SPACE DEBRIS SYMPOSIUM (A6)
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OHB MITIGATION ACTIVITIES FOR A CLEANER SPACE – CLEANSAT, DESIGN-FOR-DEMISE, IN-ORBIT REFUELLING, PROPULSION SUBSYSTEM PASSIVATION

Abstract

Reducing the number of space debris objects in the long run has to be achieved by a combination of remediation and mitigation action. This paper presents an overview and results of activities in the mitigation category that OHB System is running or has recently finished.

Clean Sat is a general study on the impacts of European Space Debris Mitigation (SDM) standards on low-Earth Orbit (LEO) satellites and their subsystems. The goal is to identify technologies and building blocks that need to be developed to make future LEO platforms compliant to SDM requirements. Through the prioritisation by a system integrator OHB helps ESA to channel future technology development effort into most urgent projects.

Design-for-demise techniques are one means of achieving compliance with the on-ground casualty risk requirement after atmospheric re-entry. ESA-funded and internal RD studies have provided initial results that will be presented. The advantages and drawbacks of individual design-for-demise strategies are compared and a conclusion is drawn for which specific type of mission each technique is best suited.

Another SDM aspect is the **passivation of the propulsion subsystem** after the satellite's end-of-life. A dedicated study on this topic assessed SDM requirements in detail with respect to their applicability to the propulsion subsystem and proposed to ESA a set of propulsion subsystem passivation requirements for space debris mitigation.

Currently operating satellites have not been designed for salvaging or extending their life through in-orbit refuelling. This makes its complexity and commercial attractiveness questionable. OHB System participates in the **hArmonised System Study on Interfaces and Standardisation of fuel Transfer (ASSIST)** led by GMV Aerospace and Defence S.A.U., which aims at defining and breadboarding a refuelling system and interfaces, possibly evolving into a standard to be adopted by satellite operators. An additional benefit of this is a reduced number of satellites and therefore large space debris objects.

The presented activities mark first steps into the future of designing and building satellites in a sustainable way. They target different aspects of space debris mitigation, but have in common that they aim at flowing-down agency-level requirements to subsystem and component suppliers through the system integrator.