

# Errata to “Polynomial Time Algorithms and Extended Formulations for Unit Commitment Problems”

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In this errata, we corrected the imprecise statements in “Polynomial Time Algorithms and Extended Formulations for Unit Commitment Problems” [IISE Transactions 50 (8): 735-751, 2018].

1. On Page 736 right column: Replace “(ii) ... with both general convex and piecewise linear cost functions” with “(ii) ... with piecewise linear cost functions”
2. On Page 737 right column: Replace “ $C(t, k)$  represents the optimal generation cost (i.e., the objective value of the economic dispatch problem)” with “ $C(t, k)$  represents the optimal cost, equals to generation cost minus revenue, in the interval  $[t, k]$ ”
3. On Pages 738: Replace “2.2. An extended ... with general convex cost function” with “2.2. An extended ... with piecewise linear convex cost function”
4. On Pages 739 and 740 in (8c), (8d), and (9c): Replace “ $k = t + L - 1$ ” with “ $k = \min[t + L - 1, T]$ ”
5. On Page 740 left column: Delete the paragraph “Note here that ... function as  $w_{tk}^s(q_{tk}^s, \beta_{tk})$ ”; replace “ $w_{tk}^s(q_{tk}^s, \beta_{tk})$ ” with “ $w_{tk}^s$ ” in expression (9a).
6. On Page 740 right column: combine expressions (8n) and (9k) as the new (9k); replace “we assume that” with “since”; replace “with the same set of Constraints (9b)-(9k) but with” with “with the same set of Constraints (9b)-(9k) without the term included in (8n) but with”
7. On Page 741 right column: In Proposition 1, replace “The” with “There exists an” and delete “are”; replace the entire proof of Proposition 1 with “The conclusion directly follows from Theorem 1 and linear objective function (9a).”
8. On Page 742 left column: Replace “single-UC problem with a general convex cost function ... and add” with “single-UC problem by adding”
9. On Page 742 Theorem 2: Replace “general convex” with “general piecewise linear convex”; replace the objective function “ $\sum_{t=1}^T (SU_t + f_t(x_t, y_t)) + \sum_{t=L}^{T-1} SD_t$ ” with “(9a)”; delete “(1i)-(1k)”; delete the proof section.

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10. On Page 742 right column: In Remark 1, replace “but also provides an . . . due to Theorem 2” with “but also provides an optimal objective converging to that of the deterministic single-UC problem (1) when  $f(\cdot)$  is a general convex function due to the compactness of the feasible region and bounded objective value for the single-UC problem and Theorem 2”
11. On Page 746, replace “ $f_t(x_t, y_t)$ ” with “ $\varphi_t$ ” and “(20b)-(20e)” with “(16), (20b)-(20e)” in Theorem 3
12. On Page 749, replace “ $f_m(x_m, y_m)$ ” with “ $\varphi_m$ ” and “(29b)-(29e)” with “(26), (29b)-(29e)” in Theorem 4

**Remark 1** *The updated integral formulations without the imprecise statements above have been available at*

1. <https://arxiv.org/abs/1906.07862> (i.e., formulation (2) in Section II and corresponding proof in Section III) and
2. <https://drive.google.com/file/d/1nb03G92xQmJBT9h0Vpw4tfI2qst6JAAR/view> with the updated parts marked in *purple*.