

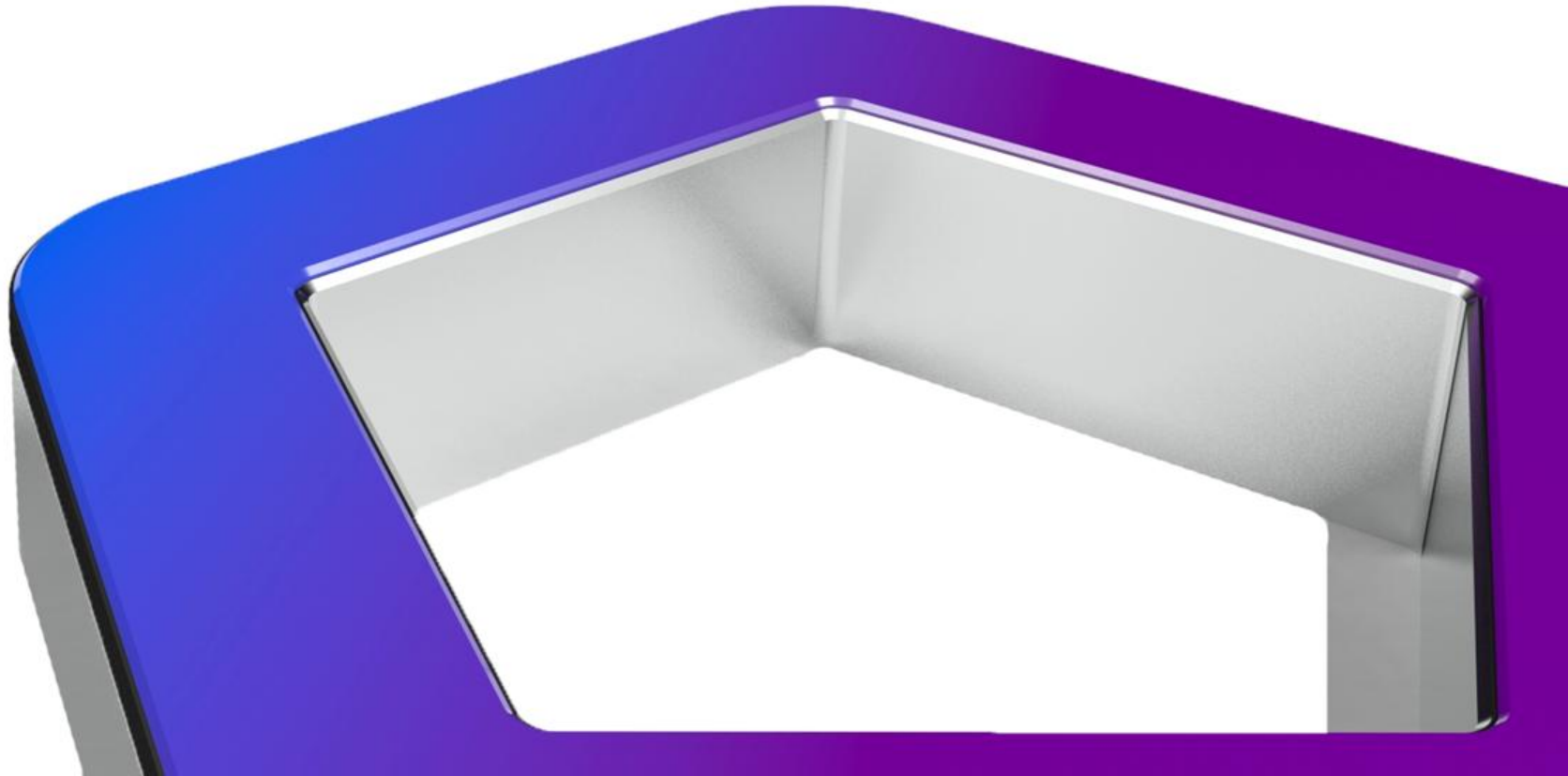


# Pentacon

Industrial  
Technical  
Solutions

Confidential

Space MGSE





# Pentacon



Mechanical  
Engineering &  
Mechatronics



50+ employees



One-stop shop  
Analysis,  
Development &  
Delivery



R&Idea Facility





# Pentaneering



Investment in early knowledge creation, avoiding late iterations



One concept is no concept



Business case & planning driven development



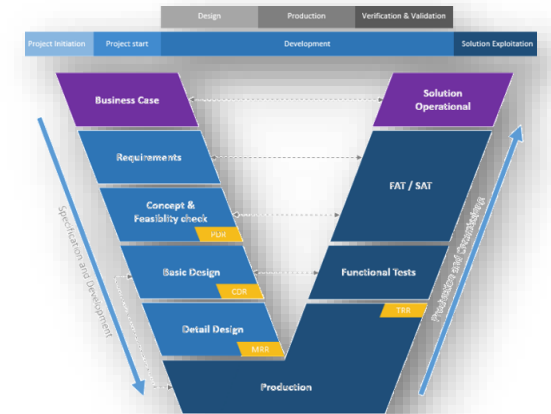
Transparent and effective communication



Developing tomorrow's solution with today's technology

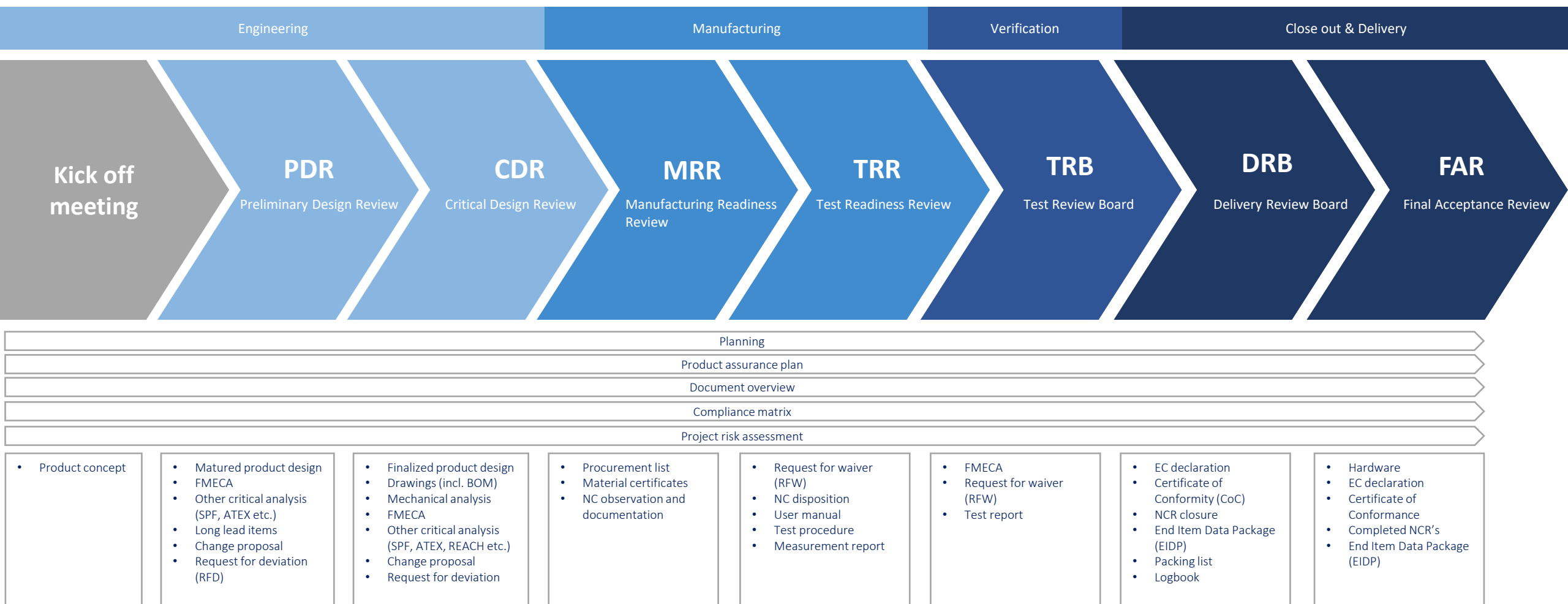


Cross industrial knowledge sharing and creativity





# ECSS Guidelines





Space  
&  
Aerospace



Pentacon

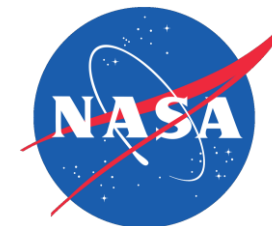
**beyond gravity**



**Airborne**



MGSE Partner





# Space programs



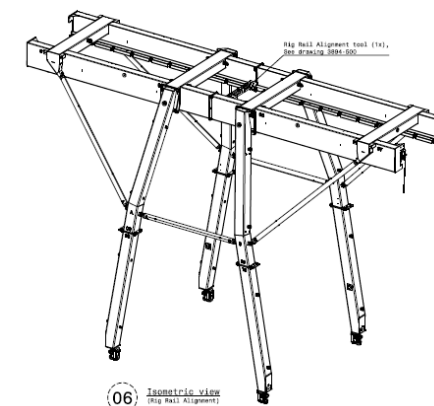
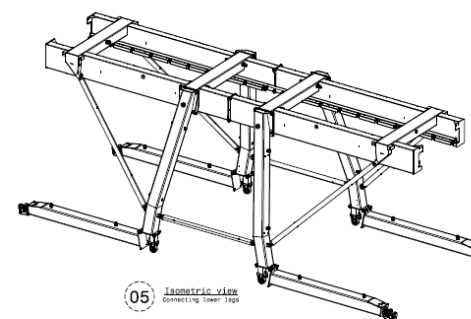
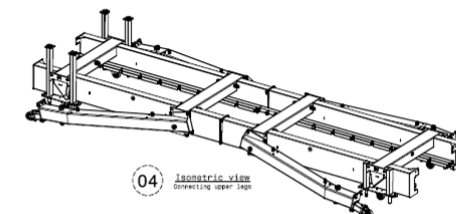
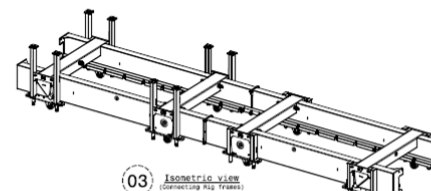
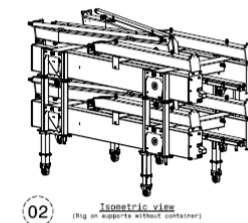
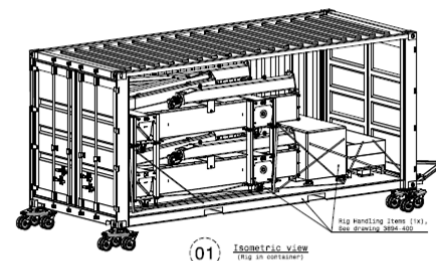
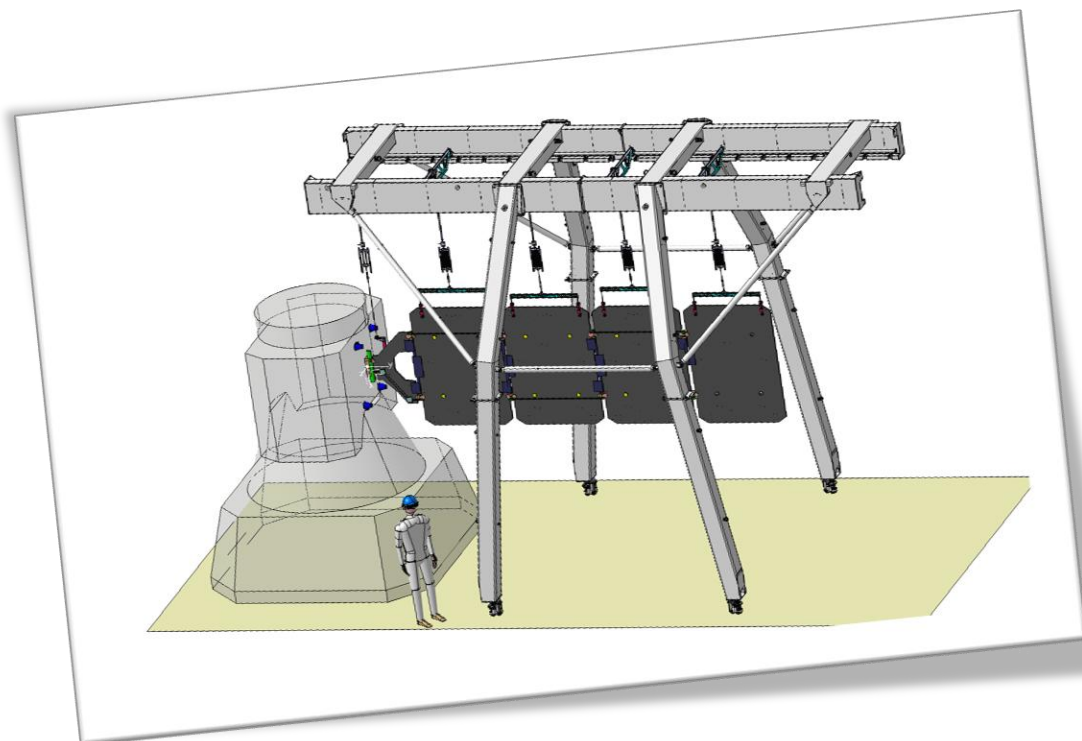
- ◇ Space Rider
- ◇ Eagle-1
- ◇ Europa Clipper
- ◇ HERA
- ◇ Sparkwing
- ◇ Spacebus NEO
- ◇ Ariane 6
- ◇ VEGA-C
- ◇ SORA
- ◇ Bepi Colombo
- ◇ Orion MPCV
- ◇ Tropomi
- ◇ MetOp
- ◇ COTS
- ◇ VEGA
- ◇ Ariane 5 (+ME)





## Solar wing deployment RIG

- Design, Project Management, Product Assurance,
- full engineering, manufacturing & commissioning



