## VALISPACE

Why ClearSpace engineers manage data in Valispace and how it helps them reach economical feasibility and time to market

In 2019, the European Space Agency commissioned ClearSpace to conduct the world's first space mission to remove an item of debris from orbit. In 2021 they were then selected by the UK space agency for the feasibility and requirements phase of another mission to remove two objects from space.

They needed an engineering platform that allowed their engineers to easily communicate on technical data, whilst also allowing external stakeholders to view the project.

They chose Valispace.

#### Background

ClearSpace was founded in 2018 out of the realization that in-orbit servicing and space debris removal are vital services for the future of space exploration and operations.

Since being commissioned by ESA in 2019, ClearSpace has been busy developing the ClearSpace-1 mission, an unprecedented endeavour to remove a 100kg piece of space junk from orbit and prevent it from colliding into a future unknown victim and spewing out 1000s of bits of desbris.

Their target is Vespa, the upper stage left behind by Esa's Vega launcher back in 2013. The team chose the object due to its relatively simple shape and sturdy construction, which make Vespa a great first goal before moving on to larger and more challenging objects to hunt down. The ease of use and intuitiveness of the platform helps systems engineers go into the details of the modelling, while allowing engineers from other disciplines to interfere with the tool in one single place

#### **Bastien Gorret**

Systems Engineer



### **Mission update**

- On 21st February 2023, ClearSpace passed their first major program review with ESA
- ClearSpace's four-armed capture system passed proof-of-concept testing at ESA's
  ESTEC technology centre
- On target to launch test flight at 500km orbit in 2026

### Real Time Collaboration & Stakeholder Communication

Clearspace needed an easy way for their engineers working in different disciplines to get an overview of the system model at the same time. Alongside this, they also needed their major partners, the European Space Agency to review information when they required it.

They chose Valispace for its real time collaboration capabilities. Engineers can be notified when changes are made to the system, start discussions, and request reviews all in a single place then relay this information to stakeholders

# Parametrization of Requirements for Dynamic Design

Clearspace-1 is a novel mission that's never been attempted before. Due to this, the engineering team needed to be able to ensure they can rapidly see the impact of design choices and assess them to find the most optimal design.

Valispace's parametrization of requirements and components gives greater flexibility to ClearSpace's ability to make changes to requirements, and guarantees that data is consistent across different parts of the project.

#### **Fast Engineering Iterations**

The ClearSpace team wanted a way of being able to keep track of engineering budgets, and specifically needed to control power consumption between different mode dependencies.

In Valispace, they are automatically able to see how changes to one part of a system affects another, they are able to maintain budgets and make the most informed trade off-decisions.





#### Get Valispace Demo

#### Iterative design for the most complex product development in $\sqrt{ALISPACE}$

- Automatic data propagation for consistent design: Prevent manual document updating and ensure traceability throughout your project. Understand who did made what change, when and why.
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**Continuous verification from design-to-spec:** Trace how product specifications and the system design relate. Ensure the system designed is aligned with requirements by setting up automatic verifications. Reduce the risk of rework and verify faster.

**Engineering data insights for better and faster decisions:** Visualise the connections between data and gain better insights. Easily understand the impact between different parts of the design and make informed decisions based on data.

Valispace empowers engineers and all involved parties to collaborate on all non-CAD engineering data. Valispace brings together disconnected data across platforms and documents into one place and enables the automation of data engineering flows related to requirements management, design calculations and iterations, test management, all the way to automatic verification.