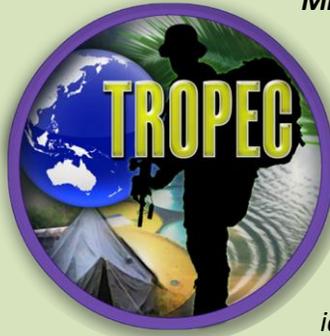


# TROPEC – CRIMSON VIPER 2012 SUMMARY STATEMENT



**Mission:** Reduce Operational Energy Consumption in Tropical Environments while maintaining or improving warfighter capability.

**Goal:** Reduce operational energy consumption at PACOM expeditionary basing by 25% in 32 months.

**Method:** By combining Department of Energy's expertise in energy efficiency & demand reduction with PACOM and MEC's expertise in operations in tropical environments and through a process of technology identification, review and assessment, provide strategy and acquisition professionals with insight and information on material and non-material solutions.

## Crimson Viper, Thailand, 2012:

**Background:** Crimson Viper (CV) 2012 is the latest annual collaborative experiment between the US DoD and the Royal Thai Ministry of Defense. MARFORPAC Experimentation Center (MEC) is the DoD lead and PACOM is the executive agent for S&T collaboration with Thailand. The TROPEC Crimson Viper 2012 report provides results of a Limited Operational Assessment (LOA) of energy saving technologies, including: radiant barrier tents, Convertible Gas/Electric Packaged environmental control units (ECU) with two-stage compressors and variable-speed fans, Light Emitting Diode (LED) shelter lights and occupancy and manual lighting controls when used in a warm, tropical environment in administration tents.

### Key Findings:

- LED lighting energy savings estimated at 25% compared to fluorescent. Hybrid lighting controls save ~ 48% of lighting energy (hybrid lighting = one light string controlled by an occupancy sensor, one manually). Combining the two would save approximately 60%.
- A new experimental two-stage air conditioner used 67% less energy than a control US Marine Corps air conditioner (retired) used as a baseline.
- Energy savings from the radiant barrier liners was 31% for tents using the experimental air conditioner.
- A shelter configuration using experimental air conditioners, radiant barrier liners, LED lighting and hybrid controls reduced energy 79% compared to a standard uninsulated tent with the control US Marine Corps air conditioner (retired) and manually controlled fluorescent lights.

Please visit [www.tropec.net](http://www.tropec.net) for more information on the TROPEC program

TROPEC's Crimson Viper 2012 detailed analysis can be accessed via the OEPP office.

### Recommendations:

- Investigate the use of air conditioners with multi-stage compressors that are designed for use in expeditionary military environments.
- Use radiant barrier liners in static applications, where cost-effective and daytime IR signature is not a concern.
- Look for tent liner solutions that are more durable for applications with requirements for multiple setups and breakdowns and that can better handle long-term use in a humid environment.
- Use LED lighting instead of fluorescents, where cost-effective.
- Investigate use of digital controls for higher energy use loads (such as air conditioning units).

