Assessing the Operational Robustness of the Homer Model for Marine Corps Use in Expeditionary Environments

By Naval Postgraduate School

Createspace, United States, 2015. Paperback. Book Condition: New. 279 x 216 mm. Language: English . Brand New Book ***** Print on Demand *****.As the Marine Corps pursues greater energy efficiency in expeditionary operations, the HOMER micropower optimization model provides potential to serve as a powerful tool for improving Marine Corps power planning. The HOMER software was developed for the modeling and simulation of micropower systems over long periods of time. Although a deterministic model, HOMER uses stochastic input data, specifically solar irradiance, temperature, and load profiles. HOMER simulation fidelity is therefore affected by the inter-annual variability of these profiles. This research quantifies HOMER robustness with regard to solar irradiance and tem-perature profile variability through full-factorial experimental designs. The effect of shortening HOMER simulation duration on the variability of HOMER simulation outputs is also investigated, and though statistically significant, the resulting increase in variability is not large enough to preclude the use of HOMER for expeditionary operations. This thesis also demonstrates how HOMER can assist in developing power planning doctrine, showing that the fuel consumption benefits of using multiple generators of different sizes is no longer present once a renewable energy asset is added to the micropower system. This analysis of...

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