



### Aerospace Engineering Disciplines

Guidance, Navigation, and Control

Autonomous Rendezvous and Docking

Computational Fluid Dynamics

Thermal Modeling and Analysis

Structural Analysis and Mechanical Simulation

#### > Space Systems Engineering

Payload Integration and Integration Support

Launch and Space Operations Planning

### Space Systems Engineering Competencies

Concept Definition

Requirements Planning

Interface Requirements Development

Project Management and Control

Requirements Verification and Validation

Engineering Analysis (Aerodynamics, GN&C, Structural Analysis, Simulation Modeling)

Systems Integration

Test Support

Configuration Management

Data Management

### About bd Systems

bd Systems is a woman-owned small business that provides engineering and information technology services for government and private industry. Based in Torrance, California, bd Systems has over 20 operating locations nationwide.

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## Space Systems Engineering

bd Systems has participated in the development and management of complex national aerospace systems since its inception. Our personnel are experienced with the most current and legacy launch and space systems in development and operation. We offer engineering and project management expertise to meet critical customer needs.

### Crew Exploration Vehicle (CEV)

Northrop Grumman/Boeing

- Integration with team supporting CEV systems requirements definition, internal and external interfaces.
- Concepts for efficient operations and contractor support.
- EVA analyses and conceptual designs.
- Operations inputs to the spacecraft design process.

### Orbital Space Plane

Boeing

- Development of key documentation, including the OSP System Specification, Element specs, and Interface Control Documents (ICD).
- Aerodynamic (CFD & thermal) analyses and testing.
- Development lead of Spacecraft Segment Specification, Resource Module Element Specification, and S/C ICDs.

### Evolved Expendable Launch Vehicle (EELV)

USAF SMC

- Program management, analysis, and information services to Space and Missile Systems Center (SMC).
- Test and evaluation support to the Air Force Operational Test and Evaluation Center (AFOTEC) at Kirtland AFB.
- Continued support for acquisition efforts and program management.

### Space Shuttle

United Space Alliance, Inc.

- Performed structural and modal analysis, modal testing, mechanical simulations of highly non-linear transient systems.
- Strength analysis of metallic and composite structures.
- Fatigue and crack growth analysis, vibroacoustic analysis, and neural network application development.

### Rocketplane XP

Rocketplane Limited Inc.

- Vehicle management computer flight software delivery, including Guidance, Navigation, and Control (GN&C) and redundancy management.
- Structural analysis support to guide design efforts.

### Titan IV

USAF SMC

- Design and performance verification testing and analyses on Titan IV components and material property characterization programs.
- Major contributors in developing and implementing motor life tests and analyses to validate service life requirements.
- Integrated process development to eliminate possible failure scenarios and led "proof of failure" test efforts.
- Specialty support including quality engineering and configuration management.

### Reusable Launch Vehicle (RLV)

Boeing

- Architectural definition studies, modeling and simulation, systems engineering, and a variety of design and integration tasks.
- Alternate RLV architecture concepts and trades, parametric analyses, and RLV functional architecture development.
- Systems engineering with focus on requirements definition, operational requirements, and ICDs.
- Evolution studies including the RLV Space Futures Report and support to specialty areas of reliability engineering and configuration management.
- Analytical and modeling and simulation tasks including Booster/Orbiter/Payload separation, docking, berthing, and landing.
- Wind tunnel tests including moment and aerothermal analyses of various configurations.

### Delta

McDonnell Douglas/USAF SMC

- Engineering support of Delta evolution to Delta II.
- Payload integration support including Global Positioning System (GPS) and a variety of NASA payloads, including ROSAT.
- Participant in first Independent Readiness Review (IRR) performed on the Delta II.