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Comprehensive Review of the Effects of Vibrations on Wind Turbine During Energy Generation Operation, Its Structural Challenges and Way Forward

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Abstract

The effects of vibration cannot be overemphasized when it comes to generating energy via wind turbine. Vibration is one of the major challenges faced by the wind turbine, due to the complexity of the structure and the area of installation. This research work focuses on a compressive review of the effects of vibration occurrence on wind turbine during energy generation operations and its economical challenges'. Therefore, this research paper has reviewed various aspects of vibration effects in horizontal wind turbine such as the blades region, tower structure, nacelles compartment, and condition monitoring along with fault diagnosis models. The result from this study has shown that, there are needs to develop and implement a good reliability

model, fatigue assessment process, and a well-developed monitoring model for wind turbine during operation. When these things are properly put in place, it will help to reduce unwanted vibration occurrence, eliminate unexpected failure of the wind turbine in operations, and hence sustainable energy generation from wind turbine.

Keywords

- **Vibration**
- **Reliability for sustainability**
- **Wind turbine blade**
- **Wind turbine tower**

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