Concentris Systems Wins $99,000 DARPA Circadian Rhythm Berth Light Fixture Contract

Proposed Solution will Facilitate the Self-Management of Sleep Cycles to Improve the Work Performance of Naval Crews

The Defense Advanced Research Projects Agency (DARPA) (http://www.dodsbir.net/selections/abs082/darpaabs082.htm) has awarded a Phase I Small Business Innovation Research (SBIR) contract to Concentris Systems to study the feasibility of producing an actively managed circadian rhythm berth light fixture.

The device is intended for use in the sleeping compartments of Naval vessels such as aircraft carriers and submarines, where sailors may spend months below decks without exposure to the natural circadian cues provided by the sun. Designed with solid-state LED lights and an intuitive user interface, the new berth light fixture will emit a series of specific light wavelengths at controlled intervals. By spending time within this halo of light, a sailor's circadian rhythm can be "reset" to better accommodate the needs of the job.

"We are pleased that DARPA selected our team to help them find a solution that meets the needs of the warfighter." said Tareq Hoque, founder and president of Concentris Systems LLC. "The applications for this technology extend far beyond the quarter-decks of Naval vessels. In today's fast-paced world, where work extends far beyond sundown, growing numbers of workers face the challenge of adjusting their circadian rhythms with every shift change."

The berth-light project is based on scientific research into the modulation of circadian rhythms. Studies have demonstrated that light suppresses secretion of the human pineal hormone melatonin. In situations where changing time zones, shift work and/or light deprivation are present, this situation can disrupt the natural circadian cycle and decrease the work performance of impacted individuals.

Research has also shown that an individual's circadian phase can be estimated by observable factors such as temperature, time since sleep, and time spent asleep. Using this estimate to guide the controlled and programmed application of blue light, it is possible to synchronize the sleep/wake cycle with the demands of work or other activities.

The lighting fixture will be a microcontroller-driven solid-state lighting module that is compatible with existing Naval vessel berth fluorescent fixtures. The device will provide both ambient white-light for reading or other activities as well as multi-spectral lighting for circadian rhythm management. Equipped with energy-efficient

and long-lasting LED arrays, it will also offer a cost-effective solution that reduces the total life-cycle cost for berth lighting.

About Concentris Systems LLC

Concentris Systems develops unique technology solutions that solve real-life, challenging problems. Since 2006, Concentris has been engaged in sponsored research and development with funding from the Office of Naval Research, Defense Advanced Projects Agency and the US Army Research Development and Engineering Command. Concentris' pioneering research in wireless mesh networks has resulted in the commercially available MakaMesh networking system, which provides easy-to-integrate, high performance embeddable wireless mesh networking to OEMs and systems developers. MakaMesh networking is ideal for applications such as unmanned systems, video surveillance, industrial automation, vehicular networks, and other situations where conventional networking techniques are impractical or cost-prohibitive. Headquartered in Honolulu, Hawaii, Concentris Systems is a small, disadvantaged minority-owned business. www.concentris-systems.com