

31 May 2012

# Entering a Changing World: Space Systems/Loral Perspectives on Servicing

*Presented by:*

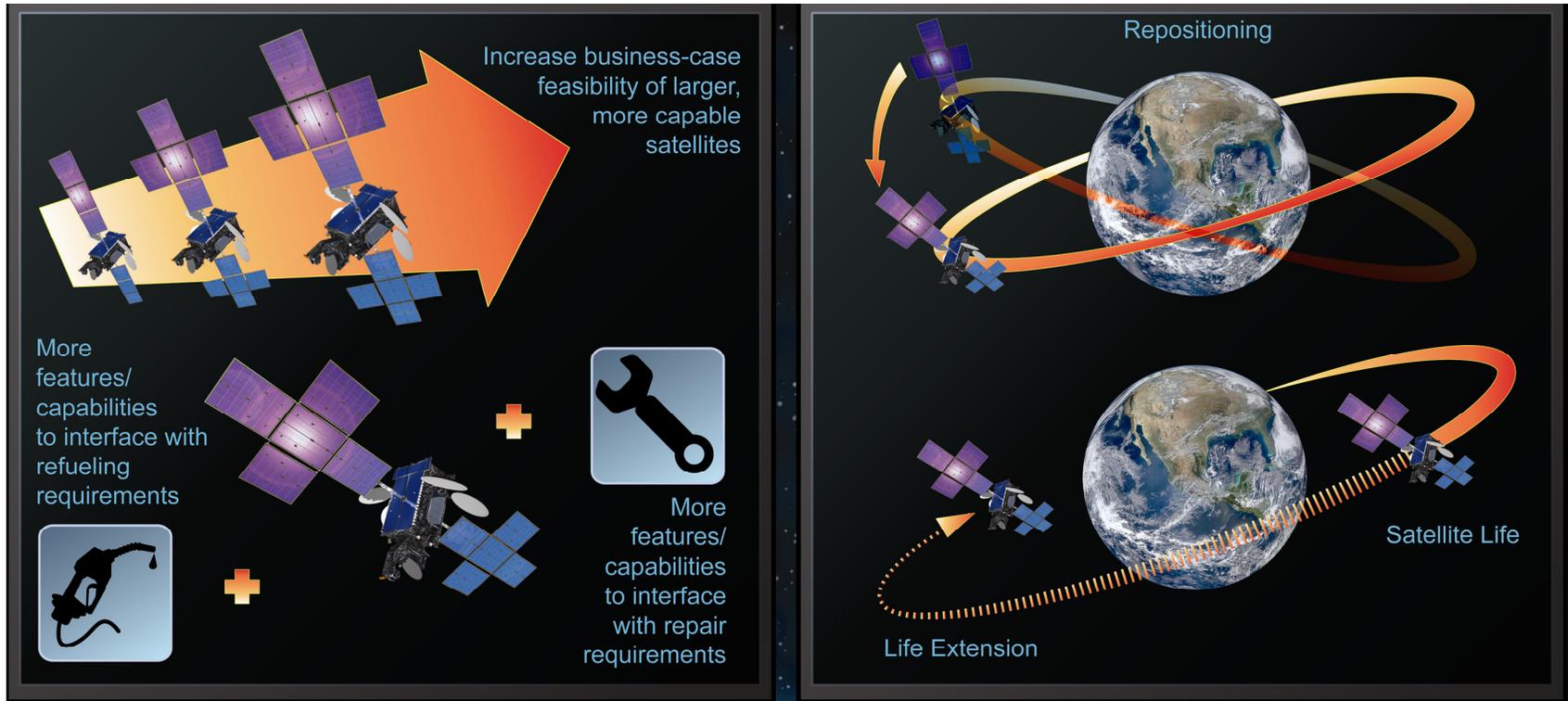
Richard H. Currier  
Vice President and Chief Technical Officer,  
Loral Space & Communications

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# How Will Satellite Servicing Increase Business?

- ◆ Increase business-case feasibility of larger, more capable satellites
  - Augmented missions and follow-on missions from repositioning, reconfiguration, and lifetime extension
  - More satellite features and capabilities to interface with refueling and repair mission requirements



