

Improvement of prediction of wind power ramp by using monitoring data

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Introduction of power generation by renewable energy such as photovoltaics(PV) and wind power (WT) is worldwide progressing. Since PV and WT power generation are markedly fluctuated due to the change of the weather, there is concern about the stability of the electric power system. Therefore, we have been developing a prediction method of wind power generation output to contribute for the stabilization of electric power system. In this method, the numerical forecast value provided by the Japan Meteorological Agency is downscaled using the weather model WRF and CFD model to predict the wind speed at the wind turbine, and the power output is predicted using the power curve. By adding the generated power output for each wind turbine obtained, the total output of the area is obtained. In this study, we have improved the prediction of wind speed and power generation output by using the monitoring data for each wind turbine, by making correction based on multiple regression and by using empirical power curve. Furthermore, we have corrected the accuracy of the area total power output by sequentially correcting the windfarms where data for each windmill is not acquired. In addition, by performing multiple regression on the amplitude of the output change, we have improved the supplementation rate of the wind power generation rapid change phenomenon, ramp.

Keywords: Wind power output prediction, wind power ramp, wind power generation, SCADA, Weather forecast

