

September 3, 2014

Meeting Summary, September 3, 2014

Tactical Operations Committee (TOC)

The sixth meeting of the Tactical Operations Committee (TOC), was held September 3, 2014 at RTCA Headquarters in Washington, DC and convened at 10:00 a.m. The meeting discussions are summarized below. The following attachments are referenced:

Attachment 1 – List of Attendees

Attachment 2 – Presentations for the Committee (containing much of the detail about the content of the material covered)

Attachment 3 – Summary of the May 16, 2014 TOC Meeting

Attachment 4 - VOR MON Recommendations on Outreach and Modification

Welcome and Introductions

Committee Co-Chairs, Mr. Jim Bowman, Vice President of Flight Operations at FedEx Express, and Mr. Dale Wright, Director of Safety and Technology at NATCA, called the meeting to order and welcomed the TOC members and others in attendance. All TOC members and attendees from the public were asked to introduce themselves (TOC members and General Public Attendees are identified in Attachment 1).

Mr. Bowman and Mr. Wright reviewed the agenda and began the proceedings of the meeting.

Designated Federal Official Statement

Ms. Elizabeth “Lynn” Ray, Vice President of Mission Support for the Air Traffic Organization (ATO), and the Designated Federal Official of the TOC, read the Federal Advisory Committee Act notice governing the open meeting.

Approval of May 16, 2014 Meeting Summary

The Chairs asked for and received approval of the written Summary for the May 16, 2014 meeting (Attachment 3).

FAA Report

Ms. Ray provided the FAA report. She began by informing the TOC the FAA expects to begin the new fiscal year in a Continuing Resolution and that work is underway for an FAA Reauthorization in 2015. She said that the work of the TOC and its help in prioritization were critical in the face of ongoing budget pressures. She noted that of the over \$7 Billion budget of the FAA's Air Traffic Organization, only about 8% was marked for flexibility on the operations side. Ms. Ray also discussed the controller workforce noting that the FAA is planning to hire approximately 1,700 new controllers in fiscal year 2015.

Ms. Ray also discussed Metroplex activities, informing the TOC that there were numerous important activities coming in the next 2 to 3 months. These include the September 18th implementation of the North Texas Metroplex, 4 new procedures upcoming in the DC Metroplex, kickoff of work in Denver, work by the Cleveland Design Team and work coming soon in Phoenix.

Implementation Roadmap for NOTAM Search

Mr. Scott Jerdan, Acting Manager of the AIM Operations Group and AIM Systems Group, briefed the TOC regarding the Implementation Plan for the NOTAM Search website. Mr. Jerdan discussed the recommendations delivered by the TOC in its role as the NOTAM Improvement Panel (NIP), an industry advisory body required in the Pilot's Bill of Rights legislation. He discussed how the previous recommendations of the NIP were used by the FAA to develop the NOTAM Search implementation plan. The Implementation approach is a four phase effort in which all of the functionality that will be developed into NOTAM Search addresses all of the NIP recommendations.

The discussion raised a number of questions and discussion points amongst the Committee members. One member asked specifically about a parameter that will limit the number of searchable waypoints in NOTAM Search to 20. The member asked whether this was enough. Unmanned missions, for example, operate with up to 100 waypoints. Mr. Jerdan pointed out to the member that the scope of NOTAM Search was domestic flights only. One Committee member also noted that integration of Unmanned Aerial Systems (UAS) in the National Airspace System (NAS) in 2015 would make this concern more relevant. Mr. Mark Cardwell, of FedEx Express and Co-Chair of the NOTAM Task Group of the TOC, noted that including an airway as part of the flight plan search for NOTAMs lowered the concern about the maximum number of searchable points in NOTAM Search. The Committee as well as the AIM office recognized that NOTAM Search will start with a maximum of 20 points and the limit may be revisited in the future.

Another question from a Committee member focused on whether NOTAM Search was more focused on General Aviation or whether this implementation plan also included external flight planning systems tapping into the NOTAM data. Mr. Jerdan talked about the NOTAM Distribution System (NDS) which is also in development in parallel to NOTAM Search. The NDS will provide raw data to external parties for integration into third party systems.

One Committee member inquired about what publicity was underway for NOTAM Search. Mr. Jerdan mentioned that work was ongoing on a communications plan. The Committee pointed out

that this was a great story of industry/government collaboration that the AIM office should work hard to communicate externally.

A Committee member inquired about how NOTAM Search will receive feedback on its new functionality. Mr. Jerdan discussed that the next phase of effort for the NOTAM Improvement Panel was to act as an industry body to provide feedback. Mr. Cardwell spoke about the plans of the NOTAM Task Group going forward. He mentioned that Task Group members would provide direct communication to their constituents and solicit direct feedback from them. He stated that the group was committed to remaining in-tact through Phase 4 of the NOTAM Search Implementation Effort. Mr. Cardwell also stated that the Task Group was excited to see its recommendations implemented in such an inclusive fashion and on a compressed timetable.

Update from NextGen Integration Working Groups

Mr. Andy Cebula of RTCA next provided briefings on the NextGen Advisory Committee (NAC), the NextGen Integration Working Groups (NIWGs) and the Performance Based Navigation (PBN) Blueprint task of the NAC.

Future of the Regional Task Groups (RTGs)

Mr. Joe Bertapelle, of JetBlue and Co-Chair of the Eastern Regional Task Group, and Mr. Mark Hopkins, of Delta Airlines and member of the TOC, next lead a discussion on the RTGs. Mr. Bertapelle provided some background on the RTGs noting that historically the RTGs and their predecessor groups have been forums for information flow from FAA to industry as well as forums to work solutions to airspace and procedural issues in the NAS. The RTG leaders noted that information flow was important but not enough to sustain the RTGs. Activity for the RTGs was currently dormant but there was interest to restart the work.

Ms. Ray communicated some of the concerns regarding the work of the RTGs. She did not wish to duplicate efforts recognizing that the National Customer Forums (NCF) were also forums in which industry and the FAA had opportunity to engage on regional operational issues. Mr. Hopkins pointed out that not all issues were given appropriate attention or resolution in the NCF environment. For example, a significant upcoming Los Angeles Airport construction effort was raised in a previous RTG forum, and coming out of that RTG meeting, an ad hoc group came together to plan for the construction.

Ms. Ray also raised a concern about bandwidth, emphasizing that any efforts by the RTGs needed to focus on the most important issues and respect the limited available time for all parties involved. Ms. Ray mentioned that she was cognizant of wanting to be sure when she requested work for the RTGs that the FAA knew where the results of the recommendations would go. Questions about any potential RTG task that needed to be answered included: What should the output be? Who should get it and what should they do with it?

The TOC discussed that continuing information exchange at a regular cadence between the industry and the FAA was important. The RTGs would have the most productive interactions with the Managers of Tactical Operations (MTOs) and the Operational Support Groups (OSGs) in the Service Centers. Once a topic in information exchange begins to require resources to further understand, study or model an issue, it would be a candidate to turn into a tasking.

The Committee discussed Special Activity Airspace (SAA) in context of the RTGs. One Committee member noted that the availability and use of real time SAA information was improving and that the National Special Activity Airspace Program (NSAAP) was progressing. The Committee recognized that it would be valuable to re-engage with NSAAP in the next Committee meeting to learn more about the Concept of Operations and implementation plan.

A Committee member inquired about the subject of Commercial Space, specifically in South Texas. Ms. Ray mentioned that there are needs to establish policy around space ports. The Mission Support organization in the FAA has been asking strategic questions on how to think through space ports and these issues may ultimately be more policy level questions for the NextGen Advisory Committee.

For next steps, the Committee advised the RTGs to continue restarting the dialogue with the MTOs and OSGs to continue the information flow between the FAA and the RTGs.

Review Potential New Tasks for the TOC

The TOC next reviewed three potential new tasks for the Committee:

1. South Florida / Caribbean Operations for the Eastern Regional Task Group

In context of the preceding Regional Task Group discussion, Mr. Bertapelle discussed the opportunity for the Eastern RTG to work on addressing operational issues in South Florida and the Caribbean. He spoke about the growth in traffic in the region and the degradation of operational performance from inefficiency and delays from Airspace Flow Programs (AFPs). Mr. Bertapelle stated that the next step on this potential task was for the Eastern RTG to meet in the third week of September to provide additional detail on the issue and what the ERTG could do to address the problem.

2. “Review, Revise, Remove (Three Rs)” for Right Sizing Procedures in the NAS

Ms. Ray next presented the concept of a task to gather industry input into the process of right sizing procedures in the NAS. She noted that it takes approximately \$3,000 per year to maintain each of the 14,000 Instrument Flight Procedure in the NAS and the FAA was looking to remove procedures that are not necessary. The FAA was working through a task to request the TOC for industry input into the criteria for evaluating which procedures to remove from the NAS. Ms. Ray spoke about the difference between regulatory and non-regulatory processes for procedure removal and that the criteria request would be for both approaches. She said the tasking would come to the TOC in 2-3 months’ time and require about 3-5 months to complete.

3. Airport Construction and Safety Risk

Mr. Dan Allen, FedEx Express, presented a concept for a tasking around airport construction. Mr. Allen's primary interest was about the safety risks introduced into an operation through the construction process. He noted historical examples in which construction programs removed vertical guidance on approaches in certain airports that resulted in safety events. He provided examples such as recent construction in Oakland (OAK) in which some carriers became involved in the process and developed temporary RNAV procedures to a displaced threshold at the airport, mitigating the safety hazard. Mr. Allen recommended the TOC initiate a task to examine historical experience in airport construction to learn what went well and what did not in an effort to develop a template of best practices.

Ms. Ray noted that a procedure can be developed in three months but there were many other procedures in the NAS and much maintenance required on the existing set. She mentioned that when one procedure is expedited in the short term, the impact on the balance of the outstanding procedure work is significant.

A Committee member mentioned that this task concept fit well into the FAA's Safety organization which has been working with airports to decrease any situation in which there is no vertical guidance to the airport. The member mentioned that it is important to start early in the process with the airport to have the time to mitigate the issues. Another committee member echoed the desire for the NAS to generally maximize the number of runway ends with vertical guidance. He stated this was a big "safety bang for the buck."

Industry Ideas for Future TOC Work

Prior to the September 3rd TOC meeting, the Committee was polled for its ideas for future TOC work. The ideas were consolidated and presented for consideration. The ideas are:

1. Transition prioritized policy decisions out of the NAC and into the TOC for implementation

Some possibilities in this idea were to use the TOC for development of PBN procedures based on the work of the PBN Blueprint and the PBN NIWG, use the TOC for implementation of recommendations from the other three teams of the NIWGs or mixed operational capability (RNP vs conventional) core airports. The Committee discussed that many of these ideas may ultimately remain in the NAC context; however, Ms. Ray pointed out that implementation based on the PBN Blueprint may have the most opportunity for future involvement of the TOC.

2. Review waivers in the system and determine direction for transitioning them to procedures

The Committee suggested that Equivalent Lateral Spacing Operation (ELSO) in DFW and ATL would be an interesting candidate. Ms. Ray noted that ELSO was to be signed out September 30th with publication in March.

3. Collaborate with ATO to evaluate use and data sharing around automation

The Committee discussed that Time Based Flow Management (TBFM) lacked visibility into its planned timing and this created challenges for operators. There was recognition that this topic may be better

suited for the Collaborative Decision Making (CDM) environment. Ms. Ray noted that earlier in the year, her team begun considering how to go about conducting industry engagement for TBFM. She offered to have her team provide an update to the TOC on where TBFM stands in its plans as well as its use policy and approach to data sharing.

4. Monitor activity and/or create work groups that support the rollout of new operational initiatives in the NAS

The first tangible idea in this category was monitoring the anticipated deployment of a SAAB-Sensis remote tower system at Leesburg (JYO). Historical experience with remote towers has been outside of the U.S. only and the Committee raised a concern that all development on standards for remote towers was happening in Europe.

Ms. Ray pointed out that Leesburg specifically was not an FAA project but a State of Virginia project which would make a tasking to the TOC challenging.

5. ATC coordination and procedures that enable UAS integration into the NAS

This concept focused on developing ATC handbook information on UAS performance/capabilities and beginning to consider how to go about integrating UAS operations in the NAS. The Committee noted there are many efforts underway on UAS's which the Committee does not want to duplicate.

VOR MON Recommendations on Outreach and Modifications

Mr. Don Dillman, FedEx Express, Co-Chair of the VHF Omni-directional Range (VOR) Minimum Operating Network (MON) Task Group, briefed the Committee on its recommendations on outreach and modifications.

Mr. Dillman explained that the VOR MON Task Group developed and delivered three broad areas of recommendations. The three areas focus on:

- Process for decommissioning VORs to achieve the MON
- Community outreach and education before and during implementation of the MON
- Required modifications and mitigations to successfully implement the MON

Regarding the process for decommissioning, Mr. Dillman stated that the current process of decommissioning VORs is not scalable to the approximately 500 VORs targeted to reach MON objectives. Additionally, the process needs to balance multiple needs, namely for stakeholders to be informed and provide feedback while allowing the FAA to review and adjudicate the comments in a reasonable amount of time with a reasonable level of resources.

Mr. Dillman presented a series of guiding principles regarding the process of decommissioning:

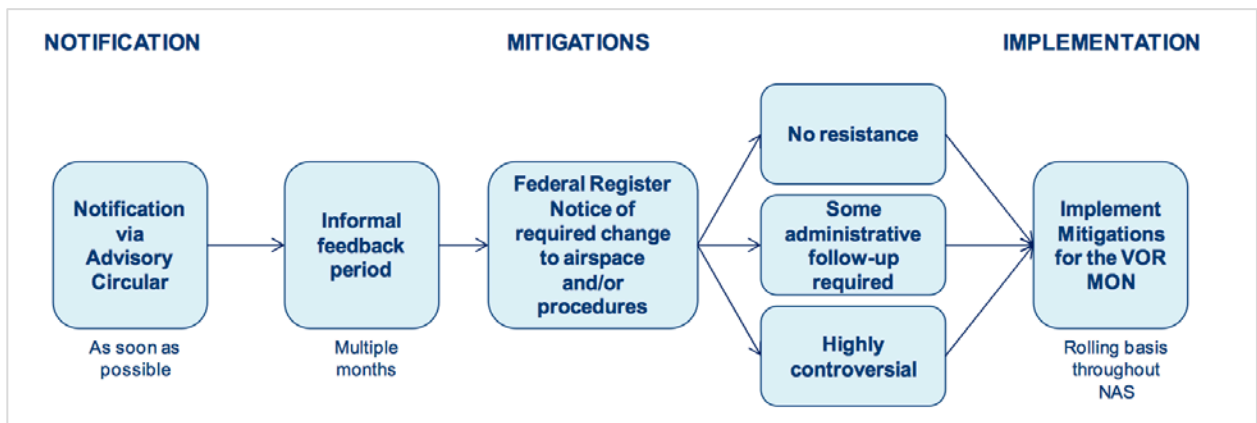
- Given the scale of decommissioning involved with the VOR MON, batch notification announcing all of the VORs planned for decommissioning to the public is preferable to individual notification (i.e., announce one VOR at a time).

- The process for providing notification, gathering public comment and addressing public comment should not be so onerous to stall or delay the MON process.
- The public comment and feedback process for one VOR should not delay the decommissioning process for other VORs.
- Notification of the VORs planned for decommissioning should be transparent to the public and the process for making final determinations of individual VORs (the mitigations to be considered) should be included in the initial notification.
- The work of determining the mitigations required by the VOR decommissioning must occur upfront to understand the network impacts of a large-scale VOR shutdown.

Next, Mr. Dillman presented three recommendations on the process of decommissioning:

- 1) At the beginning of the process, the FAA should notify the public concerning the full list of VORs to be planned for decommissioning. This may be done via non-rulemaking action such as an Advisory Circular (AC). If the FAA chooses to use ACs, publication of ACs could include one for the entire MON Program or one for each Service Center. In either case, the list(s) should be broken down by State.
- 2) Process for decommissioning should separate the notification (non-rulemaking) component from the rulemaking components to not stall the process unnecessarily.
- 3) The process for collecting, evaluating and adjudicating public comment should be communicated clearly in the notification of the VOR MON.

Mr. Dillman also presented a recommended process flow for decommissioning in the VOR MON:



Mr. Dillman next discussed three levels of outreach on the VOR MON:

- 1) Level one: Notification
 - One-way flow of information from the FAA to the Public
 - Include information about the VOR MON Program as a whole, the rationale, the value to the Public and the list of VORs and sequence for shut down
 - Standard template of information about each of the VORs scheduled for shutdown as part of the MON

- Tools for this phase of communication may include (but are not limited to) public notices, magazine articles, press releases, flyers, mailers, etc.
- 2) Level two: Interaction
- Stakeholders expected to request information at a more local and detailed level
 - Do not expect all VORs scheduled for shutdown will require extensive interaction; some will
 - May involve community town hall meetings and/or individual meetings with key local stakeholders.
- 3) Level three: Exception
- FAA may take some action to evaluate exceptions and even modify the plan(s) based on new inputs unavailable until the VOR MON list is released to the public.

Next, he reviewed Guiding Principles for outreach:

- FAA should focus on providing complete information early in the process.
- Communication about VOR MON should include messages that the process is not ad hoc and not just a random selection of VORs. Include fact that there were criteria, criteria were weighted and selection was based on a structured approach.
- Messaging about the VOR MON should be focused on the flying public and why the VOR MON Program is beneficial for the flying public. While they can and should be mentioned, the messaging should not focus on benefits to the FAA.
- VOR MON requires participation of three main groups: the FAA, VOR MON Task group (and industry they represent) and Public, each with a responsibility in the process:
 - FAA responsibility to create plan and respond to industry stakeholders in modifying that plan
 - VOR MON Task Group responsibility to represent broad constituencies and provide recommendations / feedback to FAA on the creation of criteria and implementation plans.
 - Public responsibility to provide feedback with legitimate concerns on individual VORs.

Next, Mr. Dillman reviewed Recommendations on Outreach:

- 1) The overarching theme about the VOR MON should relate to the transition to Performance-Based Navigation (PBN) and NextGen.
- 2) To ensure transparency, the FAA should provide a published VOR MON plan, including plans for decommissioning VORs, as soon as possible.
- 3) FAA should accept the support of industry organizations to help communicate the message about the VOR MON.
- 4) Utilize the internet and social media to communicate about the VOR MON.
- 5) The FAA should actively reach out to Legislative Staff to ensure they understand the Program and the approach and rationale for decision-making.

Finally, Mr. Dillman offered a series of recommendation on modifications required for the VOR MON regarding procedures, publications, notifications and training and operations.

Committee Action: The Committee agreed by consensus to approve the VOR MON Recommendations on Outreach and Modification (Attachment 4).

FAA Update on PBN Route Strategy

Mr. Robert Novia provided an update on the FAA's PBN Route Strategy which is a required input for the VOR MON Task Group to complete its remaining task. Mr. Novia described the process and the current thinking on this strategy. The Committee raised questions about the impact of changing the NAS route structure on Flight Management Computers (FMCs) and their databases.

