A Study on Vibration Signals of Wind Turbine through the Condition Monitoring System

Jinhyuk Son*, Jongchul Huh** and Kyungnam Ko***

* Presenting author, Faculty of Wind Energy Engineering, Graduate School, Jeju National University, 102 Jejudaehakro, Jeju, 690-756, Republic of Korea

**Dept. of Mechanical Engineering, Jeju National University, 102 Jejudaehakro, Jeju, 690-756, Republic of Korea

***Faculty of Wind Energy Engineering, Graduate School, Jeju National University, 102 Jejudaehakro, Jeju, 690-756, Republic of Korea

A study on wind turbine vibration signals caught by Condition Monitoring System, CMS, was carried out in Hankyeong and Seongsan wind farms of Jeju Island, South Korea. The vibration signal with 10 khz was measured by strain gages which was installed on the gearbox and the generator of wind turbines for two years from 2013 to 2015. The time domain was analyzed with the data above 50 % of the sampling rate. The vibration data was processed with band pass filter to clearly detect the wind turbine faults. The frequency domain analysis was performed using enveloping technique to find turbine faults with low frequency. Fast Fourier Transform, FFT, was applied to the processed vibration data. The result of this study showed that there was abnormal vibration signal from the gearbox which might cause to turbine breakdown, while generator had normal vibration signals that meant generator in good condition. It was found that CMS could be useful for wind farm owners and operators to detect potential turbine components failures and set up operation and maintenance plan.