

Soroush Shafiee, Hamidreza Zareipour, Andrew M. Knight, Nima Amjady, Behnam Mohammadi-Ivatloo, 2017, Risk-Constrained Bidding and Offering Strategy for a Merchant Compressed Air Energy Storage Plant, *IEEE Transactions on Power Systems*, 32(2): 946–957.

Abstract Electricity price forecasts are imperfect. Therefore, a merchant energy storage facility requires a bidding and offering strategy for purchasing and selling the electricity to manage the risk associated with price forecast errors. This paper proposes an information gap decision theory (IGDT)-based risk-constrained bidding/offering strategy for a merchant compressed air energy storage (CAES) plant that participates in the day-ahead energy markets considering price forecasting errors. Price uncertainty is modeled using IGDT. The IGDT-based self-scheduling formulation is then used to construct separate hourly bidding and offering curves. The theoretical approach to develop the proposed strategy is presented and validated using numerical simulations.

Keywords Compressed air energy storage (CAES), bidding strategy, information gap decision theory, IGDT, uncertainty.