

## Marshall Space Flight Center

# Space Systems Department Systems Engineering and Integration

The Space Systems Department Systems Engineering and Integration (SE&I) Division provides value-added solutions to a broad spectrum of SE&I challenges faced by spaceflight projects, from initial requirements definition and trade studies through product integration and verification/validation. The specialized and experienced SE&I technical staff applies the seventeen NASA common technical practices to all elements and hierarchical levels of a system over the entire project lifecycle.

The SE&I discipline manages the technical integration of technologies, hardware, and software to develop an efficient product that satisfies customers' operational needs (i.e., validation) and that is critical to the successful operation of any system comprised of multiple and interdependent subsystems and functions (i.e., verification).

The SE&I Division comprises:

- New business
- Systems integration, and
- Avionics integration

All distinct areas share in and contribute to the successful achievement of the SE&I Division's objectives and goals.

## New Business

The New Business team provides an entry point into the Space Systems Department for the customer needing engineering bid and proposal (B&P) inputs and general engineering service and resource estimates.



Engineering Cost Estimating

## New Business—Engineering Services include:

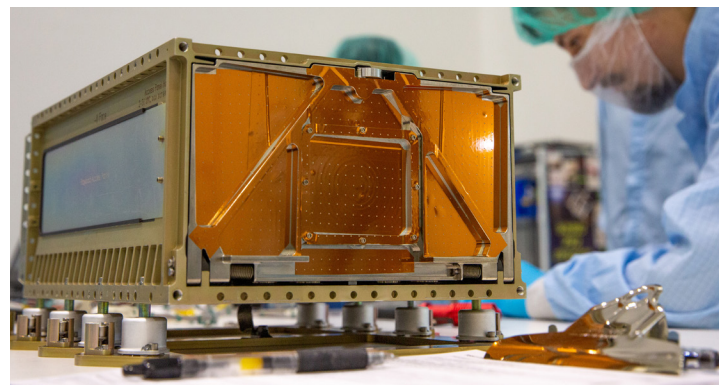
- Technical management and coordination of the needed engineering services and resources for proposal development
- Coordination and definition of engineering work descriptions for requested services
- Coordination and identification of engineering basis of estimate for requested services

## Systems Integration

The Systems Integration Branch provides lead systems engineers (LSEs) and systems engineering expertise to integrate across multi-engineering disciplines to create and model system products and capabilities to meet the needs of the customer.

## System Integration—Engineering Services include:

- Technical management and coordination of the day-to-day design, development, test, and evaluation (DDT&E) of engineering support to the customer
- Integration of technical resources and services across engineering
- Development and management of stakeholder expectations, concept of operations, system requirements, interface control, and verification/validation
- Application of model-based systems engineering methodology



Near Earth Asteroid (NEA) Scout CubeSat

## Avionics Integration

The Avionics Integration Branch provides Avionics Department lead engineers (DLEs) and Avionics systems engineering expertise to oversee integration across the avionics architectures for the customer.

### Avionics Integration—Engineering Services include:

- Coordination of the day-to-day avionics and software support to the customer
- Management and coordination of avionics and software resources
- Technical management of avionics systems integration
- Development and management of integrated avionics and software verification/validation

The Space Systems SE&I Division leads the development and instruction of the Systems Engineering Down-and-Dirty training series to practitioners across the Agency. The SE&I Division is driven for results, motivated to provide solutions, and committed to delivering for the customer.



Integrated Avionics in the SLS Core Stage

National Aeronautics and Space Administration

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