SPACE DEBRIS SYMPOSIUM (A6)
Mitigation, Standards, Removal and Legal Issues (4)

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HIGH LEVEL REQUIREMENTS FOR AN OPERATIONAL SPACE DEBRIS DEORBITER

Abstract

After more than 50 years activities in space, time has come now to clean-up the most crowded orbital regions, mainly the LEO zone; recent publications have shown that in order to stabilize the growth of space debris in LEO, a minimum of 5 large objects should be removed yearly from this zone. Several technical solutions can be considered, with diverse levels of technical maturity. Several "short-term" solutions are discussed, justified by a short trade-off. They are based on a large Orbital Transfer Vehicle OTV, studied in CNES since mid 2008, lowering the orbit of debris for direct atmospheric reentry or to an orbit compliant with the 25 years rule, or delivering to defunct upper stages small deorbitation kits based on solid propulsion. A variant, much more advanced and hypothetical, considering passive tethered deorbitation, is also discussed. The high level requirements of such a system are identified, focussing mainly on the required Research Technology activities necessary to mature the solution. It is organized following mission phases, taking into account the past demonstrations, mainly the flight of the ATV Jules Verne in 2008. There are key problems associated to this kind of solution which are not technical. These financial, political, legal or international aspects are briefly presented in the conclusion