
SESSION 3: Analysis and Testing

Paper 3.3

Tuesday ORAL Session

1:30 PM

Streamlining System Integration Times with CCE Pre-Integration

***K.D. Frohling, A.T. Lee, M.A. Calles, R.B. Victoria, Iris
Technology, Irvine, CA***

Spacecraft integrators are focused on mitigating risk and simplifying the integration process. Traditionally, the integration of Cryocooler Control Electronics (CCE) with cryocoolers is part of the overarching spacecraft integration endeavor. However, Iris Technology is modernizing this approach by offering pre-integration of the CCE with cryocoolers, thereby alleviating this burden at system-level integration.

Iris Technology's CCE and cryocooler pre-integration of the CCE and cryocooler capability enables the testing and establishment of critical sub-system parameters before delivery for system integration. These parameters encompass minimum and maximum power settings, as well as the validation of temperature and vibration control loops with predefined parameters.

The current methodology for testing and integrating CCEs involves utilizing an array of test equipment to configure complex test setups, often requiring manual initiation and recording of results. In cases where a physical cryocooler is unavailable, testing is conducted with static loads, which may not accurately represent operational conditions. To address this, Iris Technology is pioneering the development of scripted test tools capable of automating CCE testing. This innovation promises greater precision and consistency in testing while providing limited emulation of cryocooler functionality.

In this presentation, Iris Technology will unveil the architecture of the test equipment and demonstrate how software automation can enhance CCE testing and integration. The presentation will highlight the autonomous exploration of optimal CCE configuration parameters, underscoring Iris Technology's commitment to advancing integration methodologies and fostering efficiency in spacecraft systems.