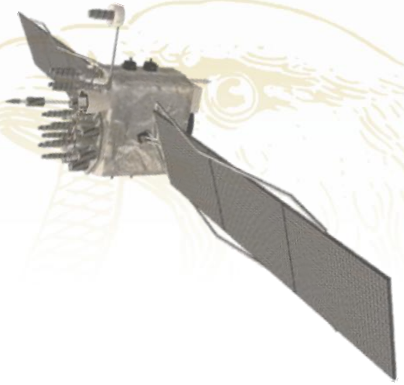
SPACE-BASED POSITIONING
NAVIGATION & TIMING

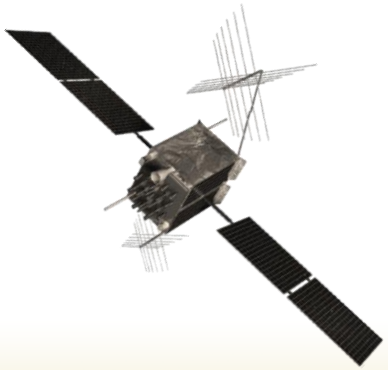
NATIONAL COORDINATION OFFICE



Space-Based PNT

Update on Executive Committee Activities

Anthony J. Russo
Director, National Coordination Office

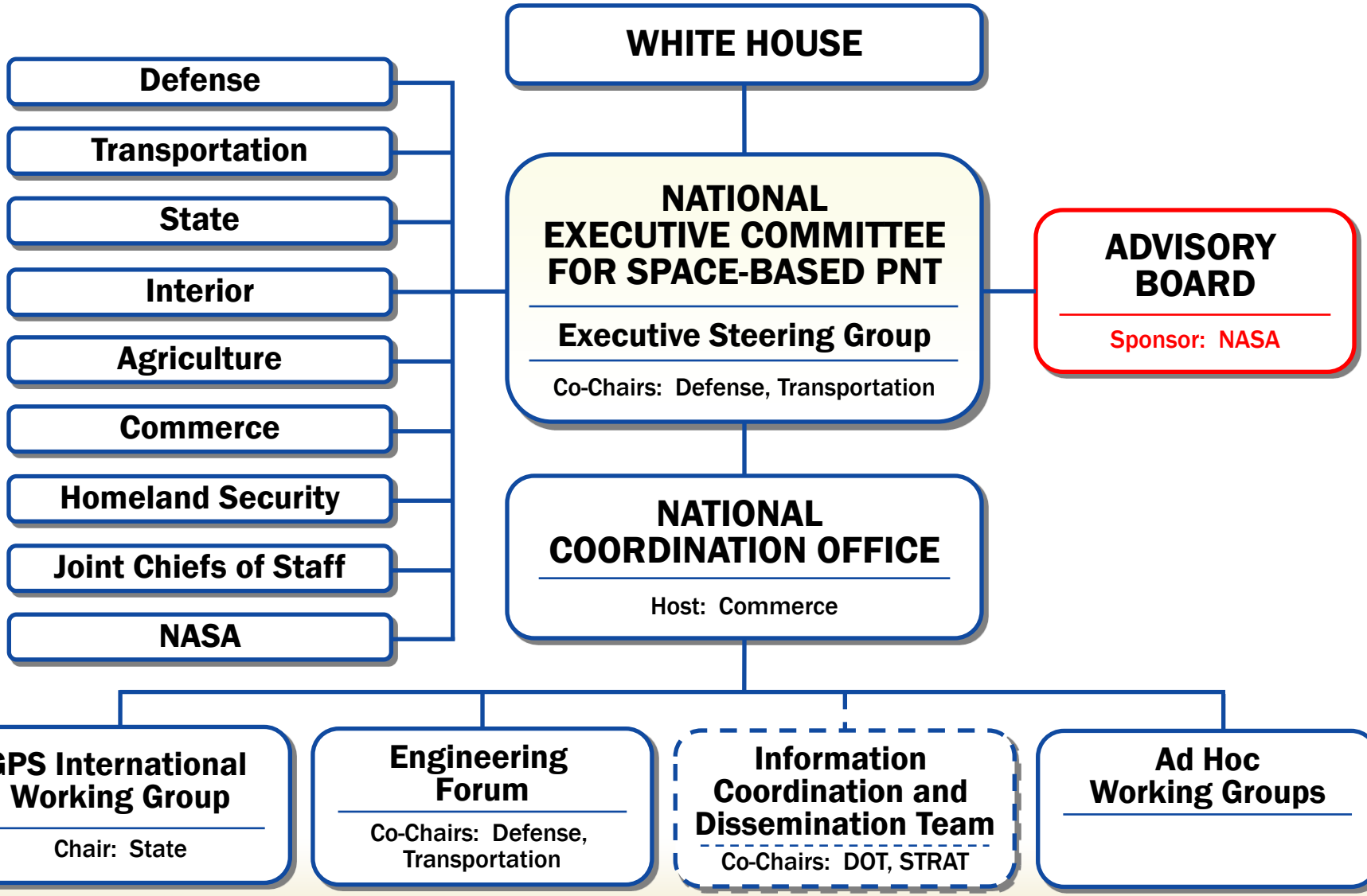


June 9, 2011

U.S. Policy History

- 1983: President announces civilian access to GPS following KAL 007
- 1991: U.S. offers free civil GPS service to the International Community
- 1996: First U.S. GPS Policy establishes joint civil/military management
- 1997: U.S. law provides civil GPS access free of direct user fees
- 2000: President ends use of *Selective Availability*
- 2004: President issues U.S. Policy on Space-Based PNT
- 2004: Agreement signed on GPS-Galileo Cooperation
- 2007: President announces *Selective Availability* eliminated from future GPS III satellites
- 2010: New National Space Policy provides high-level PNT guidance

U.S. Space-Based PNT Organizational Structure



U.S. Space-Based PNT Policy

GOAL: Ensure the U.S. maintains space-based PNT services, augmentation, back-up, and service denial capabilities that…

ASSURE SERVICE	Provide uninterrupted availability of PNT services
MEET DEMANDS	Meet growing national, homeland, economic security, and civil requirements, and scientific and commercial demands
LEAD MILITARILY	Remain the pre-eminent military space-based PNT service
STAY COMPETITIVE	Continue to provide civil services that exceed or are competitive with foreign civil space-based PNT services and augmentation systems
INTEGRATE GLOBALLY	Remain essential components of internationally accepted PNT services
LEAD TECHNICALLY	Promote U.S. technological leadership in applications involving space-based PNT services

President Obama's Space Policy June 2010

- Provide continuous worldwide access for peaceful uses, free of direct user charges
- Encourage compatibility and interoperability with foreign GNSS services
- Operate and maintain constellation to satisfy civil and national security needs
  - Foreign PNT may be used to strengthen resiliency
- Invest in domestic capabilities and support international activities to detect, mitigate and increase resiliency to harmful interference