Mr. Novia discussed the efforts underway to validate the route structure via Human In the Loop Simulations (HITLs) as well as fast time simulation. One Committee member noted that the approach to route validation parsed the NAS into multiple North-South sections while many of the routes flowed East-West. The Member pointed out that Service Center boundaries or jurisdictions of the Managers of Tactical Operations may also serve as useful organizing principles for this process.

Anticipated issues for TOC consideration and action at the next meeting

At the next meeting, the Committee will launch new taskings and receive briefings on NSAAP and TBFM.

Other business

No other business was raised.

Adjourn

Chairman Wright ended the meeting of the Committee at 3:30 p.m.

Next Meeting

The next meeting of the TOC is November 20, 2014 in Washington, DC.

Attendees:
September 3, 2014 Meeting of the Tactical Operations Committee
Washington, DC

Name¹	Company
Allen, Dan	FedEx Express
Ball, Mike	Northrup Grumman
<i>Baum, Chris</i>	Air Line Pilots Association
Bertapelle, Joe	JetBlue Airways
<i>Bowman, Jim</i>	FedEx Express
Cardwell, Mark	FedEx Express
Cebula, Andy	RTCA, Inc.
<i>Cirillo, Carlos</i>	International Air Transport Association
Courtney, Dale	Federal Aviation Administration
Dillman, Don	FedEx Express
<i>Foose, Scott</i>	Regional Airline Association
Gay, Trish	Federal Aviation Administration
<i>Hopkins, Mark</i>	Delta Air Lines, Inc.
<i>Jenny, Margaret</i>	RTCA, Inc.
Jerdan, Scott	Federal Aviation Administration
<i>Kast, Christian</i>	United Parcel Service
Mitra, Trin	RTCA, Inc.
<i>Molin, Doug</i>	The MITRE Corporation
<i>Narvid, Colonel Juan</i>	DoD Policy Board on Federal Aviation
<i>Newton, David</i>	Southwest Airlines
<i>Oswald, Chris</i>	Airports Council International - North Ame...
Powell, Gary	Federal Aviation Administration
<i>Ray, Lynn</i>	Federal Aviation Administration
Solley, Edwin	Southwest Airlines
Teel, Brandi	RTCA, Inc.

¹Committee member names appear in italics.



THE GOLD STANDARD FOR AVIATION SINCE 1935

RTCA Tactical Operations Committee

Sixth Meeting

September 3, 2014

RTCA Headquarters



THE GOLD STANDARD FOR AVIATION SINCE 1935

Welcome and Introduction

Co-Chairs:

Jim Bowman, FedEx Express

Dale Wright, NATCA

Topical Agenda

- Approval of May 16, 2014 Meeting Summary
- FAA Report
- Implementation Roadmap for NOTAM Search
- Report from the NextGen Integration Working Groups
- Future of Regional Task Groups
- Potential New Task Ideas
- Industry Ideas for Future TOC work
- VHF Omni-directional Range (VOR) Minimum Operating Network Recommendation on Outreach and Modifications
- FAA Update on PBN Route Strategy

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PUBLIC MEETING ANNOUNCEMENT

**Read by: Designated Federal Official Elizabeth Ray
Tactical Operations Committee (TOC)
September 3, 2014**

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC.

Notice of the meeting was published in the Federal Register on:

August 19, 2014

Members of the public may address the committee with PRIOR APPROVAL of the chairman. This should be arranged in advance.

Only appointed members of the Advisory Committee may vote on any matter brought to a vote by the Chairman.

The public may present written material to the Advisory Committee at any time.

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THE GOLD STANDARD FOR AVIATION SINCE 1935

Review and Approval of:
May 16, 2014 Meeting Summary

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THE GOLD STANDARD FOR AVIATION SINCE 1935

FAA Report

Elizabeth "Lynn" Ray
Vice President, Mission Support Services
Air Traffic Organization

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THE GOLD STANDARD FOR AVIATION SINCE 1935

Implementation Roadmap for NOTAM Search

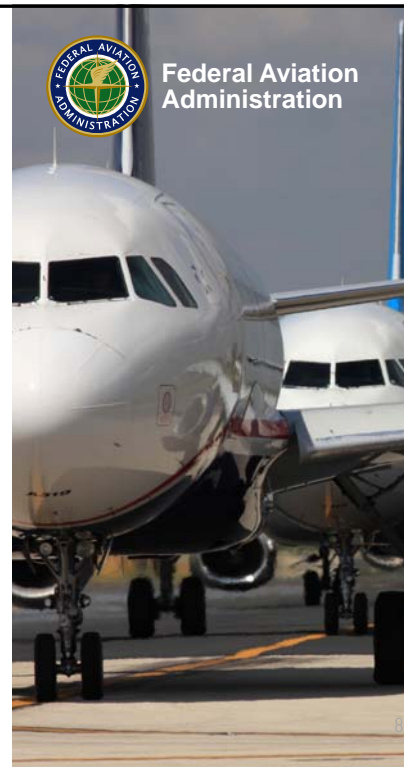
Scott Jerdan
Manager, AIM Operations Group (A)
Manager, AIM Systems Group (A)
Air Traffic Organization

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NOTAM Search Enhancements

Overview & Implementation Plan

Presented To: RTCA, Tactical Operations
Committee
By: Scott Jerdan, Manager
AIM Systems Group, FAA
Date: September 3, 2014



Background

PUBLIC LAW 112-153—AUG. 3, 2012 126 STAT. 1159

Public Law 112-153
112th Congress

An Act

To amend title 49, United States Code, to provide rights for pilots, and for other purposes.

Aug. 3,
[S. 12]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Pilot's Bill of Rights".

SEC. 2. FEDERAL AVIATION ADMINISTRATION ENFORCEMENT PROCEEDINGS AND ELIMINATION OF DEFERENCE.

126 STAT. 1162 PUBLIC LAW 112-153—AUG. 3, 2012

Board, including hearing testimony, transcripts, exhibits, decisions, and briefs submitted by the parties.

SEC. 2. NOTICES TO AIRMEN.

(a) **IN GENERAL.**—

(1) **DEFINITION.**—In this section, the term "NOTAM" means Notices to Airmen.

(2) **IMPROVEMENTS.**—Not later than 180 days after the date of the enactment of this Act, the Administrator of the Federal Aviation Administration shall begin a Notice to Airmen Improvement Program (in this section referred to as the "NOTAM Improvement Program")—

(A) to improve the system of providing airmen with pertinent and timely information regarding the national airspace system;

RTCA

Approved by the Tactical Operations
Committee November 2013

NOTAM Activity Prioritization

RTCA

Approved by the Tactical Operations
Committee February 2014

NOTAM Success Criteria and Metrics

RTCA

Approved by the Tactical Operations
Committee May 2014

NOTAM Search and Filter Options

Pilot's Bill of Rights (PBoR):
 Congressional mandate to improve the NOTAM System

RTCA NOTAM Task Group:
 Guidance from aviation stakeholders

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NOTAM Task Group Priorities

From "NOTAM Search and Filter Options: Report of the NOTAM Task Group in Response to Tasking from the Federal Aviation Administration"

NOTAM Task Group Relative Weights for New Search/Filter Options

Search/Filter Option	Relative Weight
Flight Plan Route	29%
Effective Dates/Times	27%
Keywords	19%
Procedure Type	11%
Runway Characteristics	9%
Alternate Airports	6%

Specific Search/Filter Recommendations:

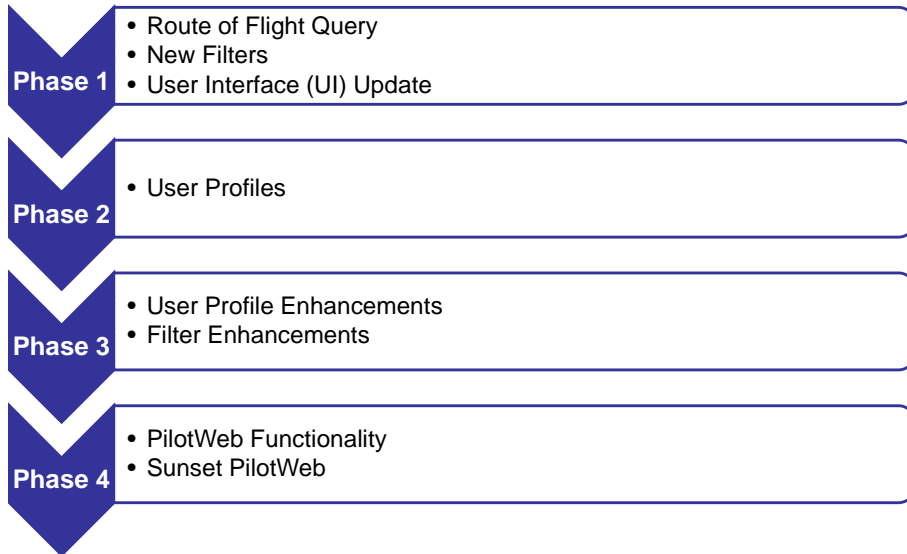
- Search by Flight Plan
- Search by Effective Dates and Times
- Filter by Keywords
- Filter for Procedure Type
- Filter by Runway Characteristics
- Append Specific Airports

Additional Recommendations:

- Search multiple keywords
- Filters include/exclude the filter term
- Create personalized accounts
- Consolidate into one FAA NOTAM website

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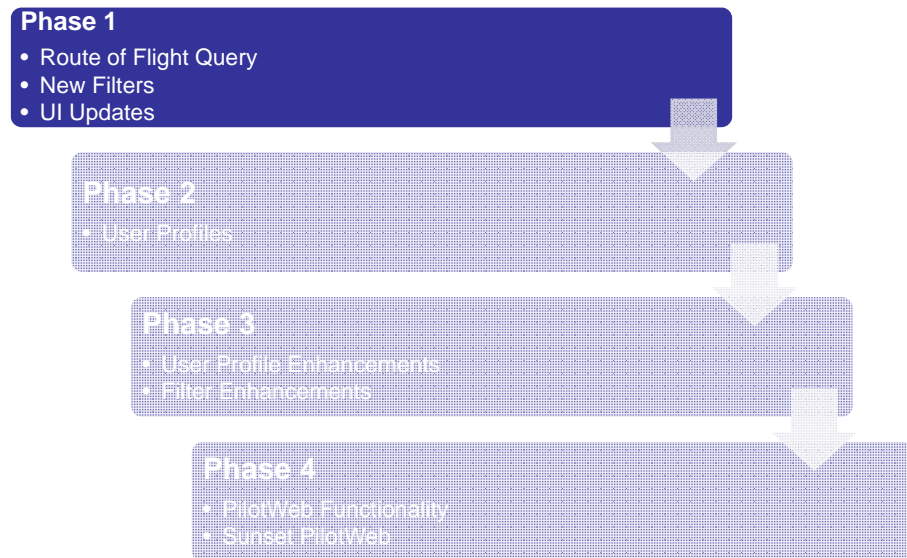
NOTAM Search Enhancements



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Phase 1 Enhancements

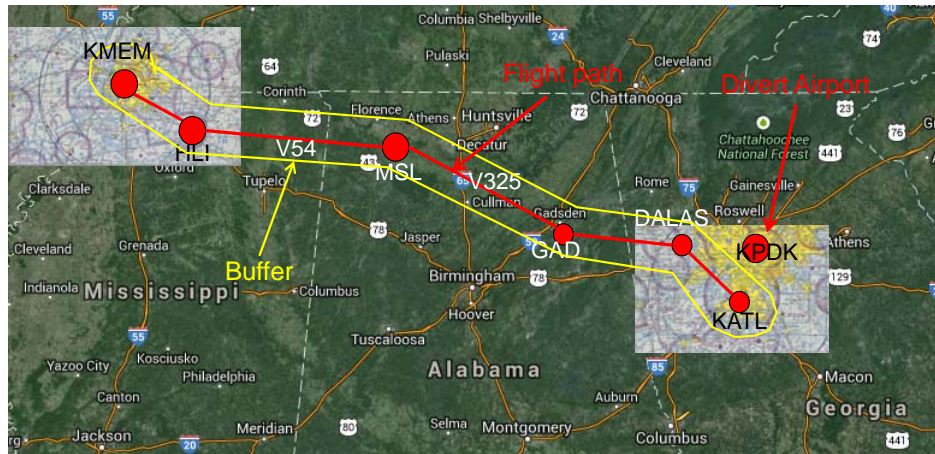


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Route of Flight Query

Example Route: KMEM HLI V54 MSL V325 GAD DALAS KATL



NOTAM Search returns all NOTAMs within buffered flight path + diverts



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Route of Flight Query Options



User Entry

- Enter flight path string
 - 2-20 designators
 - Airport
 - Navaid
 - Named fix
 - Route/airway
- Enter divert airports
 - 0-5 designators
- Enter buffer
 - 1-125 nautical miles from center line

Validation Rules

- All designators validated against FAA data
- Flight path limited to US and territories
- Flight path determined by order of entry
- First/last designators must be airports
- Consecutive routes not supported

System Output

- NOTAM results separated into groups for independent sorting & filtering
 - Departure Airport
 - Arrival Airport
 - Divert Airport(s)
 - En Route



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New Filters



Date/time range

- View only NOTAMs that are effective during a specific time period (e.g., a planned flight)

Keywords/classes

- Includes 20 standard NOTAM keywords
- Filter related keywords or special groups by choosing a class

ARTCC/FDC/regulatory notices

- Remove/include these lengthy NOTAMs as necessary

Class/Keyword

☐ Aerodrome

☐ AD

☐ APRON

☐ RWY

☐ TWY

☐ Procedure

☐ ODP

☐ SID

☐ STAR

☐ IAP

☐ VFP

☐ SPECIAL

☐ Airspace/AIRSPACE

☐ Communication/COM

☐ Data/DATA

☐ Navaid/NAV

☐ Obstruction/OBST

☐ Other/(O)

☐ Route/ROUTE

☐ Chart/CHART

☐ Security/SECURITY

☐ Services/SVC

☐ Military

☐ International



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Updated User Interface

- ✓ Google-style search
- ✓ Multiple layout options
- ✓ Modern web technology
- ✓ Printer-friendly PDF export



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Phase 2 Enhancements

Phase 1

- Route of Flight Query
- New Filters
- UI Updates

Phase 2

- User Profiles

Phase 3

- User Profile Enhancements
- Filter Enhancements

Phase 4

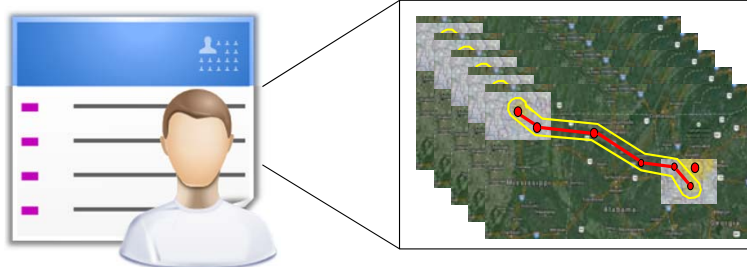
- PilotWeb Functionality
- Sunset PilotWeb



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User Profiles



- ✓ Create user login to save search preferences
- ✓ Optional feature
- ✓ Designed for avid users
- ✓ Ability to save up to 10 pre-defined flight path queries
- ✓ Additional features in Phase 3



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Phase 3 Enhancements

Phase 1

- Route of Flight Query
- New Filters
- UI Updates

Phase 2

- User Profiles

Phase 3

- User Profile Enhancements
- Filter Enhancements

Phase 4

- PlotWeb Functionality
- Sunset PlotWeb



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Profile & Filter Enhancements



User Profile Enhancements

- Designate preferred airports
- Save/recall previous queries
- Save filter settings
- Save sorting settings



Filter Enhancements

- Procedure type*
- Runway characteristics
 - Length/width
 - Surface type
- Weight limits*

*Subject to data availability



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Phase 4 Enhancements

Phase 1

- Route of Flight Query
- New Filters
- UI Updates

Phase 2

- User Profiles

Phase 3

- User Profile Enhancements
- Filter Enhancements

Phase 4

- PilotWeb Functionality
- Sunset PilotWeb



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PilotWeb Functionality

**Implement
PilotWeb
Functionality**

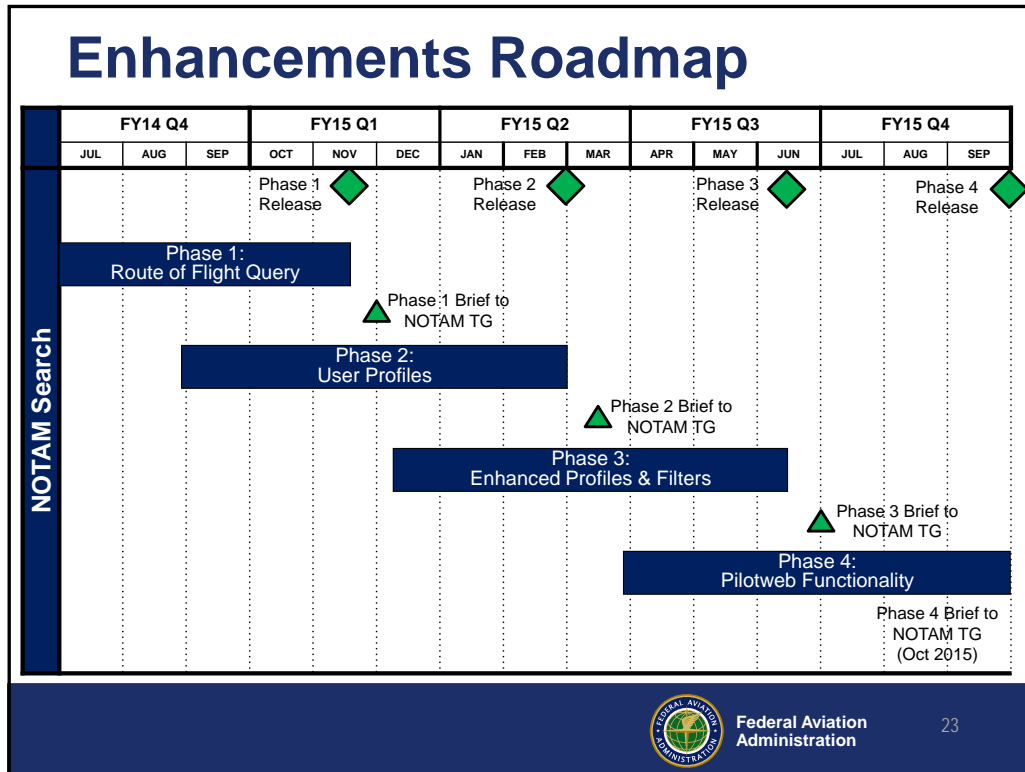
Sunset PilotWeb

- **Integrate remaining PilotWeb features**
- **Examples:**
 - Pre-defined NOTAM queries
 - o TFRs
 - o CARF
 - o GPS
 - North Atlantic and Pacific Tracks




