Working Group Outbrief

Ground System Architectures Workshop

Session 11F
Ground System Enablers and Future Small Sat Development

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Focusing Questions

• What mission(s), regardless of size, can you NOT do today because you lack the ground services to support the mission(s)?

• What ground services do you need and when do you need them?

• How is your constituency working toward developing these ground services?
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Presenters/Panelists

• Mr. Erik Eliasen, Universal Space Network
• Dr. Meagan Hubbell, NRO CubeSat Office
• Mr. Kyle Kemble, Air Force Research Laboratory
• Mr. Austin Mroczek, NAVY SPAWAR West
• Dr. Marco Villa, Tyvak Nano-Satellite Systems Inc.
Key Points

- Size of the spacecraft does not drive ground systems
  - Mission Needs
  - CONOPS
- Are we in the “Wild West” phase of Small Sat development?
  - Yes, for some R&D
    - Constrained development cost
      - Drives innovative solutions
      - Question assumptions
    - Educational component
  - No, for advanced missions
    - Very sophisticated vehicles
    - Providing specific mission needs
- Short lived system versus long life spacecraft - O&M is expensive
- Automation is a key enabler for supporting large numbers of spacecraft
Conclusions

- Small Sats can be very capable and support specific mission needs
- Constellations are a driver for future small sat ground system development
- Disruptive technology
  - Rapid development cycles, fail quickly and learn
  - Variable funding challenges long-term planning
  - Standards constrain agility
  - Adapting large satellite ground software solutions to small sat missions has not proven feasible

It is not about the bus, it is about the Mission