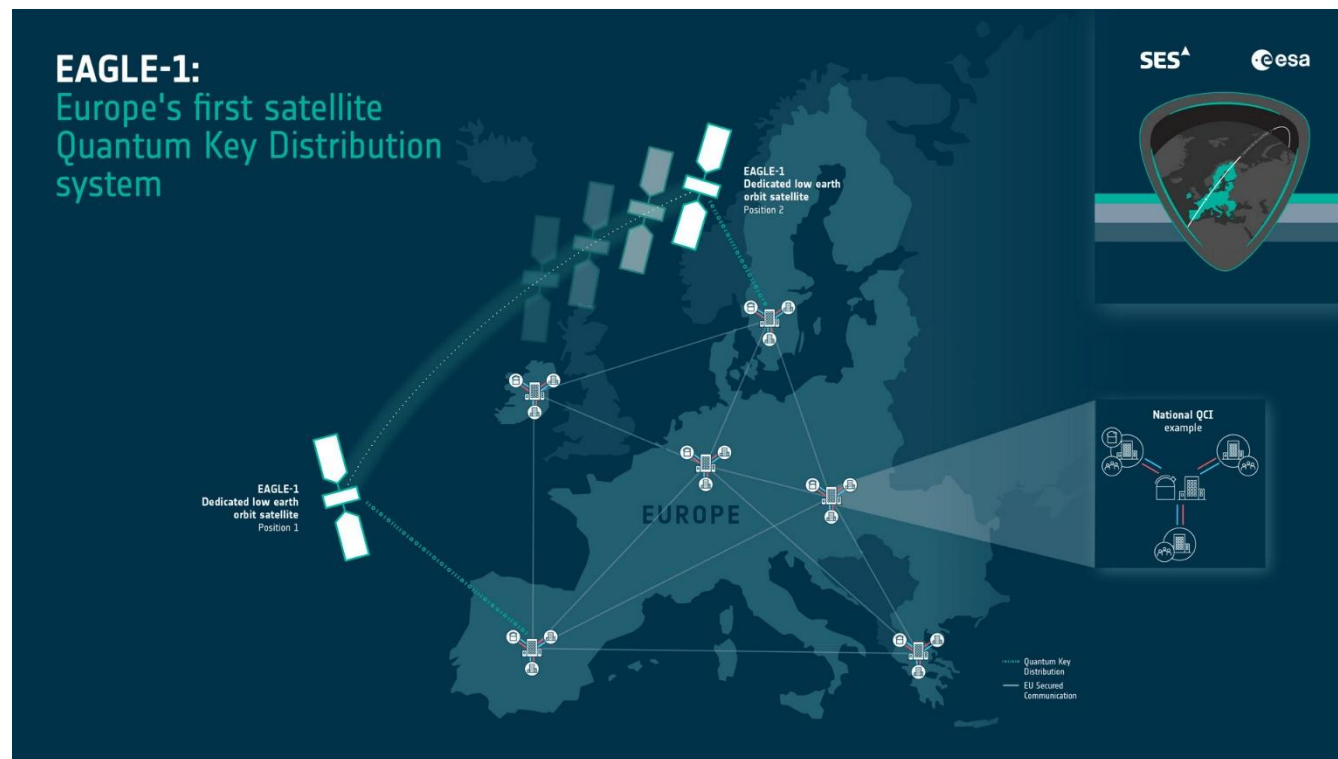


# EAGLE-1



## Riser

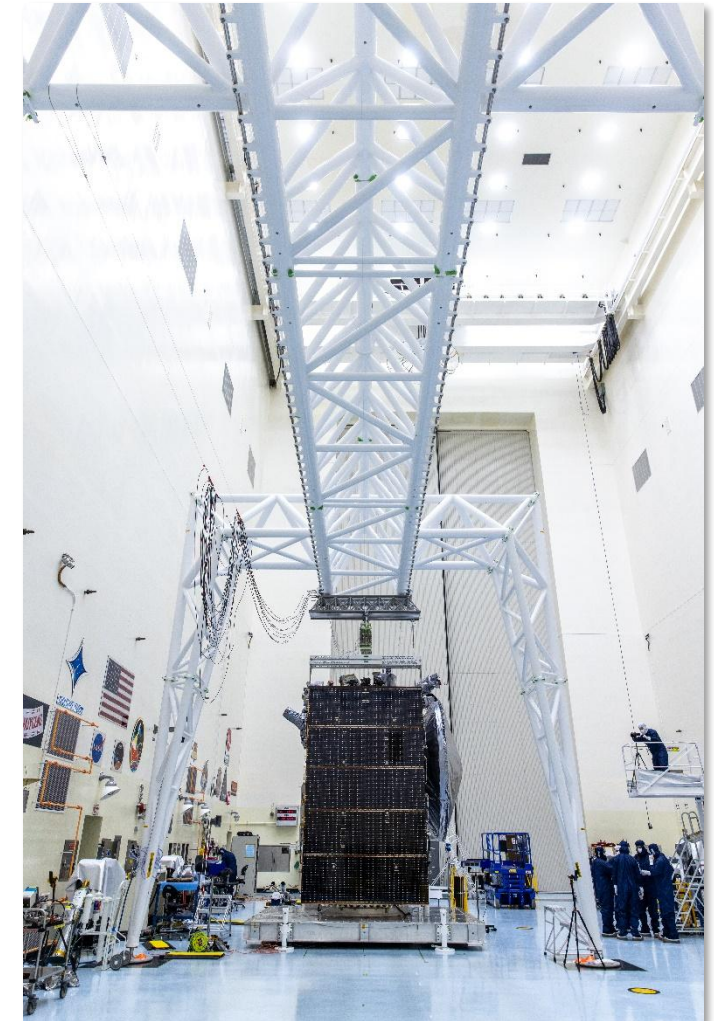
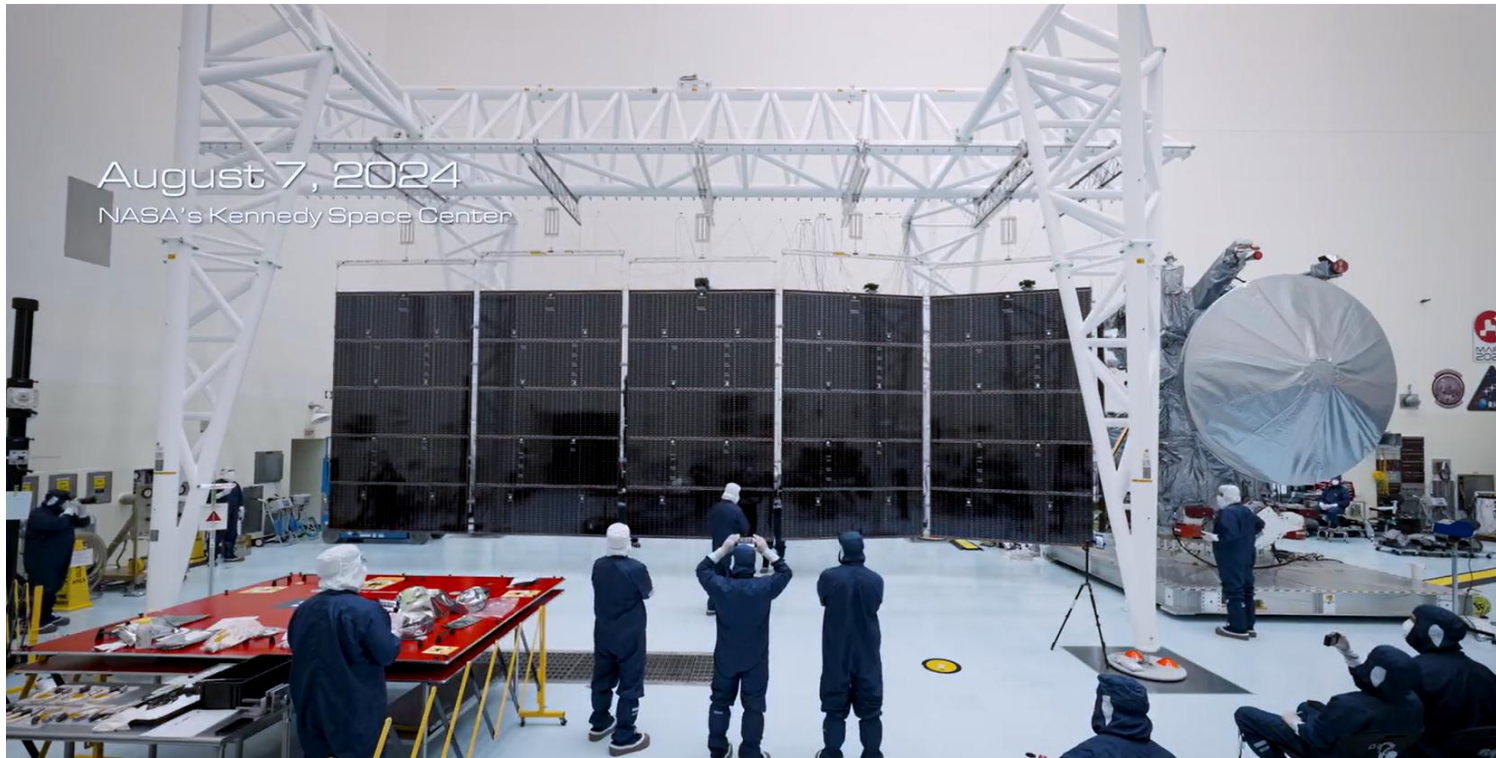
Design, Project Management, Product Assurance







# Europa Clipper



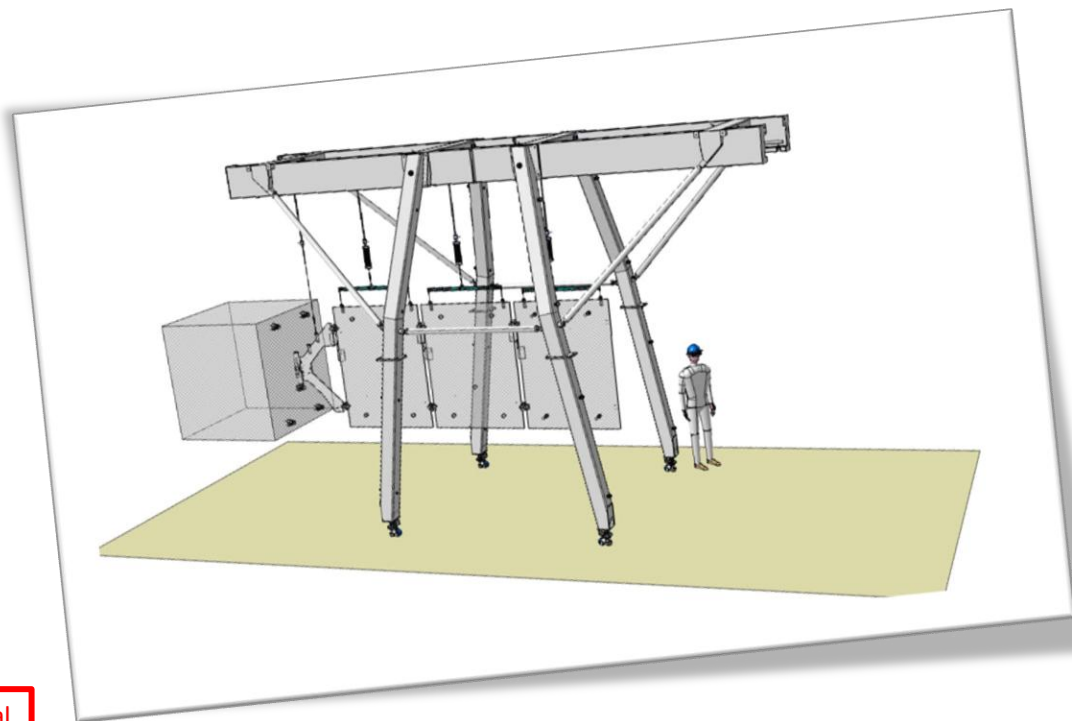


# HERA

beyond gravity

## Solar wing deployment RIG

- Design, Project Management, Product Assurance,
- full engineering, manufacturing & commissioning





