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Post Mission Disposal and Space Debris Removal (1) (5)

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IMPLEMENTATION OF A HIGH THRUST MONO-PROPELLANT ENGINE ON A PROPULSION
MODULE

Abstract

Space debris is recognised as a major risk to space missions, pushing space agencies and industries to mitigate the production of fresh space debris. One solution is satellite end of life de-orbitation.

However, a controlled re-entry is needed for large spacecraft resulting in the need for a propulsion system which can deliver high thrust at End Of Life. This can be provided by a high thrust mono-propellant engine however the integration of such an engine in a propulsion system can be a challenge for the thermal design. Specific attention has to be given to the hardware to limit the impact on surrounding units and provide suitable mechanical behaviour.

Starting with an overview of the high thrust mono-propellant engines used in the space industry, the various thermal phenomenon encountered during thruster firing – plume effect, heat soak back, radiation environment - will be presented with regards to the solution implemented.