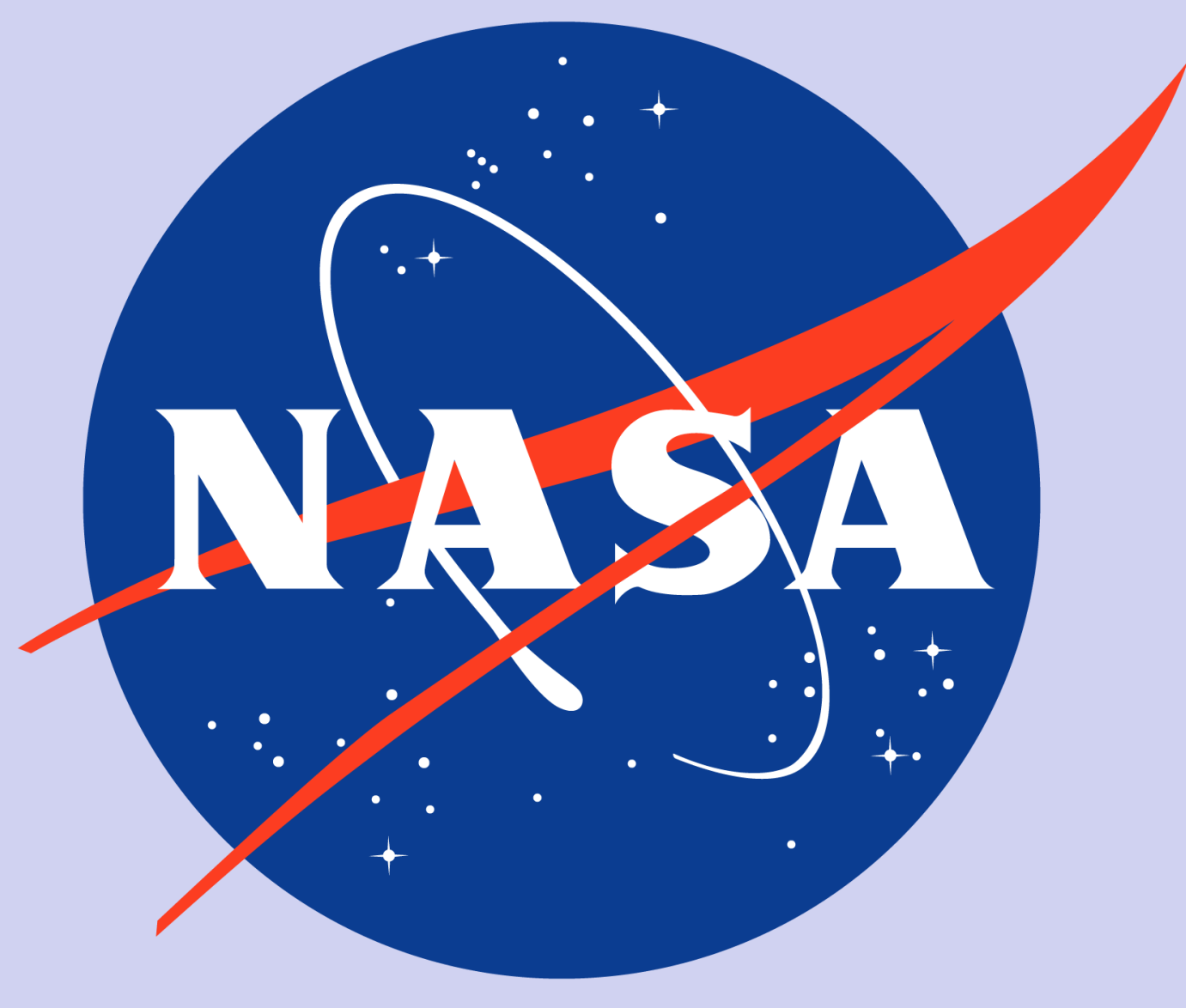
