

FAA Engineering Development Services Navigation Team at the FAA Technical Center

Overview

Presented by:

John Warburton - Manager, Engineering
Development Services Navigation Team
Manager (AJP-652)

Date: October 19, 2010



Federal Aviation
Administration

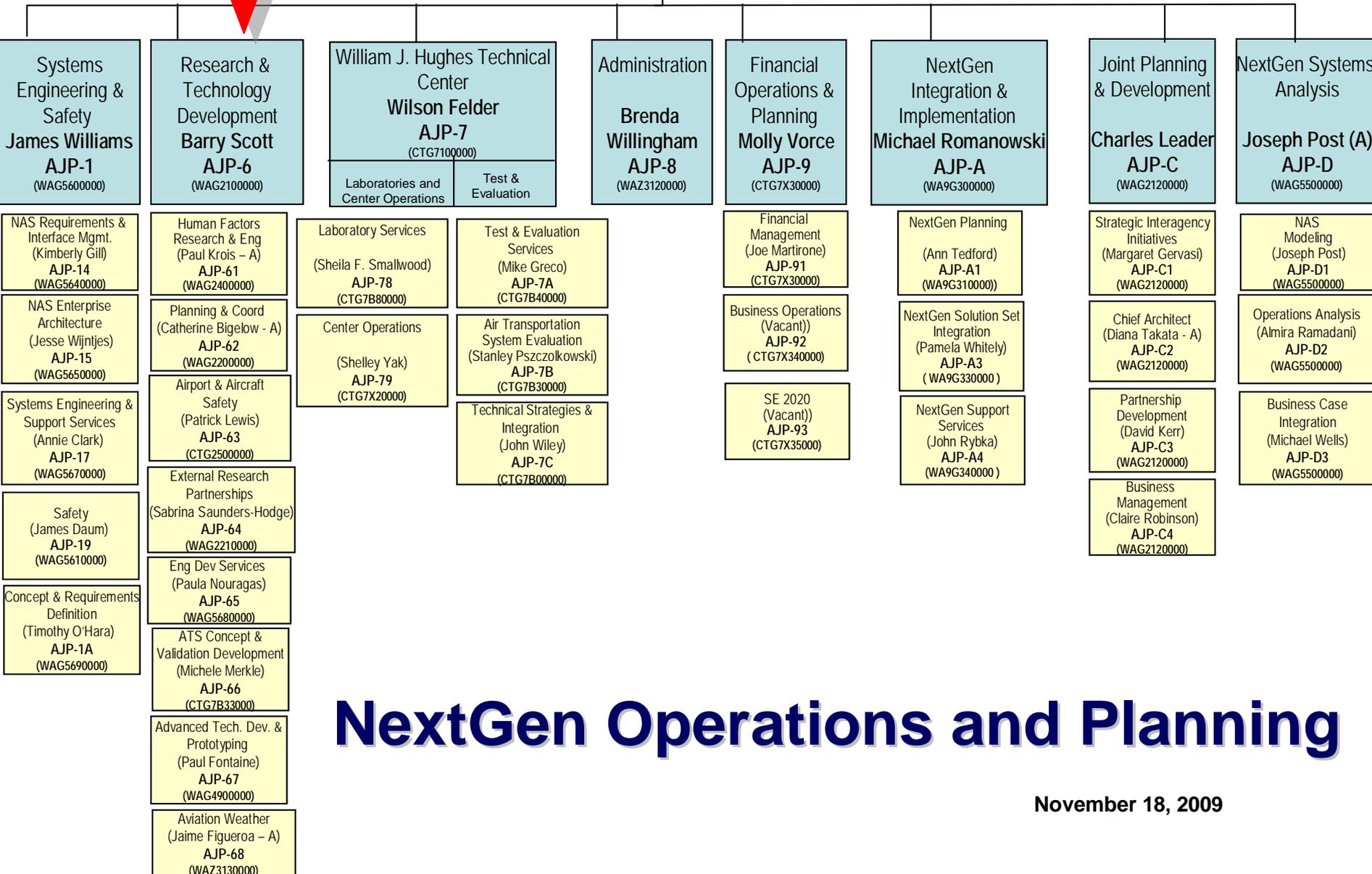
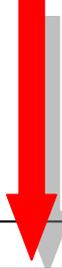


