Mohamad-Amin Nasr, Ehsan Nasr Azadani, Abbas Rabiee, and S. H. Hosseinian, 2019, A Risk-Averse Energy Management System for Isolated Microgrids Considering Generation and Demand Uncertainties Based on Information Gap Decision Theory, *IET Renewable Power Generation,* to appear.

Abstract There are many technical challenges in the integration of renewable energy sources in the context of microgrids. Among the numerous challenges associated with microgrids, spinning reserve energy management should be accurately considered in the microgrid scheduling system for a better system operation. This paper presents a methodology to model and analyze a novel scheme to integrate renewable energy sources, particularly PV systems, in diesel generation-based isolated microgrids. The proposed approach considers the uncertainties of PV power generation and the active power demand simultaneously, by solving a bi-level multi-objective optimization problem using Information Gap Decision Theory (IGDT). In the proposed approach, Energy Management System (EMS) is formulated considering spinning reserve constraints and the uncertainties associated with PV power generation and load, by solving a unit commitment problem. This method, a non-probabilistic approach, does not require the probability density function of uncertain parameters and provides a robust framework to better understand the potential savings due to the PV integration. In order to test and perform the analysis, realistic data from a 20 MW hybrid PV project is used as a case study. Furthermore, the proposed method is compared with probabilistic techniques, such as Monte Carlo simulations and Scenario-based stochastic programming technique. The presented studies demonstrate the application of the proposed model for real migrogrids.