Press Release- **TMT-Large, 1000 Watt-2.5 $m^2$ Isothermal Panel Successfully Demonstrated**

**(Mar. 2, 2015)** Thermal Management Technologies (TMT) has successfully demonstrated a 1000 watt- 1.0 m x 2.5 m (39.4 in. x 98.4 in.) near isothermal multi-functional spacecraft structural-thermal panel. Funded by the Air Force Research Laboratory Space Vehicles Directorate, through a prime contract to LoadPath, TMT was tasked to demonstrate the viability of extending the multi-functional isothermal panel technology developed for Operational Responsive Space (ORS) isothermal spacecraft to a considerably larger heat spreading application. The goal for the project was to demonstrate low temperature differences in a large spacecraft structural panel with simulated heat loads up to 1000 watts. Heat was applied through 10 discrete simulated electronic packages spread out over the panel. A laboratory test demonstration was successfully completed with a maximum measured temperature difference of 8.2 °C with ten discretely placed 100 watt heat loads operating simultaneously (1000 W total). Two conditions were evaluated: the first assumed the panel would be used as a radiator (max. dT=5.8 °C); the second assumed an insulated panel and heat would be transferred to the two short edges (max. dT=8.2 °C). The panel was designed to support up to 200 kg of components through a launch environment. A workmanship stiffness test has verified the panel structure is identical to the design stiffness.

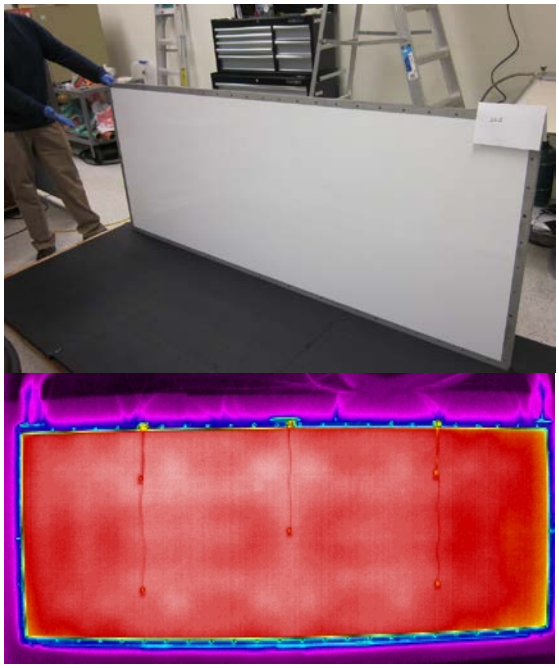

**Figure 1: Prototype 1 m x 2.5 m multifunctional spacecraft panel- radiator side (top); IR picture showing typical uniformity with heat applied from 10-discrete heat sources (bottom).**

The Thermal Control Panel technology consists of a matrix of flat, lightweight heat pipes integrated into a honeycomb panel to spread heat in two directions. The matrix provides significant heat spreading and a method of graceful degradation as a precaution against heat pipe failure due to micrometeorite damage. Metal matrix composite skins are employed in the panel to provide a high performance, rigid structure with exceptional through thickness thermal conductivity. A grid of threaded fasteners was installed in the panel for mounting of hardware. The panel will now undergo a series of structural and thermal vacuum tests at LoadPath to further verify its use in a flight like environment.

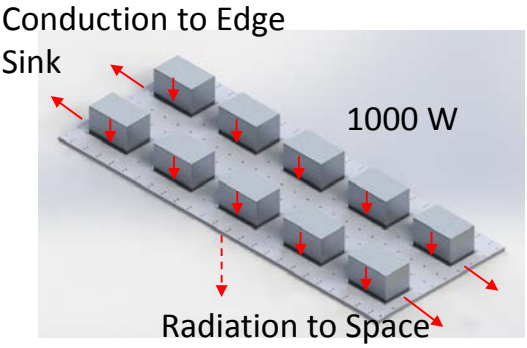


**Figure 2: Large isothermal panel design configuration showing typical component mounting, fastener grid, and potential cooling options.**

The Thermal Control Panel technology can be used for multifunctional heat spreading in spacecraft structures. Other applications include isothermal radiators, internal heat spreaders, and solar panel heat spreading. TMT wishes to express appreciation to our teammates at LoadPath and to the Air Force Research Laboratory Space Vehicles Directorate for supporting this development project under SBIR contract FA9453-12-C-0070.