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Discussion

Discussion on "Short-term environmental/economic hydrothermal scheduling"

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ABSTRACT

This short communication is a discussion of the paper entitled "Short-term environmental/economic hydrothermal scheduling" by Mohammad Reza Norouzi, Abdollah Ahmadi, Adel M. Sharaf, and Ali Esmaeel Nezhad published in the Electric Power Systems Research 116 (2014) pp. 117–127. In the discussed paper, the results presented in Tables 2, 3, 5 were different from what we have calculated, which we believe is correct. Here, we present the correct results in detail.

In Ref. [1], the authors proposed a new technique based on lexicographic optimization and ϵ-constraint method to solve the combined economic emission scheduling problem of hydrothermal systems comprising several equality constraints as well as non-equality ones. A test system of four hydro generating units and three thermal units was studied in the above reference. The date of the hydro and thermal units for this system can be found in [2]. However, we have found that the best compromise cost for the system obtained should be 47500.1148 ($), which is not consistent with the published total operating cost 40854.28 ($) given in Tables 2, 3, 5 of Ref [1]. The recalculated results are shown in detail in Table 1, which show the costs resulted in each time interval of dispatch.

The misevaluation made in Tables 2, 3, 5 of Ref. [1] can be easily verified by placing the best compromise solution presented in Table 3 of Ref. [1] into Eq. (2) of [1], which leads to a non correct result of the total cost. The correct total cost should be 47500.1148 ($), which can be obtained by summarizing all the costs of each time interval of dispatch shown in Table 1. The above indicates that the results presented by the authors in Tables 2, 3, 5 and Fig. 2 of Ref. [1] are invalid.

Table 1
The recalculated cost of each time interval.

	Thermal generations in MW			
	P_{s1t}	P_{s2t}	P_{s3t}	Cost ($)
1	137.31	174.72	150.51	1916.6633
2	146.94	186.58	159.00	2015.5313
3	122.98	156.94	138.00	1687.2108
4	108.36	138.71	125.37	1496.2810
5	108.89	139.37	125.83	1504.6877
6	140.75	178.96	153.53	1958.7498
7	171.32	216.32	180.98	2125.3651
8	175.00	229.98	191.54	2256.8836
9	175.00	256.01	212.85	2359.6862
10	175.00	243.01	201.99	2338.7985
11	175.00	246.42	204.79	2350.2745
12	175.00	269.26	224.49	2321.6227
13	175.00	248.90	206.85	2355.9219
14	167.29	211.44	177.28	2073.7055
15	160.17	202.78	170.82	2061.4200
16	173.07	218.43	182.58	2145.7061
17	168.15	212.48	178.07	2085.2325
18	175.00	241.30	200.59	2331.4478
19	170.88	215.78	180.57	2119.9415
20	162.55	205.68	172.98	2060.4994
21	119.63	152.77	135.10	1652.0995
22	104.44	133.82	122.01	1431.3144
23	101.93	130.68	119.86	1396.6833
24	87.96	113.17	107.92	1454.3884
Total cost ($) = 47500.1148				

References

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