// Quality Incumbent solution:

// MILP objective 6.3780911000e+003

// MILP solution norm |x| (Total, Max) 7.01620e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 1.42109e-013 5.68434e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 2.84217e-014

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 140 0 0 0 0 0 70 0 0]]

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inventory = [[70.49 0 70 0 0]

[29.09 0 0 30 0]

[50.25 0 0 0 0]

[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[199.59 100.01 0 75 0]

[540.93 360.01 180 0 0]

[921.61 690.02 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 0 0 0 5 10 10 5 10 10 0 0]

[10 10 10 15 10 15 10 15 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 10 10 0 0 0 0 0 0 5]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-20:** TGS1C3D2 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_2)

// solution (optimal) with objective 6379.4343

// Quality Incumbent solution:

// MILP objective 6.3794343000e+003

// MILP solution norm |x| (Total, Max) 7.12421e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 5.71748e-013 4.66300e-013

// MILP x bound error (Total, Max) 1.10864e-012 5.82914e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.17642e-012 4.66300e-013

//

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 2.0206e-13 0 70.078 -1.9895e-13 0 140 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 60.014 0 0 0 0 0 30 0 0]]

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inventory = [[77.84 -3.2677e-13 2.0206e-13 70 0]

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[109.28 0 0 0 0]

[84.44 0 0 0 0]

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[554.87 360.15 180 0 0]

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Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-21:** TGS1C3D3 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6382.5042

// Quality Incumbent solution:

// MILP objective 6.3825042000e+003

// MILP solution norm |x| (Total, Max) 7.36195e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 4.72644e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 1.33227e-015 1.33227e-015

// MILP slack bound error (Total, Max) 6.49258e-013 2.27374e-013

//

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**Test Instance-22:** TGS1C3D4 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6378.4951

// Quality Incumbent solution:

// MILP objective 6.3784951000e+003

// MILP solution norm |x| (Total, Max) 7.02556e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 7.90901e-013 3.62818e-013

// MILP x bound error (Total, Max) 8.06740e-013 3.62818e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.20896e-012 3.12639e-013

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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[10 10 10 15 10 15 15 10 15 10 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 0 10 10 0 5]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-23:** TGS1C3D5 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6385.5548

// Quality Incumbent solution:

// MILP objective 6.3855548000e+003

// MILP solution norm |x| (Total, Max) 7.27352e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 3.87956e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 5.68434e-014

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[87.64 0 0 70 0]

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[59 0 0 0 0]

[236.81 100.81 0 0 0]

[120.88 0 0 0 0]

[91.24 0 0 0 0]

[195 0 0 0 0]

[220.35 100.47 0 75.001 0]

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[978.56 691.32 460.03 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 0 0 0 5 0 5 10 5 0 10 0]

[10 10 10 10 15 15 15 10 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 5 10 5 10 0 0 0 10 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-24:** TGS1C3D6 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_6)

// solution (optimal) with objective 6401.1369

// Quality Incumbent solution:

// MILP objective 6.4011369000e+003

// MILP solution norm |x| (Total, Max) 7.81910e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 2.05277e-012 1.63247e-012

// MILP x bound error (Total, Max) 1.70530e-013 1.70530e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.08652e-012 1.63177e-012

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 71.216 0 0 0 140.03 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 0 60.228 0 0 0 30 0 0]]

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[0 0 0 0 50.62 0 50.014 0 0 0 50 0]]

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0 150]

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-25:** TGS1C3D7 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_7)

// solution (optimal) with objective 6379.5233

// Quality Incumbent solution:

// MILP objective 6.3795233000e+003

// MILP solution norm |x| (Total, Max) 7.03923e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 6.12688e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.23088e-012 9.09495e-013

// MILP x integrality error (Total, Max) 3.33067e-015 3.33067e-015

// MILP slack bound error (Total, Max) 1.99019e-012 5.68434e-013

//

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**Test Instance-26:** TGS1C3D8 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_8)

// solution (optimal) with objective 6402.3741

// Quality Incumbent solution:

// MILP objective 6.4023741000e+003

// MILP solution norm |x| (Total, Max) 7.49269e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 8.62954e-012 3.63798e-012

// MILP x bound error (Total, Max) 6.25722e-013 6.25278e-013

// MILP x integrality error (Total, Max) 4.10783e-015 1.99840e-015

// MILP slack bound error (Total, Max) 1.50258e-012 6.25278e-013

//

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**Test Instance-27:** TGS1C3D9 (Test General Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6452.6453

// Quality Incumbent solution:

// MILP objective 6.4526453000e+003

// MILP solution norm |x| (Total, Max) 8.49029e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 9.58721e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.09567e-012 7.25040e-013

// MILP x integrality error (Total, Max) 4.88498e-015 4.88498e-015

// MILP slack bound error (Total, Max) 1.34125e-012 7.25040e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 10 0 5 0 5 10 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-28:** TGS1C4D1 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6623.0911

// Quality Incumbent solution:

// MILP objective 6.6230911000e+003

// MILP solution norm |x| (Total, Max) 7.48120e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 2.18492e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.36779e-013 2.84217e-014

//

productionquantity = [[[0

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[0 0 0 0 0 140 0 0 0 70 0 0]]

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inventory = [[70.49 1.762e-13 70 0 0]

[29.09 0 0 30 0]

[50.25 0 0 0 0]

[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[199.59 100.01 0 0 0]

[720.93 540.01 360 180 0]

[921.61 690.02 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 10 5 10 10 5 0 0 5 0 5 0]