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Summary

NOTAM Task Group Recommendation	Phase 1 (Nov '14)	Phase 2 (Feb '15)	Phase 3 (Jun '15)	Phase 4 (Sep '15)
Search by Flight Plan Route String	✓			
Search by Effective Dates and Times	✓			
Filter by Keywords	✓			
Filter by Procedure Type			✓	
Filter by Runway Characteristics			✓	
Append Specific Alternate Airports	✓			
Search Multiple Keywords	✓			
Include/Exclude Filter Term	✓			
Create User Profiles		✓		
Consolidate Websites				✓



Federal Aviation Administration

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Update from NextGen Integration Working Groups

Andy Cebula
RTCA

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NextGen Advisory Committee



FAA Prioritization Task

Approved September 2013

- Response to FAA Request to understand industry priorities
- Review current FAA NextGen plans and activities
- Landmark Moment!
- Develop prioritized list of:
 - Tier 1 - what should continue no matter what (11)
 - Tier 2 - what should continue, resources permitting (8)
 - All Other (17 capabilities not ranked as priority)

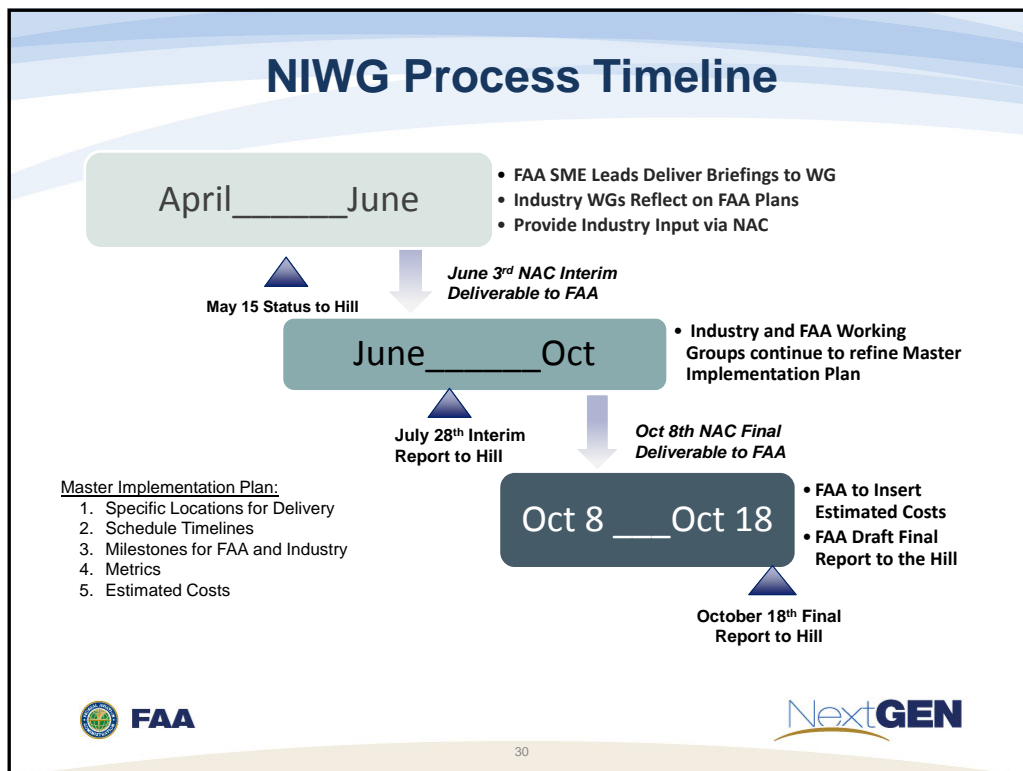
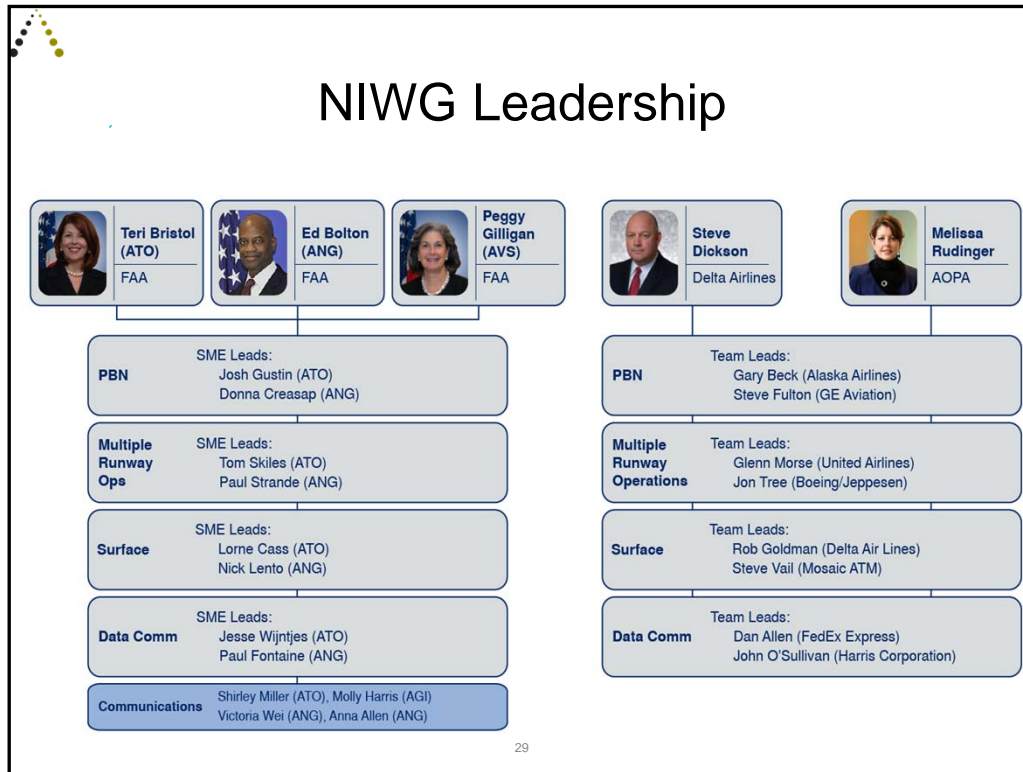
27

NextGen Integration Working Group

- Subset Tier 1 – Deep Dive to Implement by dates certain
- Focus Areas:
 - Closely Spaced Parallel Runways
 - DataComm-enabled Controller-Pilot DataLink Communications (CPDLC) and pre-departure clearances
 - Performance Based Navigation (PBN)
 - Surface
- Develop Plans
- Track Progress



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New Way of Functioning

- Joint FAA-Industry Teams
- Final Recommendation Due October NAC Meeting
- Post October – Under Discussion



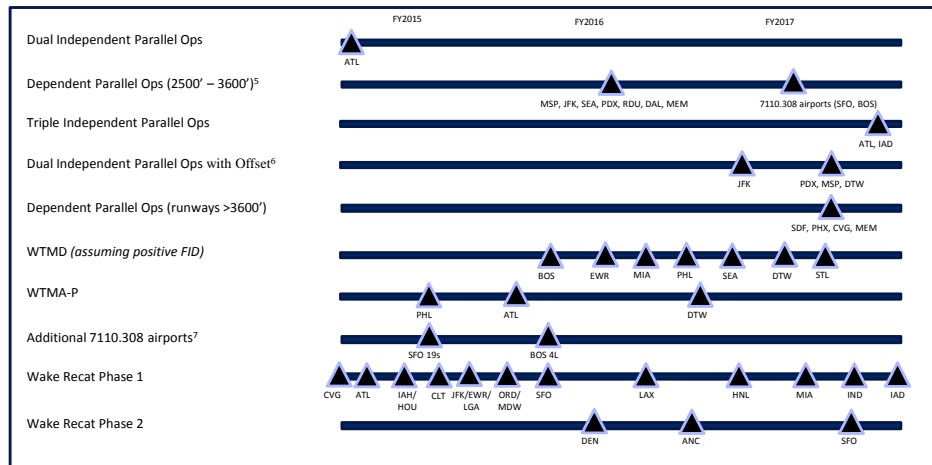
31

MRO RECOMMENDATIONS

- Industry Supports FAA MRO and Separation Management Implementation Plan, Including Locations and Timelines
 - Separation Standards Reductions Have Great Value to the NAS
- Meeting Planned Safety Case and Procedure Authorization Milestones Critical for Realizing Benefits
- Wake Recategorization Is a High Benefit-Low Cost NextGen Initiative that Should Be Given a High Priority
- Industry Acknowledges FAA Commitment to Increase Wake ReCat Implementation in FY15 and Beyond (NAC Recommendation)
- Once Implemented, New Separation Standards and Procedures Will Support New Runway Construction and Other Delay Reduction Opportunities
 - Implementation Plans Should Be Flexible to Accommodate Changing Priorities

32

Multiple Runway Operations – Locations and Timeline



FAA

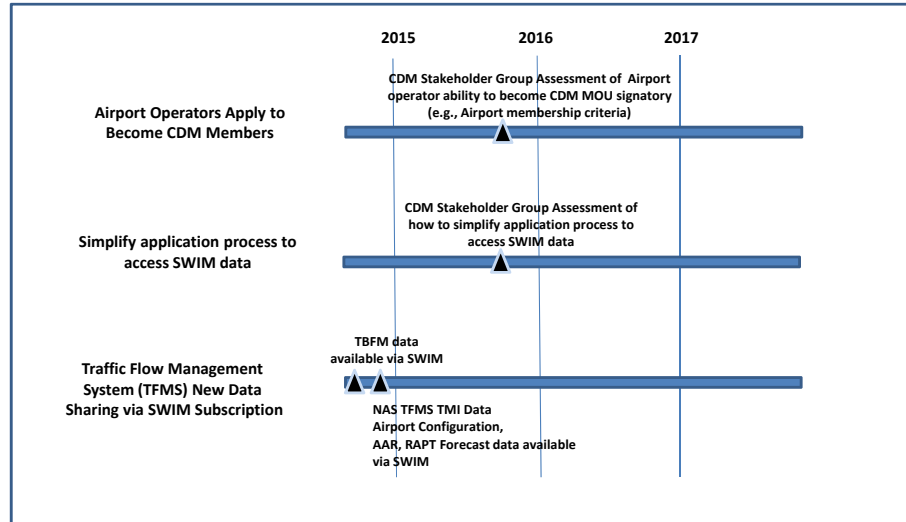
NextGEN

Surface Recommendations

- Airport CDM Membership & Improved Data Availability**
 - Improved data sharing through CDM Membership for Airports
 - Availability of TBFM, TFMS, and NTML data to CDM Members via SWIM
 - Simplified process and instructions for accessing SWIM data
- Airport Surface Departure Metering**
 - Establish an initial airport surface departure metering capability that reflects the FAA's Surface CDM Concept of Operations (CONOPS)
- Provide Real-Time Traffic Management Updates to NY ATCTs, Flight & Airport Operators**
 - Provide AEFS to NYC ATCT's
 - Provide NY ATCT controllers with real-time changes to route and other traffic management initiative (TMI) information via electronic flight strips
 - Enable NY ATCTs to better manage airport surface traffic, reduce taxi delays and increase predictability.
- Utilize Earliest Off Block Time (EOBT) or Equivalent Data Element to Reduce TBFM Delays for Short Range Flights**
 - Departure Readiness to become basis for TBFM wheels-off time assignment for short-range flights inbound to metering locations
 - Wheels-off assignment process is initiated while flight is still at the gate, as opposed to waiting until initial radio contact with ATC, which often occurs after taxiing to "the spot"

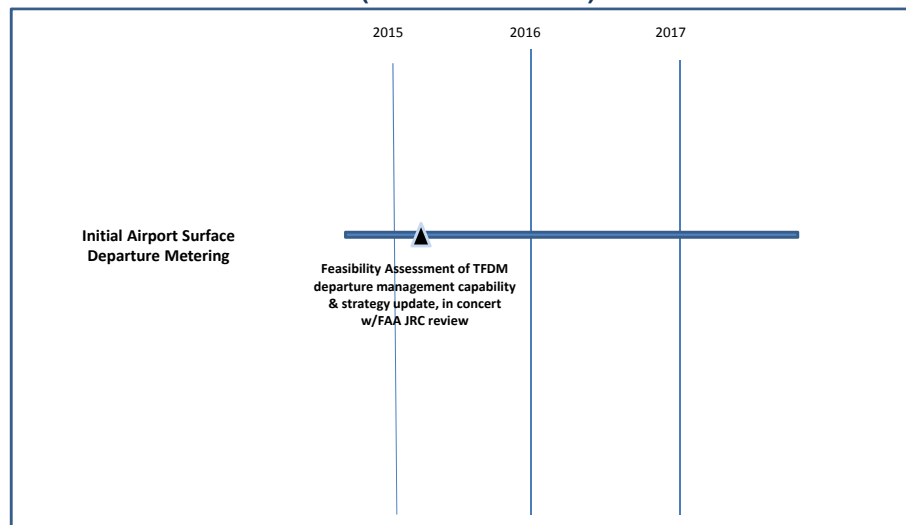
Surface Recommendation #1

*Location and Timeline
(Under Discussion)*



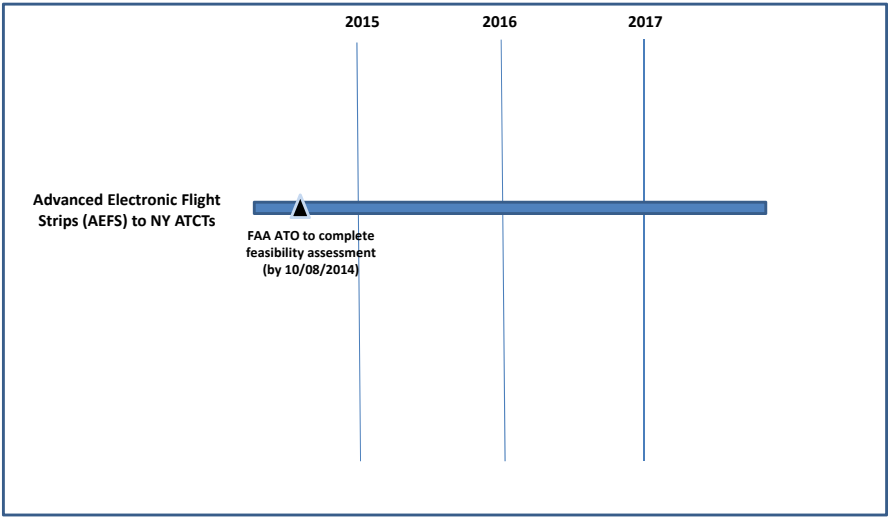
Surface Recommendation #2

*Location and Timeline
(Under Discussion)*



Surface Recommendation #3

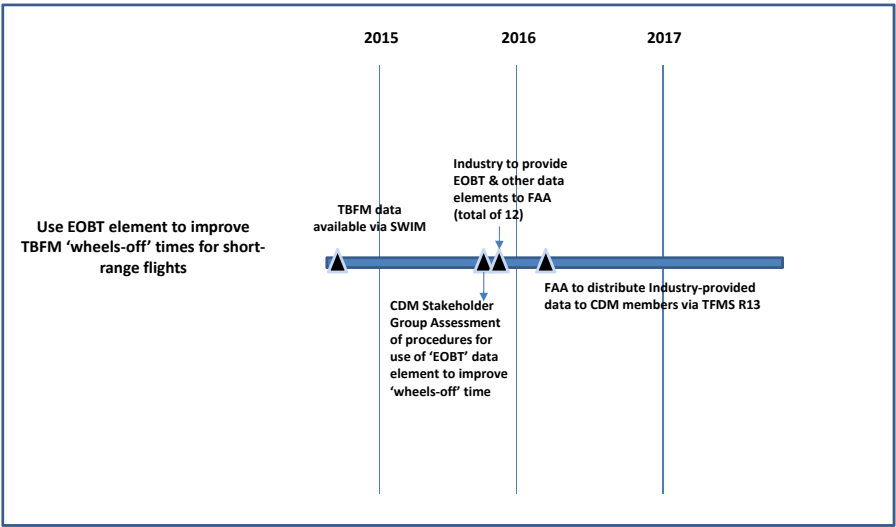
Location and Timeline
(Under Discussion)



37

Surface Recommendation #4

Location and Timeline
(Under Discussion)



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PBN Overall Recommendations

- Metroplex (OAPM)
- Established on RNP - allows ATC to clear aircraft on an RNP approach with a turn to final without providing a minimum of 1000 feet vertical or 3 miles radar separation from aircraft established on approaches to parallel runways. site.
- Equivalent Lateral Spacing Operations (ELSO) - provides lateral spacing between reduced-divergence paths of PBN departure operations that is equivalent to the spacing observed in conventional departure operations at minimum requirements of the currently applicable divergence standard (15 degrees).
- Single Site

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Metroplex

- Northern California - FAA will complete the implementation of Northern California Metroplex – 3rd Qtr 2015
 - Multiple airports in close proximity
 - Advanced aircraft capabilities
 - Integrated traffic flows
- Atlanta/Charlotte - FAA will complete the implementation of Atlanta and Charlotte Metroplex – 2nd QTR 2017
 - Large hub – delays propagate across NAS
 - Complex airspace environment
 - Mixed traffic types

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Established on RNP

- RNP Authorization Required – Denver
 - AR procedures flown in visual conditions
 - Controllers “making it work” lack of separation rules increase workload
 - Widely spaced runway configuration
 - Safety case memo received June 2014
- EoR RNP AR at Denver - Widely Spaced Operations - 1st Qtr 2015
- EoR RNP AR Widely Spaced Operations National Standard - 1st Qtr 2017
- RNP Track to Fix – (Atlanta Possible Future Implementation)
 - High volume airport
 - Lower % RNP AR aircraft – mixed equipage environment
 - FAA commitment for safety case and separation standards established
 - Potential to convert RNP/AR at PDK from radius-to-fix (RF) to TF to expand operators who can use
 - Cross aviation community acceptance and alignment
- Safety Analysis – 4th Qtr 2015

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Equivalent Lateral Spacing Operations (ELSO)

- National Standard - MIA/FLL implementation
- Initial deployment under waiver at ATL – encouraging results
 - Improved traffic flows
 - Reduced delays with higher throughput
- ELSO National Standard 2nd Qtr 2015

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Single Site

- Las Vegas
 - Complex environment
 - Design completed but unable to be implemented
 - Mixed traffic types – high percentage GA operations and tour operators at LAS
 - Adjacent airports (significant general aviation benefit)
 - Team did not reach a consensus that the Metroplex program (OAPM) should be used; operator members in particular were averse to Metroplex as a desired initial step in moving forward for the Las Vegas Basin.
 - Team members are committed to work with the FAA to develop a comprehensive plan that includes the commitment by aircraft operators and air traffic controllers to design, deploy and subsequently use PBN procedures.
 - Include an evaluation and analysis of the previous design work to determine what can be used in the deployment of future procedures.
 - This process would be determined once the FAA completes the initial assessment of feasibility.