Space-Based PNT is Essential to Our Economy and Critical Infrastructures

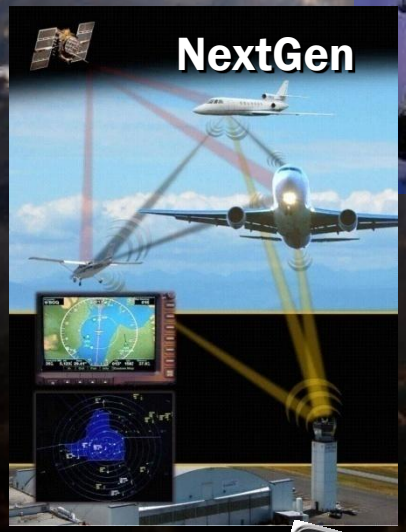
Satellite Operation

Surveying & Mapping

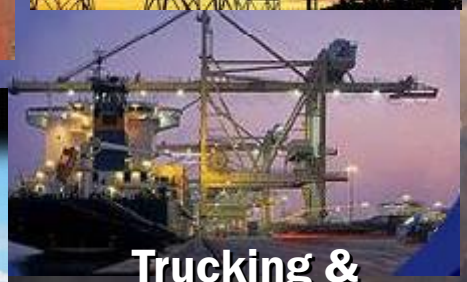
Power Grids

Precision Agriculture

Transit Operations



NextGen



Trucking & Shipping

Intelligent Vehicles

Telecom

Navigation

Disease Control

Oil Exploration

Fishing & Boating

EXCOM TOPICS

- Emerging GPS Interference Issues
  - Low-cost jammers/repeaters/spoofers
  - Enhanced Enforcement
  - Interference Detection and Mitigation
  - Civil Transportation Threat Assessment
  - Comprehensive Risk Assessment
  - Interference Testing
- Restructure of the Advisory Board
  - New Tasking
  - Rotation of Membership

EXCOM TOPICS

- International Cooperation
  - GPS/Compass ITU Coordination
  - International Committee on GNSS (ICG) Update
- GPS Program Office Update
  - Response to GAO concerns
  - GPS IIF Status
  - GPS IIIA Status
- Interagency Forum for Operational Requirements
- Broadband Initiative Impacts on GPS
- Implications of President Obama's Policy

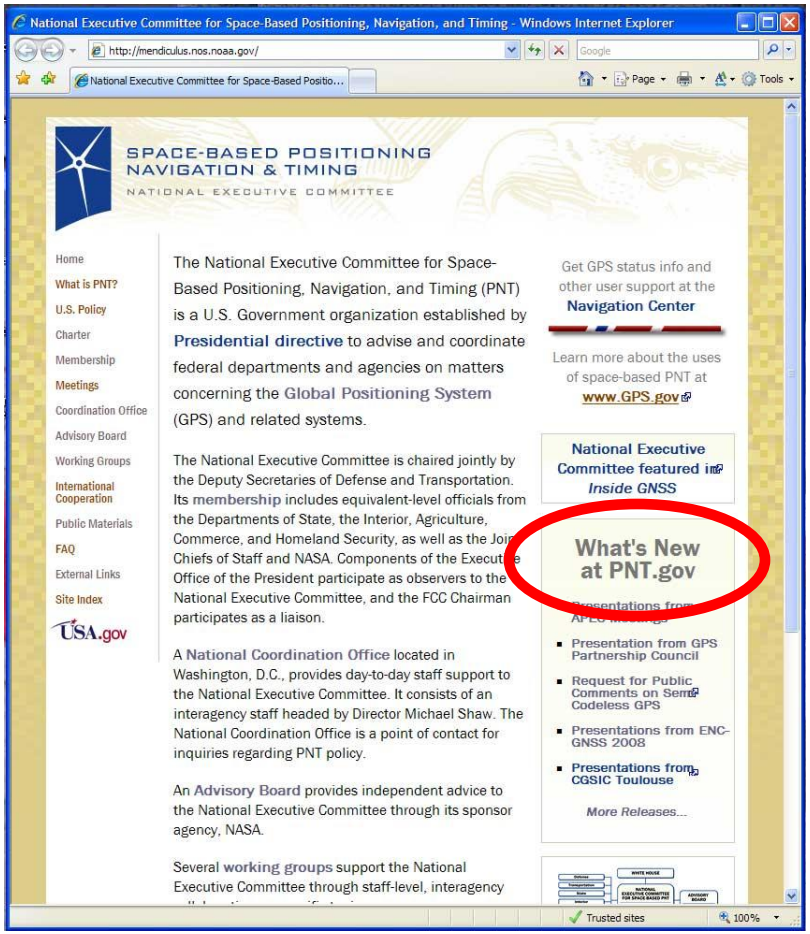
EXCOM TOPICS

- LightSquared
  - Background
  - Status of LightSquared's Technical Working Group
  - Interim NPEF Test Results
  - Recommended Next Steps

