



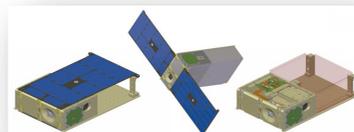
Responsive Manufacturing

The Operationally Responsive Space (ORS) Office recognized that key technical and commercial advances enabled ORS to address a need to modify how the Department of Defense approached development and production of low-volume, high-value assets at significant cost savings in a shorter time to operations. In 2013, the ORS Office kicked off an effort to create the infrastructure utilizing responsive space parts, a modular architecture for the product and production line, and take advantage of the digital world around us integrating ubiquitous data into a “digital assurance” picture, providing a radical change in how mission assurance is established.

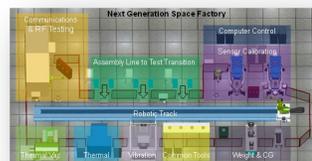
Through partnership with NASA Ames and executed through the Rapid Response Space Works (RRSW), ORS utilized Millennium Engineering and Integration Company (MEI) as the prime integrator with Raytheon Missile Systems (RMS) focusing on the next generation factory, Applied Minds Inc (AMI) innovating digital applications, and Space Dynamics Laboratory (SDL) developing a 6U modular CubeSat as the proof-of-concept article. The program focuses on three tiers to achieve the stated objectives: Open Manufacturing, Digital Assurance, and Responsive Space Parts.

Responsive Space Parts

The ORS Responsive Manufacturing 6U Spacecraft is an operationally relevant 6U CubeSat designed for the open manufacturing environment with responsive space parts and a Modular Open System Architecture (MOSA) that incorporates Space Plug-and-Play Architecture (SPA) for improved reuse and flexibility, designed and built by SDL.



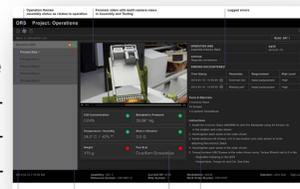
Open Manufacturing



ORS has partnered with RMS to take advantage of their Next Generation Factory that houses an autonomous, agnostic test line which utilizes a no-lift and hands-off approach using robotics and a variety of test equipment to satisfy multiple objectives. Upon teaming, a Small Space Work Cell was established at one end of the agnostic test line in order to leverage their existing test capability and augment it with a semi-autonomous assembly, integration & test capability for small space assets.

Digital Assurance

In an effort to increase the mission assurance of a satellite build, ORS partnered with an innovative think tank, AMI, to implement a solution to digitally and autonomously perform mission assurance, now coined as 'Digital Assurance'. Digital Assurance is accomplished through collecting a large pool of data from many sensors to link and analyze the data and provide the results to decision makers in a timely manner.



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Digital Assurance

Open Manufacturing Semi Autonomous Manufacturing of High Value - Low Volume Assets

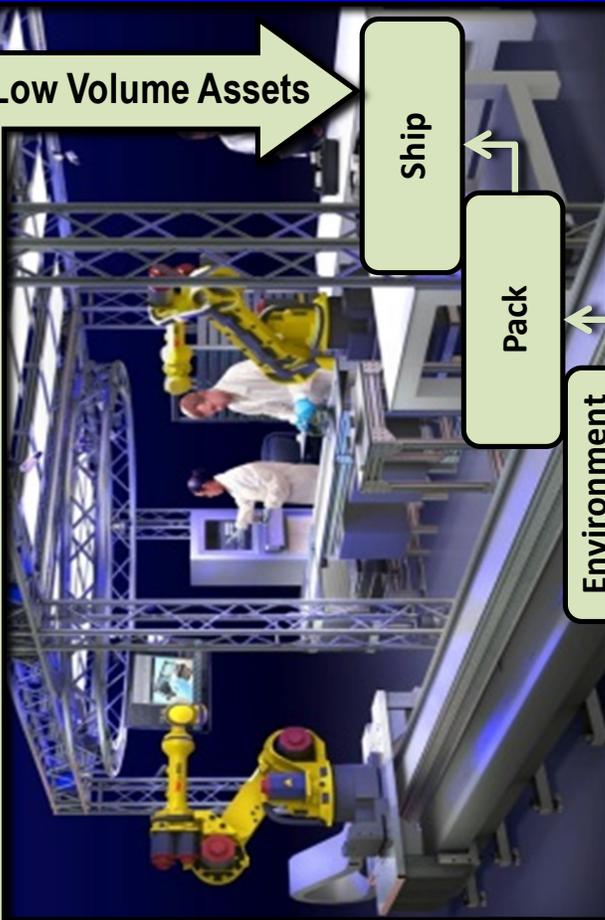


Parts Receipt / Inspection

Parts Kitting

Parts Learning

Assembly & Integration



Ship

Pack

Environment Test

Functional Test

Continuous Custody, Vision Systems, Ubiquitous Data

