

PROJECT TITLE	PROJECT NUMBER	START DATE	COMPLETION DATE
RUNWAY THERMAL MAPPING SYSTEM	C98-57	JAN 99	JUL 99

Equipment Evaluated: Thermal Mapping System", manufactured by Control Products, PO Box 1392, Vancouver, WA 98666, (360) 571-0988, Fax: (360) 571-0801. Product consists of a fixed "Base" Global Positioning System (GPS) station & one or more "Rover" stations, consisting of a 996D temperature sensors, radio transceivers, satellite receivers & computer hardware & software. A fixed temperature sensor is included to provide up-to-date real time temperature for periods when the "Rover" is garaged or out of service. **A.** The Base Station performs the following functions: Receives position signals from the US Department of Defense (DoD) satellite; performs a Base Station differential correction, using a known airport benchmark & position data received from the US DoD satellite system; receives radio frequency signals of temperature and position from the Rover. Plots the position of the Rover & the corresponding temperature on a "real time" thermal map of the airport or highway & displays it on the Base Station computer monitor. Performs alarming, paging, & other functions as required/desired. **B.** The Rover Station(s) performs the following functions: Monitors GPS Receivers to determine the current position of the host vehicle. Monitors the temperature of the surface of the runway or road surface at that precise point. Converts temperature, longitude & latitude to radio frequency & transmits these signals to the base station. **Project Monitor:** ACC MEEP Activity, for an AMC base. **Comparison:** Current methods of determining when to deploy runway & taxiway deicing equipment. **Project Results:** Due to an exceptional mild winter, lack of snow and/or freezing conditions, the Thermal Mapping System was used very little. The initial project duration was 6 months. A request for an extension through the 1999-2000 winter season, to allow time to correct problems noted & evaluate corrections, was not agreed to by the manufacturer. In fact the modification request to extend the project for 1 year was never returned. Regardless, the following was determined. The "Thermal Mapping System" provides an advanced high-tech method for mapping, monitoring, and transmitting thermal and conditions of pavement surfaces. This system continuously monitors the surface and ambient (air) temperature digitally to detect dangerous cold weather conditions. The system utilizes the US DoD GPS in conjunction with Control Products. Evaluators determined the product functioned as advertised, except for GPS data transmittal & Tapley Digital Decelerometer (TDD) input problems. GPS data that was transmitted sometimes showed the vehicle's location to be off the taxiway, when in fact, the vehicle was actually on it. This problem would only occur on the far ends of taxiways "A" & "G". The manufacturer representative said some adjustments were needed to correct this problem. However, it was not corrected before close of the project. The TDD requires 6 steps to **reset** the instrument each time before a new reading is taken. The operator must drive the vehicle & pay constant attention to the

instrument pad & punch in answers as is prompted by the software. This function requires the operator's attention, which should be primarily focused on the surrounding areas for aircraft, snow removing equipment, & other vehicles. Test personell felt that the Tapley Digital Decelerometer software must be modified to reduce the in-put steps. The manufacturer's representative said he could modify the decelerometer software so that it would only require one step to reset the instrument between decelerometer test. Again, this modification was not accomplished before the project was closed. **Noted Advantages:** The system provides a very effective method of accurately measuring surface temperatures; Base Operations & Maintenance personnel are alerted in advance when temperatures may be approaching the freezing point. No further significant disadvantages were noted, however the project had to be terminated prior to a thorough test being conducted, especially in light of the noted problems not being corrected.

Savings: Cost avoidance for the Air Force is \$70,000. **Final MEEP**

Action: While this type product, of good quality & design, was recommended for Air Force use by the test unit, the one tested cannot be recommended at this time. The product appears to have great potential & is an improvement over current methods, but problems noted precluded recommendation. In the event the manufacturer can correct the problems noted & there is a need by an activity, reconsideration could be made after further testing. HQ AFCESA concurred with this conclusion. **Project Closed.**