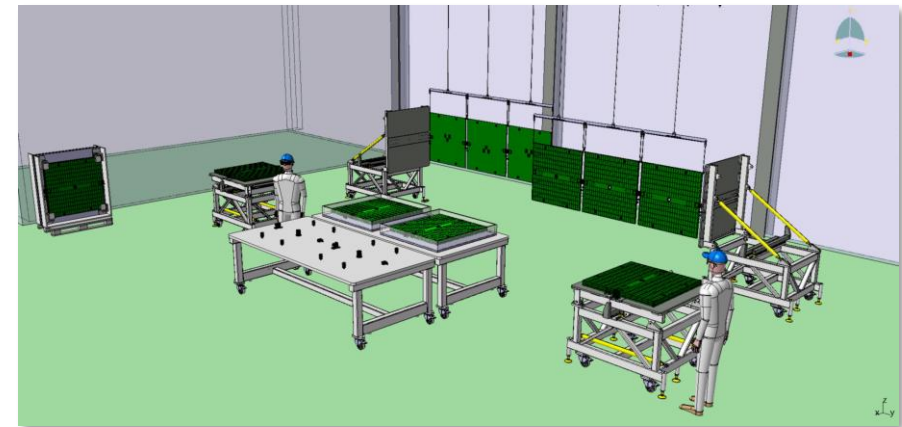
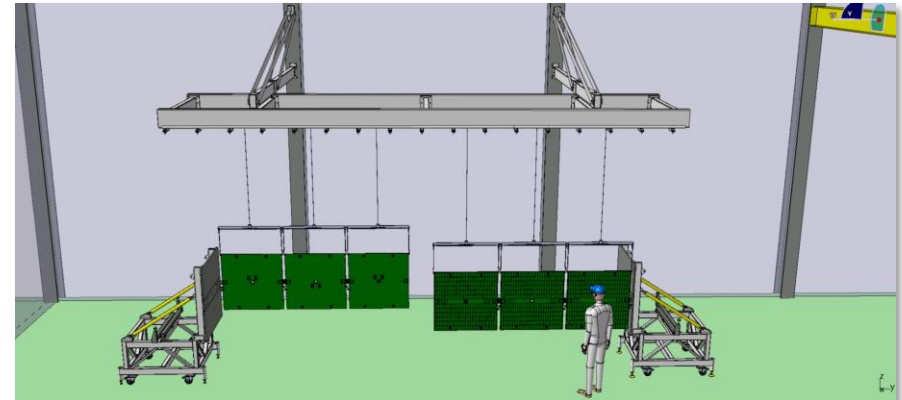
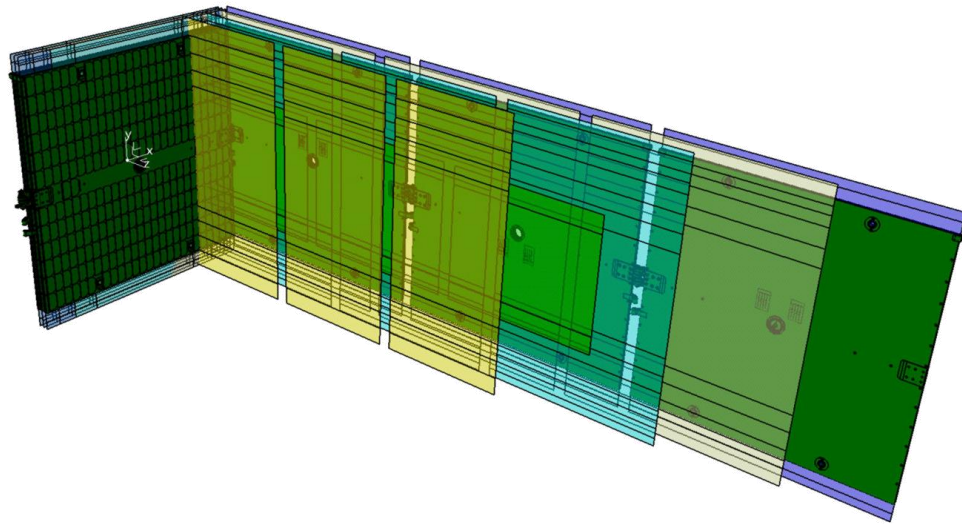


# Sparkwing



## Production tooling

- ◇ Concept / Consulting tooling for serie production

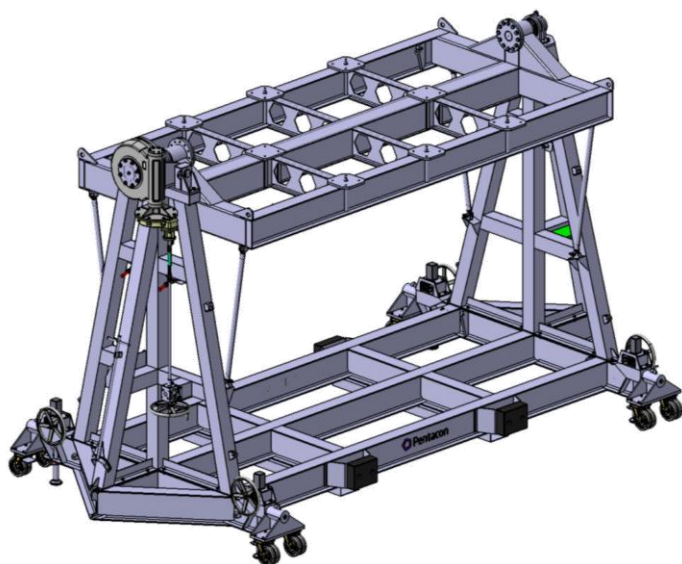




# Spacebus NEO

## Half Payload Module Tilting Trolley (PFM)

- Design, Project Management, Product Assurance,
- full engineering, manufacturing & commissioning

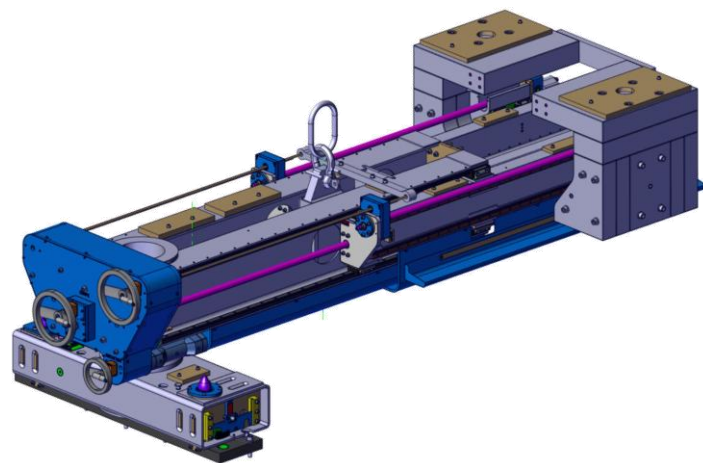




# Spacebus NEO

## Payload Module Vertical Hoisting Device (PFM)

- ◇ Design, Project Management, Product Assurance,
- ◇ full engineering, manufacturing & commissioning

