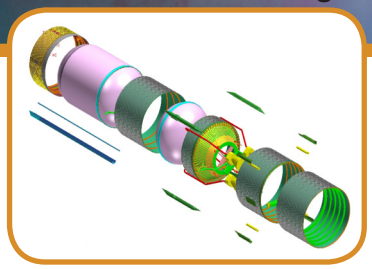
National Aeronautics and Space Administration

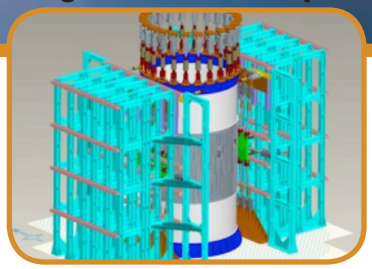
Marshall Space Flight Center
Systems Engineering and Integration

Engineering Solutions for Space Science and Exploration

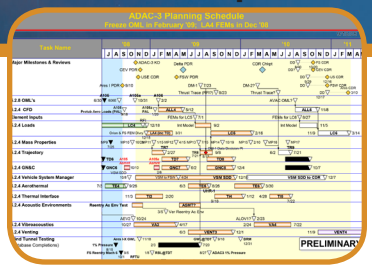
Risk Assessment Matrix (5 × 5).



Exploded view of Vehicle Stage/Element.



Assembly Conceptual Model.



Integrated Master Schedule.

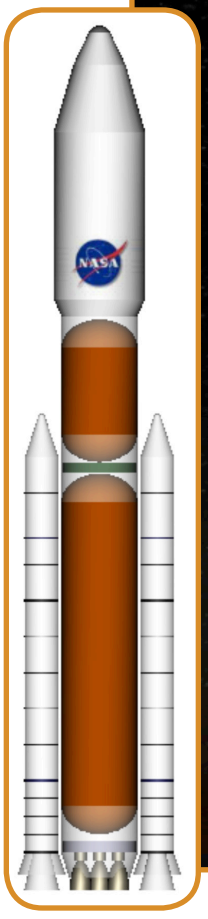
Vehicle & Spacecraft Systems Engineering & Integration (VS-SE&I)

leads the integrated design, development, test/evaluation, certification, and sustainment of affordable, innovative Spacecraft and Vehicle systems for Programs and Projects.

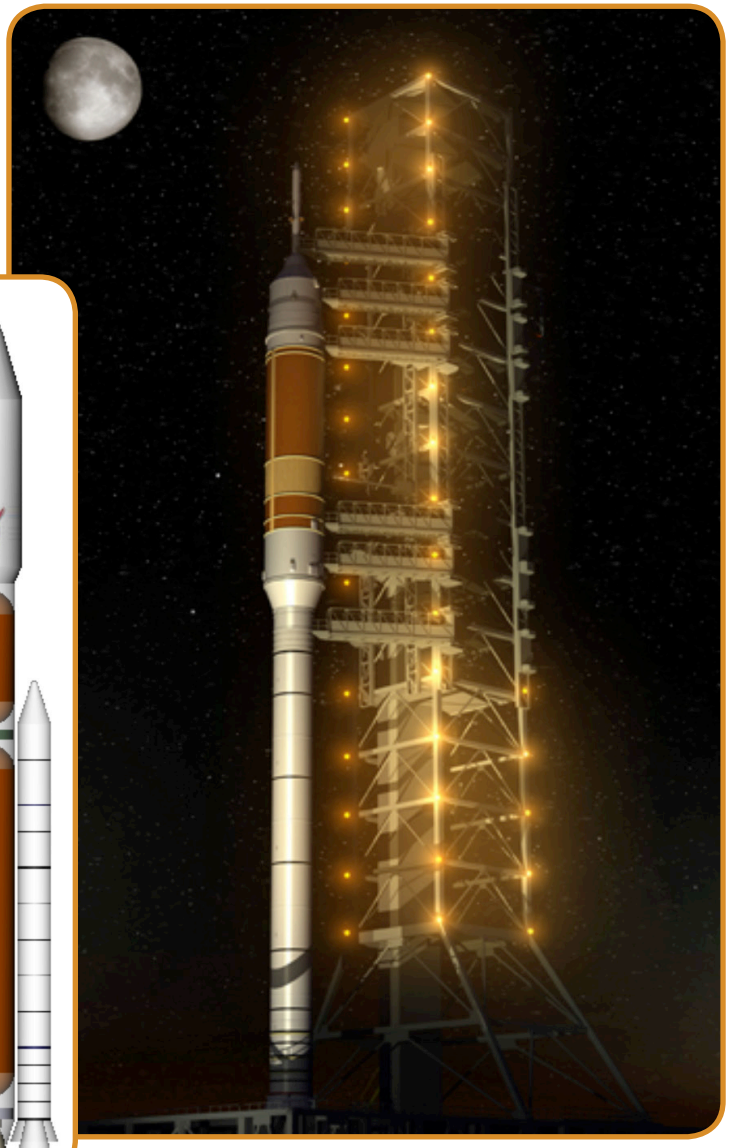
VS-SE&I is highly experienced in the management of functional decomposition and requirements flow down, integrated modeling and analysis, and the identification and execution of technical trade studies in support of critical decisions.

