List of Tables

3.1 Test results of bilateral transaction from bus 2 (area 1) to bus 21 (area 3) of the IEEE 30-bus test system 63
3.2 Test results of multilateral transaction from area 3 to area 2 of IEEE 30-bus test system 64
3.3 Test results of contingency analysis of multilateral transaction from area 3 to area 2 of IEEE 30-bus test system 65
3.4 Test results of multilateral transaction from area 4 to area 5 of UPSEB 75-bus test system 67
3.5 Test results of contingency analysis of multilateral transaction from area 4 to area 5 of UPSEB 75-bus test system 68
3.6 Effect of PSO parameters on the value of TTC in IEEE 30-bus test system . 69

4.1 Representation of a particle 82
4.2 Comparison of results of cost minimization by PSO and Non-linear programming method in IEEE 6-bus test system 90
4.3 Comparison of surplus obtained by PSO and NLP methods 91
4.4 Effect of PSO parameters on convergence 93
4.5 Comparison of results of cost minimization by PSO and Evolutionary Programming (EP) method of IEEE 30-bus test system 95
4.6 Generation cost minimization by PSO 100
4.7 Surplus of various market participants 101
4.8 Selected parameters of PSO 102

5.1 Representation of a particle 108

5.2 Comparison of LMPs obtained by PSO and interior point methods 122
5.3 Real power wheeling charges (**$/MWh**) of selected bilateral transactions . . 124
5.4 Reactive power wheeling charges (**$/MVARh**) of selected bilateral transactions126
5.5 Effect of TCSC on bilateral transaction matrix 127
5.6 Active and reactive power spot prices with and without using TCSC 130
5.7 Proposed bilateral transaction matrix 132
5.8 Secure bilateral transaction matrix 133

6.1 Representation of a particle 149
6.2 Details of power flow of congested lines of IEEE 30-bus system 150
6.3 Generator sensitivity factors of congested lines of IEEE 30-bus system 150
6.4 Comparison of results obtained by PSO for congestion management of IEEE 30-bus system 152
6.5 Voltage stability and voltage deviation indicators in pre-rescheduling and post-rescheduling states of 30-bus system 153
6.6 Selected parameters of PSO for IEEE 30-bus system 154
6.7 Statistical results of rescheduling costs for IEEE 30-bus system 154
6.8 Details of power flow of the congested lines of 75-bus system 155
6.9 Resultant Rescheduling costs of 75-bus system 158
6.10 Some results in post-rescheduling state of 75-bus system 159

A.1 Generator bus data 184
A.2 Generator data 185
A.3 Load bus data 185
A.4 Transmission line data 186
A.5 Generator active and reactive power cost functions 186
A.6 Consumers bid functions 187

B.1 Generator bus data 188
B.2 Generator data 189
B.3 Load bus data 189
B.4 Transmission line data 190

B.5 Generator active power cost functions 192
B.6 Generator reactive power cost functions 192
B.7 Consumers bid functions 192
B.8 Generator bid functions 193

C.1 Generator bus data 195
C.2 Generator data 195
C.3 Load bus data 196
C.4 Load bus data.....Contd. 197
C.5 Reactor data 197
C.6 Transmission line data 198
C.7 Transmission line data..... Contd 199
C.8 Transmission line data..... Contd 200
C.9 Generator active power cost function (bid function) 201
C.10 Generator reactive power cost function 202
C.11 Consumers bid functions 203
C.12 Consumers bid functions.....Contd. 204