Seyed-Ehsan Razavi, Ali Esmaeel Nezhad, Hani Mavalizadeh, Fatima Raeisi, Abdollah Ahmadi, 2018, Robust hydrothermal unit commitment: A mixed-integer linear framework, *Energy,* to appear.

Highlights

- Daily hydrothermal unit commitment considering practical limitations.
- Presenting a risk-constrained scheme to deal with severe load variations.
- Proposing a Mixed Integer Linear Programming (MILP) framework for the problem.
- Proposing a robust decision-making strategy taking advantage of IGDT approach.

Abstract The paper presents the info-gap theory for the sake of developing a robust framework for short term hydrothermal scheduling to tackle severe load uncertainty. Deploying this method, the system operator is provided with a robust decision-making strategy to guarantee the minimum cost under load variation condition while practical and technical limitations such as dynamic ramp rate are taken into consideration. For this purpose, the proposed Unit Commitment (UC) problem considering all above advantages would be modeled in a linear framework, which is in turn taken into account as another outstanding feature of this study as it is compatible to apply to real-world systems. In order to investigate the model efficiency, the modified version of the IEEE 118-bus test system having 54 thermal beside 8 hydro plants is chosen as the case study. Eventually, the results demonstrate how demand fluctuations and errors in the predicted load can be tolerated by allocating additional robust cost.

Keywords Hydrothermal scheduling; Information Gap Decision Theory; Mixed Integer Linear Programming; Unit Commitment; Uncertain load demand.