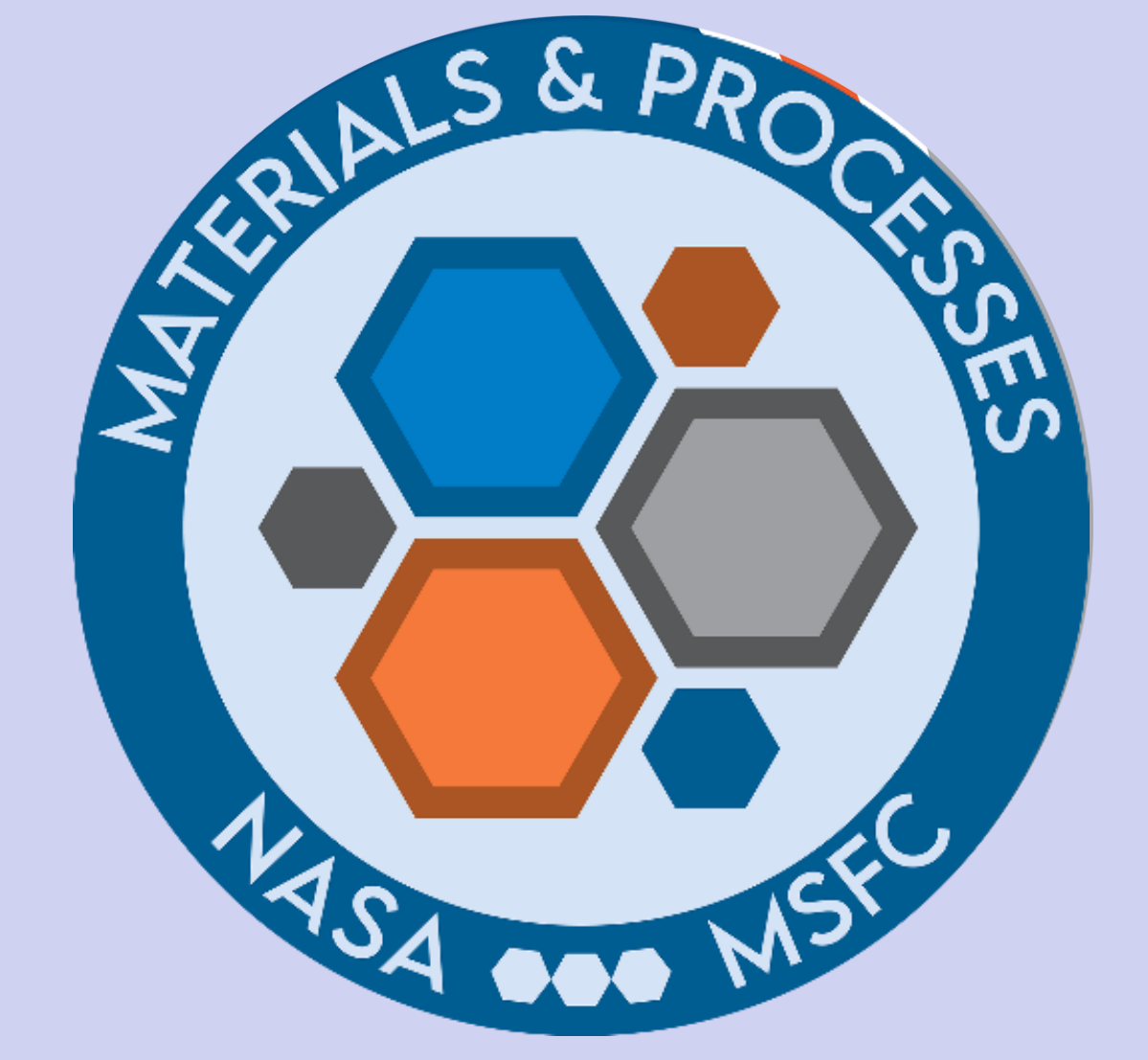