[10 10 10 15 10 10 15 15 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 10 10 5 10 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-29:** TGS1C4D2 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6624.4343

// Quality Incumbent solution:

// MILP objective 6.6244343000e+003

// MILP solution norm |x| (Total, Max) 7.58921e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 2.09610e-013 1.70530e-013

// MILP x bound error (Total, Max) 1.70530e-013 1.70530e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 6.07514e-013 1.70530e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.078 0 140 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 60.014 0 0 0 0 0 0 30 0]]

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inventory = [[77.84 0 0 70 0]

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[109.28 0 0 0 0]

[84.44 0 0 0 0]

[170 0 0 0 0]

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[734.87 540.15 360 180 0]

[945.7 690.26 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-30:** TGS1C4D3 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6627.5042

// Quality Incumbent solution:

// MILP objective 6.6275042000e+003

// MILP solution norm |x| (Total, Max) 7.82695e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 7.43228e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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**Test Instance-31:** TGS1C4D4 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6623.4951

// Quality Incumbent solution:

// MILP objective 6.6234951000e+003

// MILP solution norm |x| (Total, Max) 7.49056e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 1.41407e-012 4.44089e-013

// MILP x bound error (Total, Max) 1.77153e-012 9.17052e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.67733e-012 4.44089e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 5 5 10 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-32:** TGS1C4D5 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6630.555

// Quality Incumbent solution:

// MILP objective 6.6305550000e+003

// MILP solution norm |x| (Total, Max) 7.73852e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 3.90411e-013 9.94760e-014

// MILP x bound error (Total, Max) 7.32747e-015 7.10543e-015

// MILP x integrality error (Total, Max) 1.44329e-014 7.10543e-015

// MILP slack bound error (Total, Max) 5.18030e-013 9.94760e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 100.02 0 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 100.47 100.01 0 0 100 0 0]

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inventory = [[87.64 2.6573e-13 0 70 0]

[32.24 0 30.002 0 0]

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[236.81 100.81 0 0 0]

[120.88 0 1.279e-13 0 0]

[91.24 0 0 0 0]

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[220.35 100.47 0 0 0]

[753.88 540.76 360.02 180 0]

[978.56 691.32 460.03 230 0]];

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 10 5 10 10 5 5 0 0 5 0 0]

[10 10 10 10 15 15 15 10 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 5 0 10 10 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-33:** TGS1C4D6 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_6)

// solution (integer optimal, tolerance) with objective 6646.1374

// Quality Incumbent solution:

// MILP objective 6.6461374000e+003

// MILP solution norm |x| (Total, Max) 8.28411e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 1.42109e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 5.68434e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 71.216 0 0 0 140.03 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-34:** TGS1C4D7 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6624.5234

// Quality Incumbent solution:

// MILP objective 6.6245234000e+003

// MILP solution norm |x| (Total, Max) 7.50423e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 4.30354e-012 3.63798e-012

// MILP x bound error (Total, Max) 7.97749e-013 3.97904e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.28568e-012 3.99693e-013

//

productionquantity = [[[0

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**Test Instance-35:** TGS1C4D8 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_8)

// solution (optimal) with objective 6647.3755

// Quality Incumbent solution:

// MILP objective 6.6473755000e+003

// MILP solution norm |x| (Total, Max) 7.95769e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 6.42096e-012 3.63798e-012

// MILP x bound error (Total, Max) 3.28673e-012 1.08855e-012

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.63195e-012 1.08855e-012

//

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-1.9895e-13]

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**Test Instance-36:** TGS1C4D9 (Test General Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_9)

// solution (optimal) with objective 6697.6495

// Quality Incumbent solution:

// MILP objective 6.6976495000e+003

// MILP solution norm |x| (Total, Max) 8.95531e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 1.91847e-013 9.94760e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.31450e-013 5.68434e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 10 10 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-37:** TGS1C5D1 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_1)

// solution (optimal) with objective 6378.0911

// Quality Incumbent solution:

// MILP objective 6.3780911000e+003

// MILP solution norm |x| (Total, Max) 7.01620e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 1.52456e-012 6.99885e-013

// MILP x bound error (Total, Max) 4.44089e-013 2.22045e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27676e-012 6.99441e-013

//

productionquantity = [[[0

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[0 0 0 0 0 70.005 0 0 140 0 0 0]]

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inventory = [[70.49 0 0 70 0]

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[50.25 0 0 0 0]

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[100.58 0 0 -2.2204e-13 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[199.59 100.01 0 75 0]

[540.93 360.01 180 0 0]

[921.61 690.02 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[0 10 10 5 10 5 0 5 0 10 5 0]

[10 10 10 15 10 15 15 10 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 0 0 0 0 0 10 5 10 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-38:** TGS1C5D2 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6379.4343

// Quality Incumbent solution:

// MILP objective 6.3794343000e+003

// MILP solution norm |x| (Total, Max) 7.07421e+003 7.40697e+002

// MILP solution error (Ax=b) (Total, Max) 1.23960e-012 4.62167e-013

// MILP x bound error (Total, Max) 4.68958e-013 3.55271e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.52621e-012 4.62167e-013

//

productionquantity = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.078 2.0206e-13 0 140 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 0 60.014 0 0 0 0 30 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 50.004 2.0606e-13 0 0 0 50 0 0 50]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 4.1079e-13 0 0 100 -3.5527e-13 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 100.09 0 0 0 0 100 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 4.6217e-13 0 80.054 80.001 0 0 80 -1.1369e-13 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[77.84 1.2448e-13 2.0206e-13 70 0]