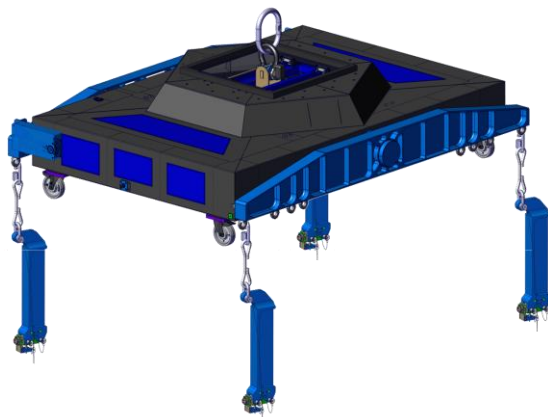




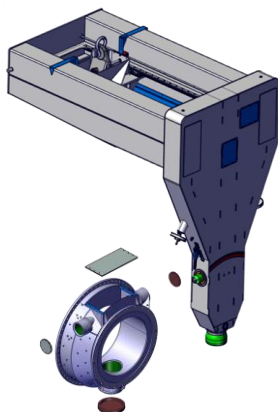


# Spacebus NEO

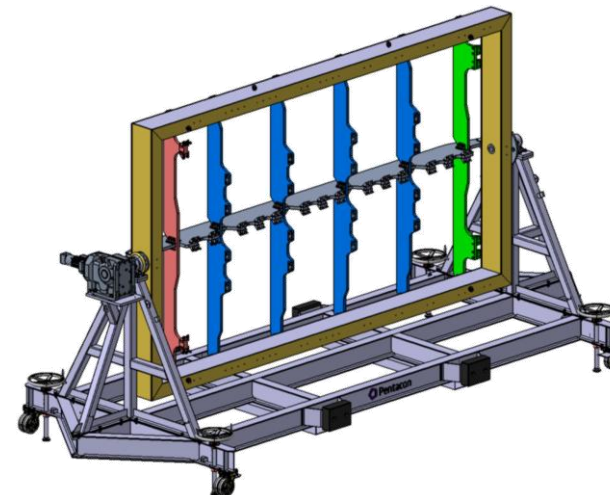
Spacecraft Vertical Hoisting Device with vertical hoisting Bracket Sets



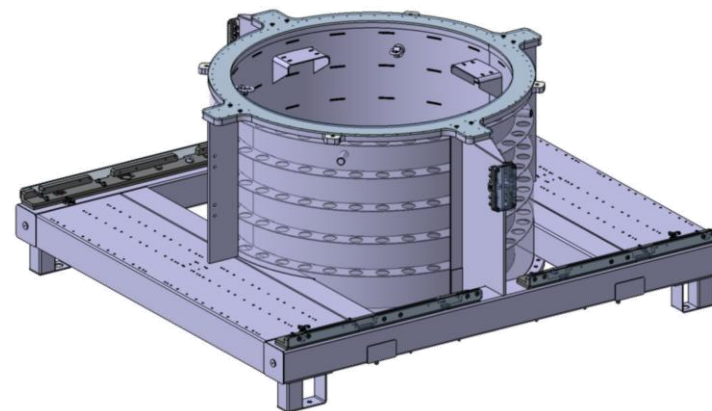
Spacecraft Horizontal Hoisting Device with spacecraft Integration Spacer



Central Shear Wall Integration Stand (PFM)



Satellite Service module Simulator (PFM&FM)







