

FY09 NextGen Portfolio

NEXTGEN DISTANCE MEASURING EQUIPMENT (DME)

Date: December 2008

Trajectory Based Navigation



Overview

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- **FY09 NextGen Implementation Plan Commitments**

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Project Capability

- **Provides a pathway for the development of the NextGen DME network to support:**
 - The RNP/RNAV concept and Enterprise Architecture,
 - Reducing and replacing high cost facilities, and
 - Increasing the availability and accuracy of the positioning/navigation capability to the NAS users
- **RNAV and RNP**
 - Permit flexibility of point-to-point operations and allow for the development of routes (Q and T), procedures, and safer approaches that support increased capacity
 - Support implementation of curved path procedures that can address terrain, noise-sensitive, and/or special-use airspace

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Project Smart Sheet

- **Project Description**

This is a national program to provide the necessary equipment enhancements, relocations, and replacements to ensure that DME facilities are able to sustain the NAS in accordance with the FAA's NAS Enterprise Architecture and Infrastructure Roadmaps. High Power DMEs (HPDMEs) will be procured to support DME-DME RNAV/RNP En Route operations in order to partially or fully decommission the VOR network in accordance with the proposed FAA Navigation Roadmap. This proposed decommissioning is in support of the transition to the Global Positioning System (GPS).

- **Problem**

There are two urgent aspects to the DME problem that must be resolved in the NAS. The first is the need to replace the first generation solid state DME equipment that are collocated with the Instrument Landing Systems (ILSs) and support precision approach and landing services. (The increase in the number of aircraft equipped with Flight Management Systems (FMS) contributes to DME saturation and a shutdown of the systems.) The second aspect is the need to install HPDMEs in appropriate locations to support DME-DME RNAV requirements and enable a reduction in the VOR infrastructure.

- **Performance Gaps**

- System capacity is being affected by first generation DME equipment collocated with the instrument landing systems
- Current DME systems do not fully support the NextGen RNAV/RNP requirements

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Project Smart Sheet (Continued)

- **Support to Goals**

Flight Plan

- Reduce commercial airline fatal accident rate
- Reduce the number of fatal accidents in general aviation
- Greater capacity

NextGen Implementation Plan

- Procure and install Low Power DME systems (LPDMEs) at the 35 Operational Evolution Partnership (OEP) airports in support of RNAV/RNP
- Procure and install HPDME systems in support of RNAV/RNP and the decommissioning of the VOR/DME/VORTAC infrastructure

- **Solution**

This program will replace first generation solid state LPDMEs with new generation solid state DMEs. The DMEs will be implemented at new ILS locations. The new LPDME availability will be greater than 99.95 percent, the mean-time to repair will be less than one-half hour, the mean-time between failures will be 14,231 hours, and the mean-time between outages will be 15,193 hours – significant improvements over our current LPDME inventory. The new generation HPDME will allow for the decommissioning of all the VOR-DME/VORTACs and allow them to be located in fewer and more appropriate locations to support RNAV/RNP.

DMEs will also support the desire to discontinue, for safety reasons, step-down non-precision approach procedures whenever possible for older, less-equipped aircraft, until they can be upgraded.

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Project Smart Sheet (Continued)

- **Interdependencies**

- Internal Interdependencies**

- None

- DME, from an operational standpoint, is a stand-alone system whose service supports a number of navigation services during the en route, terminal, and approach and landing phases of flight.

- External Interdependencies**

- No primary/critical
 - Auxiliary

- ILS Marker function

- VOR (DME-DME RNAV)

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Project Schedule (FY09)

Description	S	O	N	D	J	F	M	A	M	J	J	A	S	
Prepare Source Selection Documents	█							↓						
Milestone 1 Release SIR							△							
Source Selection Evaluation							↓	█						↓
Milestone 2 Award Contract <u>(no earlier than)</u>													△	

Note: Indicate if Milestones are deliverables for Goals, EA Decisions, or NextGen Implementation Commitment

↓ Indicates predecessor/successor relationships

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Project Schedule (FY10)

Description	S	O	N	D	J	F	M	A	M	J	J	A	S
Contract Award <u>(no later than)</u>				△									
First Article Design Approval and Build		█							↓				
Milestone 1 Deliver 1 st Article Systems							△			△			
Prepare Test Sites for OT								█					
First Article OT&E Test								█					
Production Approval													△