EXCOM Tasking to Advisory Board

- Non-ICD Compliant Civil/Commercial Receivers
- PNT Architecture Assessment
- GPS Commercial Outage Impact Assessment
- Role of PNT in Cyber Networks
- Advisory Board Technical Subcommittee

For Additional Information…



[GPS.gov](GPS.gov)

[PNT.gov](PNT.gov)

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» BACK-UP SLIDES

SPACE-BASED POSITIONING NAVIGATION & TIMING

NATIONAL EXECUTIVE COMMITTEE

Space-Based PNT Advisory Board Tasking

October 14th 2010

Anthony Russo
Director
National Coordination Office
Space-Based Positioning, Navigation and Timing

New Taskings

- Background
  - Advisory Board completed previous taskings and submitted final report in June 2009
  - September 2010: EXCOM unanimously approved five new taskings in three general areas for current cycle
- Requested Actions
  - Conduct research, prepare written report of findings and recommendations by February 2012
  - Provide 20 minute Executive Summary briefing at November 2011 Space-Based PNT Executive Committee meeting
    - Please provide briefing slides two weeks prior to EXCOM meeting

Non-ICD Compliant Civil/Commercial Receivers

Evaluate the implications of user non-compliance with GPS ICD specifications and potential solutions.

- Recent events revealed some legacy receiver equipment may not be compliant with ICDs (both civil and military)
  - Issues cause USAF to expend resources to investigate disruptions or outages to ensure issues are/are not U.S. Government induced
- ICDs are published and intended to give receiver manufacturers design guidance and ensure backward compatibility
  - Is this enough or do we need a receiver certification process?
  - What are the implications to receiver manufacturing industry?
  - Should this be a U.S. Government or private sector activity?

PNT Architecture Assessment

Perform an independent assessment of the way ahead for the National PNT Architecture Implementation Plan.

- What can the Departments and Agencies do to ensure the successful implementation of the Plan?
- What sort of organizational, functional, or technical issues does the Board believe may impede successful implementation of the Plan?
- How can the Departments and Agencies reduce the likelihood that these impediments occur?
- How can the Departments and Agencies reduce the effect these impediments may have?

GPS Commercial Outage Impact Assessment

Using scenarios and available data, conduct an assessment of the impact to U.S. commercial infrastructure of GPS outages over time (minutes, hours, days, weeks, etc.)

- Study should assess impact of GPS outages (current and future) to a representative sample of varied commercial and industrial sectors, factoring in internally designed backups and reliance on accuracy/availability of GPS over time
- Do results justify need for commercial or civil GPS backup capabilities?
- What is the extent of impact?
- What sectors are most vulnerable and to what extent?

Role of PNT in Cyber Networks

Evaluate specific role(s) of space-based PNT in the operation of civil/commercial cyber networks.

- Provide empirical evidence of the role of space-based PNT in civil/commercial networks associated with critical U.S. infrastructure
- If space-based PNT is critical to civil and commercial cyber networks, indicate:
  - how and where space-based PNT is used in these networks;
  - what PNT services are used by the networks;
  - how network systems or backups are used to mitigate loss of access to space-based PNT services;
  - the minimum space-based PNT access required to operate each network (satellites in view and/or required PNT information)
- If network systems or space-based PNT backups are used by commercial cyber networks, how long can system or backup operations be sustained without access to space-based PNT?

Combined with "GPS Commercial Outage Impact Assessment"

Advisory Board Technical Subcommittee

Establish an Advisory Board subcommittee capable of evaluation and timely feedback on emerging technical issues affecting commercial interests.

- GPS programmatic and policy changes are increasingly affecting commercial GPS users and manufacturers
  - Semi-codeless phase-out
  - SVN 49 mitigation strategy
  - L2C phase relationship
- Establish subcommittee chaired by one or more members of the Advisory Board
  - May include other industry/academia reps selected by its chairs
  - Convene only in response to specific taskings

Current Advisory Board Charter is already structured to implement this proposal