

Abdolaziz Mallahi, Amir Abdollahi, Masoud Rashidinejad, Ehsan Heydarian-Forushani, And Ameena Saad Al-Sumaiti, 2022, An Investigation on the Impacts of Low Probability and High Intensity Events on Wind Power Generator's Market Participation, *IEEE Access*, 18 February 2022.

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Abstract This paper presents an extensive decision-making model for Wind Power Generators (WPGs) for profit maximization in an electricity market environment. This model has been presented at the intraday market stage due to the fact that WPGs can react according to the latest information and also they have less forecast errors in comparison to Day-ahead (DA) market. In addition, the Intraday Demand Response Exchange (IDRX) market is modelled with the aim of covering wind generation volatility so that the WPG can participate in it as a buyer. Note that, Demand Response (DR) uncertainty is modelled through Information Gap Decision Theory (IGDT) method so that the amount of financial resistance to the possible increase of the load is considered. In this article, the probability of WPG in the event of High-Intensity and Low-Probability (HILP) events such as the hurricane, is also examined. In fact, the effects of hurricane on failure rate, reliability and aging of wind units are investigated. The Conditional Value at Risk (CVaR) is utilized to quantify the WPG risk as well. Several numerical analysis are conducted to show evidence of the approach efficacy.

Keywords Bidding strategy, demand response, HILP events, uncertainty modelling, wind power generators.