

TURBINE SELECTION FOR WIND FARM POTENTIALS IN EAST LIBYA

THESIS

**Organized to meet a part of the requirements to achieve the master
degree of Mechanical Engineering**



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Abstract

In this study, the wind speed characteristics and energy potential in the selected location Al-Fattaih-Derna in the eastern part of Libya have been investigated. The wind speed data was measured in 2003 at height of 50 m. The results shows that the annual mean wind speed is 8.21 m/s, Weibull distribution results has been used to accomplish the analysis, the two parameter of the Weibull statistics is found to lie between $2.39 \leq k \leq 5.77$ and $5.36 \leq k \leq 7.8$. The possibilities are high because of 8010 hours are available with the reasonable wind velocity values varied between 3-23 m/s, which is equal to 92.47 % . Further the result shows the annual value of the most frequent wind speed is 7.5 m/s, while the annual value of the wind speed carrying maximum energy is 8.5 m/s. The performance of the three selected wind turbine models (with rated power of 225, 1650 and 3300 KW) in this site is examined. The annual energy output for these turbines is determined. It is considered very promising as a renewable energy resource at this location.

Keywords; average wind velocity, weibull distribution, wind power density, east Libya, wind turbine.

PREFACE

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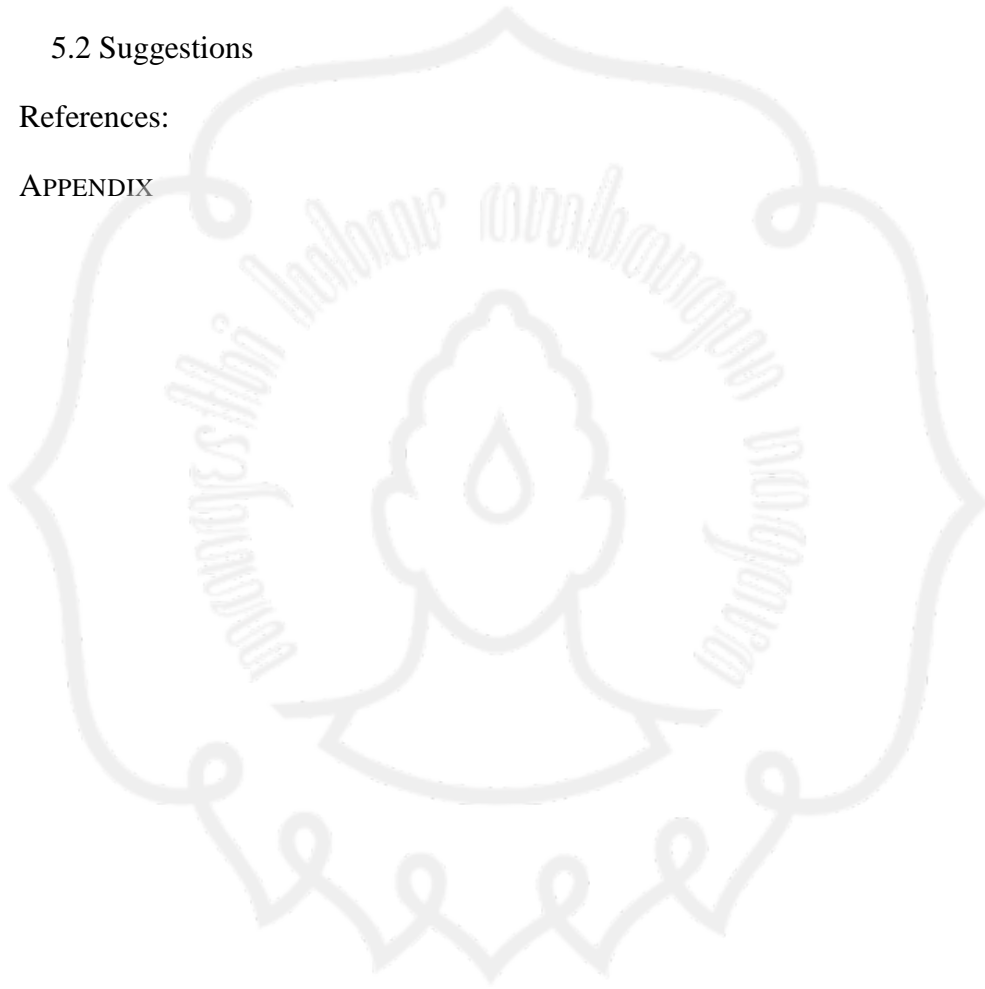


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