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Single Site

- Las Vegas Basin Assessment – Sept 2014
- Back-up: Louisville
 - Traffic mix
 - Highly equipped fleet
 - NextGen technologies – Surveillance/Navigation/Communication
 - PBN offers substantial benefits – OPDs, TRACON efficiency

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DataComm

- Endorsement

- An accelerated timeline for deployment of tower Data Comm services at 56 airports, the first of which would become operational in the third quarter of Government fiscal year 2015.
- Development of a baseline of initial en route services, to be deployed at all 20 CONUS Air Route Traffic Control Centers, beginning in 2019, that include transfer of communication, initial check in, altimeter setting, airborne reroutes and crossing restrictions.

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- 
- Transfer of Communications
 - Initial Check-In
 - Altimeter Settings
 - Altitudes
 - Airborne Reroutes
 - Controller Initiated Routes (Limited)
 - Direct-to-Fix (Limited)
 - Crossing Restrictions (Limited)

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Recommendation

- Recorder Rule for Retrofit
 - Industry members participate through the Performance-based Operations Aviation Rulemaking Committee (PARC) Comm Working Group (CWG) to develop recommendations and supporting rationale for revision or other means of compliance of the recorder rule by September, 2014.
 - FAA give priority to the recommendations and make appropriate changes to the regulations or guidance.

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Recommendation

- VDL Mode 0
 - Similar to June of 2012 FAA provided accommodation of FANS 1/A over Plain Old ACARS (POA) for tower departure clearance services recommend accommodation be granted for En-route services.
- Future Air Navigation Systems (FANS) 1/A+
 - FAA requires FANS-1/A+ for En-route services in order to mitigate a latent message hazard, recommends that FAA flight standards work with these operators on an alternate suitable means of mitigation

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Recommendation

- Industry and the FAA collectively believe that, En-Route Trials are not required for the successful deployment of En-Route Services
- FAA not uplink airway-to-airway route constructs without a published intersection point to B737 aircraft B737's flight management computer limitation to process airway-to-airway route constructs without a published intersection point.

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DISCUSSION

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PBN Blueprint Tasking from FAA

- Identify all stakeholders needed and define their roles
- Describe specific outreach strategies
- Describe specific possible outcomes and identify metrics for success
- Review existing process and incorporate lessons learned from previous and ongoing PBN initiatives, domestic & international
- Develop a methodology to ensure lessons learned and expertise are captured in the future



Task Group Members

- | | | | |
|------------------|--------------------------------------|---------------------|-------------------------|
| ● Hal Andersen | GE Aviation | ● Chris Oswald/ | |
| ● Chris Baum | ALPA | ● Katherine Preston | ACI-NA |
| ● Joe Bertapelle | JetBlue Airways | ● Colin Rice | Houston Airport System |
| ● Tom Bock | Port Authority of NY & NJ | ● Dennis Roberts | FAA-SME |
| ● Mark Bradley | Delta Air Lines, Inc. | ● Mike Sammartino | Metron Aviation, Inc. |
| ● Andy Cebula | RTCA, Inc. | ● Phil Santos | FedEx Express |
| ● Lynae Craig | Alaska Airlines | ● Jason Schwartz | Port of Portland |
| ● Donna Creasap | FAA-SME | ● Rico Short | Beacon Management Group |
| ● Jim Crites | DFW Int'l Airport | ● Stephen Smith | ATAC |
| ● Rick Dalton | Southwest Airlines | ● Stephen Smothers | Cessna Aircraft |
| ● Bill Dunlay | Leigh-Fisher | ● Mark Steinbicker | FAA-SME |
| ● Ken Elliott | Jetcraft Avionics LLC | ● Brian Townsend | US Airways |
| ● Bill Fernandez | PASS | ● Emily Tranter | NOISE |
| ● Rob Goldman | Delta Air Lines, Inc. | ● Allan Twigg | United Airlines, Inc. |
| ● Pamela Gomez | FAA-SME | ● Steve Vail | Mosaic ATM, Inc. |
| ● Daniel Hanlon/ | | ● Jeff Williams | Tetra Tech |
| ● Randy Kenagy | Raytheon | ● Jeff Woods | NATCA |
| ● Darren Harris | PSA Airlines | | |
| ● Bill Murphy | IATA | | |
| ● Col Narvid | DoD Policy Board on Federal Aviation | | |

Extensive Outreach




- Briefings
- Review/Cataloguing Existing Documents
- Identifying Complimentary Efforts

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PBN Blue Print Task Group Overall Findings and Recommendations

- Develop Overall Scope of the PBN Effort - Vital to reach agreement on overall goal of what PBN procedure is designed to achieve (also drives metrics to evaluate) including all stakeholder views/interests.
 - Goals:
 - Increase Operational Efficiency, Capacity, Fuel Efficiency, ATC Cost Efficiency, and Metroplex Access
 - Reduce/mitigate emissions and noise exposure
 - Requirement to maintain or improve safety
- Define High-level Outcomes and Metrics - selected metrics should be aligned with the established stakeholder goals for the proposed PBN procedure development effort.
- Identify and Engage Non-technical and Technical Stakeholders

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PBN Blue Print Task Group Overall Findings and Recommendations (cont.)

- Implementation & Post Implementation Analysis
 - Post Implementation Benefits Analysis Report (PIBA) - high level and concise report is a summary of the PBN Implementation process. Depending on the audience, it is written as an external report for the FAA or as an internal report for the local stakeholders
 - Post Implementation Analysis Report (PIAR) - existing FAA analytical, diagnostic report, can be a recurring report containing continuously updated data using Performance Data Analysis and Reporting System (PDARS).
 - By Phase Implementation Summary (BPIS) - short report specific to each phase of a PBN project. The corresponding metrics template will vary by type, location, and phase of procedure implementation.
- Capturing Lessons Learned
 - Project Tracking Tool with user-oriented enhancements to make it easier to use and include promote rapid application to ongoing and future implementation efforts.

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DISCUSSION

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Next NAC Meeting

- October 8th
- NIWG
- PBN Blueprint
- Discussion of New/emerging issues - Taskings



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Future of Regional Task Groups

Joe Bertapelle, JetBlue
Mark Hopkins, Delta Airlines

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Framing the Regional Task Groups

- Focus for the RTGs:
 - Information flow from FAA to Industry
 - Working solutions for airspace and procedural issues
 - Local or Regional scope
 - Time frame of 1-3 years
- Information flow is important, but not enough to sustain RTGs
- Current Status of RTGs
 - Activity is dormant; interest to restart
 - RTG Leadership met to compile best thinking on pipeline of ideas

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The “Kitchen Sink” of Ideas

1st
Tier

Category	Ideas	Examples
Information Flow on a Scheduled Cycle	Forum for information flow on SAA Proposals	29 Palms update from Marines; coordinate with DoD
	Forum for information flow on airspace changes	
	Forum for information flow on airport construction Timelines, operational / systemic impacts, procedural mitigations	JFK, LAX, SEA, LAS, PHX, ATL, others?; coordinate with ACI and FAA Airports?
Work Solutions	Addressing significant, outstanding airspace issues in the NAS (RTG / Service Center leads coordinate to identify issues)	<ul style="list-style-type: none"> • So Florida / Caribbean • Utilization of key SAAs
	Address required mitigations for planned airport construction (based on info flow on construction)	<ul style="list-style-type: none"> • Possibilities include JFK, LAX, SEA, LAS, PHX, ATL, others?

2nd
Tier

Category	Ideas	Examples
Work Solutions	Operational expert feedback on macro issues related to airspace and operations	<ul style="list-style-type: none"> • Feedback on Draft PBN Route Strategy • Evaluate NextGen TFM Tools intended use, performance, metrics • Evaluate runway use plans at large airports to assess efficiency (SLC)
	Supporting large operational implementation initiatives	<ul style="list-style-type: none"> • NIWG implementation • OAPM with no dominant carrier • Metroplex

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Plan to Move Forward

- Recommend each RTG meet on a pre-defined schedule 2-3 times per year
 - Regular calls with MTOs, Regional Directors, etc.
 - Agenda inclusive of information flow on airspace changes, SAA proposals and airport construction
- Initiate task to provide recommendations on South Florida / Caribbean operations
- When it becomes appropriate, initiate task to work airport construction mitigations
- RTG Leads remain open to additional taskings related to providing support to implementation initiatives, expert feedback on operations and concepts

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DISCUSSION

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Review Potential New Tasks for the TOC

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New Task Idea #1 of 3: *South Florida / Caribbean Operations for the Eastern Regional Task Group*

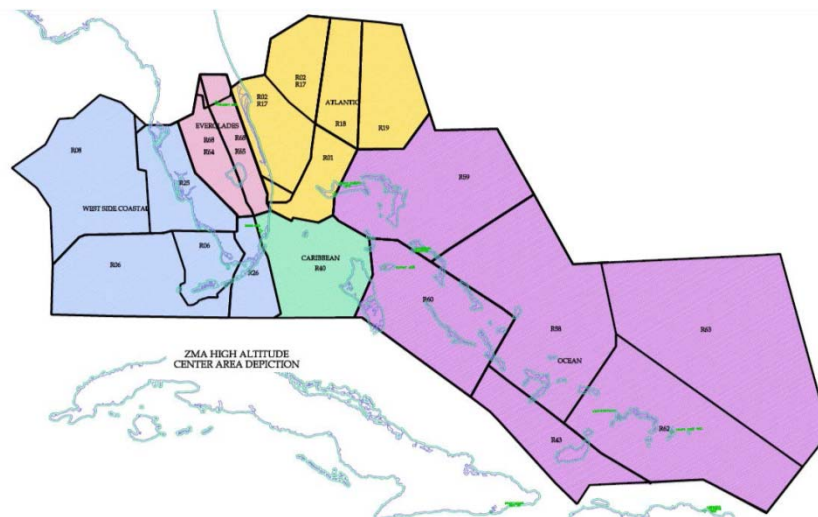
64

South Florida / Caribbean Background

- Traffic volumes and operational limitations in Caribbean driving increased Miles In Trail restrictions and/or Airspace Flow Programs
 - Feb-Apr 2014: average of 72 flights a day on Saturdays to the Caribbean were captured by AFPs.
- Challenges include:
 - Limited radar coverage below 13,000 feet and some areas above FL310
 - Unreliable infrastructure, such as radar in Bahamas and Turks and Caicos and communication lines in the Dominican Republic
- Current combination of demand, routing and sectorization results in need for TMIs

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ZMA Oceanic Sectors



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South Florida / Caribbean Tasking Idea

- Quantify problem on operational community
- Identify, cost possible solutions within purview of FAA
 - May include: staffing levels, re-sectorization of very large sectors, adding sectors, radars, frequencies, landlines, traffic flows, ADS-B in Caribbean, equipment redundancies
- Evaluation of additional options:
 - Redesign airspace in ZSU CERAP to allow OPDs from Northeast, restructuring transit gates in/out of terminal airspace and optimizing airspace between Puerto Rico and US Virgin Islands for turbojet traffic, etc.
- Develop recommendations on integrated solution and how to proceed

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New Task Idea #2 of 3: ***Airport Construction and Safety Risk***

Dan Allen, FedEx Express

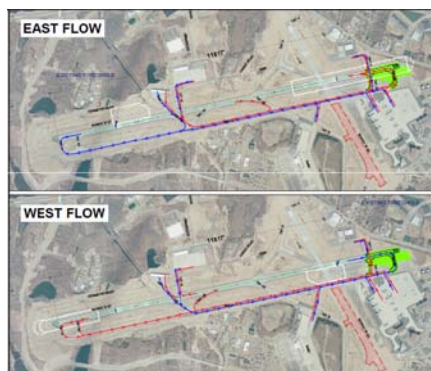
68

Background

- Stabilized approaches are a primary concern for flight departments today
- At times, airport construction projects take procedures with vertical guidance out of service
 - Flight Safety Foundation: loss of vertical guidance in a procedure increases the risk of Controlled Flight into Terrain (CFIT) five times
 - Lack of vertically guided procedure may have been contributory in the BHM and SFO accidents.
- Any construction project, including expansions of Runway Safety Areas (RSAs), are intended to improve operations and safety but introduce short term risk into the NAS

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Case Study 1: Stewart (SWF)



- April 2013 RSA Project
- Operators engaged in Nov 12
- RWY 9: Displaced threshold with no ILS, no RNAV and PAPI.

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Case Study 2: Oakland (OAK)



- July 2013 RSA project
- Operators didn't get fully engaged until Aug 2012
- RNAV Procedure developed



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Case Study 3: Los Angeles (LAX)



- Operators engaged years in advance
- Vertically guided procedure for each will be available to each complex during all phases

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Task Idea for the TOC

- Ad hoc sub-committee of the TOC to:
 - Review case studies of airport construction and impact on safety
 - Identify best practices in previous experience
 - Provide recommendations of how safety risk should be managed for aircraft operations impacted by airport construction programs
- Recommended participants include (but not limited to):
 - FAA's Safety organization (AVS), Air Traffic Organization (ATO), Runway Safety
 - Airport Operators
 - Aircraft Operators

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New Task Idea #3 of 3:
“Review, Revise, Remove (Three Rs)”
for Right Sizing Procedures in the NAS

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National Procedures Assessment (NPA) Initiative

Overview to TOC

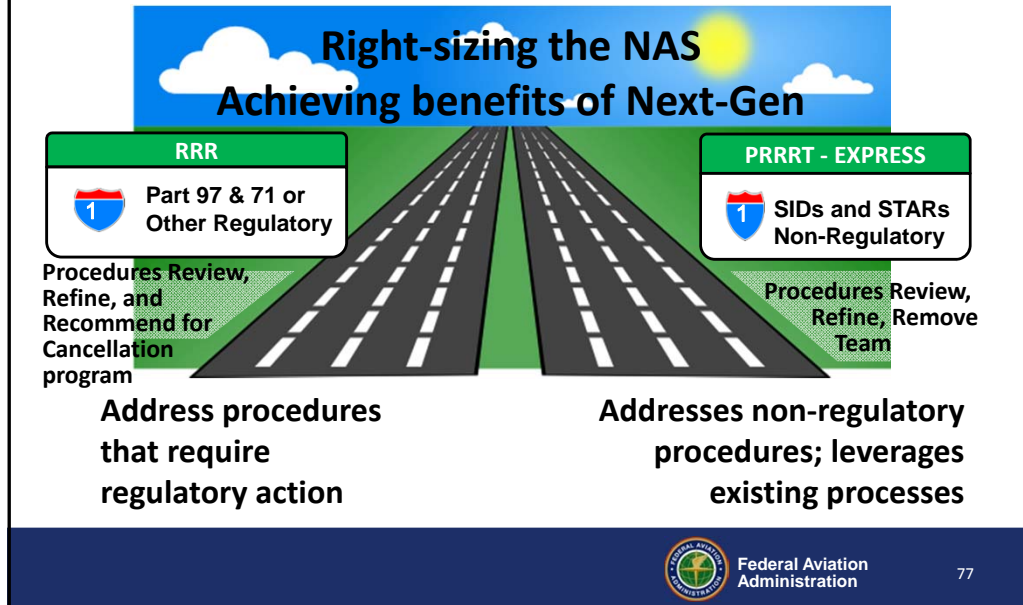
September 3, 2014



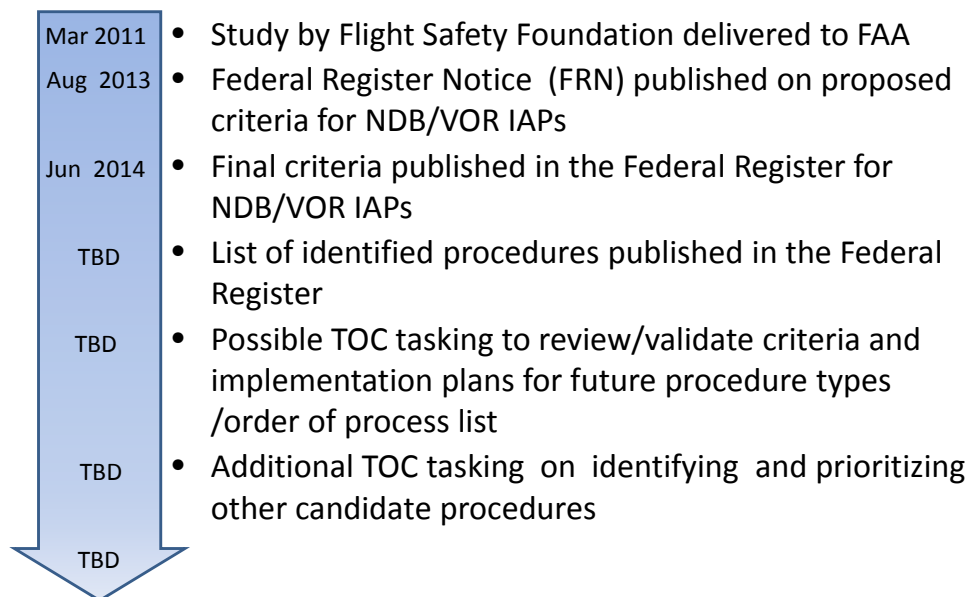
NPA-Key Drivers

- FAA cannot afford to maintain underutilized or unneeded procedures
- Training controllers and pilots on unneeded procedures wastes money and time
- Aircraft FMS may have storage limitations
- Industry and labor have identified underutilized or unneeded procedures as an impediment to increased use of more beneficial PBN procedures

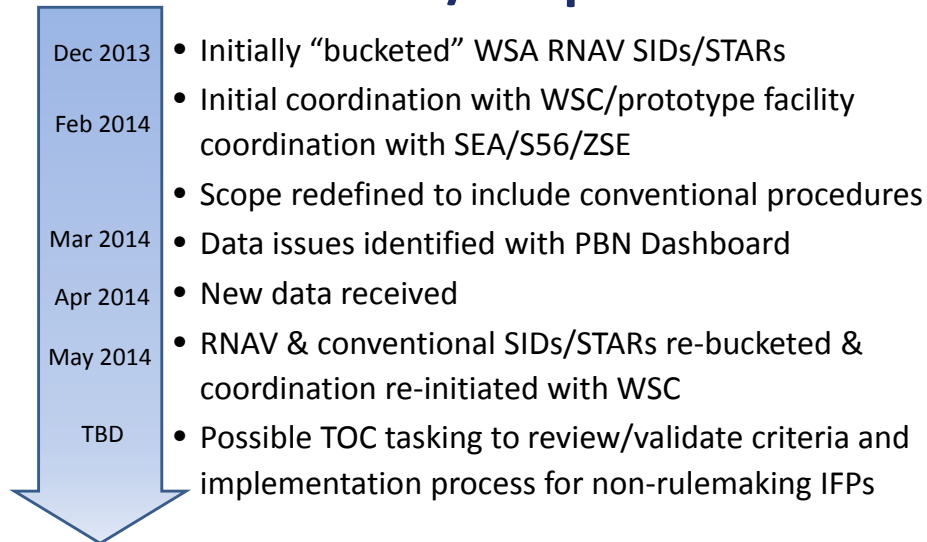
FAA's Strategic Initiative- NPA



RRR Current/Proposed Status



PRRRT Current/Proposed Status



Federal Aviation
Administration

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Industry Ideas for Future TOC Work

