Alternative Energy in Military Contexts: Training, Simulation and Educational Roles

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ABSTRACT

A major function of the simulation community is evaluation. The future holds many unknowns, not the least of which is the impact from new energy sources and from decreasing reliance on traditional ones. These influences may flow in both directions: the impact on energy policy from defense imperatives and the impact on defense from energy policies. Some of these issues are bound up in emotional and political controversies that obfuscate a rational approach to an optimal resolution of the competing interests. This community has a special place in its provision of objective representations of defense matters, driven by the constant pressure of knowing that lives are literally at state in every decision. This paper lays out the issues based on both the study and the experience of the authors, as well as an extensive literature review of the range of opinions and options. This is followed by a survey of the plethora of simulation implementations and the range of constraints and opportunities represented therein, especially those that are energy dependent or energy threatened. These matters are then considered in view of the needs of both the "end users" warfighters and the decision-makers in the civilian government. A number of experimental designs are then proffered, described and analyzed with an eye toward their impact on the stake-holders in these issues. There is an extensive discussion on how these designs will best approach the issues in a way that would make them sufficiently provably valid so as to render them immune to attacks that they too are biased. The goal set forth is to provide decision-makers in both the defense establishment and in the energy departments a look at the variety of approaches and the array of outcomes that may be in the offing. The paper concludes with a list of alternatives.

ABOUT THE AUTHORS

Mark C. Davis, Ph.D. is the Chief Technical Officer at Wood Duck Research, Inc, and is semi retired after careers in the US Navy and as a computer design engineer for both IBM and Lenovo. Rising to the level of Distinguished Engineer at Lenovo, he was responsible for the design of laptop computer cross-disciplinary technology, including PC architecture, embedded systems, open source and virtualization. Previous work was with IBM in the areas of software development and architecture involving security, storage and virtualization. Dr. Davis has been granted well over fifty patents that were filed during his service at both companies. He is a graduate of the Duke University NROTC program and was commissioned as an Ensign, attended nuclear power school, and served as a Submarine Officer for twelve years, including one duty tour as a classroom instructor. He left the active duty as a Lieutenant Commander to pursue a PhD. Mark holds a BSEE degree from Duke University and a PhD in Computer Science from the University of North Carolina, Chapel Hill, where his advisor was Professor Fredrick P. Books.

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