

Modeling the hidden flexibility of clustered unit commitment

G. Morales-España, D.A. Tejada

Abstract— This letter proposes a clustered unit commitment (CUC) formulation to accurately model flexibility requirements such as ramping, reserves, and startup/shutdown constraints. The classic CUC intrinsically and hiddenly overestimates the individual unit's flexibility, thus being unable to replicate the result of the individual UC. This letter presents a set of constraints to correctly represent the units' hidden flexibility within the cluster. Different case studies show that the proposed CUC replicates the results of the individual UC while solving significantly faster. Therefore, the proposed CUC correctly represents the individual unit's flexibility within the cluster and could be used in large-scale planning models without significantly increasing their computational burden.

Index Terms— Unit commitment, clustered UC, ramping constraints, reserves, flexibility, renewable energy sources.

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

[Request full paper to the authors](#)

If your institution has an electronic subscription to IEEE Transactions on Power Systems, you can download the paper from the journal website:

[Access to the Journal website](#)

Citation:

Morales-España, G.; Tejada, D.A. "Modeling the hidden flexibility of clustered unit commitment", IEEE Transactions on Power Systems, vol.34, no.4, pp.3294-3296. July, 2019.