Jim Bowman, FedEx Express
Dale Wright, NATCA

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Industry Ideas for Future Work

- Solicited input from non-FAA TOC members
 - Organized, consolidated, removed those out of scope
- Submitting 5 ideas for consideration today
- Industry request is that...
 - TOC Leadership continue to discuss after today
 - Next TOC meeting include feedback on these ideas

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Industry Ideas for Future Work

Idea	Specifics
1. Transition prioritized policy decisions out of the NAC and into the TOC for implementation. (Bowman)	<ul style="list-style-type: none"> • Use TOC for development of PBN procedures based on the work of the PBN Blueprint and the PBN NIWG. • Use TOC for Implementation of recommendations from the other three teams of the NIWGs. • Mixed operational capability (RNP vs conventional) core airports
2. Review waivers in the system and determine direction for transitioning them to procedures. (Hopkins)	<ul style="list-style-type: none"> • Equivalent Lateral Spacing Operation (ELSO) in DFW and ATL. • Places where Class B excursions are routine (e.g. PHL)
3. Collaborate with ATO to evaluate use and data sharing around automation. (Hopkins)	<ul style="list-style-type: none"> • Evaluate and work towards consistent application of TBFM and sharing of TBFM data.
4. Monitor activity and/or create work groups that support the rollout of new operational initiatives in the NAS. (Wright)	<ul style="list-style-type: none"> • Monitoring the anticipated deployment of a SAAB remote tower system at Leesburg (JYO). Historical experience with remote towers has been outside of the U.S. only.
5. ATC coordination and procedures that enable UAS integration into the NAS. (Narvid)	<ul style="list-style-type: none"> • Developing ATC handbook information on UAS performance/capabilities • Barriers to integration from an ATC perspective • Developing procedures to enable integration

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VHF Omni-directional Range (VOR) Minimum Operating Network Recommendations on Outreach and Modifications

Don Dillman, FedEx Express

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VOR MON Tasking

Task	Description	Due Date
Task 1 – Review and validate the VOR MON selection criteria and assumptions and make additional recommendations as needed	Provide a report documenting the following actions: 1. Review and validate the basic program assumptions made to date concerning the selection criteria. FAA will ensure the TOC has complete information on studies and analysis done to date as well as access to subject matter experts within the FAA. 2. If amendments are recommended, please provide specific details with the recommendations to include the range of options and/or alternatives discussed.	Interim Report October 2013 Final Report January 2014 COMPLETE November 2013
Task 2 – Review and validate the draft candidate VOR MON list, based on the criteria from Task 1.	Provide a report documenting the following actions: 1. Review and validate the candidate VOR MON list based on the criteria and, if the TOC recommends amending the criteria, update the candidate list based on the amendments as appropriate. If specific options were considered but not adopted via consensus, please provide the range of options and/or alternatives considered. 2. Advise FAA from a stakeholder perspective on why, how, and whether exceptions should be made to valid criteria. Again, please provide specific details to include the range of options and/or alternatives discussed.	Interim Report January 2014 Final Report April 2014 COMPLETE February 2014

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VOR MON Tasking (cont.)

<p>Task 3 – Review implementation planning to date and make recommendations to the preliminary waterfall schedule developed by FAA.</p>	<p>Provide a report documenting the following actions:</p> <ol style="list-style-type: none"> 1. Examine and analyze the PBN Route Strategy in light of the VOR MON Program and recommend up to three possible implementation/waterfall scenarios. Advise the FAA of the pros and cons of each. If incremental actions are needed in any of the scenarios, please identify those with specificity. Please include the range of options and/or alternatives discussed in the documentation. FAA will provide the TOC with a draft copy of the PBN Route Strategy. 2. Provide recommendations on which victor and jet routes should be retained in the 2013-2020 timeframe and why. Please include the range of options and/or alternatives discussed in the documentation. 3. Provide high level industry perspective on the feasibility and actions needed to completely retire the legacy route structure after 2020. 	<p>Interim Report April 2014 Final Report July 2014 ???</p>
<p>Task 4 – Provide recommendations to the FAA on outreach and education that should be accomplished to prepare stakeholders for the VOR MON reduction.</p>	<p>Provide a report documenting the following actions:</p> <ol style="list-style-type: none"> 1. Advise FAA, from an external stakeholder perspective, of what existing policies, processes, procedures or training will need to be modified to successfully implement the VOR MON. 2. Advise the FAA on an outreach strategy to include modes of outreach, timelines, etc. and provide recommendations on how industry can assist FAA in outreach efforts. 	<p>Interim Report April 2014 Final Report July 2014 September 2014</p>

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Current Tasking

- **Task 4 – Provide recommendations to the FAA on outreach and education that should be accomplished to prepare stakeholders for the VOR MON reduction.**

Provide a report documenting the following actions:

1. Advise FAA, from an external stakeholder perspective, of what existing policies, processes, procedures or training will need to be modified to successfully implement the VOR MON.
2. Advise the FAA on an outreach strategy to include modes of outreach, timelines, etc. and provide recommendations on how industry can assist FAA in outreach efforts.

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Overview of Recommendations

- Delivering three broad areas of recommendations
 - Process for decommissioning VORs to achieve the MON
 - Community outreach and education before and during implementation of the MON
 - Required modifications and mitigations to successfully implement the MON.

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Process for Decommissioning VORs to Achieve the MON

- Current process of decommissioning VORs not scalable to the approximately 500 VORs targeted to reach MON objectives
- Process needs to balance multiple needs
 - Stakeholder need to be informed and create feedback
 - Allowing FAA to review and adjudicate the comments in a reasonable amount of time with a reasonable level of resources

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Process for Decommissioning VORs

Guiding Principles

- Given the scale of decommissioning involved with the VOR MON, batch notification announcing all of the VORs planned for decommissioning to the public is preferable to individual notification (i.e., announce one VOR at a time).
- The process for providing notification, gathering public comment and addressing public comment should not be so onerous to stall or delay the MON process.
- The public comment and feedback process for one VOR should not delay the decommissioning process for other VORs.
- Notification of the VORs planned for decommissioning should be transparent to the public and the process for making final determinations of individual VORs (the mitigations to be considered) should be included in the initial notification.
- The work of determining the mitigations required by the VOR decommissioning must occur upfront to understand the network impacts of a large-scale VOR shutdown.

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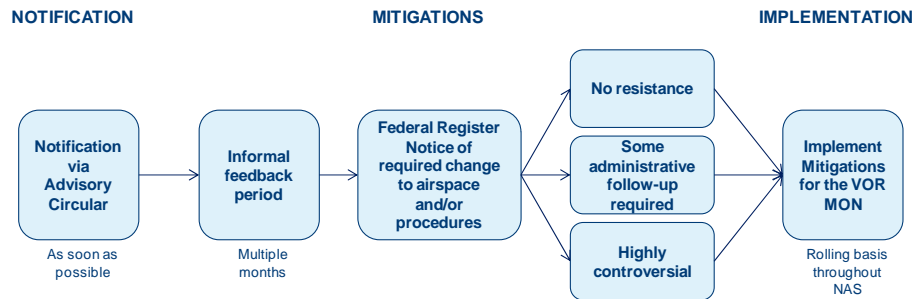
Process for Decommissioning VORs

Recommendations

- 1) At the beginning of the process, the FAA should notify the public concerning the full list of VORs to be planned for decommissioning.
 - Via non-rulemaking action such as an Advisory Circular (AC). If the FAA chooses to use ACs, publication of ACs could include one for the entire MON Program or one for each Service Center. In either case, the list(s) should be broken down by State.
- 2) Process for decommissioning should separate the notification (non-rulemaking) component from the rulemaking components to not stall the process unnecessarily.
- 3) The process for collecting, evaluating and adjudicating public comment should be communicated clearly in the notification of the VOR MON.

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Process for Decommissioning VORs *Recommended Process Flow*



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Outreach for the VOR MON

- **Level one: Notification**
 - One-way flow of information from the FAA to the Public
 - Include information about the VOR MON Program as a whole, the rationale, the value to the Public and the list of VORs and sequence for shut down
 - Standard template of information about each of the VORs scheduled for shutdown as part of the MON
 - Tools for this phase of communication may include (but are not limited to) public notices, magazine articles, press releases, flyers, mailers, etc.
- **Level two: Interaction**
 - Stakeholders expected to request information at a more local and detailed level
 - Do not expect all VORs scheduled for shutdown will require extensive interaction; some will
 - May involve community town hall meetings and/or individual meetings with key local stakeholders.
- **Level three: Exception**
 - FAA may take some action to evaluate exceptions and even modify the plan(s) based on new inputs unavailable until the VOR MON list is released to the public.

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Outreach for the VOR MON

Guiding Principles

- FAA should focus on providing complete information early in the process.
- Communication about VOR MON should include messages that the process is not ad hoc and not just a random selection of VORs. Include fact that there were criteria, criteria were weighted and selection was based on a structured approach.
- Messaging about the VOR MON should be focused on the flying public and why the VOR MON Program is beneficial for the flying public. While they can and should be mentioned, the messaging should not focus on benefits to the FAA.
- VOR MON requires participation of three main groups: the FAA, VOR MON Task group (and industry they represent) and Public, each with a responsibility in the process:
 - FAA responsibility to create plan and respond to industry stakeholders in modifying that plan
 - VOR MON Task Group responsibility to represent broad constituencies and provide recommendations / feedback to FAA on the creation of criteria and implementation plans.
 - Public responsibility to provide feedback with legitimate concerns on individual VORs.

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Outreach for the VOR MON

Recommendations

- 1) The overarching theme about the VOR MON should relate to the transition to Performance-Based Navigation (PBN) and NextGen.
- 2) To ensure transparency, the FAA should provide a published VOR MON plan, including plans for decommissioning VORs, as soon as possible.
- 3) FAA should accept the support of industry organizations to help communicate the message about the VOR MON.
- 4) Utilize the internet and social media to communicate about the VOR MON.
- 5) The FAA should actively reach out to Legislative Staff to ensure they understand the Program and the approach and rationale for decision-making.

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Recommendations on Modifications

- Procedures
- Publications
- Notifications
- Training and Operations

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Modifications for the VOR MON *Recommendations*

Most important recommendation relates to Procedures:

- All Standard Arrival Routes (STARs), Standard Instrument Departures (SIDs), Instrument Approach Procedures (IAPs) (to include Missed Approaches and One Engine Inoperative (OEI) procedures) that have the targeted VOR as part of the procedure.
 - All Obstacle Departure Procedures (ODPs) and take off minima that are dependent on the targeted VOR.
 - All Holding Patterns, Pref Routes, Fixes, Airways (high/low) and VOR CHKPs dependent on the targeted VOR.
 - Non-navigation services provided by the targeted VORs – for example, communications (Flight Service Stations (FSS), Hazardous Inflight Weather Advisory Service (HIWAS), Automatic Terminal Information Service (ATIS)) references to intersections and waypoints that define Special Activity Airspace (SAA), Notices to Airmen (NOTAM), Letters of Agreement (LOA), Sigmet/Airmets, PIREPS, airspace classifications, Temporary Flight Restrictions (TFRs), military training routes, air refueling tracks, intra-/inter-facility letters of agreement and Memorandums of Understanding (MOUs).
 - All AeroNav Chart products that depict the VOR.
- For each item identified above, the FAA needs to decide and document, in coordination with the user community:
 - (a) no mitigation or replacement is necessary, and the rationale why or
 - (b) a mitigation or replacement is needed, a description of the mitigation/replacement and the effective date.
 - Both (a) and (b) will include a cost/benefit analysis to include user costs/impacts. To extent possible, no VOR shall be decommissioned prior to implementing mitigation or publishing the replacement procedure.⁹⁶

Modifications for the VOR MON *Recommendations*

Specific to Single Engine Inoperative:

- FAA request in Task #1 response letter: FAA does not have access to this OEI procedures; FAA requested feedback on how it should address the Task Group's recommendation for OEI procedures.
- Task Group recommends that operators retain responsibility for adjustment of these procedures.
 - Require ample advanced notification of all VORs planned for decommissioning. This will allow operators to evaluate which VORs are most critical to internal company procedures.
- Task Group recommends providing decommissioning info to:
 - Large commercial and business aviation operators:
 - Large membership organizations such as A4A, NBAA and NATA
 - Performance engineering companies
 - Chart vendors often create company procedures on behalf of an operator

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Modifications for the VOR MON *Recommendations*

Specific to Publications:

- Multiple publications that require an explanation of the VOR MON, a listing of affected airports and a listing of safe-landing airports. These publications include:
 - Aeronautical Information Manual (AIM)
 - Airport/Facility Directory (AFD)
 - Instrument Procedures Handbook (IPH)
 - Instrument Flying Handbook (IFH)
 - Controller Handbook (7110.65)

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Modifications for the VOR MON *Recommendations*

Specific to Notifications:

- Changes may be required to IFR charting, if requirement to depict the VORs that will remain as part of the VOR MON or to depict VOR MON safe landing airports on charts
 - Beneficial for charts (paper and electronic) to depict those VORs that will remain once the drawdown is complete as well as those airports designated as safe landing airports
 - Refer immediately to the Aeronautical Charting Forum (ACF) for Oct meeting
- NOTAM service needs process for notification of a GPS event.
 - Scheduled or unscheduled loss of GPS should be included in NOTAM service.
 - Example is required maintenance down times for VORs within the MON. When such down time occurs, MON will have gaps in its required 100 nm.

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Modifications for the VOR MON *Recommendations*

Specific to Training and Operations:

- May be need to define VOR MON operating procedures
 - Do aircraft have to land immediately? Should aircraft continue to operate to the closest safe landing airport? Should they operate to the safe landing airport nearest their original destination? Etc.
 - May require AC that explains VOR MON operating procedures
- Training on aeronautical decision making in conjunction with the MON should be developed for pilots.
 - May require charts that depict the closest MON airport at any point in the NAS.
- Navigational databases need to be updated to reflect the VOR MON as it evolves.
 - May consider providing additional color coding on charts to alert pilots of VORs that are planned for decommissioning as part of the MON.
- Training and testing on the MON and operational use of it may be required for Instrument Rating and an Airline Transport Pilot (ATP)
- Training will be required in ATC facilities on new procedures resulting from the MON.

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DISCUSSION

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TOC Action

Consider Recommendation on:

***VOR MON Outreach
and Modifications***

and Transmit to FAA

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FAA Update on PBN Route Strategy

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PBN Route Structure Concept of Operations

TOC
(High Level Brief)

By: Robert Novia, AJV-14

Date: September 2014



Federal Aviation
Administration



PBN Route Structure CONOPs (PBN-RS)

- **CONOPs Scope**

- Describes a NAS wide end-state route structure concept consisting of both PBN Air Traffic Service (ATS) routes (i.e., Q-routes, T-routes & Y routes) and point-to-point navigation.

- **Guiding principle**

- *“Structure where structure is necessary and, point-to-point where it is not.”*
- Route structure requirements will be based on factors such as traffic demand, airspace utilization, ATC task complexity, airspace access and user operational efficiencies.



Why Establish Q and T Routes

- **High Altitude (Q's)**

- Publish high altitude PBN ATS routes precisely where needed to...
 - Increase airspace capacity and reduce complexity in high volume corridors
 - Procedurally deconflict and segregate flows onto more numerous route options.
 - Improve flight path predictability in congested airspace via optimized routes
 - Retain flexibility via point to point flight path options in less congested airspace.

- **Low altitude (T's)**

- Publish low altitude PBN ATS routes precisely where needed to...
 - Access rather than circumvent Class B/C airspace
 - Lower minimum altitudes in areas of high terrain to improve access and avoid icing
 - Circumvent Special Use Airspace in safe and optimal manner



Point to Point Navigation

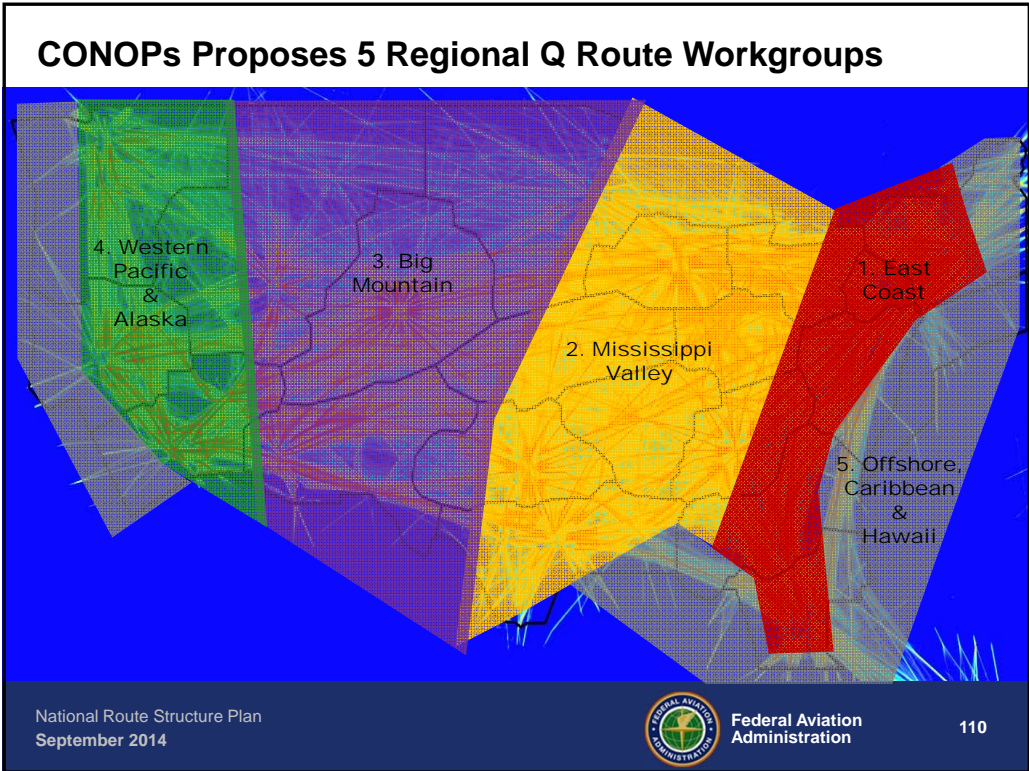
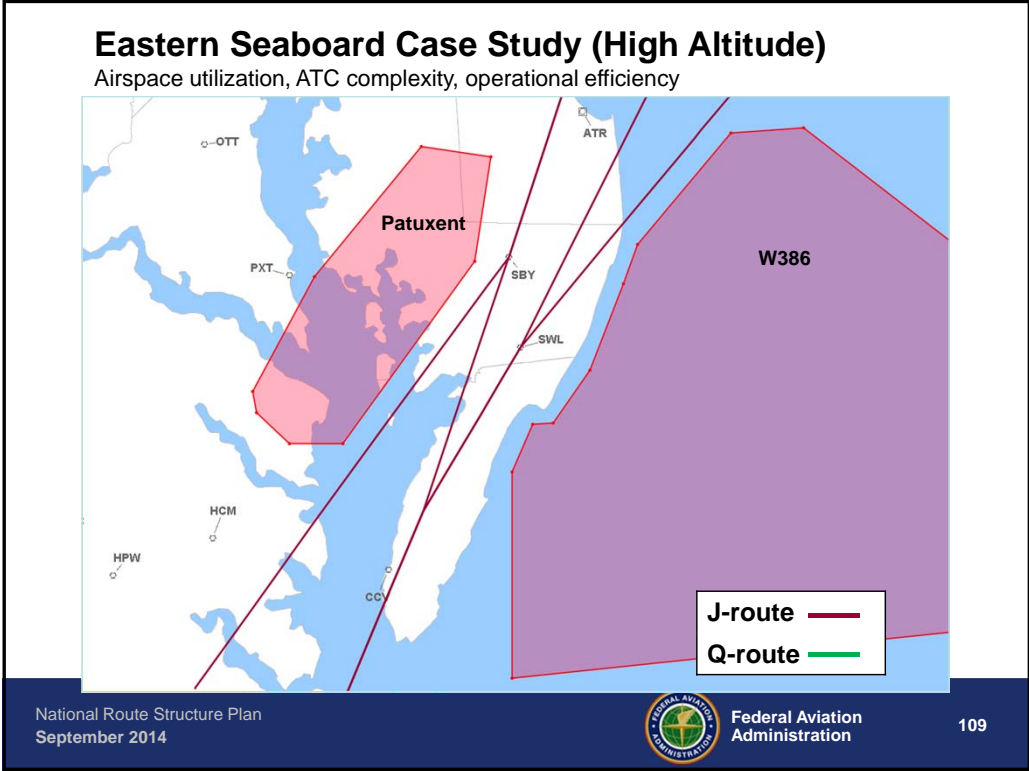
- **Legacy programs have become less relevant**
 - North American Route Program (NRP)
 - Initiated 200nm from origin, terminates 200nm from dest
 - Non-restrictive routing (NRR)
 - Established or traditional “pitch” and “catch” points
 - Navigation Reference System (NRS)
 - Grid of waypoints across NAS
- **Today**
 - Users file any combination of route segments, NAVAIDs, & waypoints when not route restricted by ATC and automation
- **PBN-RS CONOPs**
 - Retire NRP and NRR, begin to phase out NRS
 - Work with stakeholders to place network of optimally placed waypoints
 - ATC IFR preferred routes will be primary method of communicating where route structure utilization is required. Point to point available elsewhere