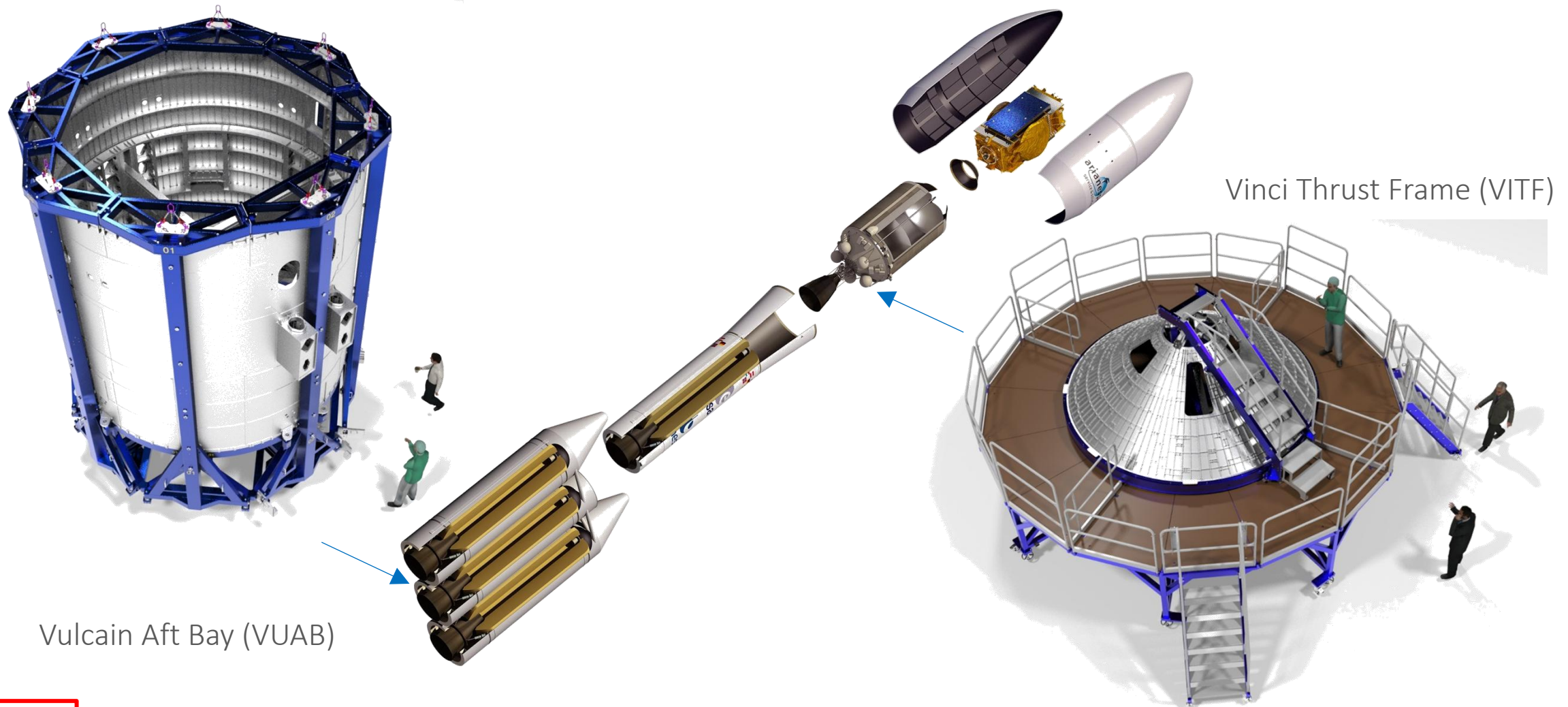
# Ariane 6



Confidential



# Ariane 6





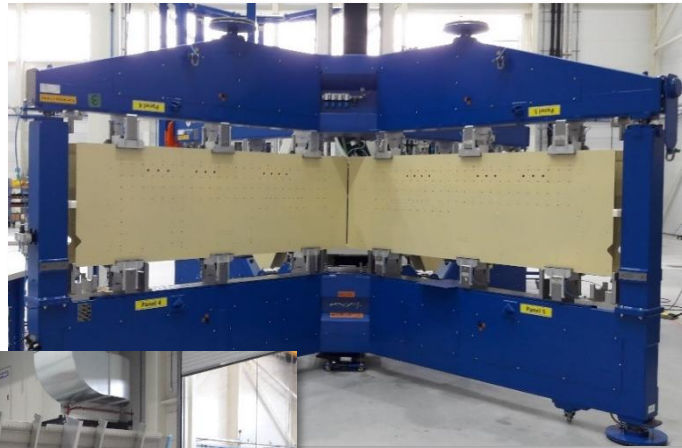


# Ariane 6



## VUAB handling and assembly equipment

- Design, Project Management, full engineering





# Ariane 6



## VUAB lifting equipment & container

- Design, Project Management, full engineering



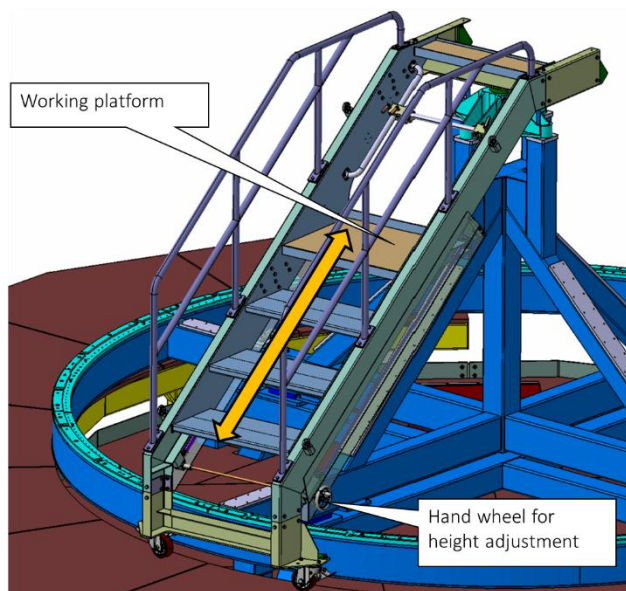




# Ariane 6

## VITF handling and assembly equipment

- Design, Project Management, full engineering



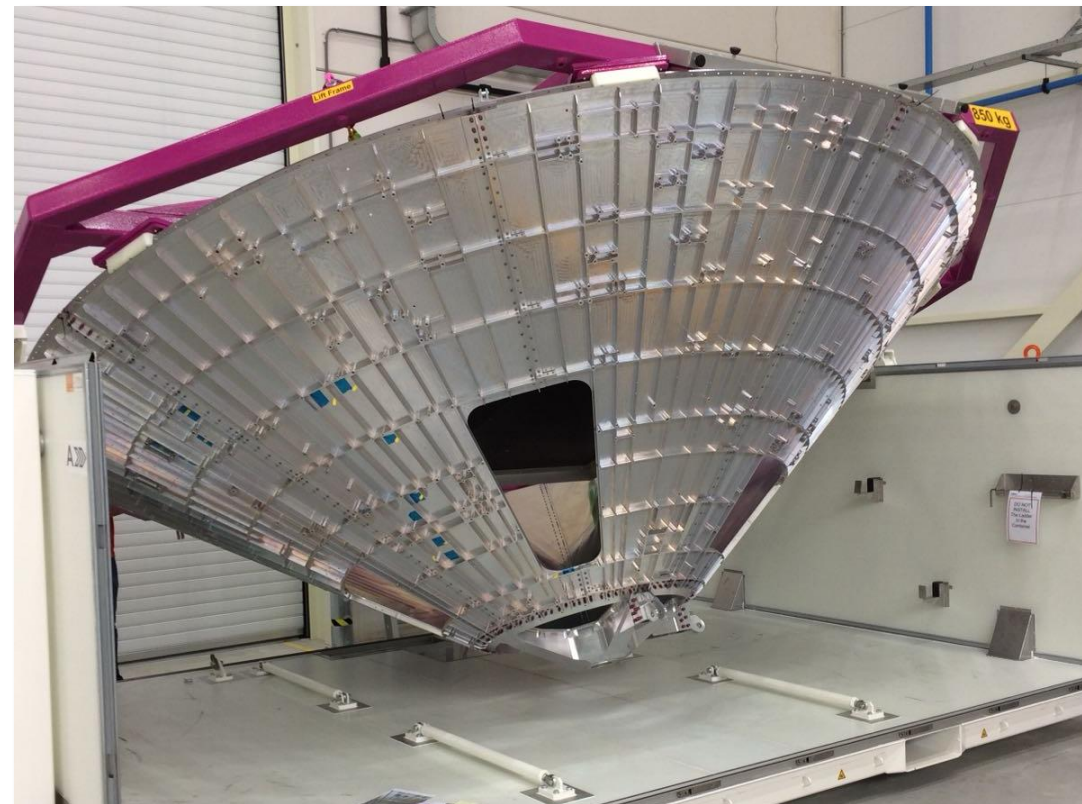


