Domestic Space-Based PNT Interference Detection and Mitigation

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Presentation Overview

- Current GPS Interference Detection and Mitigation Process
- Interference Case Study
- Interference Detection and Mitigation (IDM) Plan and Implementation
Current GPS Interference Detection and Mitigation Process

• GPS SPS Outage Causes
  ▪ GPS Constellation anomalies
  ▪ User equipment anomalies
  ▪ GPS frequency interference
    — Intentional
    — Unintentional
Current GPS Interference Detection and Mitigation Process

USAF GPSOC
(military)

USCG NAVCEN
(surface)

FAA NOCC
(aviation)

Domestic GPS Outage Reporting
Current GPS Interference Detection and Mitigation Process

• GPS Outage Detection
  - Government managed systems that monitor and/or augment GPS
    - GPS Ground Segment Monitors (USAF)
    - WAAS (FAA)
    - NDGPS (USCG)
    - CORS (NOAA)
    - JPL DGPS Network (NASA)
  - User Reports (domestic and international)
    - Web-based
    - Phone calls
    - Emails
Date: 22 January 2007

Location: San Diego harbor south to Mexican border and up to 10 miles inland.

Duration: 1200-1600 PST

Cause: Unintentional Interference
Interference Case Study

- **General Aviation Pilot Report GPS Malfunction**
- **AIS Display Console Anomaly**
- **Potential for First Responder Impacts**
- **DGPS Site Inoperative 2 Hours**
- **Medical Services Paging Provider Network Inoperative 1.5 Hours – 20 sites**
- **Cell Provider Network 150 sites detected error 2 sites inoperative**

Interference Case Study Map with areas highlighted for interference issues.
**IDM Plan Goals**

- **Coordinate domestic capabilities** to identify, analyze, locate, attribute, and mitigate sources of interference to the GPS and its augmentations.

- **Collect, analyze, store, and disseminate interference reports** from all sources to enable appropriate investigation, notification and enforcement action.

- **Develop and maintain capabilities, procedures and techniques**, and routinely exercise civil contingency responses to ensure continuity of operations in the event that access to the GPS is disrupted or denied.
IDM Implementation Actions

- August 2007 – The President approved the National PNT IDM Plan
- January 2008 – DHS signed IDM Plan Implementation Strategy into force
- DHS expected to issue publicly releasable fact sheet and summary of IDM Plan
Implementation Actions

• February 7, 2008 – DHS announced adoption of eLoran as a national backup to the GPS to mitigate any safety, security, or economic effects of a GPS outage or disruption

• President’s Fiscal Year 2009 Budget Request:
  ▪ Migrate administration of LORAN-C from USCG to DHS National Protection and Programs Directorate (NPPD), includes transfer of budget authority for funding and personnel
    —Prepare for conversion of Loran-C operations to eLoran
  ▪ NPPD to oversee development of eLoran to provide national backup capabilities for positioning, navigation, and timing.
  ▪ Coast Guard will continue operation of the system in 2009 on a reimbursable basis
Questions?
The February DHS Press Secretary’s Statement can be downloaded from the NAVCEN website homepage.

- Adoption of a National Backup System to GPS – On Feb 7th, 2008, DHS issued a statement regarding the adoption of eLoran (enhanced LORAN) as the back-up to GPS. Read the statement in its entirety (18K, PDF).
- The 2007 Light Lists have been published and are available for download in PDF.
- Please read Civil Guard Marine Safety Alert 2-07 (PDF, 82K) regarding marine radars and AIS equipment.
- You may view previous news items here.
U.S. 2009 Budget Information

• Department of Homeland Security 2009 Budget

• U. S. Coast Guard Posture Statement with 2009 Budget in brief, Loran discussed on page 41