Space Launch and Transportation Systems

Course Description:

This three to five day tailorable workshop provides an integrated view of space launch and transportation systems (SLaTS) design and operations, from customer needs, objectives and requirements, through launch and transportation system design, development, test and manufacturing to creating operations concepts and infrastructure capabilities. Lifecycle cost and the business case will also be assessed. The thrust of the workshop is to identify technical risk and mitigate it in the most cost-effective manner, while maintaining the technical integrity of the vehicle(s) and infrastructure.

The workshop summarizes and amplifies on the efforts of 67 industry and government professionals with over 1000 years – 10 centuries – of collective experience that examined SLaTS design, reducing cost, and cost-effective launch operations. The workshop is packed with wisdom that the space industry has gained over the last 25 years of launch activities, including expendable, unmanned and reusable, crewed vehicles.

In the workshop you will take a fresh look at space launch and transportation systems by emphasizing a process-oriented approach for creating cost-effective concepts to meet customer needs and objectives.

Course Objectives:

At the end of this course you should walk away with…

- Gain an end-to-end systems engineering perspective on designing, developing, and operating space launch systems and space transportation systems
- An emphasis on the design of the entire launch architecture, not just the vehicle
- A keen appreciation for strategies to implement cost-effective concepts and designs
- A "gut feel" for the complex trade-offs needed to develop a viable SLaTS mission
- An organized framework for future space learning—on your own, through academic courses, or future short courses

Who Should Attend:

This course is designed for a variety of space professionals who must interact with one another to produce, operate and use cost-effective space launch and transportation systems, including project managers, subsystem engineers, designers, analysts, operators and users of launch systems.

Course Materials

Each participant will receive:

- A complete set of course notes with copies of all slides used in the presentations
- Instructions on how to request a free copy of *Space Launch and Transportations Systems: Design and Operations*, by Kirkpatrick, Larson, Ryan and Weyers, from the Government Printing Office
- TSTI Alumni status allowing on-line access to course materials and other resources

Testimonials

"A comprehensive overview of launch system design"
"Great course...communicates the complexity of design"
"Now I am officially a rocket scientist"

Course Topics

- **Introduction**
  - Overview of the workshop
- **SLaTS design process**
  - Big picture design process for entire architecture
- **Creating Alternative SLaTS Concepts and Architectures**
  - Sorting the Options
- **The Operating Environment**
  - Hazards and Mitigation Techniques
- **Launch Vehicle Conceptual Design**
  - Characterizing the vehicle concept
- **Launch Operations Concept and Architecture**
  - Creating launch/landing operations concepts
- **System Engineering Process**
  - for SLaTS Development and Operations
- **Subsystems**
  - Basic Principles, Options, Sizing and Application
- **Special Topics**
  - Manufacturing, transportation, logistics, regulations, cost
  - Integrating Examples
  - Space transportation system design and two-stage launch system design