# Ariane 6



## VITF handling and assembly equipment

- Design, Project Management, full engineering



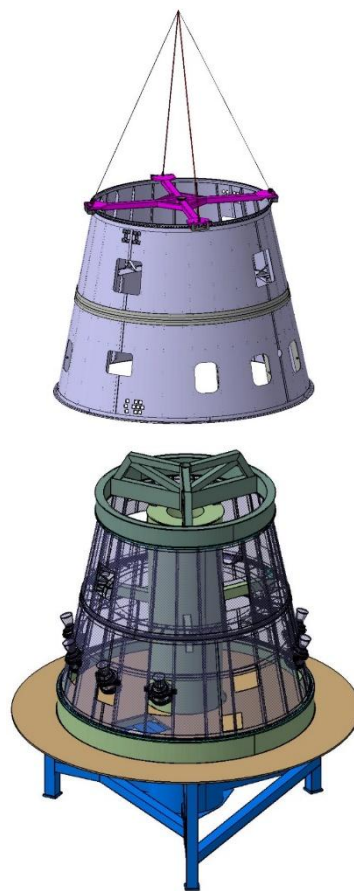
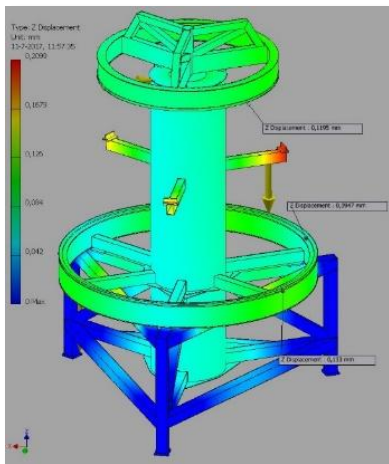




# Vega-C

## Lifting and assembly equipment

- ◇ Jig Concept Design, full engineering lifting equipment

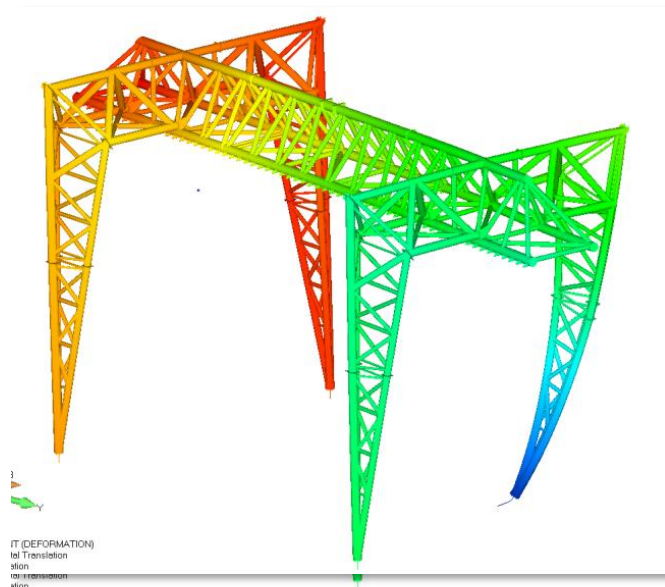




# Bepi Colombo

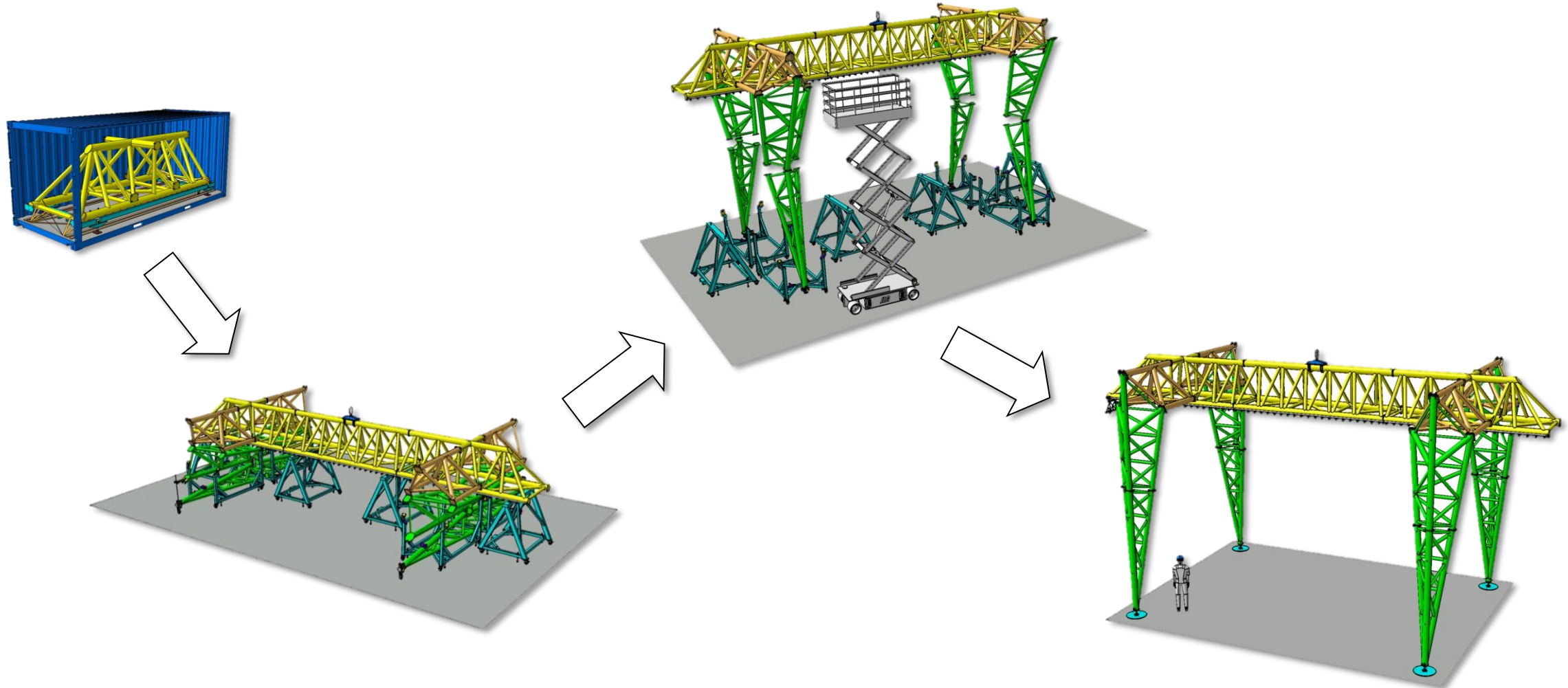
## Design and manufacturing of zero gravity solar panel deployment simulation rig including support tooling