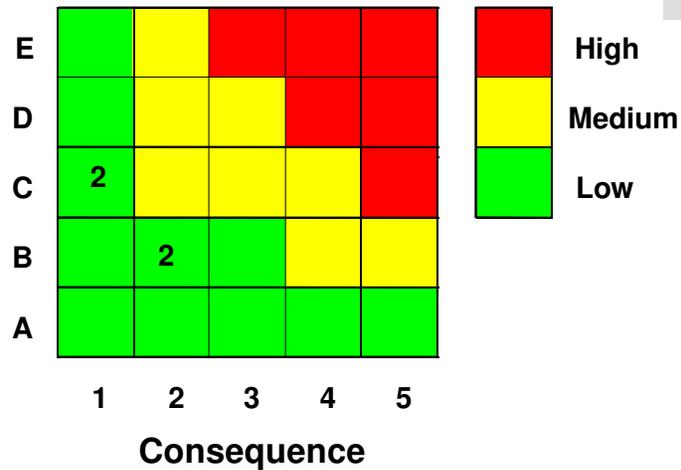
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Project Risks



Risk Level (T,S,C)	Description	Impacts	Mitigation Strategy
S-B2	Delay in award of contract due to lack of Contracting Officer resources	Delay in Implementing Trajectory Based Operations (RNAV)	Request prioritization of contract personnel to support acquisition schedule
T-C1	System Safety Analysis	Delay in production deliveries resulting in delayed implementation and achievement of benefits	Ensure system safety requirements, contract deliverables, and analysis supports project schedule
S-B2	CDRL deliverables/ acceptance	Delay in schedule and increase in cost	Ensure contract requirements support required review schedule. Ensure that all evaluators understand and commit to review process and required response dates
S-C1	In-Service Decision (ISD)	Delay in implementation of system	Begin process early and status throughout the acquisition process to ensure all issues are addressed to support planned ISD

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Project Details

• Acquisition Strategy

- The DME contract will be a competitive firm-fixed price contract with a time-and-materials CLIN for engineering support services. Contractor Depot Level Support (CDLS) will be provided at a firm-fixed price
- A Screening Information Request (SIR) will be issued requiring a Technical Proposal, Cost Proposal, and a production system for testing against the base-lined DME Performance Specification FAA-E-2996
- Selection will be “Best Value”
- Post Award will be in two phases
 - Three basic and three HP First Article DMEs for test and acceptance
 - Production will start after First Articles are accepted

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Project Details - continued

- **What are the related projects/programs? What is the integration between the projects/programs?**
 - Planning/coordination
 - NextGen navigation initiatives (maintaining capacity during IMC conditions at OEP airports utilizing DME-DME RNAV without IRU equipage)
 - Other ground-based navigation services (e.g., VOR, ILS)
 - Satellite navigation services to ensure backup service meets FAA roadmap requirements, timeline, and anticipated cost reductions
 - Flight inspection, commissioning of replaced, relocated, new facilities
 - Logistics/Training for new DME systems/architectures
 - Procurement and implementation of DME ground-based equipment to provide enhanced reliability, accuracy (DME RNAV), and Remote Maintenance Monitoring (RMM)

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Project Details - continued

- **What system dependencies exist?**

- Resolve performance gap (capacity) of first generation DME ground equipment at critical locations
- Support conventional navigation and landing services during transition to satellite-based service
- Support current and planned RNAV procedures for en route, terminal, and non-precision approach operations

- **What system requirements will be developed?**

- Software/Hardware Design/Performance Requirements Documents
- Ground Equipment Performance Verification Plans/Procedures
- Safety Management System (SMS) Documents for New Ground Equipment (Transponders)
- System-level (ground/air) Test and Evaluation Documents
- Revised Flight Inspection Criteria/Procedures for DME/DME/INS RNAV
- Life Cycle Documents
- Reliability/Maintainability Documents

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Project Details - continued

- **What other activities are required to reach implementation?**
 - Complete Procurement
 - Release SIR
 - Complete Source Selection
 - Award Contract
 - Accept first articles
 - Complete System Safety Analysis
 - Baseline System
 - Complete OT&E
 - In-Service Decision
 - Initiate Implementation
 - P&R Support for installation and commissioning
 - Approve Project Scope Agreement (PjSA)

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Resources

- **FAA Personnel**
 - Support required from other organizations/programs
 - Technical Center – Test Director
 - National Engineering Center – Document Development/Review and Testing
 - Logistics Center/Depot – Document Review, Provisioning
 - Training Academy – Training, Documents Review
 - Systems Engineering – CM, Safety Analysis Review
 - Human Factors – Product Evaluation
 - Quality Assurance – System Acceptance, Documents Review
 - Service Area P&R – Implementation

- **Other Government Personnel**
 - None

- **Contract Personnel**
 - Technical Support Contractors

- **Challenges**
 - Contracting Officers time/making early schedule dates

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FY '09 NextGen Implementation Plan Commitments

(PLA Milestones)

- **FY09 Major Milestones to be reported in the NextGen Implementation Plan**
 - SIR release
 - Contract award (no earlier than)
- **FY09 NASEA Decisions supported**
 - N/A
- **FY09 Deliverables/Products**
 - Performance technical analyses to support source selection
- **FY09 Funding Request**
 - Required for contract award; CLINs and CDRLS
 - Required for source selection testing and evaluation

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