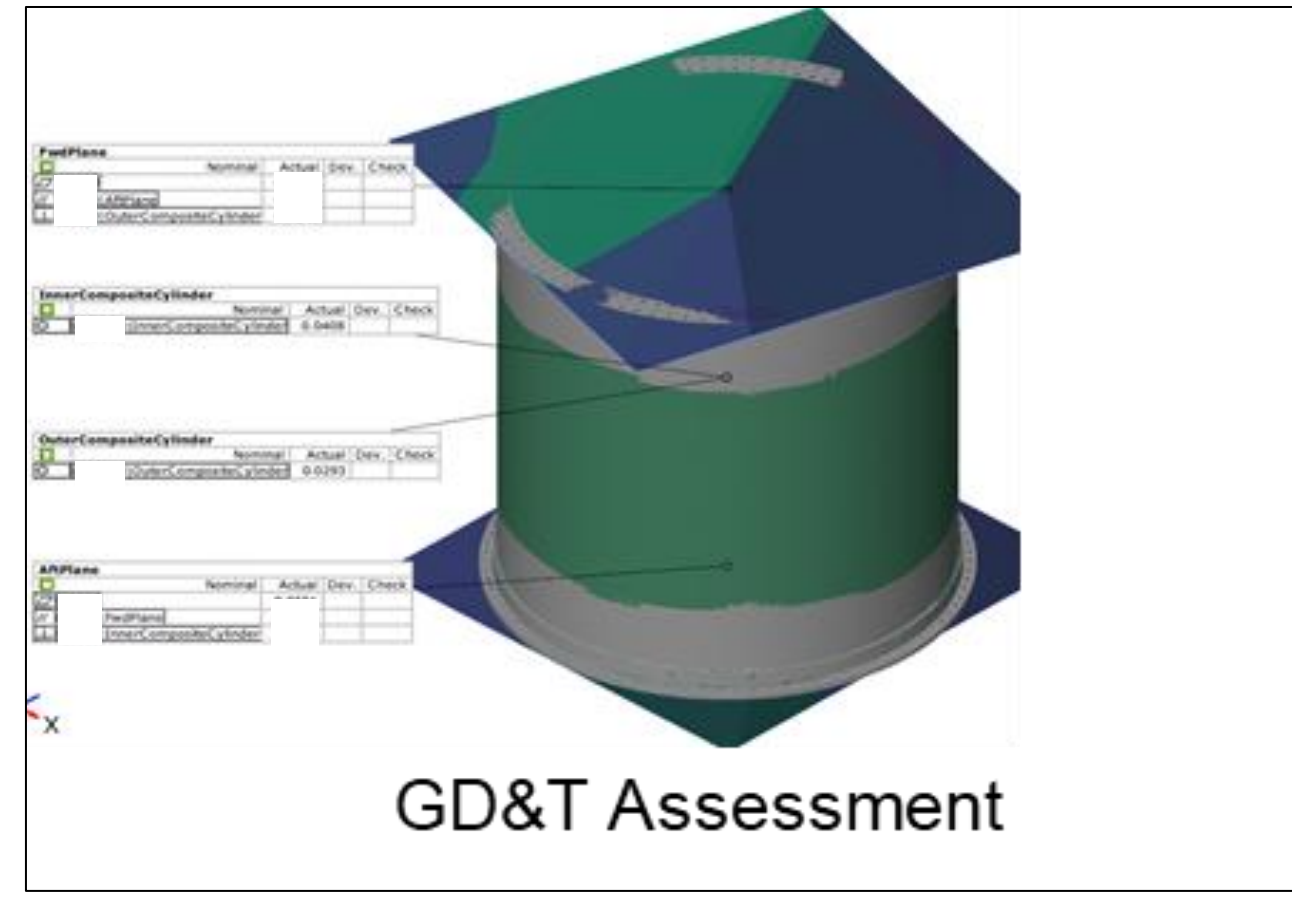
3D Scanning Laboratory

NASA Marshall Space Flight Center
Engineering Directorate, Materials & Processes Lab
John Ivester, Advanced Manufacturing Branch – EM42

