The Marriage of Flight Software to Ground Systems

Gerry Simon
Spacecraft developer to Ground System Developer data exchanges

- Telemetry Metadata
- Command Metadata
- Spacecraft Mass & Thruster Data
- Operations Goals, Constraints, Resources
- Operations Procedures

Spacecraft Factory

Ground System Developer
Observations

- Spacecraft & Ground System developers are not always interested in each others success
  - Oftentimes competitors
  - Spacecraft builders all have capable I&T systems
  - Compete for the same program dollars
  - Schedule can become a big game of chicken

- Data Exchanges are not a one time event

- Engineers are not *great* communicators
  - Vocabulary is not the same

- Spacecraft oftentimes outlive the ground system

- Holy Grail is a simple data transfer for mission handover
Recommendations

• Incentivize team success
• Understand each other’s development lifecycle
• Limit creativity by Flight software team

... then ....

• Use available exchange standards
  – Business process models (UML & BPMN)
  – T&C metadata (XTCE)
  – Procedures (SOLM)

• Develop missing standards