VS-SE&I also has the capability to manage integrated verification planning and test by developing flight certification strategies, leading/facilitating vehicle and element integrated tests and providing insight for manufacturing, assembly and test.

Four specialized capabilities within VS-SE&I work effectively to provide a cohesive and comprehensive SE&I approach that enables the discipline to provide clear, product-focused accountability to engineering for vehicle and spacecraft integration.

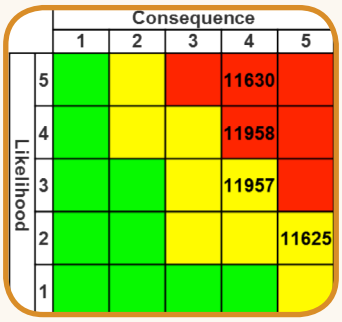


Heavy lift vehicle conceptual design.

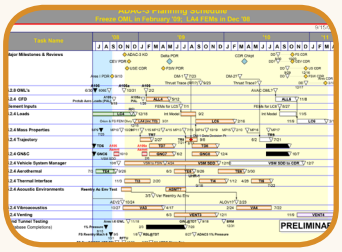


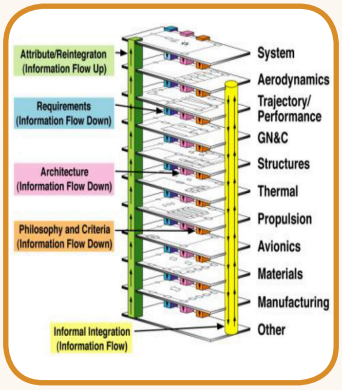
ARES-1X on pad at Launch Complex 39.

Capabilities



Risk Assessment Matrix (5 × 5).


Integrated Master Schedule.



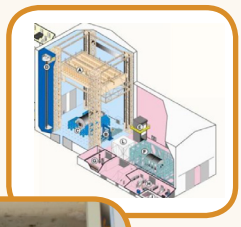
Technical Integration of System and Discipline Functions.

Technical Management leads and facilitates the flow of technical data and information for the design. It develops both technical and Programmatic planning, tracks progress, and manages communication across interfaces to facilitate sound design decisions.

- Risk & Knowledge Management
- Performance Metrics & Margin Management
- Lifecycle Review Planning
- Certification of Flight Readiness Strategy
- Trade Study Identification and Tracking

Systems Design and Definition integrates and manages the overall System Design. This includes establishing design concepts, leading the functional design process, leading design trades, and providing a cross-discipline interface for design definition & integration. It also develops and validates system and element requirements as the design advances, and facilitates requirements compliance throughout the system.

Integrated Structural Test Facility Conceptual Layout.




MSFC Structural Test Facility.


Human Factors Engineering mockup to assess crew accessibility while wearing a SCAPE suit, as an aid to spacecraft designers.

Test and Verification leads verification & validation(V&V) planning & integration and guides integrated system & element test activities in support of design qualification & certification. It also provides contractor Resident Office insight, in support of integrated vehicle manufacturing, assembly & test.

Systems Analysis develops modeling/simulation strategies and defining system sensitivities, critical parameters & critical models as the design advances. Areas of expertise include Human Factors Engineering to define human-machine interface requirements and the use of virtual & physical models to help define, develop & verify design operability.

For more information, please visit www.nasa.gov/centers/marshall/about/business.html

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