Strategic Alignment of PBN ATS Routes Development

- **Central clearinghouse for establishing decision criteria and ensuring strategic alignment**
- **Ensures integration of NAS-wide initiatives and addresses disjointed route structure**
 - Integrates Metroplex & non-Metroplex initiatives with route structure in adjacent airspace
- **Removal of obsolete infrastructure**
 - Supports divestment of VORs and Minimum Operation Network
 - Removal of unnecessary conventional route structure (right-sizing)







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- Review of meeting actions
- Anticipated Issues for TOC Consideration and Action at Next Meeting
- Other business

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Closing Comments

Co-Chairs:

Jim Bowman, FedEx Express

Dale Wright, NATCA

Designated Federal Official:

Lynn Ray, Federal Aviation Administration

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Next Meetings:

February 4, 2015

Early June 2015

Late October 2015

Washington, DC

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Adjournment

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RTCA Paper No. 152-14/TOC-12

May 16, 2014

Meeting Summary, May 16, 2014

Tactical Operations Committee (TOC)

The fifth meeting of the Tactical Operations Committee (TOC), held May 16, 2014 at RTCA Headquarters in Washington, DC, and virtually, convened at 9:15 a.m. The meeting discussions are summarized below. The following attachments are referenced:

Attachment 1 – List of Attendees

Attachment 2 – Presentations for the Committee (containing much of the detail about the content of the material covered)

Attachment 3 – Summary of the February 6, 2014 TOC Meeting

Attachment 4 – FAA Response to Recommendations on Visual Area Surface 20:1 Obstacle Clearance

Attachment 5 – FAA Response to Recommendations on VHF Omni-directional Range (VOR) Minimum Operating Network Prioritization

Attachment 6 – FAA Response to Recommendations on VHF Omni-directional Range (VOR) Minimum Operating Network Criteria Prioritization

Attachment 7 – FAA Response to Recommendations on NOTAM Success Criteria and Metrics

Attachment 8 – NOTAM Search and Filter Options

Welcome and Introductions

Committee Co-Chair, Mr. Jim Bowman, Vice President of Flight Operations at FedEx Express called the meeting to order and welcomed the TOC members and others in attendance. All TOC members and attendees from the public were asked to introduce themselves (TOC members and General Public Attendees are identified in Attachment 1). Mr. Bowman explained that this TOC meeting was planned as a virtual meeting since the agenda was only a half day. He informed the TOC members that generally the plenary meetings will be full day and in person but, where appropriate, shorter virtual meetings may be used as well.

Mr. Bowman reviewed the agenda and began the proceedings of the meeting. Co-Chairman Dale Wright of the National Air Traffic Controllers Association had a conflicting commitment and joined the meeting in progress at 10:30am.

Designated Federal Official Statement

Ms. Elizabeth “Lynn” Ray, Vice President of Mission Support for the Air Traffic Organization (ATO), and the Designated Federal Official of the TOC, read the Federal Advisory Committee Act notice governing the open meeting.

Approval of February 6, 2014 Meeting Summary

The Chairs asked for and received approval of the written Summary for the February 6, 2014 meeting (Attachment 3).

FAA Report

Ms. Ray provided the FAA report. She began by informing the TOC that the President’s budget for FY2015 had been submitted in March and the House mark-up was expected in May. The budget included \$7.39 Billion for the FAA, which was \$85 million, or 1.2%, higher than FY2014. The mark up from the Senate is expected in early June. Ms. Ray also noted that planning for FY2016 was underway, and in June the FAA expected to submit a FY2016 budget to the Department of Transportation.

Ms. Ray next addressed the subject of alternate funding sources for the FAA. She mentioned that as the reauthorization for the FAA is set to expire in FY2015, Congress is exploring all options for funding the FAA. Approaches such as the corporatized model used for Nav Canada are under consideration. Ms. Ray stated that the FAA’s Management Advisory Committee is assessing the options. The FAA, she stated, maintains no position on the issue and is open to looking at new approaches to funding.

Ms. Ray then spoke about plans for hiring air traffic controllers. Sequestration had stopped controller hiring and training late in calendar year 2013, but this restarted in January 2014. The target for 2014 is 1,286 new hires with 720 Terminal and 550 En Route. Tentative offers had been made to approximately 1,200 individuals but litigation associated with changes in the hiring process has created some hiring delays. Ms. Ray stated that the FAA received 28,000 applications and that the applicant pool was strong.

Next, Ms. Ray addressed the subject of Unmanned Aerial Systems (UAS) in the NAS. She informed the TOC that two UAS Test Sites are up and running. North Dakota became active in late April with a Draganflyer focused on agricultural applications of crop and soil inspection. The site will collect underlying operational data. The second active test site is the University of Alaska Fairbanks. This site is operating a miniature helicopter called the Aeryon. The site’s intent is to survey large animals such as caribou, reindeer, muscats and bears. Similar to other test sites, operational data will be collected as the test site utilizes the UAS to conduct its wildlife observations.

Finally, Ms. Ray briefly addressed New York Airspace Redesign and the subject of a potential future Integrated Control Facility (ICF) housing New York TRACON and New York Center. Ms. Ray stated that evaluation on how to proceed on the ICF and airspace redesign was ongoing and required extensive coordination between multiple parties in Federal and Local government. She requested that TOC

members wait for such coordination to be completed and that the FAA would announce plans on these subjects in the near future.

FAA Response to Previous TOC Recommendations – 20:1 Visual Area Surface

Mr. Bill Davis, Deputy Vice President of Mission Support at the Air Traffic Organization (ATO), provided an FAA response to the TOC's February 2014 recommendation regarding the November 2013 draft policy memo on obstructions in the 20:1 Visual Area Surface (VAS) (the FAA letter is included as Attachment 4). Mr. Davis expressed appreciation to Chris Baum (ALPA) and Chris Oswald (ACI-North America) who Co-Chaired the 20:1 VAS Task Group. Mr. Davis stated the FAA recognized a need to develop a risk-based approach that identified and mitigated obstructions in the 20:1 surface. He said that the FAA was focused on an approach that gave industry time to determine if an obstacle existed and to identify remedies commensurate with the safety risk. The intent was to not be too disruptive to the operation.

Mr. Davis communicated FAA concurrence with all of the findings in the TOC's recommendation. The FAA agreed that industry needed time to determine if obstacles were real and improved guidance to clarify the process. The FAA agreed that no survey should be required in an initial assessment given the logistical limitations. A visual assessment would be acceptable in the verification stage. Mr. Davis continued, saying that the FAA understood the request for a standard format for compliance plans and this would be included in the upcoming Airport Geographic Information System the FAA was developing. He informed the TOC that the system would be ready for release for the CONUS shortly and would help the operational community visualize potential obstacles. One TOC member noted that he received a demonstration of the tool at a recent industry forum and the tool received very positive reviews. The TOC member indicated that the industry looked forward to having public access to the tool to use it.

Mr. Davis spoke next about outreach on the policy. He said the FAA has worked extensively with technical groups regarding the policy but had more work to do on working with the non-technical community. He recognized that compliance with the policy will be dependent upon awareness and further outreach was required.

Mr. Davis then responded to some additional recommendations from the VAS Task Group. The Task Group recommended the FAA continue to evaluate whether the geometry of the Visual Area Surface should be modified given changes in technology and operations since it originated. Mr. Gary Powell, TOC Member from FAA Flight Standards, told the TOC that studies on this matter were ongoing. He said the FAA had installed visual trackers at New York's Laganrdia Airport (LGA) and Washington DC's Reagan National Airport (DCA) as well as one in Oklahoma City (OKC) to collect data on where aircraft are actually tracking using precision approaches. Such data will eventually assist in measuring whether the current surface remains valid. One TOC member pointed out that it was important to track both visual as well as instrument approaches when considering obstacles. Mr. Powell indicated the FAA was examining both visual and instrument approaches, and they would be evaluating small airport operations as well.

Finally, Mr. Davis stated a plan to publish an updated memo this summer and that he would request the VAS TG to provide a review of the updated memo in the February 2015 timeframe. The FAA's intent is to have the process and policy finalized by January 2016, about 2 years after publishing the initial draft memo.

One TOC member noted that the industry has been interested in getting data on the number of penetrations by risk category. Mr. Davis indicated that this data would be made available on an airport basis through the GIS tool.

Eastern Regional Task Groups (RTGs)

The Committee next addressed the work of the Eastern Regional Task Group (RTG).

The Committee began by approving Joe Bertapelle, Director Strategic Airspace Programs at JetBlue Airways, as a new Co-Chair of the Eastern Regional Task Group (ERTG), along with Glenn Morse of United Airlines.

Mr. Morse then provided an overview of the recent work of the ERTG. The ERTG had a meeting in Miami Center in March 2014 during which the RTG reviewed the following subjects:

- Efforts to further deconflict airports in the New York airspace, especially with next year's planned closure of runway 4L at JFK for construction
- Efforts to develop Optimized Profile Descents (OPDs) to JFK for some international arrivals
- Washington Optimization of Airspace & Procedures in the Metroplex (OAPM)
- Q routes in Cleveland Center
- Runway construction at Fort Lauderdale (FLL) and associated airspace changes

Next, Mr. Bill Cranor of United Airlines spoke about operational challenges in the Caribbean. Mr. Cranor explained that due to airspace structure, equipment limitations, increasing demand and other factors, the number of Airspace Flow Programs (AFPs) in the Caribbean had increased dramatically on peak days in the last 2 years. The increase in AFPs is creating delays and increasing fuel costs for all operators. The ERTG indicated an interest to utilize the RTG and TOC forum to make recommendations to the FAA on how to best address the operational problems in the Caribbean. The next step is for the ERTG to provide a written proposal of a Caribbean operations tasking for consideration to TOC Leadership.

Regional Task Groups and Special Activity Airspace (SAA)

Ms. Ray of the FAA next addressed whether the RTGs could be utilized as the industry forum for responding to Special Activity Airspace proposals. Ms. Ray explained that once any SAA proposal reaches the FAA, the FAA is ex parte. That implies that the FAA must act as an honest broker and cannot request information from specific groups within the public on the proposal. If the TOC retained special rights to provide input on a proposal to the FAA, the FAA would no longer be ex parte.

Before a proposal reaches the FAA, it resides in an informal process operated by the Department of Defense (DoD). During that stage, the DoD holds meetings and conducts outreach with various members of the public. Ms. Ray noted that the optimal window for operator input on proposals was during this informal stage. However, during this stage of the process, the process is owned by the DoD and not the FAA. Hence, Ms. Ray stated that she and the FAA have no place to task an FAA Federal Advisory Committee to participate in a DoD process. She mentioned that the RTGs can and should continue to have guest speakers from the DoD come to RTG meetings and brief the RTGs on SAA proposals for the purpose of information flow.

FAA Response to Previous TOC Recommendations – VHF Omnidirectional Range (VOR) Minimum Operating Network (MON)

Mr. Dale Courtney, National Resource Engineer for Navigation at the ATO, provided an FAA response to the TOC's November 2013 and February 2014 recommendations on the VOR MON (the FAA's letters are included as Attachments 5 and 6). Mr. Courtney expressed agreement with the recommendations the VOR MON Task Group provided in their report of November 2013. Specifically, the FAA agreed with retaining VORs in areas of GPS interference, ensuring adequate navigation services for non-RNAV capable aircraft and retaining VORs in Western mountainous regions and outside the CONUS.

Mr. Courtney told the TOC that the FAA agreed with the set of mitigations required prior to decommissioning any VOR. These mitigations include modifying all procedures (arrival, departure, instrument approach, obstacle departure procedures), holding patterns, routes, fixes, airways, etc. They also involve appropriate adjustments to non-navigation services provided by VORs, including communications, references to intersections and waypoints, charts, etc.

Mr. Courtney raised one request for clarification with regards to the TOC's recommendation for the FAA to mitigate all procedures prior to decommissioning, including Single Engine Inoperative procedures. He indicated the FAA does not have insight into these operator generated procedures and requested the TOC's recommendation on the best approach to coordinate with operators to gather this information.

With regards to the recommendation to permit transfer of Federal VORs to a non-Federal owner, Mr. Courtney said the FAA was open to this on a case-by-case basis. He reminded the TOC that since VORs are aging, the FAA's intent has been that as VORs turn off, parts from those decommissioned assets will be utilized to keep the remainder of the MON running.

Mr. Courtney expressed appreciation for the TOC's recommendation to expand the service volume of the VORs in the MON below 5,000 feet. He said that the FAA had not considered this idea previously and considered this recommendation as a new additional idea from the TOC. This summer, the FAA will be examining the possibility of expanding the service volume at 4,000 and 3,000 feet.

Finally, Mr. Courtney reminded the TOC that the FAA was still assessing Alternative Position Navigation and Timing (APNT) services as a full scale backup to GPS. The FAA has not reached a conclusion on this yet.

Mr. Courtney then responded to the second recommendation from the TOC, delivered in February 2014. The February 2014 report provided TOC input on the relative weights of different criteria used to evaluate the MON. He communicated agreement with the recommendations in this report, stating that weighted criteria will make head-to-head evaluation of VORs more straightforward. Additionally, as the FAA plans for public comment on the VOR MON, the TOC's weighted criteria will be useful in evaluating whether to swap VORs in and out of the MON.

FAA Response to Previous TOC Recommendations – NOTAM Success Criteria and Metrics

Mr. Glenn Sigley, Acting Deputy Director for the AIM Directorate at the ATO, provided an FAA response to the TOC's February 2014 recommendations on NOTAM Success Criteria and Metrics (the FAA's letter is included as Attachment 7). Mr. Sigley informed the TOC that he was moving into a new role in the FAA and he introduced Mr. Scott Jerdan as his successor as the FAA point of contact for the NOTAM Improvement Panel.

Mr. Sigley first provided the FAA's response on the high level metrics recommended by the TOC. The first metric covered was percent of NOTAMs that are digital, and Mr. Sigley communicated this was a metric the FAA was already tracking closely. He said the FAA currently had about 60% NOTAMs digital. As the DoD was in process of coming online to originate NOTAMs digitally, the FAA expected this number to increase in 2014. He agreed that this was a critical metric to measure process on NOTAMs.

Next, Mr. Sigley addressed the TOC's recommendation to provide the functionality required in the Pilot's Bill of Rights within the FAA's NOTAM Search site. He mentioned that the ability to access archived NOTAMs for the last three years was available in NOTAM search. He said NOTAM search currently had some ability to do filter, prioritize and search. However, the next step was to enhance NOTAM Search's capabilities on filter, prioritization and search and that integrating the route of flight as an option was an important priority.

Finally, Mr. Sigley addressed the functionality of third parties being able to access and use NOTAM data for 3rd party tools and applications. He said that in late May 2014, the Federal NOTAM System would allow request/response of NOTAM data via SWIM. By September or October 2014, the FAA will enable publish/subscribe access for NOTAM data via SWIM. Mr. Sigley indicated that the AIM office expects between 18 and 20 customers for the pub/sub service with some large commercial airlines already indicating intent to sign up.

Mr. Sigley next addressed the second part of the TOC's recommendation which suggested a synthetic measure of user satisfaction with NOTAM Search. He indicated that NOTAM Search already included a capability for gathering feedback but the TOC's recommendation went beyond what is currently in

NOTAM Search. The FAA communicated an interest to have the NOTAM Task Group create a survey tool that gathers the data that would provide these measures of satisfaction.

Mr. Jerdan spoke next to the TOC. He indicated that feedback from the NOTAM Task Group and TOC has proven very helpful to the AIM office, providing clear direction on priorities for NOTAM Search.

NextGen Advisory Committee (NAC)

Mr. Andy Cebula of RTCA spoke next, providing the TOC with an overview of activities on the NAC. Mr. Cebula indicated that the NAC had two primary areas of focus currently: the NextGen Integration Working Groups (NIWG) and the PBN Blueprint Task Group (TG). The PBN Blueprint TG has been meeting recently and learning about implementation experiences in various locations and from various stakeholder perspectives – airports, ATC, operators, etc. The goal of the Task Group is to identify answers to questions such as:

- Who should be involved in successful PBN implementations (technical and non-technical)?
- What strategies work to engage all stakeholders?
- What is the definition of success?
- What are the lessons learned from previous attempts and how to structure implementations in the future?

Mr. Cebula explained that the NextGen Integration Working Groups grew out of the NAC's prioritization recommendations delivered to the FAA in September 2013. In the NAC's February meeting, they approved a deep dive on a subset of the Tier 1 Recommendations from last September. The specific capabilities approved for the deep dive were: Performance Based Navigation (PBN), Multiple Runway Operations, Data Communications and Surface. Integrated teams between the FAA and industry have been created to make plans and commitments to move forward on these four Tier 1 options.

