기후변화에 따른 태양광-풍력-에너지저장시스템(ESS)의 신재생에너지 통합 하수처리장의 신뢰성평가 및 마르코프 분석

Hoang Hai Tra Nguyen, Usman Safder, Li Qian, 유창규[1,†]

경희대학교; [1]Kyung Hee University

The contribution of renewable energy resources (RES) to power system reliability is influenced by the uncontrolled power supply from the intermittent behavior and climate change impact of these sources, it is necessary to analyze system's reliability. The objective of this work is to analyze reliability of wastewater treatment plant (WWTP) integrated with RES using hybrid fault tree analysis (FTA) and Markov process (MP). The research focuses on developing reliability models for evaluating the benefits associated with wind turbine (WT), solar photovoltaic (PV), and energy storage system (ESS) in power supply to WWTP. Intensively, probability of occurrence of WT is obtained 0.333, which is predominantly because of wind transmission. The overall reliability of RES to the WWTP process obtained 73.15%. Acknowledgement: This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. NRF-2017R1E1A1A03070713) and Korea Ministry of Environment (MOE) as Graduate School specialized in Climate Change.