Commercialization progress in the Global TT&C market.

An update of the state of commercial TT&C services for satellite launch and operations.
Progress in the market

- Commercial TT&C and data services providers have matured to the point where they are being utilized for augmentation and replacement of in-house capabilities.
- The economic argument has been there from the beginning, however the operational and mission-critical support argument required time and experience.
- Several Gov’t agencies, satellite manufacturers, satellite operators and launch providers are benefitting from commercial services on a regular basis.
- The purpose of this presentation is to highlight a growing trend where commercial networks have been used to successfully augment or replace in-house TT&C services.
Access to Commercial Ground Stations allows ground network users to cost-effectively augment in-house capabilities.
NASA Approach

- NASA owned sites were expensive to maintain and presented international challenges
- In 80’s NASA began transitioning assets to TDRS to allow closure of Ground Network
  - TDRS transponder cost/weight/power limited use for many near Earth spacecraft
- Commercial TT&C assets developed to fill gap by providing low cost alternatives
- NASA determined need for core NASA owned capability—Manned Space Flight
- In Feb 2008, with USN purchase of HTSI/DataLynx assets, NASA commits to close 2 NASA owned Polar antennas
- Only Remaining NASA GN assets are:
  - UAF, White Sands, Wallops and Mila--support Manned Space Flight
  - McMurdo (No current commercial Business Case)

NASA is Achieving Significant Cost Savings with Very Low Mission Risk

- Savings shown is O&M only
- Savings from reductions in civil service/blue suit labor not included
- Savings do not include substantial reduction in sustainment and development spending as well
Current NASA - NEN Configuration

Scheduling

Pre-mission Planning & Analysis

Pre-mission Testing

Network Monitoring & Coordination

NASA
Commercial
Partner

Alaska Satellite Facility
Fairbanks, Alaska

Partner Station: NOAA CDA Station
Gilmore Creek, Alaska

SSC/USN Alaska (1)
Poker Flat, Alaska

SSC/USN Alaska (2)
North Pole, Alaska

Kongsberg Satellite Services
Svalbard, Norway

Swedish Space Corp. (SSC)
Kiruna, Sweden

German Space Agency (DLR)
Weilheim, Germany

SSC/USN Australia
Dongara, Australia

SSC/USN Hawaii
South Point, Hawaii

White Sands Complex
White Sands, New Mexico

Merritt Island Launch Annex
Merritt Island, Florida

Wallops Ground Station
Wallops, Virginia

SSC Chile
Santiago, Chile

McMurdo Ground Station
McMurdo Base, Antarctica

Satellite Applications Center
Hartebeesthoek, Africa
Department of Defense

Commercial Support of DoD has been successful but for limited use only
USN, SMC, SMTDW, and 50th SW demonstrated commercial SGLS capability can meet DoD requirements
   • Successfully demonstrated full SGLS support in Alaska and USB compatibility with the CCS-C ground control system from 2004-2006

DoD has used commercial X-Band downlink services from USN for Coriolis, STP-R1, NFIRE, and SBSS

Boeing is procuring USB and SGLS support for orbit raising and in-orbit checkout of all Wideband Global Satcom (WGS) launches

SMC is now studying options for the future of the Air Force Satellite Control Network including what services could be acquired from commercial TT&C providers

Cost Effective DoD Mission Support is a Proven Commercial Capability
Integrated Gov’t Agency and Commercial S-Band launch network

ESA, DLR and other European agencies use similar integrated approaches
Commercial Example

Geostationary Launch and Orbit Raising Network – Fully outsourced and integrated by Commercial Services Provider
Current trends in the industry

• The industry, Gov’t agencies and commercial manufacturers, are all addressing the issue of risk and control versus cost

• Use of commercial shared infrastructure allows:
  – Reduction of TT&C infrastructure and associated investment and maintenance costs
  – Leveraging of commercial investment that can be amortized over a large customer base.
  – Expanding the number of network sites to reduce overall risk
  – Paying for TT&C services only when needed

• Agencies give up absolute control over the availability of the assets and rely on a network provider for support

• Commercial TT&C services are now a mature, low risk product with proven prioritization schemes that ensure assets are available when needed.

• Government agencies and commercial manufacturers are increasingly integrating commercial TT&C assets into their networks.