New System: 40 thermoelectric units

This system has been created based on data presented in Chen and Chang [1995] and Naresh et al. [2004]. The original system consists of 40 thermoelectric units [Chen and Chang, 1995] with POZ constraints [Naresh et al., 2004]. Therefore, in this system the valve-point effect and multiple fuels constraints has been included in some thermoelectric units. The data of POZ and of this system are presented in Table 1 and Table 2, respectively.

Table 1: Prohibit zones data of the thermoelectric units

Thermoelectric Unit	**Zone 1** [MW]	**Zone 2** [MW]	**Zone 3** [MW]
2	[80; 85]		
3	[82; 88]		
7	[155; 162]	[221; 235]	
9	[235; 246]		
10	[200; 211]		
11	[213; 220]		
12	[213; 220]		
13	[201; 211]	[290; 310]	[413; 425]
14	[205; 217]	[306; 318]	[409; 420]
15	[214; 230]	[277; 290]	[402; 412]
16	[214; 230]	[277; 290]	[402; 412]
17	[214; 230]	[277; 290]	[402; 412]
18	[307; 321]	[407; 421]	
19	[301; 310]	[421; 431]	
20	[340; 351]	[421; 431]	
21	[340; 351]	[421; 431]	
22	[306; 320]	[440; 445]	
23	[306; 320]	[440; 445]	
24	[370; 390]	[495; 502]	
25	[370; 390]	[495; 502]	
26	[380; 410]	[501; 520]	
27	[380; 410]	[501; 520]	
28	[102; 113]		
29	[102; 113]		
30	[102; 113]		

References

Po-Hung Chen and Hong-Chan Chang. Large-scale economic dispatch by genetic algorithm. *Power Systems, IEEE Transactions on*, 10(4):1919–1926, 1995.

R Naresh, J Dubey, and J Sharma. Two-phase neural network based modelling framework of constrained economic load dispatch. *IEE Proceedings-Generation, Transmission and Distribution*, 151(3):373–378, 2004.

Table 2: Thermoelectric unit data - Proposed thermal system

Thermoelectric Unit	Fuel Type	a [$/h]	b [$/MWh]	c [$/MW^{2}h]	e [$/h]	f [rad/MW]	P^{min} [MW]	P^{max} [MW]
1	1	170.44	8.336	0.03073	–	–	40	55
	2	159.07	8.770	0.02873	–	–	55	80
2	-	309.54	7.0706	0.2028	–	–	60	120
3	-	369.03	8.1817	0.00942	–	–	80	190
4	-	135.48	6.9467	0.08482	–	–	24	42
5	-	135.19	6.5595	0.09693	0.13519	6.5595	26	42
6	-	222.33	8.0543	0.01142	–	–	68	140
7	-	287.71	8.0323	0.0357	0.028771	0.80323	110	300
8	1	391.98	6.999	0.00492	0.0039198	0.06999	135	192
	2	401.8	5.870	0.01492	0.004018	0.0587	192	300
9	-	455.76	6.602	0.00573	–	–	135	300
10	1	722.82	12.908	0.00605	0.072282	0.12908	130	257
	2	675.31	11.821	0.00725	0.067531	0.11821	257	300
11	1	635.2	12.986	0.00515	–	–	94	160
	2	620.2	13.236	0.00600	–	–	160	213
	3	630.5	13.125	0.00572	–	–	220	375
12	-	654.69	12.796	0.00569	–	–	94	375
13	1	913.4	12.501	0.00421	–	–	125	250
	2	960.4	13.201	0.00752	–	–	250	500
14	1	1760.4	8.8412	0.00752	0.17604	0.88412	125	280
	2	1235.7	6.9872	0.00552	0.12357	6.9872	280	409
	3	1584.4	7.5225	0.00682	0.15844	7.5225	420	500
15	-	1728.3	9.1575	0.00708	–	–	125	500
16	1	1728.3	9.1575	0.00708	0.017283	0.09157	125	250
	2	1858.7	8.8524	0.00672	0.18587	0.8852	250	450
	3	1927.1	9.5142	0.00718	0.19271	0.95142	450	500
17	-	1728.3	9.1575	0.00708	0.017283	0.09157	125	500
18	-	647.85	7.9691	0.00313	–	–	220	500
19	1	649.69	7.955	0.00313	0.064969	0.7955	220	275
	2	705.23	8.955	0.00425	0.70523	8.955	275	457
	3	589.72	6.874	0.00215	0.58972	0.6874	457	500
20	-	647.83	7.9691	0.00313	–	–	242	500
21	-	647.81	7.9691	0.00313	0.006478	0.0797	242	500
22	-	785.96	6.6313	0.00298	–	–	254	550
23	1	785.96	6.6313	0.00298	–	–	254	270
	2	697.89	5.5698	0.00214	–	–	270	380
	3	727.36	6.0135	0.00249	–	–	380	550
24	1	794.53	6.6611	0.00284	0.079453	0.6661	254	415
	2	736.24	5.8762	0.00217	0.73624	5.876	415	550
25	-	794.53	6.6611	0.00284	–	–	254	550
26	-	801.32	7.1032	0.00277	0.80132	7.103	254	550
27	-	801.32	7.1032	0.00277	–	–	254	550
28	-	1055.1	3.3353	0.52124	–	–	10	150
29	1	1055.1	3.3353	0.52124	0.10551	3.3353	10	83
	2	1178.2	4.0589	0.60278	0.011782	4.0589	83	135
	3	989.9	2.7894	0.48721	0.09899	0.27894	135	150
30	1	1055.1	3.3353	0.52124	–	–	10	150
31	1	1207.8	13.052	0.25098	–	–	20	50
	2	1148.2	11.784	0.18695	–	–	50	70
32	-	810.79	21.887	0.16766	–	–	20	70
33	-	1247.7	10.244	0.2635	0.12477	1.0244	20	70
34	-	1219.2	8.3707	0.30575	–	–	20	70
35	1	641.43	26.258	0.18362	–	–	18	35
	2	678.87	28.458	0.23458	–	–	35	49
	3	714.85	30.875	0.27896	–	–	49	60
36	-	1112.8	9.6956	0.32563	–	–	18	60
37	-	1044.4	7.1633	0.33722	0.10444	7.1633	20	60
38	-	832.24	16.339	0.23915	–	–	25	60
39	1	834.24	16.339	0.23915	0.083424	1.6339	25	40
	2	895.34	18.178	0.31785	0.089534	0.18178	40	60
40	1	1035.2	16.339	0.23915	0.10352	1.6339	25	35
	2	1178.4	18.284	0.27853	0.011784	1.8284	35	47
	3	1247.3	20.147	0.32987	0.12473	0.20147	47	60