Mr. Cebula then went through the schedule for the NIWGs. During the June 3rd NAC meeting, the Working Groups will provide interim reports. In July, the FAA will report progress on the Working Groups to Congress. The NAC will hear final reports from the groups on October 8th and Congress will receive final reports on October 18th.

VHF Omni-directional Range (VOR) Minimum Operating Network (MON) Update

Mr. Don Dillman, Airlines for America, and Mr. Bob Lamond, National Business Aviation Association, Co-Chairs of the VOR MON Task Group, provided a brief update to the TOC on the work of the VOR MON Task Group. They explained that the group had completed Tasks 1 and 2 previously. The next task, Task 3, was on hold because it required access to a PBN Route Strategy document from the FAA, which was currently not available. Mr. Dillman and Mr. Lamond explained the Task Group and TOC Leadership had coordinated with the FAA and RTCA to adjust the schedule of the VOR MON Task Group. The TG will begin work on Task 4, which focuses on outreach and education on the VOR MON,

and postpone Task 3 until a later time. The VOR MON Task Group expects to report on Task 4 during the September 3rd TOC Meeting.

NOTAM Search and Filter Options

Mr. Mark Cardwell, FedEx Express, Co-Chair of the Notice to Airman (NOTAM) Task Group, briefed the Committee on its recommendations on prioritization of search and filter criteria for NOTAM Search. This Task Group serves as the NOTAM Working Group of the TOC, which serves as the NOTAM Improvement Panel, an industry advisory panel required by the language in the Pilot's Bill of Rights (PBoR) legislation.

Mr. Cardwell explained that his Co-Chair for the NOTAM Task Group, Mr. Tom Kramer (AOPA), had a previous commitment and was unable to participate in this TOC meeting.

Mr. Cardwell then went through the recommendations. He explained that this recommendation was provided in direct response to a letter from the FAA regarding the initial NOTAM Task Group recommendation submitted in November 2013. In the letter, the FAA stated: "The FAA AIM office requests a working meeting involving the members of the task group and the Federal NOTAM System (FNS) engineering and development teams to define stakeholder requirements for some of the specific requests (e.g., the flight path search tool)." As a result of this request, NOTAM Task Group Leadership, RTCA and the FAA AIM office met to clarify what questions the FAA wanted addressed by the Task Group. Once this was clarified, the Task Group met, addressed the questions and prepared this recommendation report.

Mr. Cardwell then explained that the request from the FAA included three areas of work:

- Clarification of search and filter terms
- Prioritization of search and filter options
- Specific questions from the FAA response letter

Mr. Cardwell first addressed the clarification of search and filter terms. The FNS engineering and development teams requested clarification on the NOTAM Task Group's intent for each of the following recommended filter or search options for NOTAM search:

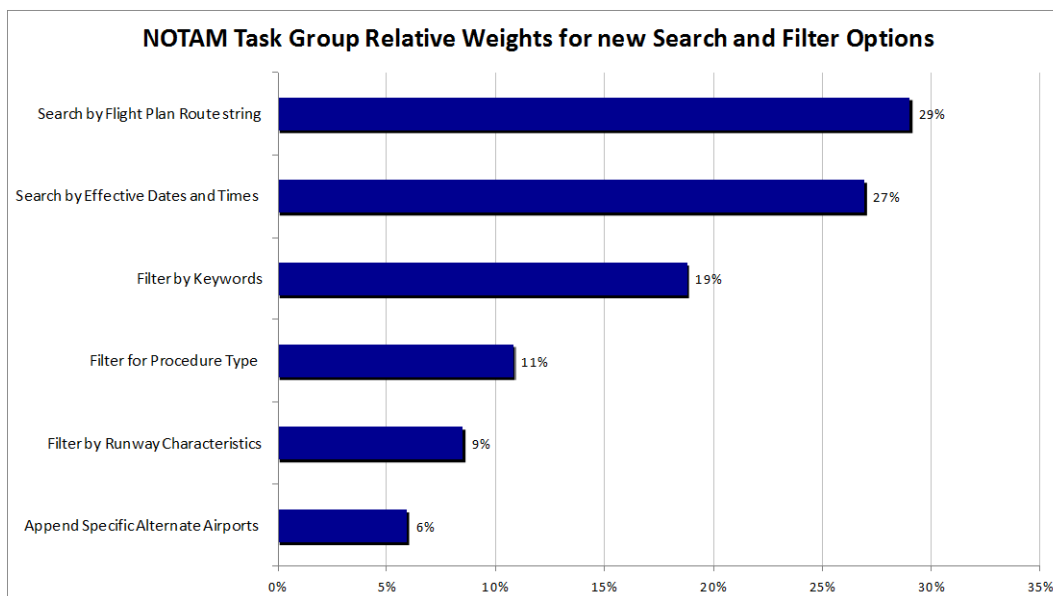
- Runways
- Regions
- FIRs
- Procedures
- Effective Dates and Times
- Altitude/Flight Level
- Keywords
- Flight Plan Route
- Desired Route Width
- Specific Airport along airman's route

The NOTAM Task Group provided clarification on each of these terms and Mr. Cardwell explained that the details of these clarifications are available in the final written recommendations from the Task Group.¹

Next, Mr. Cardwell addressed the Task Group's recommendation on prioritization of search and filter options. He explained that the underlying question for the Task Group was in what sequence should FAA implement the following options not currently in NOTAM Search?

1. Filter by Runway Characteristics (length, width, surface types)
2. Filter for Procedure Type to include or exclude a procedure type
3. Filter by Keywords (RWY, TWY, APRON, AD, OBST, NAV, COM, SVC, AIRSPACE, ODP, SID, STAR, CHART, DATA, IAP, VFP, ROUTE, SPECIAL, SECURITY)
4. Search by Effective Dates and Times with a time buffer
5. Search by Flight Plan Route string with a route and altitude width around it
6. Append Specific Alternate Airports outside of route of flight and route width to the search

Mr. Cardwell informed the TOC that the Task Group went through a prioritization exercise using a software tool called Decision Lens to identify relative importance of each of these six options. The results of the exercise are depicted in the chart below:



Mr. Cardwell explained that searching and filtering by route of flight and effective dates and times were clearly the first priorities of the Task Group. A second tier priority was the ability to filter by keywords. Finally, the lowest tier of priority included filtering by procedure type, runway characteristics and appending a specific alternate airport to a search.

Next, Mr. Cardwell reviewed a series of additional recommendations the Task Group had to offer:

¹ This report is available as Attachment 8 and on the Tactical Operations Committee page of RTCA's website: www.rtca.org

1. The general approach users will take for searching and filtering NOTAMs is by searching broadly to begin. From there, users expect to drill down to specifics using filtering capabilities.
2. NOTAM Search should allow users to search for multiple keywords at the same time.
3. NOTAM Search should allow users to filter keywords to both include and exclude the filter term.
4. NOTAM Search should allow users to create personalized accounts. Accounts could include saved information specific to the individual's operation. This may include items such as saved profiles for specific aircraft types, certain city pairs, specific routes, previous trips, preferred alternates and preferred flight levels. The Task Group recognizes there would be more work required to define the requirements of a user profile.
5. The "end state" for NOTAMs is a single Federal NOTAM Service web site combining the best features of the current DoD NOTAM and Pilot Web sites into the NOTAM Search web site. The TG realizes DoD may desire to keep its own site for DoD specific purposes.

Finally, Mr. Cardwell explained that the Task Group addressed three additional questions the FAA had posed in their response letter. The questions and Task Group responses are below:

1. **What is intended or implied by "Integration of Artificial Intelligence technology to facilitate ease of use (e.g. pattern recognition)"?**
Artificial Intelligence (AI) is an emerging discipline that offers great promise for human/machine interface. At present, in its most sophisticated form, it is probably not a practical addition to FNS, but less sophisticated aspects, like user profiles, may be a reasonable goal. The Task Group recognizes AI has much long term promise but suggests user profiles as a starting point for this item.
2. **On the recommendation for Flight Service Specialists: is the recommendation to allow FSS's to create NOTAMs (which they do today with ENII) or for FSS's to use NOTAM Manager in the future?**
The Task Group recommends Flight Service Specialists utilize NOTAM Manager in the future. The Group is aware there may be other factors that make this recommendation difficult. However, the Task Group leaves this recommendation as is for the time being with the request to hear further detail from the FAA on the ramifications of the recommendation. While the Task Group envisions full use of NOTAM Manager from all NOTAM originators, the Group is also interested in understanding the challenges it creates for the FAA.
3. **The FAA has stated that the NOTAM Improvement Panel will be an important participant in helping digitize the last 20% of NOTAMs. What ideas do different stakeholders particularly those representing airports general and business aviation stakeholders and airports have to partner with the FAA to motivate digitization towards 100%?**
The Task Group suggested the FAA consider whether it should define a date in the future to require digital entry for all NOTAMs. Additionally, some Task Group members indicated an

interest to examine data on which NOTAM generators are not originating NOTAMs digitally. Some Task Group members are membership based organizations and may be able to leverage local members to support outreach to airports that are not transitioning to digital. The members suggested that the message may have more weight if delivered from a local entity, and the local members of some organizations may be able to support this in the future. Finally, the Task Group suggested the FAA consider including a link to the primary FNS site in the “One Stop Shop” AIM Modernization Portal.

Committee Action: The Committee agreed by consensus to approve the NOTAM Search and Filter Options recommendation (Attachment 8).

Anticipated issues for TOC consideration and action at the next meeting

At the next meeting, the Committee will receive recommendations for consideration from the VOR MON Task Group and reports from the RTGs.

Other business

No other business was raised.

Adjourn

Chairman Wright ended the meeting of the Committee at 1:00 p.m.

Next Meeting

The next meeting of the TOC is September 3, 2014 in Washington, DC.



**Approved by the Tactical Operations
Committee September 2014**

**VOR MON Outreach, Education and
Required Modifications**

*Report of the Tactical Operations Committee in Response to Tasking from
The Federal Aviation Administration*

September 2014

VOR MON Outreach, Education and Required Modifications

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Background/Introduction

In order to transition from the use of a very high frequency (VHF) Omni-directional Range (VOR) based route structure to one based on Performance-Based Navigation (PBN), the VOR Minimum Operational Network (VOR MON) Implementation Program was established by the Federal Aviation Administration (FAA). It is one of many activities required to shift resources and operations from the legacy National Airspace System (NAS) to NextGen. The VOR MON Task Group (TG) was tasked by the RTCA Tactical Operations Committee (TOC) in July 2013 to provide recommendations to the FAA on the MON Implementation Program¹ so as to meet the target date of 2025.

Prior to the Task Group forming, the FAA developed initial draft VOR MON criteria and published them in the Federal Register for comment in December 2011. These criteria were further addressed in a notice in August 2012, and the VOR MON Task Group has offered additional criteria and prioritization in its recommendations. Currently, criteria for the VOR MON call for retaining VORs outside of the CONUS, those in Western mountainous regions, oceanic VORs and those in known GPS “jamming” locations. Criteria for the MON ensure that an operator can navigate to a safe landing airport within 100 NM of any point in the CONUS and full en-route coverage is provided at or above 5,000 ft AGL, enabling adequate navigation for non-RNAV capable aircraft. Where possible, retaining VORs for training purposes and the ability to hold for Core 30 airports is also considered.

The VOR MON Program went before the FAA Joint Resources Council (JRC) and was approved for Investment Analysis Readiness Decision (IARD) in March 2014. A Final Investment Decision (FID) is expected in 2015. Originally plans for the VOR MON expected completion of the MON program in 2020. However, recent assessment of the procedural modifications required to implement the MON were conducted, and the FAA concluded the completion data of 2020 was untenable given the volume of modifications and available staff. The final implementation date of the MON was moved from 2020 to 2025. Decommissioning of individual VORs prior to FID has taken place and is planned to continue. In many cases, these VORs are not sustainable and cannot wait for FID.

The VOR MON Task Group has completed two previous tasks for the FAA to review VOR MON selection criteria and assumptions, offer additional criteria if appropriate and prioritization of criteria. At the request of the FAA, the Task Group deferred Task #3 and moved ahead to Task #4 since Task #3 was predicated on evaluating the draft PBN Route Strategy which is currently unavailable.

This report focuses on Task #4, which addresses outreach and education required to successfully implement the VOR MON. Additionally, this report advises the FAA of what existing policies, processes, procedures or training needs modification for successful implementation of the MON.

Executive Summary

This document provides the Task Group’s response to Task #4 of the FAA Tasking letter and is focused on the outreach and education required to successfully implement the VOR MON.

¹ Letter from Elizabeth L. Ray (Vice President, Mission Support Services) to Margaret Jenny (RTCA President) dated July 10, 2013.

This report provides recommendations in three broad areas: 1) the process for decommissioning VORs to achieve the MON, 2) community outreach and education before and during implementation of the MON and 3) required modifications and mitigations to successfully implement the MON.

The Task Group recognizes that the current process of decommissioning VORs is not scalable to the approximately 500 VORs targeted to reach MON objectives. The program therefore must be modified to balance the needs of stakeholders to be informed and create feedback while simultaneously allowing the FAA to review and adjudicate the comments in a reasonable amount of time with a reasonable level of resources. The TG provided recommendations aimed at balancing these needs.

The TG feels that a robust outreach and education process is foundational to the success of implementing the VOR MON. This process must notify all stakeholders, provide interaction between the stakeholders and the FAA, and allow for consideration of some exceptions. With regard to messaging, the VOR MON is not an end in and of itself, but rather a piece of the larger transition to NextGen and its inherent benefits. Therefore the message to the stakeholders must state the case for the benefits, be transparent and complete, and utilize a wide variety of channels including industry groups, the internet, social media and outreach to the Legislative Staff.

Finally, the TG believes that the third element of a successful implementation is the creation of a comprehensive list of all airspace and procedural modifications and mitigations associated with each decommissioned VOR. It is through this information that the public will fully understand the impact of the MON while also appreciating the extent of mitigation the FAA is providing in the transition to the VOR MON.

Process for Decommissioning VORs to Achieve the MON

Presently, the FAA already decommissions VORs. Some VORs have been made inoperable and non-repairable due to weather or natural deterioration of the facility. Others reside on land for which a lease cannot reasonably be renewed. In such cases, the FAA follows a standard process for decommissioning a Navigational Aid (NAVAID). The initial process is a non-rulemaking process in which the FAA provides an Advisory Circular (AC) from the appropriate Service Area. Each Service Area has a list of stakeholders to whom the AC is sent. There is no requirement to publish the intent to decommission in the Federal Register.

The current process handles one NAVAID at a time, and does not scale up effectively for a VOR MON program that plans to decommission on the order of 500 VORs.

Current Process Flow for Decommissioning

The following chart depicts the FAA's current process for decommissioning a navigational aid. The first row communicates the steps to identify which navigational aids are planned for decommissioning. (The current VOR MON Program is effectively doing the work depicted in the first row by identifying the 500 or so VORs that will be identified for decommissioning in the MON.)

The second row in this flow chart communicates the process for distributing notification of the plan for decommissioning, acceptance and adjudication of public comment. The final row presents the process for communicating an updated intent for decommissioning based on public comment as well as identification of any mitigations required.

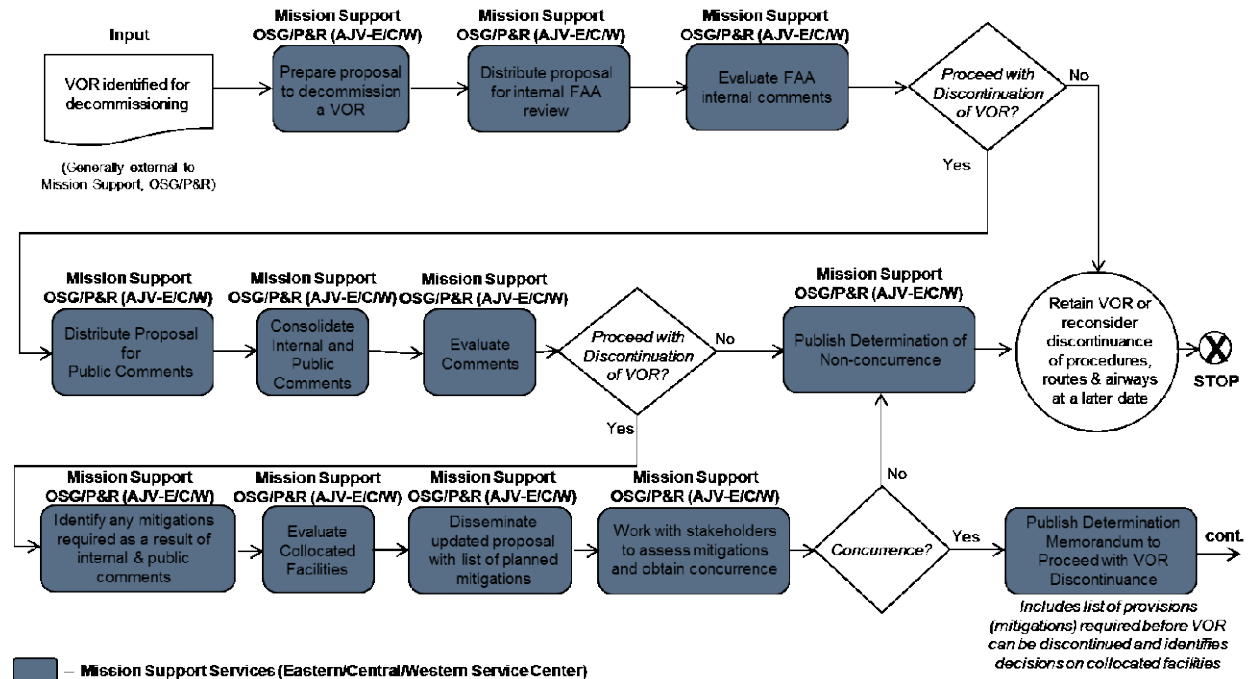


Figure 1: Current Process for Decommissioning VORs

Guiding Principles

The VOR MON Task Group considered the following guidelines when developing recommendations for the decommissioning process:

1. Given the scale of decommissioning involved with the VOR MON, batch notification announcing all of the VORs planned for decommissioning to the public is preferable to individual notification (i.e., announce one VOR at a time).
2. The process for providing notification, gathering public comment and addressing public comment should not be so onerous to stall or delay the MON process.
3. The public comment and feedback process for one VOR should not delay the decommissioning process for other VORs.
4. Notification of the VORs planned for decommissioning should be transparent to the public and the process for making final determinations of individual VORs (the mitigations to be considered) should be included in the initial notification.
5. The work of determining the mitigations required by the VOR decommissioning must occur upfront to understand the network impacts of a large-scale VOR shutdown.