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[216.16 100.16 4.1079e-13 0 0]

[109.28 0 0 0 0]

[84.44 0 0 0 0]

[170 0 0 0 0]

[208.37 100.09 0 100 0]

[734.87 540.15 360 180 0]

[740.7 485.26 255 25 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-39:** TGS1C5D3 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6382.5042

// Quality Incumbent solution:

// MILP objective 6.3825042000e+003

// MILP solution norm |x| (Total, Max) 7.31195e+003 7.93697e+002

// MILP solution error (Ax=b) (Total, Max) 7.73226e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.22045e-016 2.22045e-016

// MILP x integrality error (Total, Max) 4.44089e-016 2.22045e-016

// MILP slack bound error (Total, Max) 4.05231e-013 2.13163e-013

//

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**Test Instance-40:** TGS1C5D4 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6378.4951

// Quality Incumbent solution:

// MILP objective 6.3784951000e+003

// MILP solution norm |x| (Total, Max) 6.97556e+003 7.22118e+002

// MILP solution error (Ax=b) (Total, Max) 1.63425e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 5 10 5 0 0 0 0 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-41:** TGS1C5D5 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6385.5548

// Quality Incumbent solution:

// MILP objective 6.3855548000e+003

// MILP solution norm |x| (Total, Max) 7.27352e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 3.03757e-013 1.13687e-013

// MILP x bound error (Total, Max) 9.16600e-013 9.16600e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.18705e-012 9.16600e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 100.02 0 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 100.47 0 100.01 0 0 100 0 0]

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[[1 0 0 0 0 0 0 0 175.01 25 0 0]

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inventory = [[87.64 0 0 70 0]

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[59 0 0 0 0]

[236.81 100.81 0 0 0]

[120.88 0 0 0 0]

[91.24 0 0 0 0]

[195 0 0 0 0]

[220.35 100.47 0 75.001 0]

[573.88 360.76 180.02 0 0]

[978.56 691.32 460.03 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[5 5 5 5 5 5 5 5 5 5 5 0]

[10 10 10 10 5 10 5 10 10 10 5 0]

[10 10 10 15 10 15 10 15 10 15 15 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-42:** TGS1C5D6 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_6)

// solution (optimal) with objective 6401.1369

// Quality Incumbent solution:

// MILP objective 6.4011369000e+003

// MILP solution norm |x| (Total, Max) 7.81910e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 7.65946e-013 3.99683e-013

// MILP x bound error (Total, Max) 4.58857e-013 1.98952e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.06848e-012 3.99683e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 71.216 -1.1069e-13 0 0 0 140.03 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 60.228 0 0 0 0 0 30 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 50.62 0 50.014 0 50 -1.4921e-13 1.1102e-13]]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 100.06 -1.9895e-13 1.8474e-13 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-43:** TGS1C5D7 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6379.5233

// Quality Incumbent solution:

// MILP objective 6.3795233000e+003

// MILP solution norm |x| (Total, Max) 7.03923e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 4.74721e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.15187e-012 4.44106e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.21039e-012 3.44489e-013

//

productionquantity = [[[0

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[0 0 0 0 1.2448e-13 70.078 140 0 0 0 0 0]]

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**Test Instance-44:** TGS1C5D8 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_8)

// solution (integer optimal, tolerance) with objective 6402.3741

// Quality Incumbent solution:

// MILP objective 6.4023741000e+003

// MILP solution norm |x| (Total, Max) 7.49269e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 1.27404e-012 2.66681e-013

// MILP x bound error (Total, Max) 2.27374e-013 2.27374e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.11258e-012 5.37098e-013

//

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[100.76 0 0 0 0]

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[237.6 101.48 0 75.006 0]

[601.33 362.45 180.09 0 0]

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**Test Instance-45:** TGS1C5D9 (Test General Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6452.6453

// Quality Incumbent solution:

// MILP objective 6.4526453000e+003

// MILP solution norm |x| (Total, Max) 8.49029e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 3.81917e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.33955e-013 9.94760e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

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**SETUP-II (Profile)**

**Test Instance-1:** TGS2C1D1 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6776.4461

// Quality Incumbent solution:

// MILP objective 6.7764461000e+003

// MILP solution norm |x| (Total, Max) 7.74178e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 1.42109e-013 1.13687e-013

// MILP x bound error (Total, Max) 4.68958e-013 4.68958e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 6.53699e-013 4.68958e-013

//

productionquantity = [[[0

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inventory = [[70.49 1.279e-13 70 0 0]

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[50.25 0 0 0 0]

[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[179.6 28.355 18.889 9.4444 0]

[245.14 145.56 45.556 22.778 0]

[720.93 540.01 360 180 0]

[921.61 690.02 460 230 0]];

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E\_setuptime = [[15 15 15 15 15 15 15 15 15 15 15 0]

[0 0 0 0 15 0 15 0 0 0 10 0]

[10 10 5 10 10 10 5 5 10 5 5 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 10 10 10 10 0 10 0 10 10 15 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-2:** TGS2C1D2 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6778.1256

// Quality Incumbent solution:

// MILP objective 6.7781256000e+003

// MILP solution norm |x| (Total, Max) 7.85012e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 3.87956e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.41061e-013 9.94760e-014

//

productionquantity = [[[0

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[0 0 0 0 0 70.078 0 0 140 0 0 0]]

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[[1 0 0 0 0 0 0 0 77.222 77.222 0 0]

