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Modeling Time Based Power for Military Dismounted Small Units

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Author Note: Sean Arcilla, Kevin Larry, Gustavo Maldonado, and Jeffrey Malm-Annan are Cadets from the Department of Systems Engineering, United States Military Academy Class of 2017. They worked under the advisement of Paul Evangelista, a US Army Lieutenant Colonel and academy professor in the Department of Systems Engineering.

Abstract: As the Army injects technology into the Soldier's individual equipment, electrical energy requirements continue to increase. Soldiers and leaders need to be able to predict the amount of energy required for the duration of their missions. There is a need for modeling that supports future acquisition decisions related to military dismounted small unit power through assessment of energy consumption, storage and regeneration, and net energy at platoon and below levels. This research presents an electrical energy expenditure model for a dismounted infantry platoon. The model considers a 72 hour contingency and energy consumption. Equipment includes communications, navigation, and command and control systems. The scalable design of this model represents an essential contribution of this work. Results include a model capable of supporting changes in contingency plans, equipment specifications and equipment configurations.

Keywords: Small unit energy expenditure, tactical regeneration, scalable energy modeling