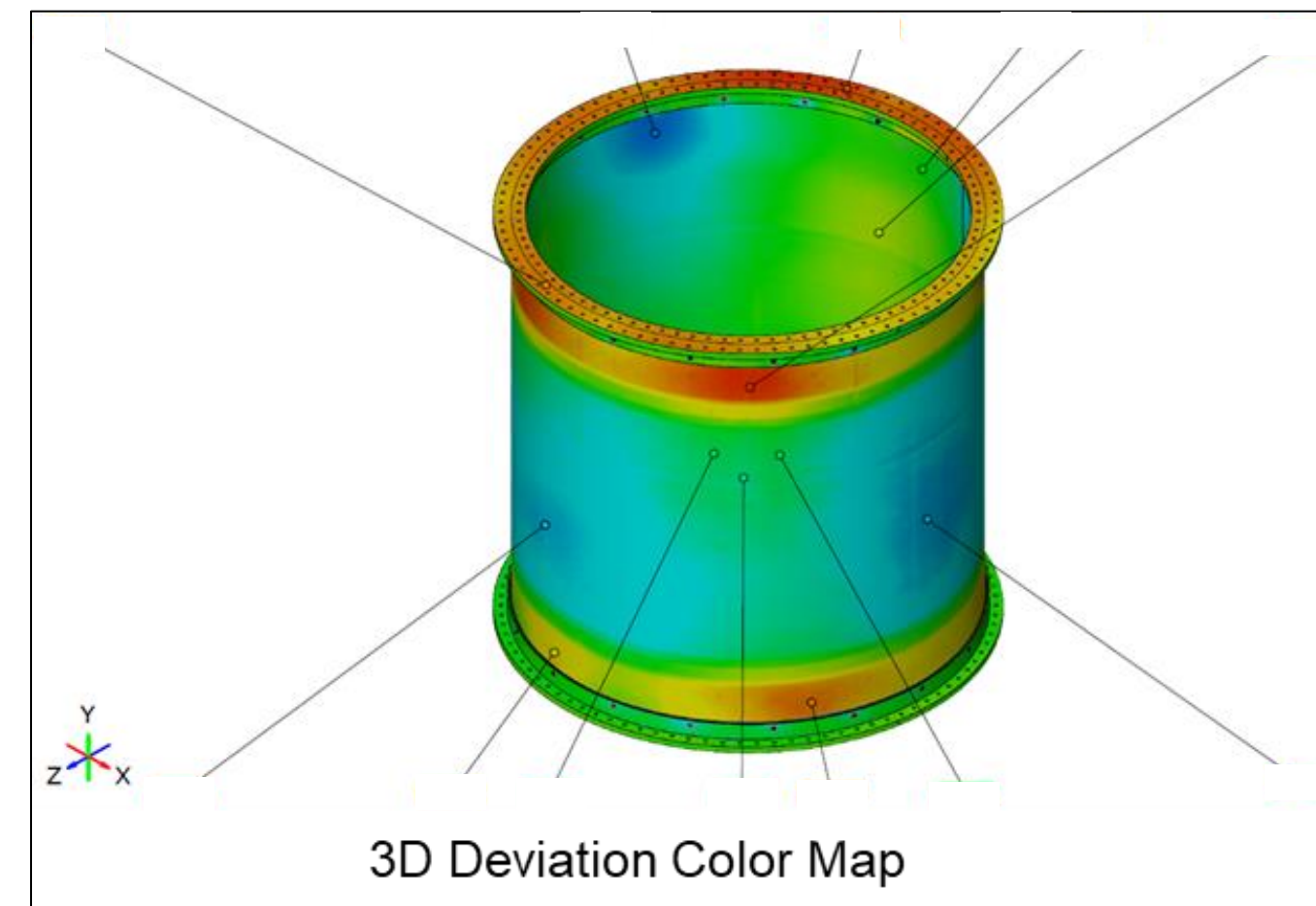


Inspection

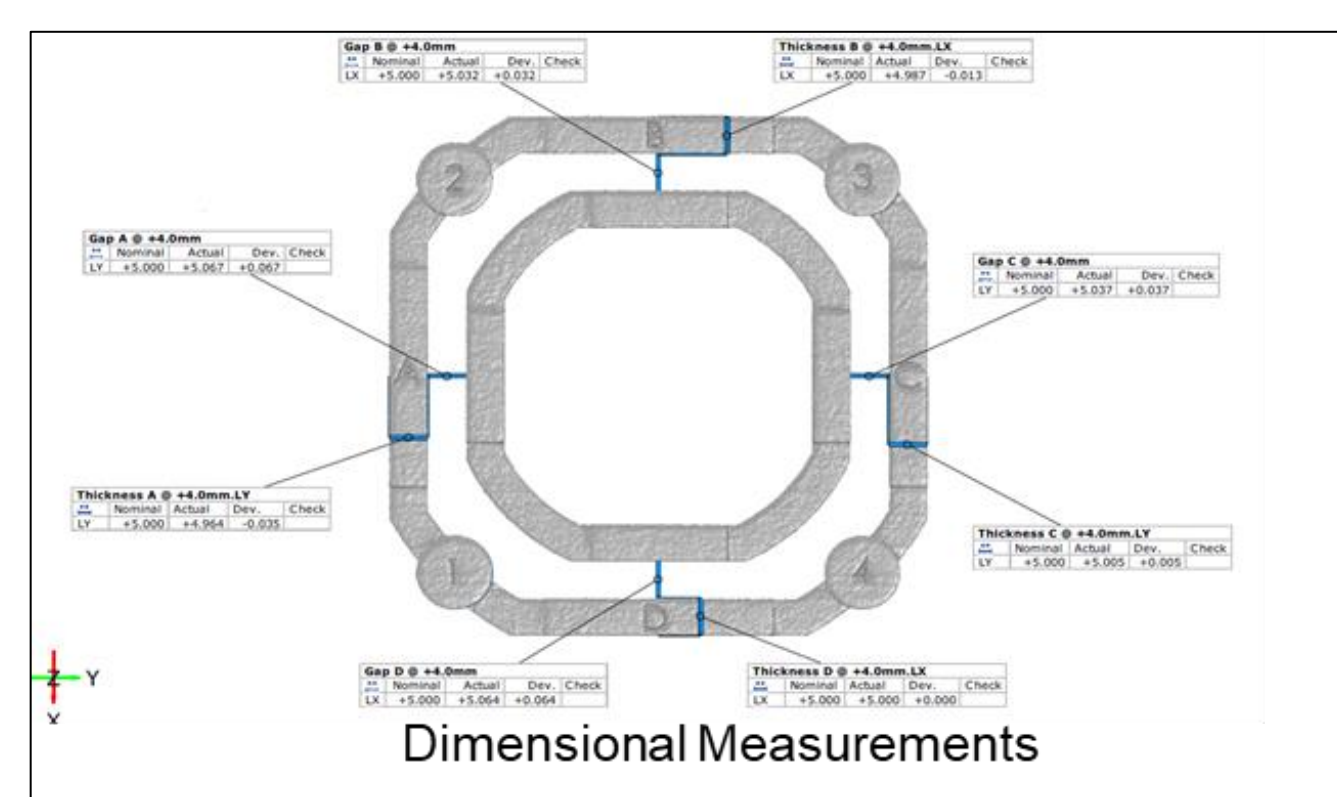
- Surface Comparisons
- GD&T Assessment
- Basic Dimensional Measurements



