OVERVIEW OF ISRO REUSABLE LAUNCH VEHICLE HYPERSONIC FLIGHT EXPERIMENT

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Abstract

Indian Space Research Organisation has achieved self reliance in space based systems, interms of launch capabilities, spacecrafts and ground segments. As a next logical step is to reduce the cost of space access and make space programme as more economical. Towards the low cost access to space, ISRO conceived a Hypersonic Wing Body Technology Demonstrator and develope critical technologies towards the same. This vehicle was designed to cater low subsonic to hypersonic speeds, re-enters into earth atmosphere and meeting the landing requirements. Design, analysis and testing schemes in terms of aerodynamics, structural, dynamics and thermo-structural aspects were done using augmented in-house tools/facilities. New technologies such as Flush Air Data System, Autonomous Integrated Navigation, Guidance and control for hypersonic aircraft, slow burn rate booster, Li-ion battery, Monopropellant thrusters, Carbon/Carbon composites and water proofed thermal protection system were indigenously developed. Airframe components were realized and assembled. All the subsystems were integrated to airframe with 500 measurement channels. The Reusable Launch Vehicle Technology Demonstrator flight was taken place in May 2016 and demonstrator was accomplished all the objectives and finally splash down in Bay of Bengal. The post flight analysis from various measurements revealed that the design procedure, testing methodology and approaches adopted are in order and gives lot of confidence to proceed to next mile stone in the development of Reusable Launch Vehicle technologies.

Keywords: RLV, FADS, Wing Body, Hypersonic Flight Test