

FLIGHT MEASUREMENT SCHEME IN RLV-TD

L. Dayaanandu, J. Muthupandian, T. Sivamurugan, M. Jayakumar,
N. Shyam Mohan, R. Rajkumar, Xavier Raja
Scientist/Engineer
RLV-TD Project
Vikram Sarabhai Space Centre (VSSC)
Department of Space, ISRO Post
Thiruvananthapuram-695 022, India
Email: l_dayaanandu@vssc.gov.in

Abstract

Reusable Launch Vehicle - Technology Demonstrator (RLV-TD) is a experiment vehicle to demonstrate technologies required for a reusable launch vehicle. Flight instrument is critical to collect data from the experimental vehicle. It is through instrumentation, flight performance of different subsystems is monitored. This paper gives a glimpse of what is measured in maiden hypersonic flight, why it is measured, and how the installation is done. Complexity of instrumentation system mirrors the phases of the mission. The mission started with low sub sonic regime then passed through transonic, supersonic and attained hypersonic velocity and decelerated finally to low subsonic. Instrumentation system should be able to work and perform its intended function in all phases. Data obtained during the flight is the one of the significant inputs for future RLV missions. Flight environment is continuously monitored till touch down by means of different transducers mounted in hardware. The parameters measured include pressure, temperature, heat flux, acceleration, vibration and acoustics. Sensor location is decided based on the sub system level tests and pre flight prediction. However, accuracy of sensor output is determined by correctness of sensor installation. Final location is decided by integration feasibility and other sub system interface. All sensors are qualified for their health before flight.

Keywords: Thermal Protection System (TPS), Accuracy, Smart Sensor, Acoustic Sensor, Array Sensor