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inventory = [[77.84 0 0 70 0]

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[216.16 100.16 0 0 0]

[109.28 0 0 0 0]

[84.44 0 0 0 0]

[198.68 28.684 18.892 9.4444 0]

[253.93 145.65 45.557 22.778 0]

[734.87 540.15 360 180 0]

[945.7 690.26 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-3:** TGS2C1D3 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6781.9356

// Quality Incumbent solution:

// MILP objective 6.7819356000e+003

// MILP solution norm |x| (Total, Max) 8.08859e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 4.07119e-012 3.63798e-012

// MILP x bound error (Total, Max) 5.62217e-013 3.12639e-013

// MILP x integrality error (Total, Max) 8.21565e-015 7.10543e-015

// MILP slack bound error (Total, Max) 7.85483e-012 3.63798e-012

//

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**Test Instance-4:** TGS2C1D4 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6776.94619999814

// Quality Incumbent solution:

// MILP objective 6.7769462000e+003

// MILP solution norm |x| (Total, Max) 7.75123e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 7.35610e-012 8.88178e-013

// MILP x bound error (Total, Max) 4.61231e-009 1.00040e-009

// MILP x integrality error (Total, Max) 2.57626e-010 3.33331e-011

// MILP slack bound error (Total, Max) 7.11010e-008 1.38225e-008

//

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B\_setuptime = [[0 0 0 0 0 0 5 15 0 0 15 0]

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**Test Instance-5:** TGS2C1D5 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6785.7795

// Quality Incumbent solution:

// MILP objective 6.7857795000e+003

// MILP solution norm |x| (Total, Max) 8.00094e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 3.06678e-012 1.37312e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.33183e-012 1.37250e-012

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 15 0 0]

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**Test Instance-6:** TGS2C1D6 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_6)

// solution (integer optimal, tolerance) with objective 6805.2643

// Quality Incumbent solution:

// MILP objective 6.8052643000e+003

// MILP solution norm |x| (Total, Max) 8.55036e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 2.27374e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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[309.97 147.03 45.589 22.778 0]

[823.76 542.33 360.05 180 0]

[1099.3 694.03 460.09 230 0]];

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B\_setuptime = [[0 0 0 0 0 0 5 0 0 5 0 0]

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**Test Instance-7:** TGS2C1D7 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6778.2517

// Quality Incumbent solution:

// MILP objective 6.7782517000e+003

// MILP solution norm |x| (Total, Max) 7.76617e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 3.73801e-012 1.81899e-012

// MILP x bound error (Total, Max) 5.05612e-013 5.05168e-013

// MILP x integrality error (Total, Max) 5.55112e-016 4.44089e-016

// MILP slack bound error (Total, Max) 4.90514e-013 2.63363e-013

//

productionquantity = [[[0

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[102.32 0 0 0 0]

[80.36 0 0 0 0]

[183.69 28.695 18.903 9.4449 0]

[246.97 145.65 45.559 22.778 0]

[723.83 540.15 360.01 180 0]

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**Test Instance-8:** TGS2C1D8 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_8)

// solution (integer optimal, tolerance) with objective 6807.039

// Quality Incumbent solution:

// MILP objective 6.8070390000e+003

// MILP solution norm |x| (Total, Max) 8.22440e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 7.84605e-012 3.63798e-012

// MILP x bound error (Total, Max) 8.30647e-013 4.54747e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.26603e-013 3.41061e-013

//

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**Test Instance-9:** TGS2C1D9 (Test General Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6870.3698

// Quality Incumbent solution:

// MILP objective 6.8703698000e+003

// MILP solution norm |x| (Total, Max) 9.23470e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 4.62770e-012 3.63798e-012

// MILP x bound error (Total, Max) 4.12115e-013 4.12115e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.91958e-013 1.22316e-013

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 5 0 0 0 15 0 15 0]

[0 10 10 10 0 0 0 10 15 0 15 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-10:** TGS2C2D1 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6623.0911

// Quality Incumbent solution:

// MILP objective 6.6230911000e+003

// MILP solution norm |x| (Total, Max) 7.57120e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 2.27374e-013 5.68434e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

productionquantity = [[[0

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[0 0 0 0 0 70.005 0 140 0 0 0 0]]

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inventory = [[70.49 0 0 70 0]

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[50.25 0 0 0 0]

[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[199.59 100.01 0 0 0]

[720.93 540.01 360 180 0]

[921.61 690.02 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[15 15 15 15 15 10 15 15 15 10 15 0]

[0 0 0 0 0 10 0 15 10 10 15 0]

[10 10 10 5 10 5 10 5 5 10 5 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 0 0 5 0]

[0 10 10 10 15 10 0 10 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-11:** TGS2C2D2 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6624.4343

// Quality Incumbent solution:

// MILP objective 6.6244343000e+003

// MILP solution norm |x| (Total, Max) 7.67921e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 1.03895e-012 3.55274e-013

// MILP x bound error (Total, Max) 3.10196e-013 1.70530e-013

// MILP x integrality error (Total, Max) 4.66294e-015 3.33067e-015

// MILP slack bound error (Total, Max) 9.28371e-013 3.55274e-013

//

productionquantity = [[[0

0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.078 0 140 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 0 0 60.014 0 0 0 30 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 80.054 0 0 0 3.5527e-13 80 80 0 0]

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inventory = [[77.84 0 0 70 0]

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[216.16 100.16 0 0 0]

[109.28 0 0 0 0]