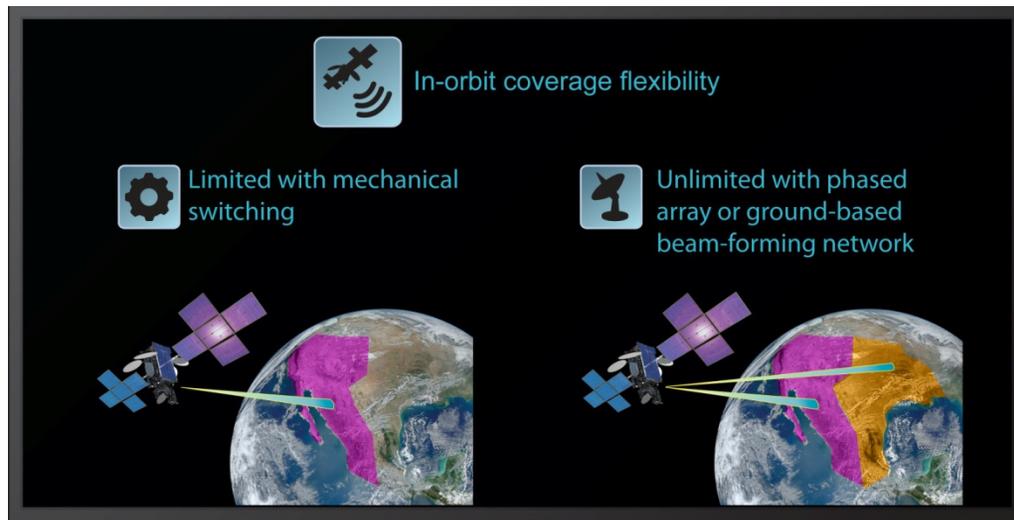
# How Will Satellite Servicing Make The Industry More Profitable?

- ◆ Enhanced revenue through
  - Life extension
  - Mission repurposing
  - Maximizing use of systems already in space
- ◆ Reduced insurance costs
  - Less risk to orbit raising and deployments
  - Less risk to failures with servicing restoration after on-board redundancy exhausted



# How Will Satellite Servicing Affect Satellite Flexibility?

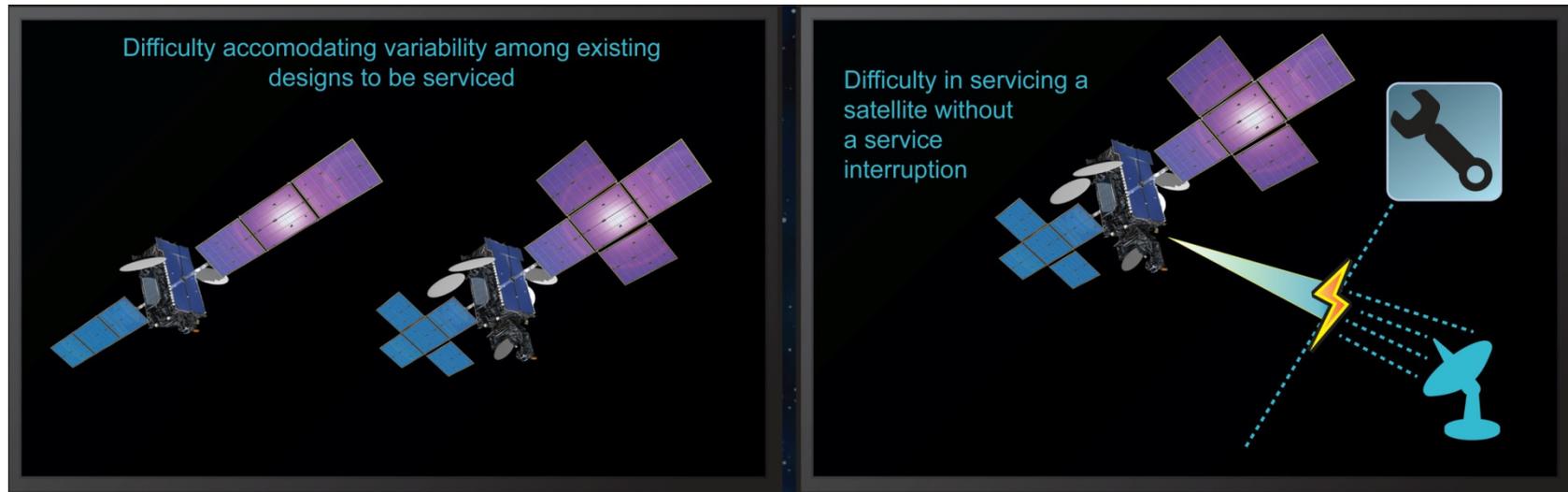
- ◆ Value of satellite flexibility planned or being deployed will increase
  - In-orbit coverage flexibility
    - Limited with mechanical switching
    - Unlimited with phased array or ground-based beam-forming network
  - Channel frequency, bandwidth, and switching flexibility
    - Limited with IF solid state switch matrix
    - Unlimited with digital channelizer



## What Are The Most Difficult Aspects of Servicing?

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- ◆ Accommodating variability among existing designs to be serviced
- ◆ Servicing a satellite without a service interruption



## How Are Risks of Servicing Best Addressed?

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- ◆ Refuel in a parking orbit (non-operational refueling)
- ◆ Provide flexible TT&C systems
- ◆ Provide modified propulsion systems designed to accommodate servicing



## Further Perspectives on Satellite Servicing

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- ◆ Options will increase as satellite designs incorporate servicing capabilities
- ◆ Life extension may enable second tier missions
  - Provides low cost approach for new businesses
  - Primary mission within original design life
- ◆ Key enablers
  - Cost-benefit trade (i.e., “business case”) needs to be positive both for the servicing mission and owners of serviced satellites
  - Adequate reliability of other satellite components necessary for extended life