GD&T Assessment



3D Deviation Color Map

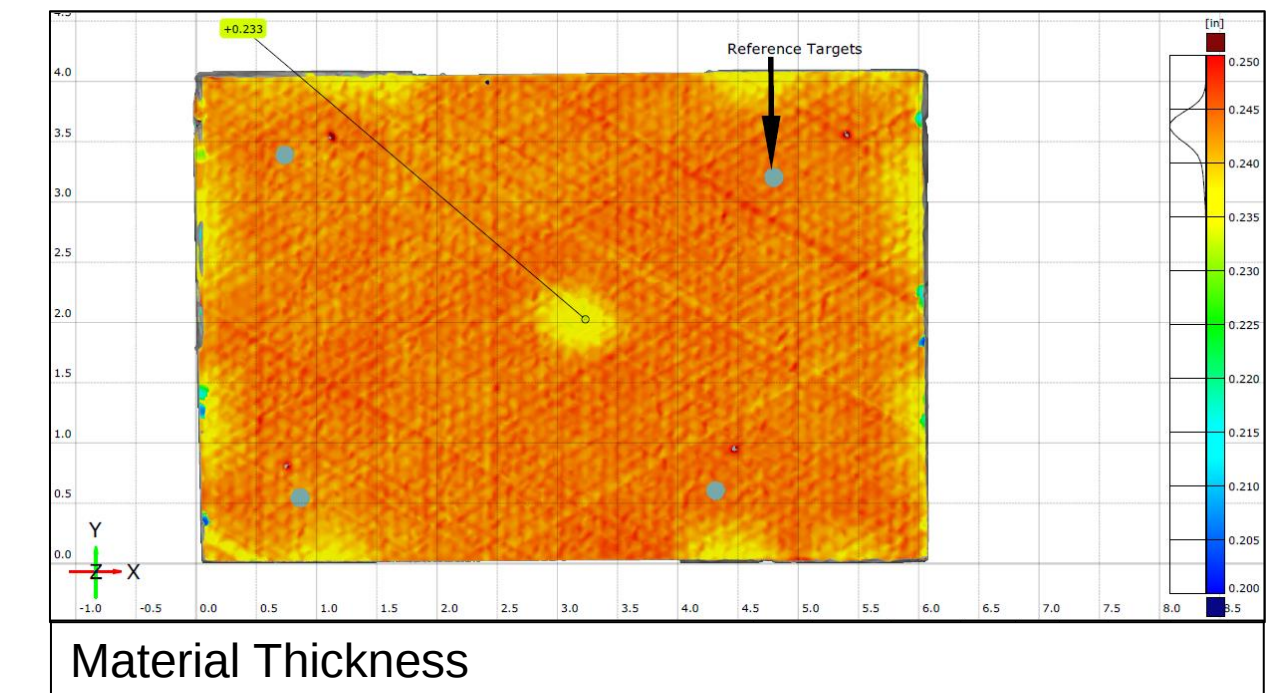


Dimensional Measurements

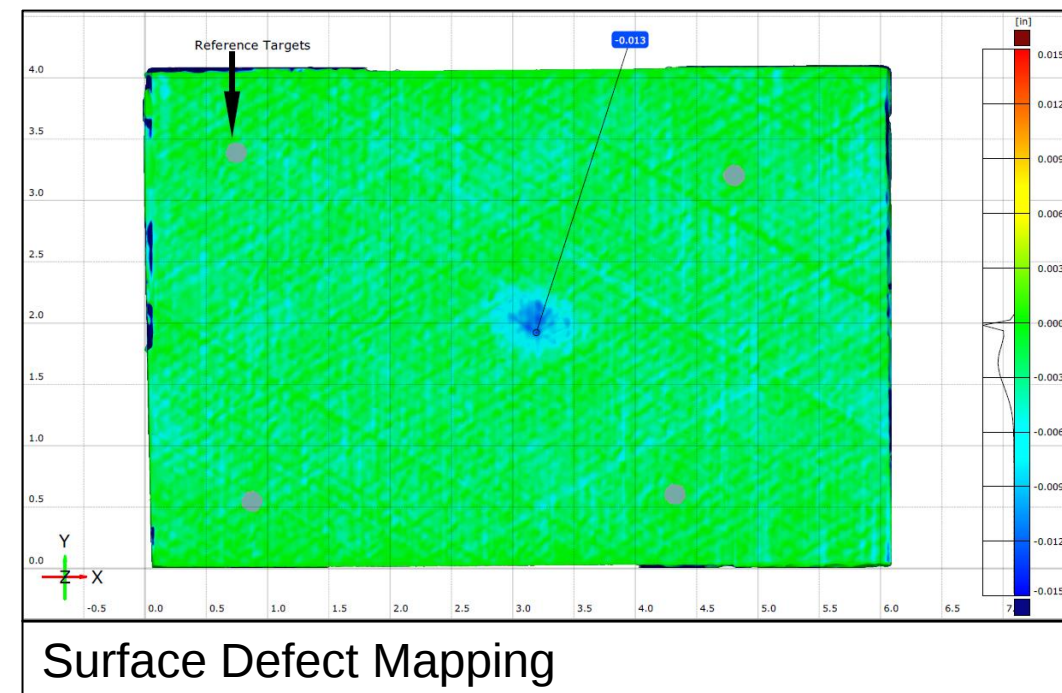
Pre/Post Testing Inspection

- Part is scanned before and/or after testing

Impact Sample Inspections



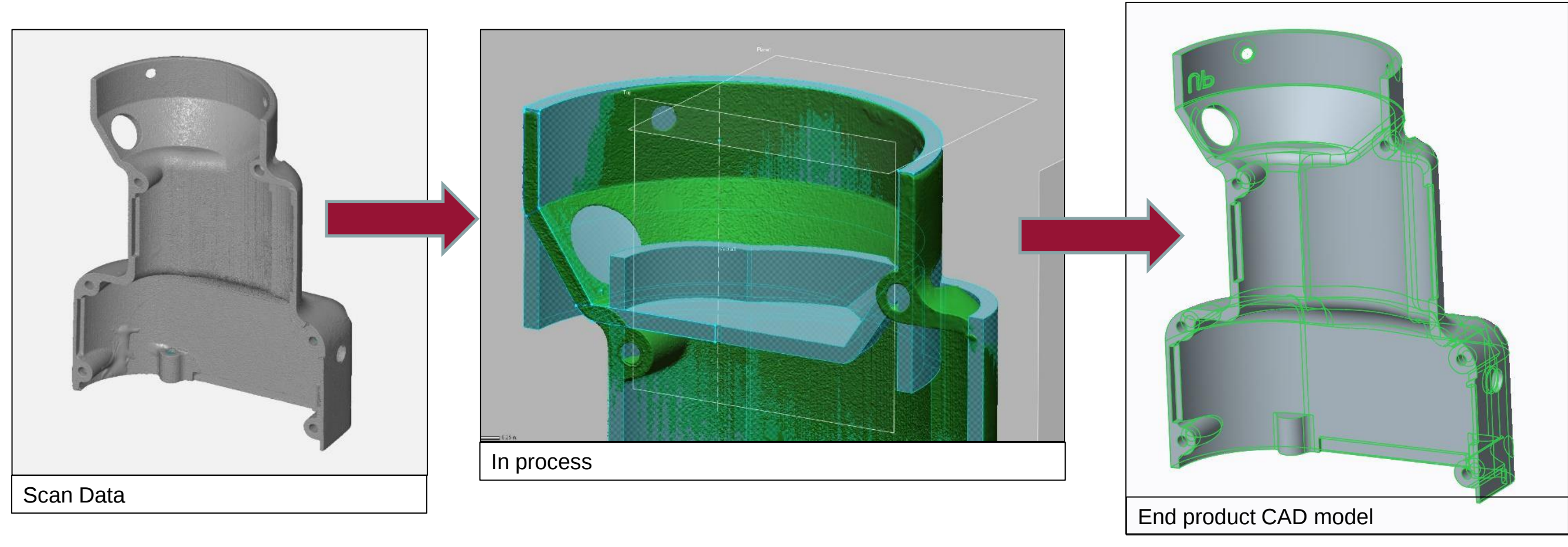