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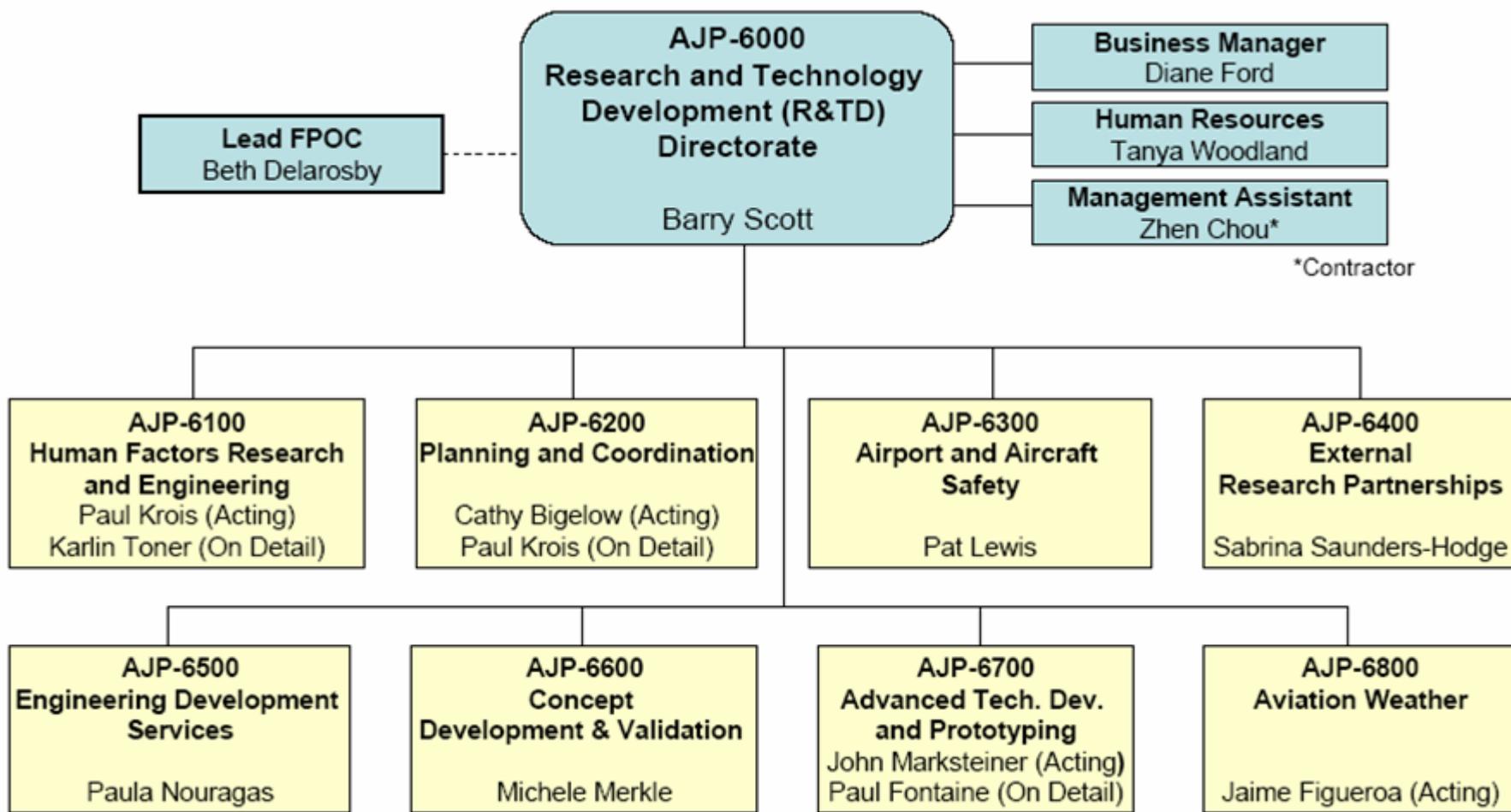
**Sr. Vice President
Victoria Cox
AJP-0**
(WA9Z100000)



