

Amir Hossein Shojaei, Ali Asghar Ghadimi, Mohammad Reza Miveh, Foad H. Gandoman and Abdollah Ahmadi, 2021, Multiobjective reactive power planning considering the uncertainties of wind farms and loads using Information Gap Decision Theory, *Renewable Energy*, 163: 1427-1443. DOI: 10.1016/j.renene.2020.06.129

Abstract This study deals with multiobjective reactive power planning, considering the uncertainties of load demand and wind power generation. The main feature of the current study is to examine the impact of multiple uncertainties on Reactive Power Planning (RPP), while several objectives exist. To fulfill this goal, the Information Gap Decision Theory (IGDT) is used to handle the uncertainties of load demand and wind power production. In order to cope with the probabilistic optimal RPP problem and to create Pareto optimal solutions, the ε -Constraint method is utilized. Fuzzy Decision Maker (FDM) and min-max approach are jointly applied to find the Best Compromise Solution (BCS). To evaluate the efficiency and the proficiency of the proposed multiobjective RPP model, it is implemented on the IEEE-30 bus test system via the GAMS software environment. To prove the superiority of the proposed model, the obtained results are compared with the scenario-based approach. The results imply that for specific amounts of uncertainty, the IGDT method performs reasonably towards the scenario-based approach.

Keywords IGDT (info-gap decision theory), Multiobjective RPP, Uncertainty, Pareto front, Best compromise solution.