FAA Navigation Programs Status Update

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Navigation Programs Strategy Goals

• Provide navigation services to enable the PBN NAS Strategy – 2016
  – Provide GNSS (GPS and WAAS) to enable all PBN operations and ADS-B (accuracy & integrity for all separation levels)
  – Provide resilient navigation services to ensure safety, capacity, and efficiency
    • Implement the NextGen Distance Measuring Equipment (DME) Program to provide an RNAV backup for Class A airspace and the Navigation Service Group (NSG) 1-2 airports, during GNSS outages

• Rationalize NavAids infrastructure to meet the NESS initiative
  – Implement the VOR Minimum Operational Network (VOR MON)
  – Perform Instrument Landing System (ILS), Non-directional Beacon (NDB), TACAN, and DME rationalization

• Procure systems to sustain the retained infrastructure
• Innovate navigation services to enable new capabilities
• GNSS is the primary enabler for all PBN (RNAV and RNP) and ADS-B accuracy & integrity for all separation levels
• DME/DME provides an RNAV alternative
• VOR MON can be used by aircraft that are not DME/DME RNAV equipped
• CAT-I ILSs will be retained as needed to support safe recovery in the event of a GNSS outage
NavAids Sustainment

• Meeting the NAS PBN Strategy requires both conventional NavAids and GNSS
• VOR MON, DME, and ILSs may be reduced, but the remaining systems will need sustainment contracts in place
• TACAN sustainment requirements will be coordinated with DoD
  – No acquisition strategy in place currently
• Lighting systems will be sustained and gradually refreshed to use LED technology
Current WAAS Components

- Wide-area Master Station
- Wide-area Reference Station
- GEO Uplink Subsystem
- Operations & Maintenance (O&M) Console
- GEO Satellites
WAAS Current Status

- **Current WAAS provides high availability service to aviation users in North America**
  - **3779** Localizer Performance with Vertical Guidance (LPV) approaches in the NAS
  - **972** LPVs are LPV-200’s which provide CAT I equivalent instrument approach performance

- **Preparing WAAS to take advantage of dual frequency service that will be provided by GPS**
  - To continue high availability of WAAS vertical service during ionospheric disturbances

- **GEO sustainability**
  - Currently maintaining 3 GEO’s (AMR, CRE, CRW)
  - Developing future GEO’s 5/6/7 to replace legacy GEO’s upon lease expiration

- **GNSS Ongoing strategies**
  - Dual Frequency Multi-Constellation (DFMC)
  - Advance Receiver Integrity Monitoring (ARAIM)
GNSS Programs Strategy

- Integrate 5th & 6th GEOs; and establish procurement strategy for 7th GEO
- Continue 2nd civil signal L5 implementation
- Develop Dual-Frequency MOPS
- Evaluate Multi-Constellation and Advanced Receiver Autonomous Integrity Monitoring (ARAIM)
- Continue technical refresh activities
Summary

• **Navigation Programs will:**
  – Support resiliency by sustaining Ground Based NavAids
  – Support PBN Strategy with NextGen DME
  – Rationalize NavAids based on recommendation from ICAO Air Navigation Conference

• **Future work to include:**
  – Reduce Lighting Systems Footprint
  – Lower approach minimums with WAAS and EFVS
  – Advanced Receiver Autonomous Integrity Monitoring (ARAIM)
Questions?