**Table I Unit technical parameters**

| Unit | Pmax (MW) | Pmin (MW) | Initial Status | Up ramp speed (MW/h) | Down ramp speed (MW/h) | Start-up power consumption(MW) | Shut-down power consumption(MW) |
|---|---|---|---|---|---|---|---|
| G1 | 100 | 20 | 1 | 35 | 35 | 50 | 25 |
| G2 | 100 | 10 | 0 | 20 | 20 | 20 | 10 |
| G3 | 100 | 10 | 0 | 20 | 20 | 25 | 12.5 |

**Table II Parameters of power transmission branch**

| Branch | From Bus | To Bus | X | Flow Limit |
|---|---|---|---|---|
| | | | (p.u.) | (MW) |
| Line 1 | 1 | 2 | 0.17 | 200 |
| Line 2 | 1 | 4 | 0.258 | 100 |
| Line 3 | 2 | 3 | 0.197 | 100 |
| Line 4 | 2 | 4 | 0.14 | 100 |
| Line 5 | 3 | 6 | 0.037 | 100 |
| Line 6 | 4 | 5 | 0.037 | 100 |
| Line 7 | 5 | 6 | 0.018 | 100 |

**Table III Parameters of natural Gas Supplier**

| Supplier No. | Node No. | Min Output (kcf/h) | Max Output (kcf/h) | Up ramp speed (kcf/h) | Down ramp speed (kcf/h) |
|---|---|---|---|---|---|
| 1 | 4 | 300 | 1000 | 200 | 200 |
| 2 | 6 | 400 | 1200 | 250 | 250 |

**Table IV Parameters of gas pipeline**

| Index | From Node | To Node | C (kcf/Psig) |
|---|---|---|---|
| Pipe 1 | 1 | 2 | 25.3 |
| Pipe 2 | 2 | 4 | 25.05 |
| Pipe 3 | 2 | 5 | 18.75 |
| Pipe 4 | 3 | 5 | 21.75 |
| Pipe 5 | 5 | 6 | 22.65 |

**Table IV Parameters of Nodes in Gas Transmission system**

| Node No. | Min-Pressure (Psig) | Max-Pressure (Psig) |
|---|---|---|
| 1 | 52.5 | 60 |
| 2 | 60 | 67.5 |
| 3 | 62.5 | 70 |
| 4 | 67.5 | 77.5 |
| 5 | 70 | 77.5 |
| 6 | 77.5 | 87.5 |

**Table V Parameters of electric energy storage**

| $E^{max}$/MW | $E^{min}$/MW | $E_0$/MW | $P_{ch}^{max}$/MW | $P_{dc}^{max}$/MW | Charge-discharge efficiency |
|---|---|---|---|---|---|
| 50 | 5 | 20 | 30 | 30 | 0.98 |

**Table VI Parameters of gas storage**

| $G^{max}$/kcf | $G^{min}$/kcf | $G_0$/kcf | $F_{ch}^{max}$/kcf | $F_{dc}^{max}$/kcf | Charge-discharge efficiency |
|---|---|---|---|---|---|
| 300 | 30 | 120 | 180 | 180 | 0.98 |

**Table VII Other parameters**

| $\phi_i$ (kcf/MW) | $L_{e1}^{max}$/MW | $L_{e2}^{max}$/MW | $L_{e3}^{max}$/MW | $L_{g2}^{max}$/kcf | $L_{g3}^{max}$/kcf | $N_s$ |
|---|---|---|---|---|---|---|
| 4 | 150 | 150 | 150 | 1200 | 600 | 10000 |

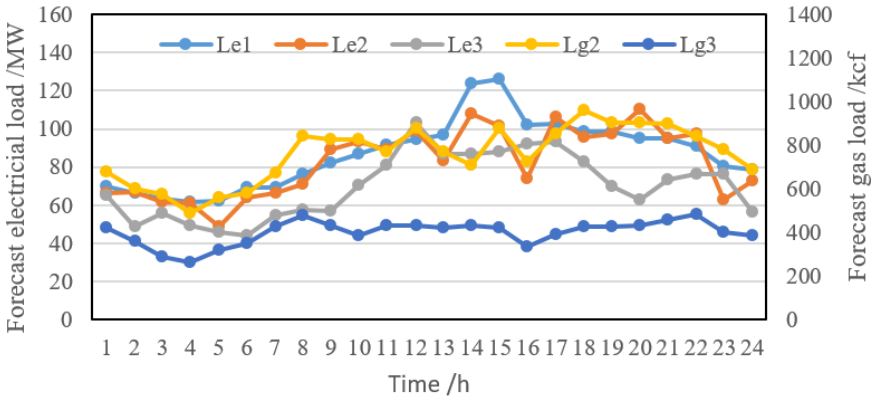


Fig .1 Forecast value of node load of electricity and natural gas system

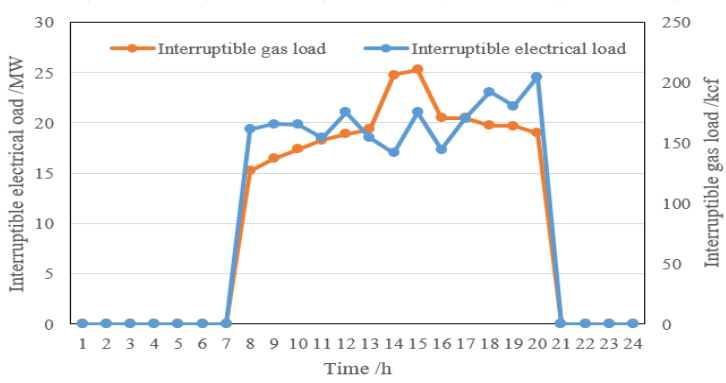


Fig .1 Interruptible load

（The interruptible electrical load locate at bus 3 and the interruptible gas load locate at node 1 ）