NextGen Operations and Planning

November 18, 2009

Research and Technology Development



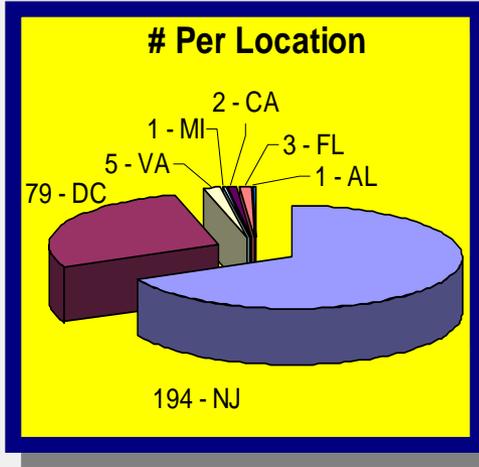
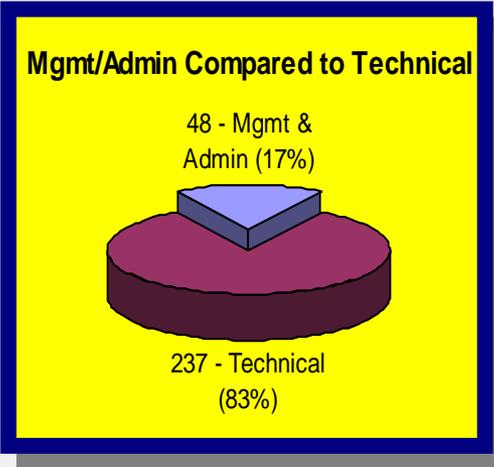
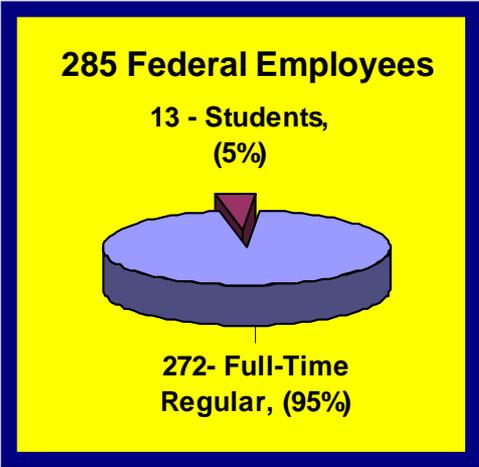
R&TD Responsibilities

- *Manage the Research, Engineering & Development (R,E&D) Program to assure alignment with the agency's Flight Plan, the NextGen Concept of Operations, and agency strategic and business plans.*
- *Provide U.S. leadership in the coordination of aviation research with international organizations worldwide.*
- *Identify, execute, and manage research and development projects related to existing and new technologies and procedures consistent with FAA's mission.*
- *Manage, direct and coordinate the agency's human factors program, and the aircraft and airport safety programs.*
- *Manage FAA liaison offices at NASA's Langley and Ames Research Centers.*
- *Serve as the agency's R&D spokesperson and maintain liaison with other agencies, industry, and foreign governments.*



R&TD Staff Characteristics

- As of the beginning of Fiscal Year 2010, the R&TD Directorate employed 285 employees.
 - *At that time there were 272 full-time federal employees, 13 students, and 24 vacancies.*
- Over 86% of staff is technical compared to management/administrative.
- Over 76% of R&TD employees are GS-13 level or higher with diverse scientific and technical backgrounds and educations.
 - *This highly skilled labor mix is required for performing the mission of R&TD, working with the technical complexities associated with modernizing the National Airspace System (NAS).*
- Staff is geographically dispersed throughout US.



Engineering Development Services Group (AJP-6500)