Material Thickness



Surface Defect Mapping

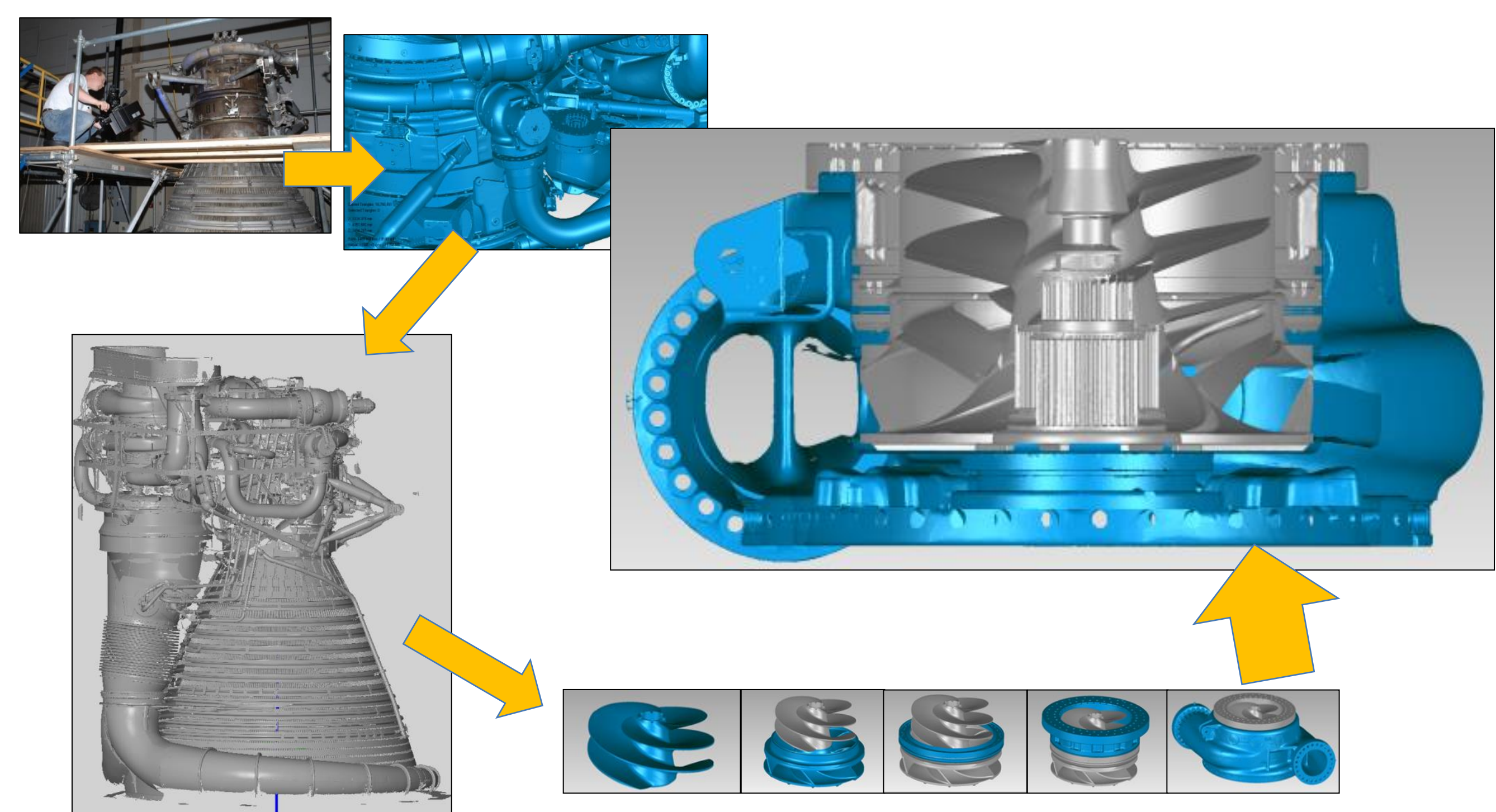
Reverse Engineering

- Developing parametric data from 3D scan data



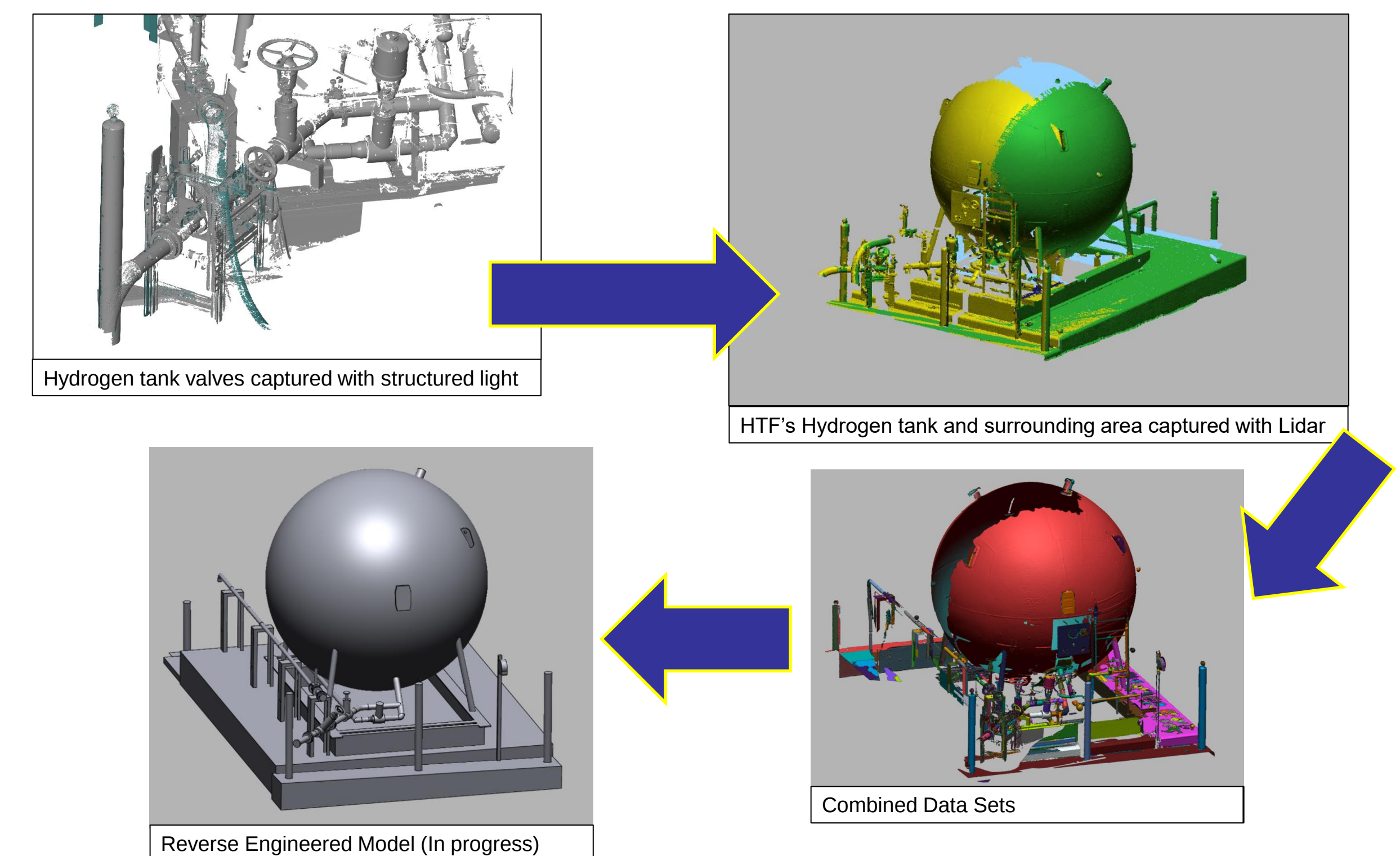
Digital Assemblies

- Digital Assembly of F1 Engine
 - 3D scan hardware in assembled and individual components
