Alisan Ayvaz and V.M. Istemihan Genc, 2020, Information gap decision theory based transient stability constrained optimal power flow considering the uncertainties of wind energy resources, *IET Renewable Power Generation,* Aug 2020, Vol. 14, issue 11, pp. 1946–1955. doi: 10.1049/iet-rpg.2019

Abstract Studies on transient stability constrained optimal power flow (TSCOPF) have become crucial for power systems to guarantee their dynamic securities against credible contingencies, while their optimum operations are to be continuously projected under changing conditions. However, the current approach to the TSCOPF problem is not sufficient to meet the expectations of a modern power system because it suffers from uncertainties mainly due to the rapid and large integration of distributed energy sources. This study proposes a novel method using the information-gap decision theory (IGDT) technique to solve the TSCOPF problem in the presence of uncertainties due to the penetration of wind farms. The IGDT is a non-probabilistic decision-making method that can be easily implemented to handle uncertainty in optimisation problems. While presenting applicable strategies, it does not require any information about the historical data, probability density function or membership function of the uncertain parameters. The proposed method offers an analysis for the economic dispatch in a power system with wind energy resources while providing robustness against transient instabilities and uncertainties in power generation. To demonstrate the effectiveness of the proposed method, it is implemented on New England 39-bus and IEEE 118-bus test systems