[84.44 0 0 0 0]

[170 0 0 0 0]

[208.37 100.09 0 0 0]

[734.87 540.15 360 180 0]

[945.7 690.26 460 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-12:** TGS2C2D3 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_3)

// solution (optimal) with objective 6627.5042

// Quality Incumbent solution:

// MILP objective 6.6275042000e+003

// MILP solution norm |x| (Total, Max) 7.91695e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 3.91687e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.72307e-013 5.68434e-014

//

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**Test Instance-13:** TGS2C2D4 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6623.4951

// Quality Incumbent solution:

// MILP objective 6.6234951000e+003

// MILP solution norm |x| (Total, Max) 7.58056e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 2.06057e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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[79.765 0 0 0 0]

[152.81 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 15 0 5 0 0 0 0]

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**Test Instance-14:** TGS2C2D5 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6630.555

// Quality Incumbent solution:

// MILP objective 6.6305550000e+003

// MILP solution norm |x| (Total, Max) 7.82852e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 2.12704e-012 4.63629e-013

// MILP x bound error (Total, Max) 1.34474e-012 1.04450e-012

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.99170e-012 1.04450e-012

//

productionquantity = [[[0

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B\_setuptime = [[0 0 0 0 0 0 15 15 0 0 0 0]

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**Test Instance-15:** TGS2C2D6 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_6)

// solution (integer optimal, tolerance) with objective 6646.1374

// Quality Incumbent solution:

// MILP objective 6.6461374000e+003

// MILP solution norm |x| (Total, Max) 8.37411e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 2.67498e-012 4.30820e-013

// MILP x bound error (Total, Max) 1.28356e-012 4.30820e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.80959e-012 4.30820e-013

//

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-3.5527e-13 80 0]

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B\_setuptime = [[0 0 0 0 0 0 0 0 15 0 5 0]

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**Test Instance-16:** TGS2C2D7 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_7)

// solution (optimal) with objective 6624.52339999

// Quality Incumbent solution:

// MILP objective 6.6245234000e+003

// MILP solution norm |x| (Total, Max) 7.59423e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 2.31130e-011 3.63798e-012

// MILP x bound error (Total, Max) 2.66860e-009 1.00000e-009

// MILP x integrality error (Total, Max) 2.64545e-011 6.61364e-012

// MILP slack bound error (Total, Max) 9.04400e-009 3.00003e-009

//

productionquantity = [[[0

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100]

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[80.36 0 0 0 0]

[155 0 0 0 0]

[201.41 100.09 0 0 0]

[723.83 540.15 360.01 180 0]

[926.62 690.26 460.01 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-17:** TGS2C2D8 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_8)

// solution (integer optimal, tolerance) with objective 6647.3755

// Quality Incumbent solution:

// MILP objective 6.6473755000e+003

// MILP solution norm |x| (Total, Max) 8.04769e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 4.28995e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.73050e-012 7.19885e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 3.19075e-012 7.19885e-013

//

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50.001]]

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**Test Instance-18:** TGS2C2D9 (Test General Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6697.6495

// Quality Incumbent solution:

// MILP objective 6.6976495000e+003

// MILP solution norm |x| (Total, Max) 9.04531e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 3.88667e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.31450e-013 5.68434e-014

//

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B\_setuptime = [[0 0 0 0 15 0 0 0 0 0 0 0]

[0 10 10 10 15 10 0 10 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-19:** TGS2C3D1 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_1)

// solution (optimal) with objective 6438.0911

// Quality Incumbent solution:

// MILP objective 6.4380911000e+003

// MILP solution norm |x| (Total, Max) 7.19620e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 6.11444e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.22591e-012 8.24230e-013

// MILP x integrality error (Total, Max) 1.08802e-014 9.10383e-015

// MILP slack bound error (Total, Max) 1.09711e-010 9.09495e-011

//

productionquantity = [[[0

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inventory = [[70.49 0 0 70 0]

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[201.01 100.01 0 0 0]

[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 0 0 0 0]

[224.59 125.01 25 100 0]

[545.93 365.01 185 5 0]

[921.61 690.02 460 230 0]];

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[0 15 15 -1.3678e-13 15 15 15 0 15 15 -2.6645e-14 0]

[0 0 10 0 10 10 10 0 0 0 0 0]

[10 10 10 10 5 5 10 5 5 10 5 0]];

B\_setuptime = [[0 15 0 0 15 0 0 0 15 0 0 15]

[0 10 10 0 15 0 0 0 15 10 10 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-20:** TGS2C3D2 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6439.4352

// Quality Incumbent solution:

// MILP objective 6.4394352000e+003

// MILP solution norm |x| (Total, Max) 7.30421e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 6.64625e-012 1.48148e-012

// MILP x bound error (Total, Max) 1.47242e-012 5.24922e-013

// MILP x integrality error (Total, Max) 2.20038e-013 1.10023e-013

// MILP slack bound error (Total, Max) 7.17389e-011 7.04097e-011

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 -3.2677e-13 70.078 140 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 60.014 0 0 0 0 0 30 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 50.004 0 0 0 50 0 50 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 -5.2492e-13 0 0 100 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 1.1002e-13 0 0 100.09 0 0 100 0 0 100]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

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B\_setuptime = [[0 0 0 0 0 0 5 0 0 15 0 0]

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**Test Instance-21:** TGS2C3D3 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6442.507

// Quality Incumbent solution:

// MILP objective 6.4425070000e+003

// MILP solution norm |x| (Total, Max) 7.54195e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 1.05216e-011 3.63798e-012