 - Digitally reassemble the components into their as-assembled positions
- Internal Geometry can now be measured



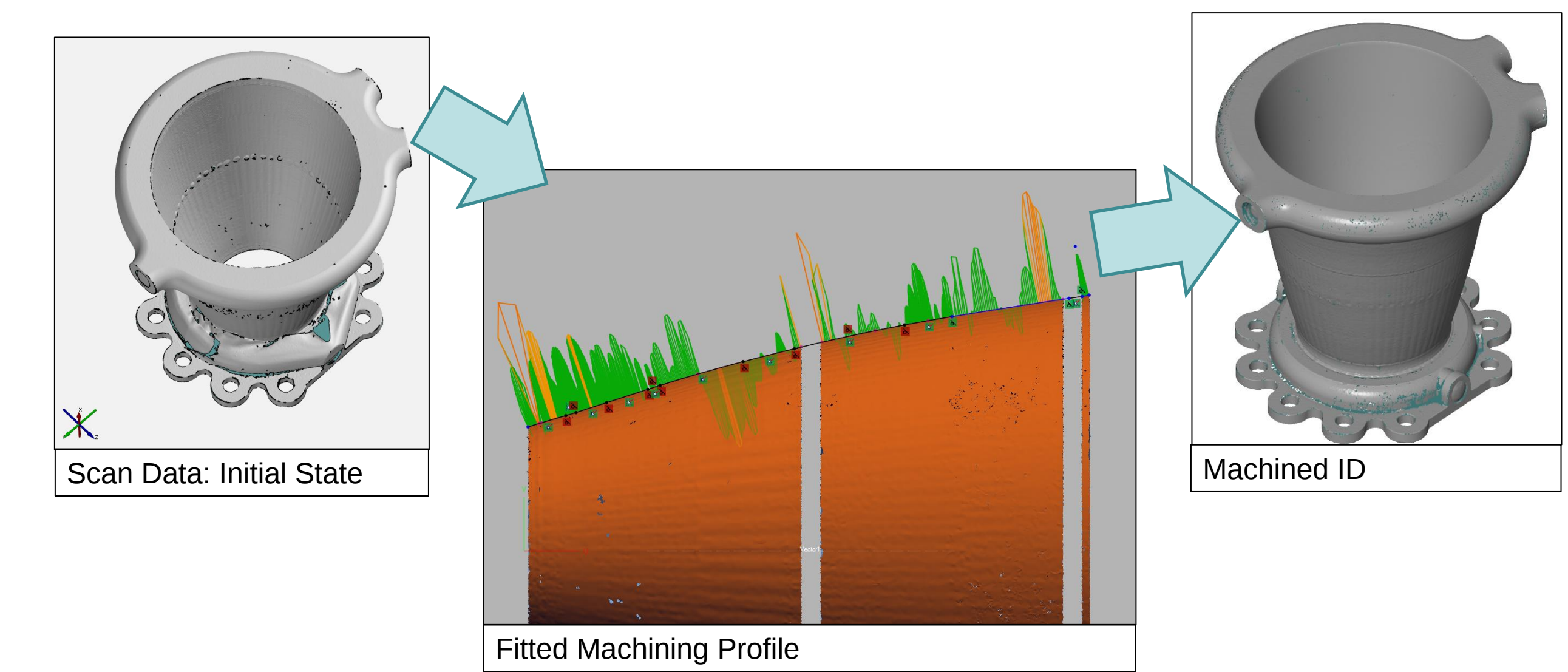
Lidar Capabilities

- Expanded 3D scanning capabilities
 - Larger than 50ft
 - Up to 220ft
- Quickly/effectively capture large items
 - Rocket sections/fairings
 - Testing structures
 - Architecture / buildings / high bays



Manufacturing/Process Development

- Match Machining
 - Driving machining process with 3D scanning



Reverse Projection

- Using 3D scanning to drive hardware alterations

