Lessons Learned From Engaging International Markets
Success with Satellite-Based Augmentation Systems

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Possible civil GNSS futures

ASSUMES THAT USG WILL MAINTAIN A MILITARY CAPABILITY

Today

- MSAS
- GPS
- NDGPS
- WAAS
- LAAS
- EGNOS
- Development
  Phase
  Galileo

2010

- Japan
- Augmentations
  System
- India
- Brazil
- China
- Others?

2020

- GPS Standard
- New GNSS
  Standard
- Galileo Standard

Deployed
Galileo

What will determine the future?
GPS Aided GEO Augmented Navigation System (GAGAN)

- Joint program with Indian Space Research Organization (ISRO) and Airports Authority of India (AAI)
  - 15 Reference Stations
  - 3 Uplink Stations
  - 3 Mission Control Centers
  - 3 GEO Navigation Payloads
- Competition: Thales/Alcatel
- GAGAN Technology Demonstration System (TDS) contract awarded to Raytheon April 2004
- GAGAN Final Operation Phase (FOP) contract awarded to Raytheon July 2009
- New procurement process offers a more consultative approach to industry
- Government to Government links still important!
- Procurement more focused on fulfilling equipment needs
- Still some work to do to make the process more agile
US Policy and GAGAN Acquisition

US GPS Policy

2nd GPS Civil Signal

ISRO Sanctions

3rd GPS Civil Signal

SA Discontinued

GAGAN RFI

GAGAN Proposals Submitted

Requested USG GAGAN Advocacy

• GPS for peaceful civil applications worldwide
• GPS standard for international use

Active USG GAGAN Support

Bush-Vajpayee NSSP

US GPS Policy #2

Bush-Singh Joint Stmtnt

Eliminate SA

Chandrayaan-1 TAAs

GAGAN-TDS

GAGAN- FOS Awarded to Raytheon

GAGAN-TDS Awarded to Raytheon
Summary

- **India is seeking reliable and committed defense and security suppliers** – There is currently a political incentive to work with U.S. firms, but India will not necessarily do so. Non-US competitors currently outperform U.S. companies in “early” demonstrated commitment and presence.

- **Technology Transfer** – India is very sensitive to developing in-country capabilities to sustain and maintain products. They want leapfrog technology at the lowest price and will use international competitions to get it.

- **Technology Transfer** – There is an ongoing shift toward development of a modern private aerospace-defense sector (e.g., ISRO-Antrix, DRDO-BEL)

- **Relationship** – India is very focused on long term presence and visible investment.