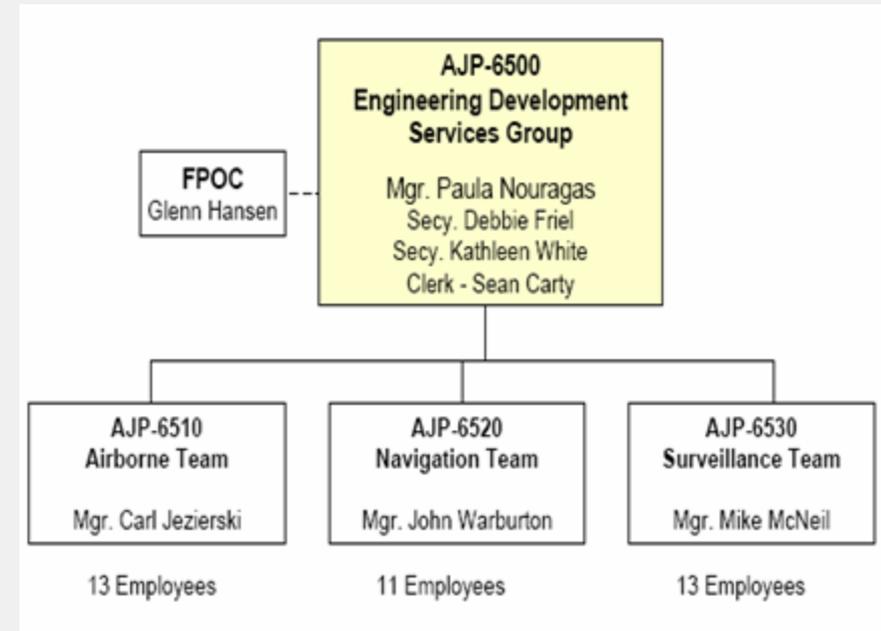
Manager, Ms. Paula Nouragas

Mission

.....to design and develop prototypes and configure ground and airborne test beds for the purpose of evaluating and validating NextGen technologies and applicable operational procedures in the areas of surveillance, navigation, and airborne/avionics systems. This enables the identification of candidate technical solutions in support of the evolution of the NAS Enterprise Architecture

Responsibilities

- Establishes, maintains, and configures ground and airborne test beds. Applies simulation and modeling techniques to evaluate enabling NextGen technologies and applicable operational procedures to support evolution of the NAS Enterprise Architecture (EA).*



Key Project Areas

- Traffic Collision Avoidance System (TCAS)*
- Surveillance Broadcast System (SBS)*
- Unmanned Aircraft Systems (UAS)*
- Local Area Augmentation System (LAAS) / Ground Based Augmentation System (GBAS)*
- Enhanced LORAN (eLORAN)*
- Automatic Dependent Surveillance - Broadcast Services (ADS-B)*
- UAS MAV Spectrum Analysis*

Navigation Team Role in SATNAV

- **Provide technical expertise to Washington DC Program Headquarters**
 - Support reviews, testing, and verification to complete the Category-I System Design Approval (SDA) for the Honeywell SLS-4000
 - Serve as Technical Director for the LAAS Development Projects
 - Project Newark, CAT I Enhancements, CAT III Prototype
 - Evaluate Vendor and Key Technical Advisor (KTA) LAAS products
 - Participate in LAAS Standards Development
 - Specification, MOPS, SARPS, Siting Standards
 - Quarterly report on LAAS Signal in Space performance
 - Participate in international technical working group meetings
- **Maintain and Operate several LAAS Test Prototype (LTP) systems**
 - Primary LAAS SIS data collection and analysis organization in the FAA
 - Provide LAAS data to the Integrated Program Team (IPT)
 - Provide systems for interoperability testing, international cooperative efforts

LAAS Products

Test Systems

ACY LAAS Test Prototype

SLS-4000

Brazil Test System

L1/L2 Data Collection

GNSS Monitors

GPS Anomalous Event Monitor
(GAEM)

Interference Testing (Prototype)

Siting Validation

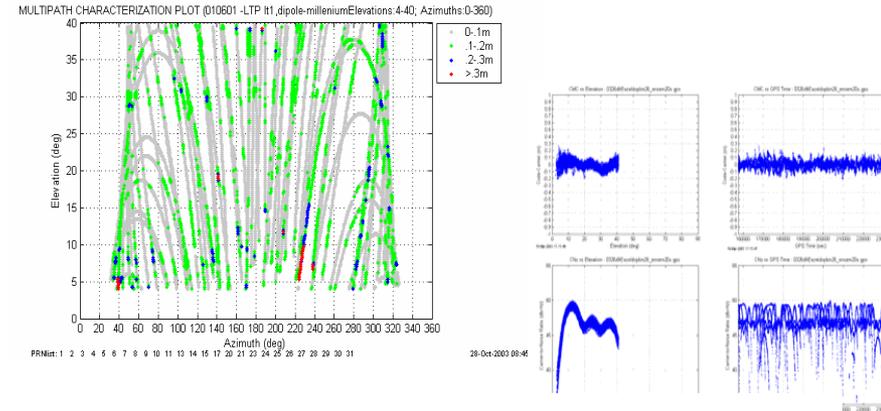
Long baseline LTP

Terminal Area Path (TAP)

