



Ground System Architectures Workshop Focusing on the User

March 23 – 26, 2009

Dr. Wanda Austin, President and CEO
The Aerospace Corporation

Different Ground System User Perspectives

Users	Perspective
System Controllers and Operators	Supports launch facilities when launching satellites into orbit, day-to-day operation
Satellite System and Subsystem Engineers	Health, analysis of satellite subsystem and payload
Mission Planners	Plans, monitors and controls the execution of the overall mission
Data Analysts and Consumers	May be located within the control centers, but typically are dispersed across the globe
Scientific Community	The conduit through which users receive the benefit of the space assets
System Maintainers	For maintenance, enhancement, and anomaly resolution of ground systems
Warfighters	Strategic data and communication link.

“The magic is on the ground.” –Col. E.T. Cope, Deputy CIO, NRO, GSAW2002

Multiple Challenges Associated With Ground Systems

Constraints	Impact
Time	<ul style="list-style-type: none">•Less time to develop system•Shorter time to put into field for operational support
Cost	<ul style="list-style-type: none">•Decreasing development budgets•Increasing development and sustainment costs
Flexibility	<ul style="list-style-type: none">•Changing user requirements•Autonomous systems with humans in the loop
Interoperability	<ul style="list-style-type: none">•Compatibility -must go backward and forward•Conformance to standards
Maintenance and Duration	<ul style="list-style-type: none">•Longer mission duration requires accommodation of new technology to avoid obsolescence•Handling of spacecraft anomalies through changes to the ground system
Technology Advances	<ul style="list-style-type: none">•Complex Sensors , Payloads & Satellites, larger volume of data•Increasing amount of software and complexity of software
Information Assurance	<ul style="list-style-type: none">•Users are distributed globally and demand uncorrupted information• Protection of system from Cyber attack

GSAW Brings the Ground Systems Community Together

- Share lessons learned
- Address development challenges
- Work on current problems
 - *Incorporate standards*
 - *Secure timely transparent data dissemination on demand*
- Provide educational opportunities
- Envision the future



(Photo/The Aerospace Corporation)

Spacelift Telemetry Acquisition and Reporting System (STARS)