

Net Zero Energy for Security Lighting at Contingency Locations (Task N.0841)

Statement of Need

Security lighting is critical for protection of warfighters at forward locations and the self-contained portable light cart is ubiquitous to contingency locations for this purpose. In many locations, such as Camp Buehring, Kuwait, current lighting technology requires daily starting, re-fueling, maintenance checks, and shut down of the diesel-powered light carts. Lighting efficiency improvements, to include an auto start/stop mechanism, were identified as Net Zero actions in a Net Zero Action Plan for Camp Buehring. It appears there is significant opportunity to improve the operational efficiency of the existing portable light carts for this location and similar camps.

Technical Approach

The NDCEE will investigate light cart modifications and internal light system capabilities to meet contingency location requirements. This will be achieved by developing and testing proposed modifications on an initial light cart, providing hardware and drawing packages to implement lighting improvements for optimal performance, and developing and delivering a draft *Demonstration and Validation Plan for Lighting Efficiency Improvements* (Dem/Val Plan). The Dem/Val Plan will provide the Government with a roadmap for further validation of proposed modifications to existing light carts, and will incorporate lessons learned from other alternative lighting technology efforts in the Department of Defense.

The NDCEE will investigate and compare multiple options for improving the efficiency of portable light cart operation while maintaining the same or better illumination and ensuring no net increase in maintenance burden. Options to be investigated include: 1) development and integration of auto start/stop controls of light cart generators; 2) LED lamps instead of metal halide lamps; 3) the ability to operate several lights sets from one light cart generator; 4) alternate battery technologies; and, 5) renewable-energy powered carts. These alternative options will be compared based on performance, cost, maintenance requirements and return on investment. Past performance data will be used if available, as solar light carts have been deployed in certain contexts. Results of preliminary activities conducted under NDCEE Task 0813 will be leveraged in the execution of this Task.

Anticipated Results and Benefits

Improvements for operational efficiency that also meet harsh environmental operating conditions have the potential to reduce manpower requirements, reduce fuel use, and achieve overall cost savings. The NDCEE will prepare a detailed Dem/Val Plan under this effort with estimates to retrofit up to 30 carts. The Dem/Val Plan will provide the Government with a roadmap for further validation of proposed modifications to existing light carts and will incorporate lessons learned from other alternative lighting technology efforts in the Department of Defense. Using the results of the light system capabilities testing, the Dem/Val Plan will outline the resources necessary to complete the proposed modifications. It will describe how performance data must be collected in order to evaluate the impact of the retrofits to reducing energy use and maintenance burden in support of a cost-benefit analysis. The Dem/Val Plan will present potential locations for the demonstration and estimate the level of effort necessary to execute.

Technology Transfer and Outreach

The NDCEE will coordinate with the Government to determine how to accomplish technology transfer, during or upon completion of this Task. Technology transfer will require field validation of the proposed light cart modifications, thus the Army will have the Dem/Val approach for doing this. The NDCEE will identify other potential users, organizations, etc., that would be anticipated to be able to implement this technology and provide a description to the Government as to the potential need of the technology implementation. Lessons learned from this effort will inform the applicability of the Army's Net Zero Directive to contingency locations, as well as inform future Net Zero and Operational Energy technology efforts.

Government POC

Kristine Kingery,
DASA(E&E)

Status

Ongoing