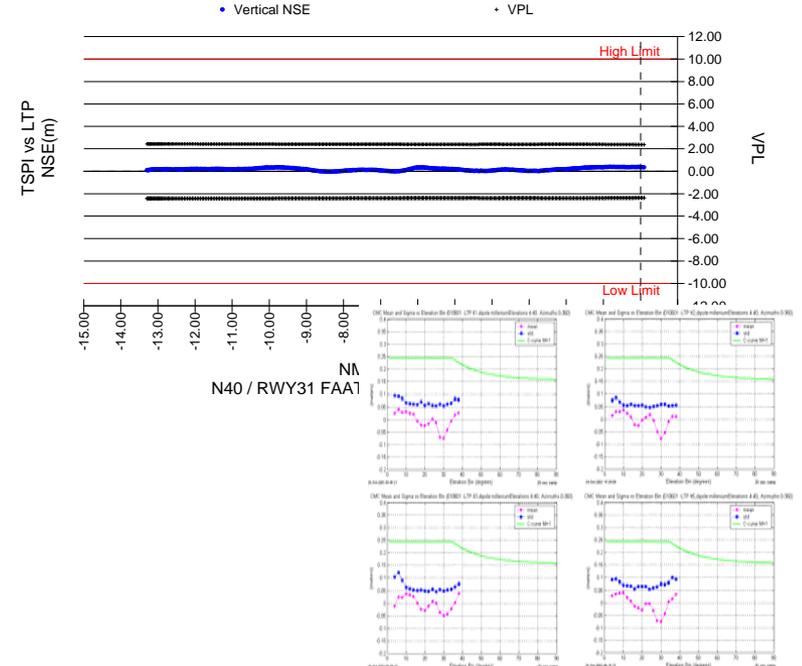


LAAS Products

- Analysis Products
 - Test System “Quick Look” processing
 - BAE Antenna Development
 - Long Term Overbounding Data
 - Collection and Performance details
 - Interference Testing
 - Commercial prototype development
 - ADD Development
 - Position Monitor Test Tool
 - Site Evaluation
 - System Design Approval
 - Brazil Ionosphere Analysis
 - EUROCONTROL Software Analysis
 - WAAS Translator data analysis



FAA LAAS Flight Test @ ACY
 Navigational Sensor Error (NSE)



Meeting Plan

- **Goals:**

- Provide details on the FAA GBAS developments
- Provide “Hands-On” access to GBAS Equipment
- Provide answers to the any questions provided
 - Capture unanswered or additional questions for later review
- Provide Points of Contact (POC) within the Navigation Team to assist with future developments

Shelly Beauchamp (CAT III, Monitors)

Dean Joannou (Flight Testing)

Carmen Tedeschi (Siting)

Chad Kemp (Prototype Operations)

Ruben Velez (Flight Analysis)

Mark Dickinson (VDB, Antennas)

Joe Gillespie (New Installations)

Shawn Casler (Web Site, Monitor)

Bina Pastakia (Newark Simulations)

October 18-22 Agenda

Time	Monday	Tuesday	Wednesday	Thursday	Friday	
09:00 AM	Arrive at Newark	Welcome/Administrative	Review / Overview	Review / Overview	Review / Overview	
09:15 AM	Introductions	Introductions				
09:30 AM	Newark Airport GBAS Installation:	Technical Center and the Navigation Team Meeting Plan	Honeywell SLS-4000 Integrity Algorithms	SATNAV Program Status	Project Newark Goals and Objectives Simulations	
09:45 AM	Motivation and Objectives	Basic GBAS Overview High Level System Description		CAT III Standards Development and Validation Plan		
10:00 AM	Break	Break	Break	Break	Break	
10:15 AM	SLS-4000 Facility Tour Newark	GBAS Integrity GBAS Key Risk Areas	Honeywell SLS-4000 Integrity Algorithms (Continued)	Non-Federal Certification Process	Airborne Equipment MultiMode Receivers Flight Test Results	
10:45 AM	Commercial Installation		Honeywell Installation Procedures	Facility Approval Checklist	Test Aircraft Tour Instrumentation	
11:00 AM					Facility Approval	
11:15 AM					Facility Approval Checklist	
11:30 AM						
11:45 AM						
12:00 PM	Depart for ACY	Lunch	Lunch	Lunch	Lunch	
01:30 PM	Travel to ACY	ACY GBAS Site Visit SLS-4000 and LAAS Test Prototype	FAA Siting Order Basic Siting Rules Application to Newark NJ	Hazardously Misleading Information (HMI) Report Purpose and Contents HMI Examples	CAAC Plans for GBAS* Tentative Slot for presentation or discussions	
01:45 PM			GAST-D Siting Requirements	Ionospheric Threat Model		
02:00 PM			Siting at Houston TX			
02:15 PM		Break	Break	Break	Break	
02:30 PM		Details GBAS Component Review: Multipath Limiting Antenna, VHF Data Broadcast, DCP	GBAS Monitors	Service Provider Responsibilities for Integrity	Summary Discussions	
02:45 PM						
03:00 PM						
03:15 PM						
03:30 PM						
03:45 PM						
04:00 PM						

