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LESSONS LEARNED FROM THE IXV FLAP CONTROL SYSTEM DEVELOPMENT

Abstract

The ESA's Intermediate eXperimental re-entry Vehicle (IXV) has successfully completed its flight on February 11th, validating key technologies for European re-entry capabilities. S.A.B.C.A. has been in charge of the development, manufacturing and qualification of the Flap Control System (FpCS) of the IXV. The FpCS, comprising 2 actuators, an electronic control unit and a battery set, is based on electromechanical linear actuation technology. Its design is derived from the electromechanical Thrust Vector Control (TVC) system developed by S.A.B.C.A. for the Vega launcher. It is a successful case of modified COTS use, aiming at cost reduction. The original TVC design has been modified to take into account the particularities related to re-entry missions, such as the ability to sustain high aerodynamic loads during extended period of time, and higher temperature range. Modifications include, for example, a newly developed static brake, allowing to lock the actuators during some flight phases. Lessons learned during the IXV FpCS development and qualification are presented, together with the return of experience of the flight data exploitation.