- ◇ Design, full engineering, manufacturing & commissioning (CE-marking)
- ◇ Easy assembly and dis-assembly
- ◇ Transport in containers for global shipping





# Bepi Colombo

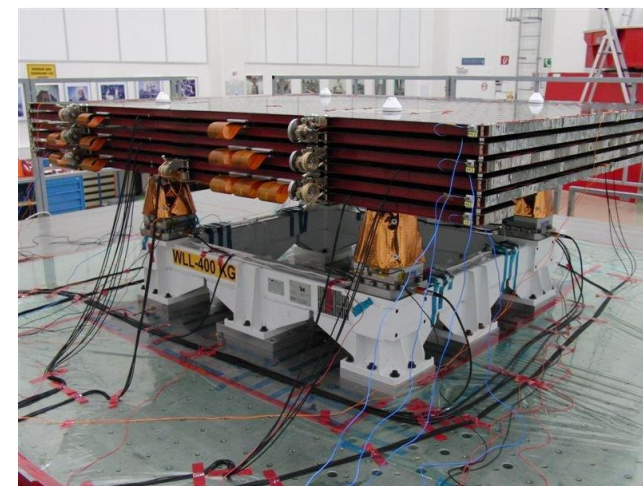
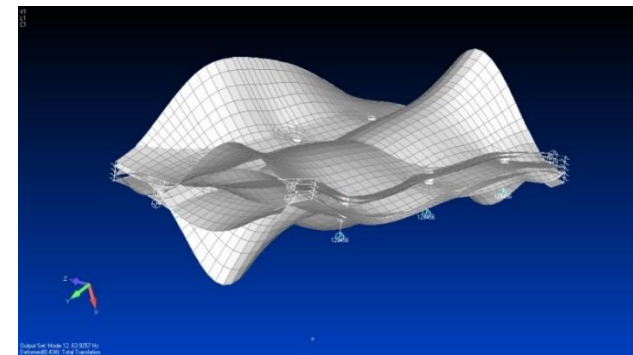
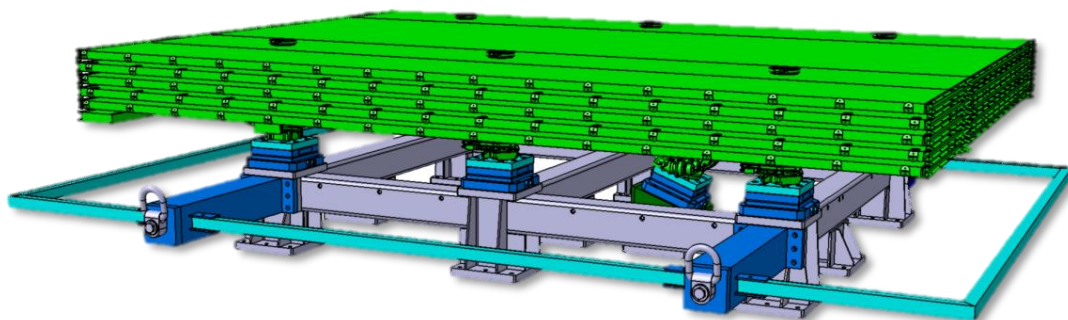






## Vibration adapter

- Design, full engineering, manufacturing & commissioning (CE-marking)



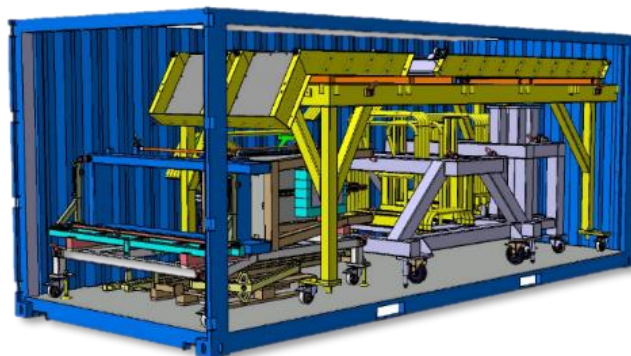
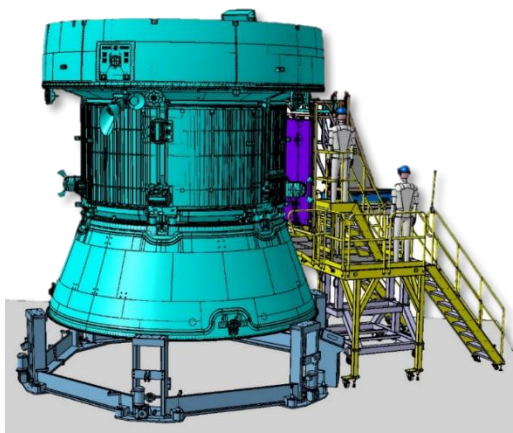


# Orion MPCV



## Solar panel vertical integration rig for the Multi Purpose Crew Vehicle – European Service Module

- ◇ Design, full engineering, manufacturing & commissioning (CE-marking)
- ◇ Rig for fast, safe and precise installation of solar array
- ◇ Transport & storage in just one 20ft container.





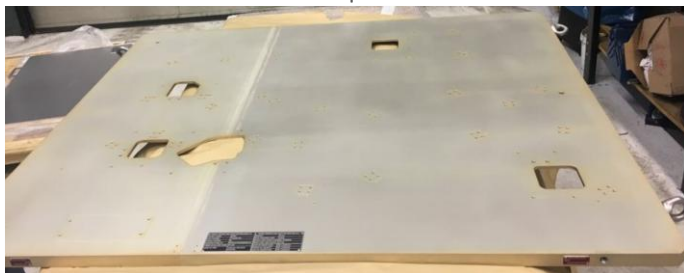
# SORA



## Hoisting, assembly and test equipment

- Design, Project Management, Product Assurance, full engineering, manufacturing & commissioning

