

ECE 558 - Project 3 Solutions

1. 80 MW continuous load (load factor 100%)

a. 5x20 MW units w/ FOR=0.5%

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	100	9.752e-001	0	0.000e+000
20	80	2.450e-002	0	0.000e+000
40	60	2.463e-004	20	4.925e-003
60	40	1.238e-006	40	4.950e-005
80	20	3.109e-009	60	1.866e-007
100	0	3.125e-012	80	2.500e-010

expected load loss 4.975e-003

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	100	9.752e-001	0	0.000e+000
20	80	2.450e-002	0	0.000e+000
40	60	2.463e-004	8760	2.157e+000
60	40	1.238e-006	8760	1.084e-002
80	20	3.109e-009	8760	2.724e-005
100	0	3.125e-012	8760	2.738e-008

expected curtailment 2.168e+000

b. 9x10 MW units w/ FOR=1.5%

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	90	8.728e-001	0	0.000e+000
10	80	1.196e-001	0	0.000e+000
20	70	7.287e-003	10	7.287e-002
30	60	2.589e-004	20	5.178e-003
40	50	5.914e-006	30	1.774e-004
50	40	9.007e-008	40	3.603e-006
60	30	9.144e-010	50	4.572e-008
70	20	5.968e-012	60	3.581e-010
80	10	2.272e-014	70	1.590e-012
90	0	3.844e-017	80	3.075e-015

expected load loss 7.823e-002

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	90	8.728e-001	0	0.000e+000
10	80	1.196e-001	0	0.000e+000
20	70	7.287e-003	8760	6.383e+001
30	60	2.589e-004	8760	2.268e+000
40	50	5.914e-006	8760	5.181e-002
50	40	9.007e-008	8760	7.890e-004
60	30	9.144e-010	8760	8.010e-006
70	20	5.968e-012	8760	5.228e-008
80	10	2.272e-014	8760	1.990e-010
90	0	3.844e-017	8760	3.368e-013

expected curtailment 6.615e+001

2. 100 MW continuous load fed by transformers w/ FOR=1%

a. 3x100 MVA

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	300	9.703e-001	0	0.000e+000
100	200	2.940e-002	0	0.000e+000
200	100	2.970e-004	0	0.000e+000
300	0	1.000e-006	100	1.000e-004
			expected load loss	1.000e-004

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	300	9.703e-001	0	0.000e+000
100	200	2.940e-002	0	0.000e+000
200	100	2.970e-004	0	0.000e+000
300	0	1.000e-006	8760	8.760e-003
			expected curtailment	8.760e-003

b. 3x90 MVA

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	270	9.703e-001	0	0.000e+000
90	180	2.940e-002	0	0.000e+000
180	90	2.970e-004	10	2.970e-003
270	0	1.000e-006	100	1.000e-004
			expected load loss	3.070e-003

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	270	9.703e-001	0	0.000e+000
90	180	2.940e-002	0	0.000e+000
180	90	2.970e-004	8760	2.602e+000
270	0	1.000e-006	8760	8.760e-003
			expected curtailment	2.610e+000

c. 3x50 MVA

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	150	9.703e-001	0	0.000e+000
50	100	2.940e-002	0	0.000e+000
100	50	2.970e-004	50	1.485e-002
150	0	1.000e-006	100	1.000e-004
			expected load loss	1.495e-002

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	150	9.703e-001	0	0.000e+000
50	100	2.940e-002	0	0.000e+000
100	50	2.970e-004	8760	2.602e+000
150	0	1.000e-006	8760	8.760e-003
			expected curtailment	2.610e+000

d. 4x33.33 MVA

Cap Out	Cap Avail	Ind Prob	Load Loss	Prob Load Loss
0	132	9.606e-001	0	0.000e+000
33	99	3.881e-002	0	0.000e+000
66	66	5.881e-004	33	1.941e-002
99	33	3.960e-006	66	2.614e-004
132	0	1.000e-008	99	9.900e-007
expected load loss				1.967e-002

Cap Out	Cap Avail	Ind Prob	Curtail (hr)	Prob Curtail (hr)
0	132	9.606e-001	0	0.000e+000
33	99	3.881e-002	0	0.000e+000
66	66	5.881e-004	8760	5.151e+000
99	33	3.960e-006	8760	3.469e-002
132	0	1.000e-008	8760	8.760e-005
expected curtailment				5.186e+000