



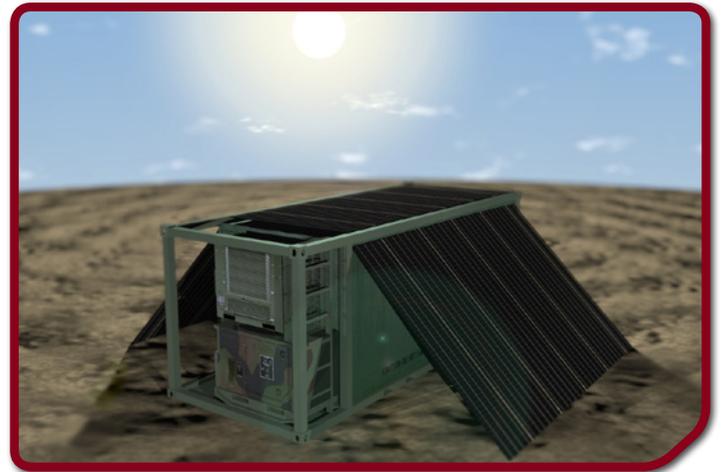
HIGH-EFFICIENCY SOLAR-POWERED MULTI-TEMPERATURE REFRIGERATED CONTAINER SYSTEM (MTRCS)

PURPOSE:

With recognition that the transport of fuel through battlefields is a significant expense and security liability, efforts are underway to use solar power for military assets. An obvious initial application is aboard the Refrigerated Container Systems (RCS) needed for transport and on-site storage of food, ice and water. The CFD Equipment and Energy Technology Team initiated a Solar-Powered Refrigerated Container (SPRC) project and is transitioning results to PM-Force Sustainment Systems (PM-FSS) Food Service Equipment Team (FSET), specifically to benefit the Multi-Temperature Refrigerated Container System (MTRCS).

CHARACTERISTICS:

Presently, the MTRCS consumes between .8-1 gal (3-3.7 liters) per hour of JP-8 in ambient temperatures near its operational limit of approximately 120°F (50°C). To promote fuel savings, the MTRCS Operational Requirements Document (ORD) allows for alternative energy technology implementation as a Pre-Planned Product Improvement (P3I). The standard equipment relies on aged refrigeration technology, requiring far too much power and energy to practically employ the frugal output from solar photovoltaics. However, the SPRC project research has empirically demonstrated the MTRCS performance can be dramatically improved through modification, thereby enabling it for solar power.



CAPABILITIES & BENEFITS:

- Extends ambient operational temperature limit from approximately 120°F (50°C) to approximately 135°F (55°C).
- Reduces heat-soak pulldown time by 50 percent.
- Reduces fuel consumption by 50% at temperatures over approximately 100°F (40°C); results in 30% fuel savings annually.
- Has the potential to reduce the Mean Time Between Failures (MTBF) by 50 percent.
- Enables the integration of solar photovoltaic power supplies.

COMMENTS:

Upon fulfillment of predefined objectives, the technology is projected to transition from EETT to PM-FSS FSET in FY10. Meanwhile, ongoing efforts include development of the equipment, Production Qualification Testing, user testing, logistical demonstrations, and First Article Testing. Successful development and positive results from verification testing will allow for transition to production in FY13.

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