// MILP x bound error (Total, Max) 7.84489e-013 2.41585e-013

// MILP x integrality error (Total, Max) 1.22125e-014 7.10543e-015

// MILP slack bound error (Total, Max) 3.00360e-012 9.09495e-013

//

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**Test Instance-22:** TGS2C3D4 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6438.4958

// Quality Incumbent solution:

// MILP objective 6.4384958000e+003

// MILP solution norm |x| (Total, Max) 7.20556e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 3.05134e-013 1.17240e-013

// MILP x bound error (Total, Max) 1.68761e-012 1.20460e-012

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.10249e-012 2.23654e-013

//

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**Test Instance-23:** TGS2C3D5 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6445.566

// Quality Incumbent solution:

// MILP objective 6.4455660000e+003

// MILP solution norm |x| (Total, Max) 7.45355e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 7.77600e-013 1.27898e-013

// MILP x bound error (Total, Max) 1.64135e-012 7.24754e-013

// MILP x integrality error (Total, Max) 4.77396e-015 3.99680e-015

// MILP slack bound error (Total, Max) 1.36269e-012 7.24754e-013

//

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E\_setuptime = [[15 15 15 15 15 10 15 15 0 15 6.0396e-14 0]

[0 10 10 15 10 10 0 0 0 10 0 0]

[10 10 10 5 10 5 10 5 10 5 5 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 0 15 0 15]

[0 10 0 0 0 0 0 15 10 10 0 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-24:** TGS2C3D6 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_6)

// solution (optimal) with objective 6461.1712

// Quality Incumbent solution:

// MILP objective 6.4611712000e+003

// MILP solution norm |x| (Total, Max) 7.99917e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 1.19199e-012 3.99680e-013

// MILP x bound error (Total, Max) 2.30981e-013 2.30981e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.11925e-013 3.99810e-013

//

productionquantity = [[[0

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[[0 0 0 0 0 0 0 0 0 0 0 149.97]

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inventory = [[124.02 0 0 70.001 0]

[38.922 0 30.005 0 0]

[77.563 0 0 0 0]

[312.73 102.48 0 0 0]

[163.94 0 0 0 0]

[116.49 0 0 0 0]

[287.81 0 0 0 0]

[264.38 101.44 0 74.968 0]

[673.8 392.37 210.09 30.034 0]

[1099.3 694.03 460.09 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[15 15 15 15 15 10 15 15 0 15 0 0]

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[10 10 10 5 10 5 5 10 5 10 5 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 0 15 0 15]

[0 10 0 0 0 0 0 15 10 10 0 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-25:** TGS2C3D7 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6439.5273

// Quality Incumbent solution:

// MILP objective 6.4395273000e+003

// MILP solution norm |x| (Total, Max) 7.21924e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 1.13999e-012 7.10543e-013

// MILP x bound error (Total, Max) 8.23963e-013 2.13163e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.20041e-012 7.10543e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.078 0 140 0 1.1369e-13 0 1.7053e-13 -2.1316e-13]]

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[1 0 0 60.015 0 0 0 0 0 0 30 0]]

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[0 0 0 -1.8889e-13 0 50.04 0 50.002 0 2.5535e-13 0 50]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 -2.1096e-13 0 0 100.01 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 100.09 0 0 0 100 100 0 7.1054e-13]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 1.6676e-13 150.2 150.01 0 0 0 0 150]

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inventory = [[71.96 2.3341e-13 0 70 0]

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[80.36 0 0 0 0]

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[201.41 100.09 0 74.996 0]

[573.84 390.16 210.01 30.004 0]

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Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 15 0 0 0 15 15 0]

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**Test Instance-26:** TGS2C3D8 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_8)

// solution (optimal) with objective 6462.4397

// Quality Incumbent solution:

// MILP objective 6.4624397000e+003

// MILP solution norm |x| (Total, Max) 7.67282e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 3.78009e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.17240e-013 5.68434e-014

//

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**Test Instance-27:** TGS2C3D9 (Test General Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6512.84600000001

// Quality Incumbent solution:

// MILP objective 6.5128460000e+003

// MILP solution norm |x| (Total, Max) 8.67069e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 1.17867e-012 9.39693e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.01309e-012 9.40173e-013

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 15 0 0 0 5 0 0 0]

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**Test Instance-28:** TGS2C4D1 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_1)

// solution (integer optimal, tolerance) with objective 6691.4245

// Quality Incumbent solution:

// MILP objective 6.6914245000e+003

// MILP solution norm |x| (Total, Max) 7.68509e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 1.23879e-012 5.96856e-013

// MILP x bound error (Total, Max) 4.40759e-013 2.41585e-013

// MILP x integrality error (Total, Max) 3.33067e-016 2.22045e-016

// MILP slack bound error (Total, Max) 1.83686e-012 5.96856e-013

//

productionquantity = [[[0

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[100.58 0 0 0 0]

[79.34 0 0 0 0]

[151.25 -1.9895e-13 0 0 0]

[245.14 145.56 45.556 22.778 0]

[720.93 540.01 360 180 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[15 15 15 15 0 15 15 15 0 0 15 0]

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B\_setuptime = [[0 0 0 0 0 15 0 0 0 15 15 0]

[0 0 10 15 10 10 0 10 0 10 10 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-29:** TGS2C4D2 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_2)

// solution (optimal) with objective 6692.7686

// Quality Incumbent solution:

// MILP objective 6.6927686000e+003

// MILP solution norm |x| (Total, Max) 7.79310e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 3.67351e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.56319e-013 5.68434e-014

//

productionquantity = [[[0

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 5 0 0]

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**Test Instance-30:** TGS2C4D3 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6695.8404

// Quality Incumbent solution:

// MILP objective 6.6958404000e+003

// MILP solution norm |x| (Total, Max) 8.03084e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 7.91478e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.41585e-013 2.27374e-013

// MILP x integrality error (Total, Max) 1.44329e-014 1.37668e-014

// MILP slack bound error (Total, Max) 9.75664e-013 4.40536e-013

//

productionquantity = [[[0

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[765.54 540.46 360 180 0]

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**Test Instance-31:** TGS2C4D4 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_4)

// solution (optimal) with objective 6691.8292

// Quality Incumbent solution:

// MILP objective 6.6918292000e+003

// MILP solution norm |x| (Total, Max) 7.69445e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 2.06057e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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**Test Instance-32:** TGS2C4D5 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6698.89940000001

// Quality Incumbent solution:

// MILP objective 6.6988994000e+003

// MILP solution norm |x| (Total, Max) 7.94244e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 8.47434e-012 3.63798e-012

// MILP x bound error (Total, Max) 3.22914e-013 2.06057e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.59394e-012 7.32859e-013

//

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B\_setuptime = [[0 0 0 0 0 15 0 15 0 0 0 5]

[0 0 0 0 0 10 10 15 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-33:** TGS2C4D6 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_6)

// solution (optimal) with objective 6714.5046

// Quality Incumbent solution:

// MILP objective 6.7145046000e+003

// MILP solution norm |x| (Total, Max) 8.48806e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 4.29812e-012 1.81899e-012

// MILP x bound error (Total, Max) 2.25153e-013 1.84741e-013

// MILP x integrality error (Total, Max) 1.44329e-014 1.19904e-014

// MILP slack bound error (Total, Max) 1.88765e-011 1.81899e-011

//

productionquantity = [[[0

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[0 0 0 0 0 71.216 140.03 0 0 0 0 0]]

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inventory = [[124.02 0 0 70.001 0]

[38.922 0 30.005 0 0]

[77.563 0 0 0 0]

[312.73 102.48 0 0 0]

[163.94 0 0 0 0]

[116.49 0 0 0 0]

[287.81 0 0 0 0]

[309.97 147.03 45.589 22.778 0]

[823.76 542.33 360.05 180 0]

[1099.3 694.03 460.09 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[0 0 15 15 15 15 15 15 -2.6645e-14 15 15 0]

[10 10 10 15 0 0 0 10 0 15 0 0]

[10 10 10 5 10 10 5 5 10 5 5 0]];

B\_setuptime = [[0 15 15 0 0 0 0 0 0 15 0 0]

[0 0 0 0 0 10 15 10 0 10 0 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-34:** TGS2C4D7 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_7)

// solution (optimal) with objective 6692.8607

// Quality Incumbent solution:

// MILP objective 6.6928607000e+003

// MILP solution norm |x| (Total, Max) 7.70813e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 8.81076e-013 2.66454e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.75543e-013 2.66454e-013

//

productionquantity = [[[0

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[0 0 0 0 70.078 0 0 0 140 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 0 0 60.015 0 0 0 30 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[71.96 0 0 70 0]

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[51 0 0 0 0]

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[102.32 0 0 0 0]

[80.36 0 0 0 0]

[155 0 0 0 0]

[246.97 145.65 45.559 22.778 0]

[723.83 540.15 360.01 180 0]

[926.63 690.26 460.01 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-35:** TGS2C4D8 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_8)

// solution (optimal) with objective 6715.7731

// Quality Incumbent solution:

// MILP objective 6.7157731000e+003

// MILP solution norm |x| (Total, Max) 8.16171e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 1.70642e-011 3.63798e-012

// MILP x bound error (Total, Max) 1.24999e-011 1.24999e-011

// MILP x integrality error (Total, Max) 2.49998e-011 1.24999e-011

// MILP slack bound error (Total, Max) 8.75276e-009 5.71424e-009

//

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**Test Instance-36:** TGS2C4D9 (Test General Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_9)

// solution (integer optimal, tolerance) with objective 6766.1794

// Quality Incumbent solution:

// MILP objective 6.7661794000e+003

// MILP solution norm |x| (Total, Max) 9.15958e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 3.93108e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.70006e-013 2.70006e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 4.38760e-013 9.94760e-014

//

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B\_setuptime = [[0 0 0 0 0 15 0 15 0 0 0 0]

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**Test Instance-37:** TGS2C5D1 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_1)

// solution (optimal) with objective 6438.0911

// Quality Incumbent solution:

// MILP objective 6.4380911000e+003

// MILP solution norm |x| (Total, Max) 7.19620e+003 9.21606e+002

// MILP solution error (Ax=b) (Total, Max) 3.19764e-013 1.42109e-013

// MILP x bound error (Total, Max) 1.42109e-013 1.42109e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.74432e-013 3.99700e-013

//

productionquantity = [[[0

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[100.58 0 0 0 0]

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[570.93 390.01 210 30 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[15 15 15 15 15 0 15 15 10 0 15 0]

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B\_setuptime = [[0 0 0 0 0 0 15 0 0 5 15 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-38:** TGS2C5D2 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_2)

// solution (integer optimal, tolerance) with objective 6439.4352

// Quality Incumbent solution:

// MILP objective 6.4394352000e+003

// MILP solution norm |x| (Total, Max) 7.30421e+003 9.45697e+002

// MILP solution error (Ax=b) (Total, Max) 1.17194e-012 4.83169e-013

// MILP x bound error (Total, Max) 5.98632e-013 4.83169e-013

// MILP x integrality error (Total, Max) 2.22045e-015 1.77636e-015

// MILP slack bound error (Total, Max) 1.44907e-012 4.83169e-013

//

productionquantity = [[[0

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[0 0 0 70.078 0 0 140 0 0 0 0 0]]

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B\_setuptime = [[0 0 0 0 0 0 15 0 5 0 15 0]

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**Test Instance-39:** TGS2C5D3 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_3)

// solution (integer optimal, tolerance) with objective 6442.507

// Quality Incumbent solution:

// MILP objective 6.4425070000e+003

// MILP solution norm |x| (Total, Max) 7.54195e+003 9.98697e+002

// MILP solution error (Ax=b) (Total, Max) 7.90662e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.56319e-013 1.56319e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.41469e-013 5.25802e-013

//

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**Test Instance-40:** TGS2C5D4 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_4)

// solution (integer optimal, tolerance) with objective 6438.4958

// Quality Incumbent solution:

// MILP objective 6.4384958000e+003

// MILP solution norm |x| (Total, Max) 7.20556e+003 9.23660e+002

// MILP solution error (Ax=b) (Total, Max) 2.77112e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 5.68434e-014

//

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**Test Instance-41:** TGS2C5D5 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_5)

// solution (integer optimal, tolerance) with objective 6445.566

// Quality Incumbent solution:

// MILP objective 6.4455660000e+003

// MILP solution norm |x| (Total, Max) 7.45355e+003 9.78558e+002

// MILP solution error (Ax=b) (Total, Max) 4.37828e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.88658e-015 2.66454e-015

// MILP x integrality error (Total, Max) 2.88658e-015 2.66454e-015

// MILP slack bound error (Total, Max) 6.65024e-013 2.88659e-013

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 5 0 0 15]

[0 10 0 0 10 10 0 10 0 0 10 15]

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**Test Instance-42:** TGS2C5D6 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_6)

// solution (integer optimal, tolerance) with objective 6461.1712

// Quality Incumbent solution:

// MILP objective 6.4611712000e+003

// MILP solution norm |x| (Total, Max) 7.99917e+003 1.09933e+003

// MILP solution error (Ax=b) (Total, Max) 1.48816e-012 3.37859e-013

// MILP x bound error (Total, Max) 8.57875e-013 3.46284e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.48013e-012 3.46284e-013

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 -3.4628e-13 3.3207e-13 71.216 0 0 140.03 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 60.228 3.4226e-13 0 0 0 0 30 0]]

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[0 0 0 50.62 -1.8474e-13 0 50.014 0 0 50 0 1.9185e-13]]

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[0 0 0 0 0 0 0 100.06 0 0 0 100]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 149.97]

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inventory = [[124.02 0 0 70.001 0]

[38.922 0 30.005 0 0]

[77.563 0 0 0 0]

[312.73 102.48 0 0 0]

[163.94 0 0 1.7764e-13 0]

[116.49 0 0 0 0]

[287.81 0 0 0 0]

[264.38 101.44 0 74.968 0]

[673.8 392.37 210.09 30.034 0]

[1099.3 694.03 460.09 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[15 15 15 15 15 10 10 15 15 0 15 0]

[0 0 15 10 10 10 10 15 0 0 0 0]

[10 10 5 10 10 5 5 10 5 10 5 0]];

B\_setuptime = [[0 0 0 0 0 0 5 5 0 0 15 0]

[0 10 10 0 0 0 0 0 0 10 10 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-43:** TGS2C5D7 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_7)

// solution (integer optimal, tolerance) with objective 6439.5273

// Quality Incumbent solution:

// MILP objective 6.4395273000e+003

// MILP solution norm |x| (Total, Max) 7.21924e+003 9.26625e+002

// MILP solution error (Ax=b) (Total, Max) 3.98614e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.17240e-013 5.68434e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 70.078 0 0 0 140 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[1 0 0 0 0 60.015 0 0 0 30 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 50.04 0 0 0 50.002 0 0 50 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 100.01 0 0 0 0 100]]

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[0 0 0 100.09 0 0 100 0 0 0 100 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[71.96 0 0 70 0]

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[102.32 0 0 0 0]

[80.36 0 0 0 0]

[155 0 0 0 0]

[201.41 100.09 0 74.996 0]

[573.84 390.16 210.01 30.004 0]

[926.63 690.26 460.01 230 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-44:** TGS2C5D8 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_8)

// solution (optimal) with objective 6462.4397

// Quality Incumbent solution:

// MILP objective 6.4624397000e+003

// MILP solution norm |x| (Total, Max) 7.67282e+003 1.02600e+003

// MILP solution error (Ax=b) (Total, Max) 4.10694e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.45661e-013 5.68434e-014

//

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**Test Instance-45:** TGS2C5D9 (Test General Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_9)

// solution (optimal) with objective 6512.846

// Quality Incumbent solution:

// MILP objective 6.5128460000e+003

// MILP solution norm |x| (Total, Max) 8.67069e+003 1.24462e+003

// MILP solution error (Ax=b) (Total, Max) 1.14807e-012 3.12639e-013

// MILP x bound error (Total, Max) 1.70530e-013 1.70530e-013

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.78682e-012 5.01167e-013

//

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