Thermal Balance Adapters



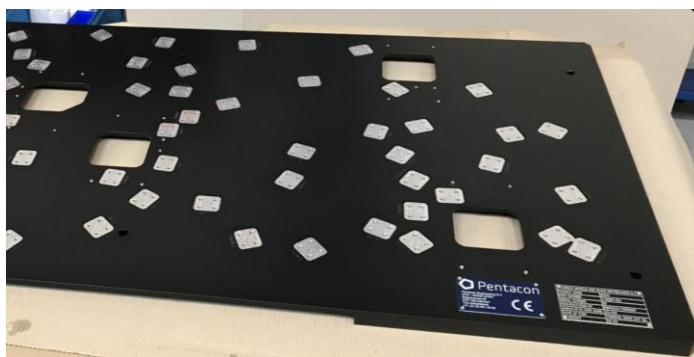
Shock Adapters



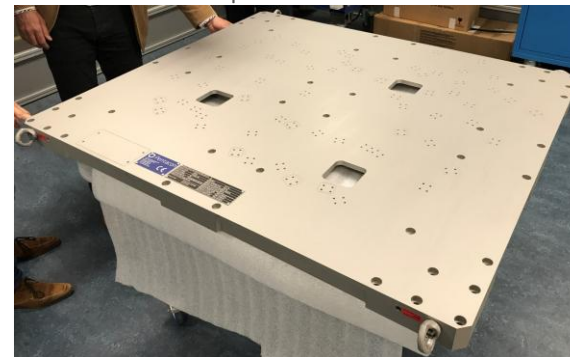
Protection covers



Thermal Bake Out Plate



Vibration adapter



Thermal cycle adapter





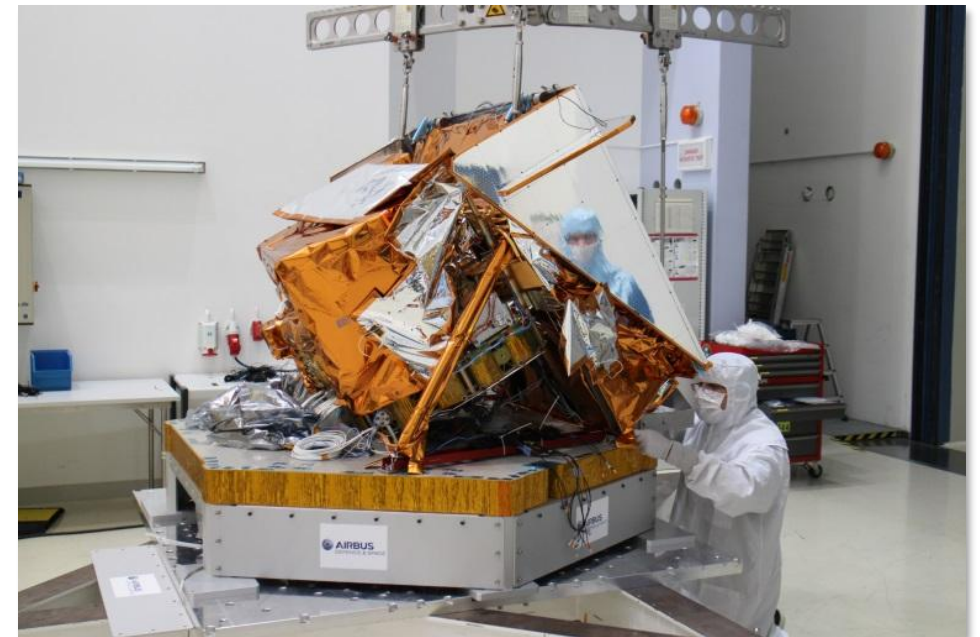
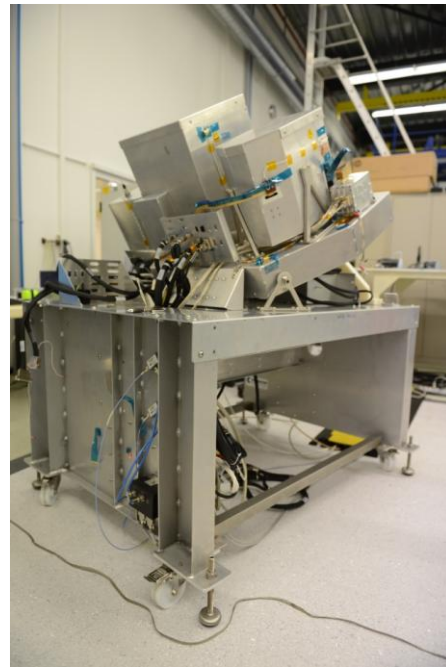


# Tropomi



## Transport and test equipment

- ◇ Design, full engineering, manufacturing & commissioning (CE-marking)
- ◇ Transport tilting trolley
- ◇ Simulation adapter
- ◇ Electrical mockup

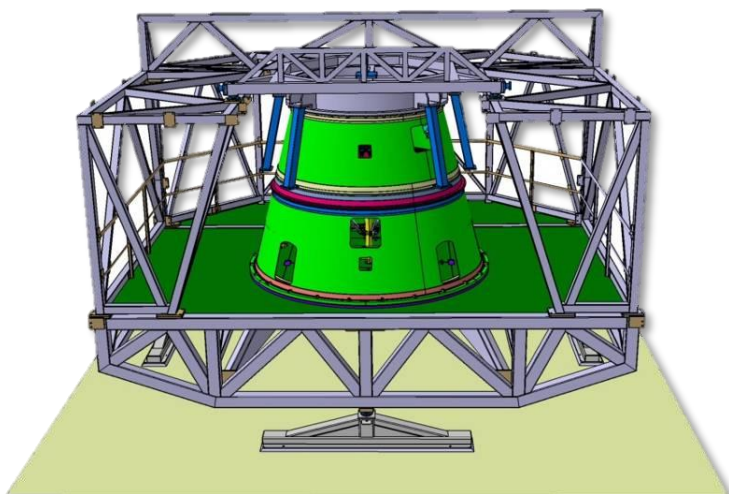




# Vega

## Rocket interstage 1/2 Assembly JIG incl necessary tooling

- ◇ Design, full engineering, manufacturing & commissioning (CE-marking)
- ◇ Rig for accurate, fast & safe assembly



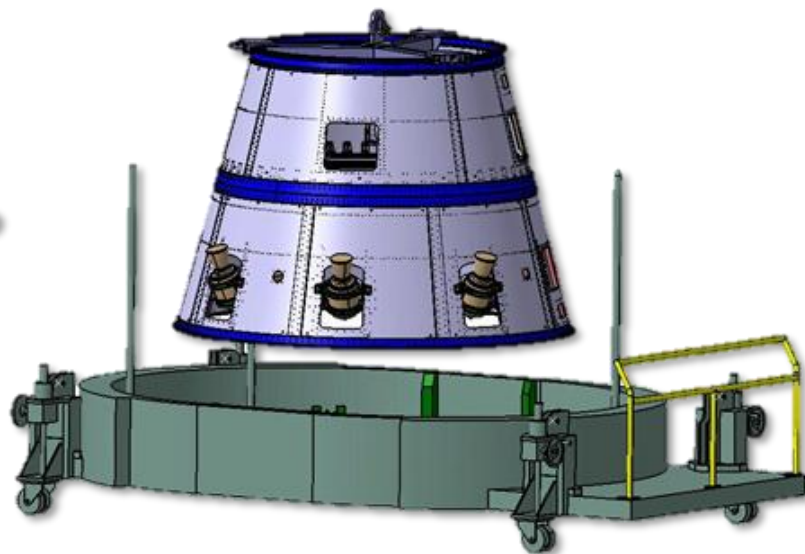
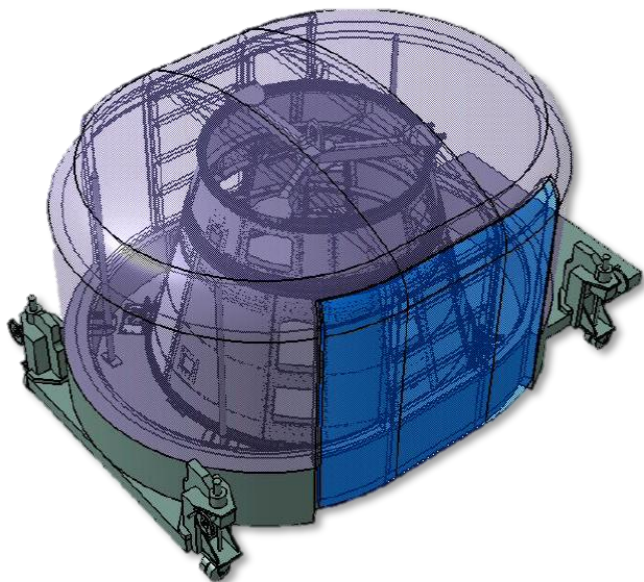




# Vega

## Transport & storage container

- ◇ Design, full engineering, manufacturing & commissioning (CE-marking)
- ◇ Safe storage and transport after assembly

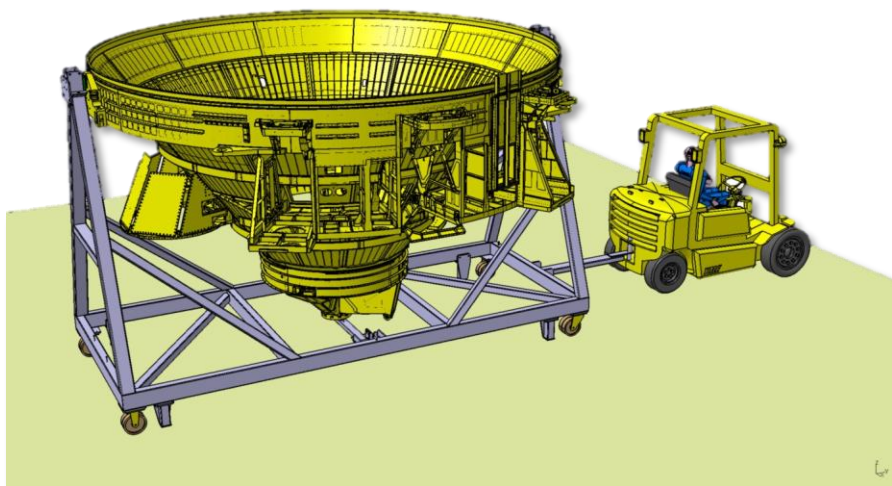




# Ariane 5

## Ariane 5 transport and storage trolley

- Design, full engineering, manufacturing & commissioning (CE-marking)



# Contact



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