Recommendations

The VOR MON Task Group offers the following recommendations with respect to the process for decommissioning:

1. **At the beginning of the process, the FAA should notify the public concerning the full list of VORs to be planned for decommissioning; this should be done via non-rulemaking action such as an Advisory Circular (AC). If the FAA chooses to use ACs, publication of ACs could include one for the entire MON Program or one for each Service Center. In either case, the list(s) should be broken down by State.**

The Task Group strongly recommends that the FAA publish a list of all VORs planned for decommissioning at the beginning of the notification process. It is paramount to publish the full list upfront so there are no surprises to the public later in the process about which VORs are being shut down.

Notification can be done in one or multiple Advisory Circulars. The intent of multiple ACs is to break the information down geographically to make the information more accessible. However, publication of an Advisory Circular for every individual VOR planned for decommissioning would be too onerous, both in terms of production and consumption of the information.

The Task Group also suggests publishing a notification of the VOR MON Program in the Federal Register at the same time. The specific list of VORs intended for decommissioning in the MON should not be published in the Federal Register notice; the Task Group recommends not initiating a public comment mechanism at the time of notification. Readers of the Federal Register should be referenced to the AC's for specific VOR listings.

2. **Process for decommissioning should separate the notification (non-rulemaking) component from the rulemaking components to not stall the process unnecessarily.**

Once a VOR is approved for decommissioning, any impact to procedures, routes, etc. may require rulemaking procedures which can take substantial time. Currently, the average time required for the rulemaking process around procedure or route changes is 241 days. The Task Group recommends that the notification process and, to the extent possible, feedback from and engagement with the public should be independent of any required rulemaking.

3. **The process for collecting, evaluating and adjudicating public comment should be communicated clearly in the notification of the VOR MON.**

The FAA should communicate to the public how it will adjudicate public comments.

Recommended Process Flow for VOR MON Decommissioning

The recommendations relate to the process flow for VOR decommissioning. The following graphic depicts a simple picture of an alternate process flow for decommissioning that the Task Group is proposing for consideration:

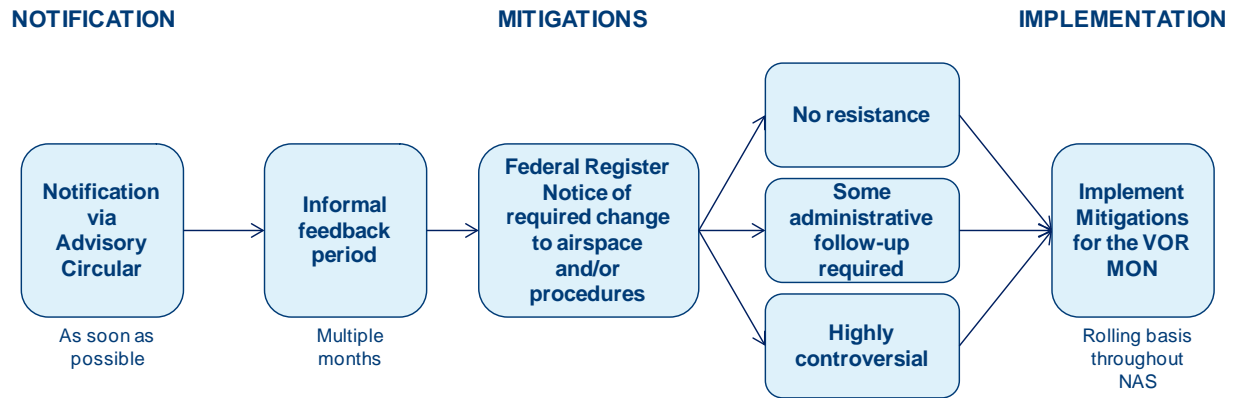


Figure 2: Simplified Alternative Process for Communicating VOR MON

The Task Group recommends that the initial notification be provided as quickly as possible and be a complete list of VORs. The initial notification is separate in process and time from the rulemaking steps of notification of procedure and route mitigations required as a result of decommissioning. This rulemaking step will require a Federal Register notice for each VOR planned for decommissioning. The time between AC notification(s) and FR notices will be a number of months during which the FAA will gain further understanding of which VORs are meeting no resistance, which require some administrative follow-up and which will be highly controversial and require additional attention, such as individual outreach or local town hall meetings. The TG expects that most VORs will be in the first category. The process as recommended is designed to informally gather feedback on which VORs will be most controversial and hence require the most allocation of resources to follow up.

Outreach and Education on the VOR MON

The VOR MON Task Group envisions three levels of notification and communication from the FAA to the Public regarding the VOR MON:

1. The first level of communication is NOTIFICATION. This step involves a one-way flow of information from the FAA to the Public. Communication would include information about the VOR MON Program as a whole, the rationale, the value to the Public and the list of VORs and sequence for shut down. It will also include a standard template of information about each of the VORs scheduled for shutdown as part of the MON. Some tools for this phase of communication may include (but are not limited to) public notices, magazine articles, press releases, flyers, mailers, etc.
2. The second level of communication is INTERACTION. In this phase, stakeholders are expected to request information at a more local and detailed level. The Task Group does not expect that all VORs scheduled for shutdown will require extensive interaction, but some will. This may involve community town hall meetings and/or individual meetings with key local stakeholders.
3. The third level of communication is EXCEPTION. In this final phase, the FAA may take some action to evaluate exceptions and even modify the plan(s) based on new inputs unavailable until the VOR MON list is released to the public. Legitimate stakeholders with substantive concerns and feedback may sway the FAA to modify the plan(s).

Guiding principles

The VOR MON Task Group worked from the following set of Guiding Principles in its development of recommendations on the process for Outreach:

1. The FAA should focus on providing complete information early in the process.
2. Communication about the VOR MON should include messages that the process is not ad hoc and not just a random selection of VORs. The communication should include the fact that there were criteria, criteria were weighted and the selection was based on a structured approach.
3. Messaging about the VOR MON should be focused on the flying public and why the VOR MON Program is beneficial for the flying public. While they can and should be mentioned, the messaging should not focus on benefits to the FAA.
4. Planning of and transition to the VOR MON requires the participation of three main groups: the FAA, the VOR MON Task group (and the industry they represent) and the public. Each has a role and responsibility in the process. The FAA has the responsibility to create a plan and be responsive to industry stakeholders in modifying that plan. The VOR MON Task Group has the responsibility to represent broad constituencies while providing recommendations and feedback to the FAA on the creation of criteria and implementation plans. The public has the responsibility to provide detailed feedback with legitimate concerns and questions on individual VORs.

Recommendations

1. The overarching theme about the VOR MON should relate to the transition to Performance-Based Navigation (PBN) and NextGen.

The critical message is that NextGen is anticipated to improve air travel for all parties involved, including the flying public. An important component of NextGen is industry transition to Performance-Based Navigation. This is partially enabled by moving from ground-based to satellite-based navigation. The Task Group expects that this detail can be drawn from existing information within the FAA's NextGen Office.

The message should also communicate the idea that the VOR MON is a natural consequence of the transition to NextGen. Part of the transition to PBN is a reduced need for legacy equipment and procedures as well as a necessary reallocation of human resources to fully support the new PBN operation. This financial and human resource reallocation drives the need for the VOR MON. Finally, the message should include the list, and aggregated information on the age of the VORs and expenses to maintain the current VOR inventory.

Additionally, the message should include background on the process for developing the VOR MON list. This includes the idea that there has been a rigorous process involving quantitatively weighted criteria and formal input from industry.

The Task Group also notes that within the transition to PBN, the VOR MON is not the only valuable step being taken as part of this transition. The FAA should be able to communicate the full set of changes

associated with the move to PBN that the Industry and Public may care about.

2. To ensure transparency, the FAA should provide a published VOR MON plan, including plans for decommissioning VORs, as soon as possible.

A published VOR MON plan helps the aviation industry to move forward and plan in earnest for the VOR MON. (Industry participants do not want to outpace the FAA in any decisions.) Also, published plans help the industry support protection of FAA funding for the VOR MON Program.

A component of this communication should recognize that the pilot community will be a critical recipient of this information. Communications that help pilots understand the changes taking place and their impact on training, charting, flight planning and other aspects of the operation are of particular importance.

Finally, the FAA should be clear in its publications that the VOR MON may continue to evolve even after publication. For example, if a VOR planned for decommissioning is ultimately retained in the MON, it may be swapped into the MON for another VOR that was not originally planned for shutdown. While the FAA should work to minimize the number of these changes, the Task Group recognizes some will be inevitable.

Recommendations on Tools for Communication about the VOR MON

3. FAA should accept the support of industry organizations to help communicate the message about the VOR MON.

Industry organizations, such as the National Business Aviation Association (NBAA), Airlines for America (A4A) and the Aircraft Owners and Pilots Association (AOPA) are willing to help advocate this effort to their members. The organizations need as much information as possible in a well structured format to support the FAA in communicating the rationale, approach and mitigations to their members in a way that makes sense for each organization. The organizations are willing to have “skin in the game” for communication of the VOR MON. Events such as A4A Ops Council, NBAA events, ACF, Oshkosh, Sun n’ Fun are forums in which the VOR MON Program could be communicated.

Though these organizations are willing to support outreach, any public form of communication should be led by the FAA in partnership with other industry organizations. Ultimately, public stakeholders are interested to hear the message from the FAA directly. The organizations can help provide the forums and opportunities to deliver the communication, but the FAA needs to lead the actual communication process.

Finally, while organizations can provide the forums to communicate the overarching storyline about the VOR MON, any engagement or dialogue on specific VORs would be between the public and the FAA directly.

4. Utilize the internet and social media to communicate about the VOR MON.

The Task Group recommends the FAA create a VOR MON website that communicates a graphical version of the VOR MON storyline. Such a website could depict a graphical version of the VOR MON, i.e., which VORs are planned for shutdown, what the alternatives are, safe landing airports from any point in

the NAS, etc. The website could allow users to “mouse over” any VOR and learn about its specific plans as part of the MON. Such a website could be a very effective means of communicating the complex details of the VOR MON. Additionally, utilization of Social Media options such as Facebook and Twitter should be employed to broadly communicate the messages about the VOR MON. The FAA may consider providing geographically targeted information to General Aviation pilots to alert them of VORs scheduled for decommissioning in their region (as opposed to the 500 or so in the entire NAS).

5. The FAA should actively reach out to Legislative Staff to ensure they understand the Program and the approach and rationale for decision-making.

The FAA should outreach to Congressional Staff about the VOR MON Program. Additionally, the FAA should communicate about the VOR MON to the Legislative Staff of industry organizations to ensure that all parties have the same information about the VOR MON.

Recommendations on Required Modifications for the VOR MON

The VOR MON Task Group considered the different modifications required for successful implementation of the MON. The TG offers the following recommendations on required modifications to policies, processes, procedures or training for successful implementation of the MON:

Required Modifications to Procedures

The Task Group offered the following recommendations in its initial Recommendation for Task #1, submitted in November 2013. The Group believes that the following required considerations for modifications to procedures represent the most important requirements in the transition to the VOR MON:

- All Standard Arrival Routes (STARs), Standard Instrument Departures (SIDs), Instrument Approach Procedures (IAPs) (to include Missed Approaches and One Engine Inoperative (OEI) procedures) that have the targeted VOR as part of the procedure.
 - All Obstacle Departure Procedures (ODPs) and take off minima that are dependent on the targeted VOR.
 - All Holding Patterns, Pref Routes, Fixes, Airways (high/low) and VOR CHKPs dependent on the targeted VOR.
 - Non-navigation services provided by the targeted VORs – for example, communications (Flight Service Stations (FSS), Hazardous Inflight Weather Advisory Service (HIWAS), Automatic Terminal Information Service (ATIS)) references to intersections and waypoints that define Special Activity Airspace (SAA), Notices to Airmen (NOTAM), Letters of Agreement (LOA), Sigmets/Airmets, PIREPS, airspace classifications, Temporary Flight Restrictions (TFRs), military training routes, air refueling tracks, intra-/inter-facility letters of agreement and Memorandums of Understanding (MOUs).
 - All AeroNav Chart products that depict the VOR.
 - For each item identified above, the FAA needs to decide and document, in coordination with the user community (a) no mitigation or replacement is necessary, and the rationale why or (b) a mitigation or replacement is needed, a description of the mitigation/replacement and the effective date. Both (a) and (b) will include a cost/benefit analysis to include user costs/impacts. To the maximum extent possible, no VOR shall be decommissioned prior to implementing the mitigation or publishing the replacement procedure.

Single Engine Inoperative

The recommendations discussed in the previous section relate to all Instrument Approach Procedures, including One Engine Inoperative procedures. The FAA, in its response letter to the Task #1 Recommendation, noted that OEI procedures were typically designed by operators or third party vendors, and the FAA did not have access to this information. The FAA requested feedback on how it should address the Task Group's recommendation as it relates to OEI procedures.

The Task Group recommends that operators retain responsibility for adjustment of these procedures. For the operators to effectively adjust their internal procedures, they require ample advanced notification of all VORs planned for decommissioning. This will allow operators to evaluate which VORs are most critical to internal company procedures. With this notification, the onus falls on the operators to evaluate and adjust their procedures. This provides further emphasis on the FAA providing the full list of VORs planned for decommissioning upfront in the notification process.

In addition to large commercial and business aviation operators, the Task Group recommends the FAA communicate the list of VORs planned for decommissioning to large membership organizations such as A4A, NBAA and NATA. Also, the performance engineering companies should be directly contacted to inform them of the VOR MON in light of their work with flight departments/airlines on OEIs. Finally, chart vendors often create company procedures on behalf of an operator, and these vendors should be actively notified about the MON as well.

Required Modifications to Publications

There are multiple publications that require an explanation of the VOR MON, a listing of affected airports and a listing of safe-landing airports. These publications include:

- Aeronautical Information Manual (AIM)
- Airport/Facility Directory (AFD)
- Instrument Procedures Handbook (IPH)
- Instrument Flying Handbook (IFH)
- Controller Handbook (7110.65)

Required Modifications to Notifications

- There may be required changes to IFR charting if there is either a requirement to depict the VORs that will remain as part of the VOR MON or to depict VOR MON safe landing airports on charts. As the transition to the VOR MON will take place over many years, it would be beneficial for charts (paper and electronic) to depict those VORs that will remain once the drawdown is complete as well as those airports designated as safe landing airports. The Task Group notes that such discussion should be referred immediately to the Aeronautical Charting Forum (ACF) for the October 2014 ACF meeting.
- The NOTAM service needs a process for notification of a GPS event. Currently there are NOTAMs provided for DoD GPS jamming tests. Such NOTAMs should continue and any additional loss of GPS signal, whether scheduled or unscheduled, should be included in the NOTAM service. One specific example of this is required maintenance down times for VORs within the MON. When such down time occurs, the MON will have gaps in its required 100 nm or less for a safe landing airport. Such gaps would require prioritization in NOTAM information.

Required Modifications to Training and Operations

- Should GPS be unavailable in certain parts of the country, there may be a need to define VOR MON operating procedures. There are multiple considerations in the event of an outage: Do aircraft have to land immediately? Should aircraft continue to operate to the closest safe landing airport? Should they operate to the safe landing airport nearest their original destination? Etc. When a MON scenario develops, procedures that pilots use like calculating “Bingo fuel” in the hold may need a different approach than in non-MON scenarios. The Task Group believes that FAA Flight Standards will have to evaluate such scenarios and identify the appropriate operating rules, if any are required.
- With the implementation of the VOR MON, training on aeronautical decision making in conjunction with the MON should be developed for pilots. Operators will need a mechanism to identify the closest safe landing airport during operations. This may require charts that depict the closest MON airport at any point in the NAS.
- Navigational databases will need to be updated to reflect the VOR MON as it evolves. The industry as a whole may consider providing additional color coding on charts to alert pilots of VORs that are planned for decommissioning as part of the MON. This would be another agenda item for consideration by the Aeronautical Charting Forum.
- As part of Instrument Rating and an Airline Transport Pilot (ATP) License, training may be required on the existence of the VOR MON and safe landing airports as well as how a pilot would operationally use the VOR MON in the case of a GPS outage in Instrument Meteorological Conditions (IMC).
 - There may be a need for an Advisory Circular that explains VOR MON operating procedures.
 - When the MON is operational in a region, there may be a need for training and testing on the MON.
- Training will be required in ATC facilities on new procedures resulting from the MON.
- Training for inclement weather may require changes such as diversion decisions for military aircraft that may only land at one of the safe landing airports
- Testing standards may include use of the VOR MON. Such testing may involve the Flight Review or Instrument Proficiency Checks for General Aviation, air carrier recurrent training, controller recurrent training, etc.
-
- While this may be beyond the scope of the VOR MON, the FAA must plan for managing operations in the case of a large scale GPS outage. Training must be in place, especially in high density operations. Some level of route structure may be warranted to assist controllers in sequencing aircraft.

Appendix A: Members of the VOR MON Task Group

Kal Bala	RTCA, Inc.
Phillip Basso	DoD Policy Board on Federal Aviation
Rich Boll	National Business Aviation Association
Andy Cebula	RTCA, Inc.
Dale Courtney	Federal Aviation Administration (Subject Matter Expert)
Donald Dillman	Airlines for America (Co-Chair)
Bob Ferguson	NetJets Association of Shared Aircraft Pilots
Denise Fountain	DoD Policy Board on Federal Aviation
Jens Hennig	General Aviation Manufacturers Association
Mark Hopkins	Delta Air Lines, Inc.
Tom Kramer	Aircraft Owners and Pilots Association
Bob Lamond	National Business Aviation Association (Co-Chair)
Deborah Lawrence	Federal Aviation Administration (Subject Matter Expert)
David Manville	U.S. Army
Vince Massimini	The MITRE Corporation
Don McClure	Air Line Pilots Association
Trin Mitra	RTCA, Inc.
Rick Niles	The MITRE Corporation
Matthew Ross	Real NewEnergy
Edwin Solley	Southwest Airlines
Stephen Sorkness	SkyWest Airlines
Greg Tennille	The MITRE Corporation
Robert Utley	National Air Traffic Controllers Association
David Vogt	Delta Air Lines, Inc.

Appendix B: Glossary of Acronyms

- A4A – Airlines for America
- AC – Advisory Circular
- ACF – Aeronautical Charting Forum
- AFD – Airport/Facility Directory
- AIM – Aeronautical Information Manual
- AOPA – Aircraft Owners and Pilots Association
- ATIS – Automatic Terminal Information Service (ATIS)
- ATP – Airline Transport Pilot
- DoD – Department of Defense
- FAA – Federal Aviation Administration
- FID – Final Investment Decision
- FSS – Flight Service Stations
- GPS – Global Positioning System
- HIWAS – Hazardous Inflight Weather Advisory Service
- IAP – Instrument Approach Procedure
- IARD – Investment Analysis Readiness Decision
- IFH – Instrument Flying Handbook
- IMC – Instrument Meteorological Conditions
- IPH – Instrument Procedures Handbook
- JRC – Joint Resources Council
- LOA – Letter of Agreement
- MOU – Memorandum of Understanding
- NAVAID – Navigational Aid
- NBAA – National Business Aviation Association
- NOTAM – Notice to Airmen
- ODP – Obstacle Departure Procedure
- OEI – One Engine Inoperative
- PBN – Performance Based Navigation
- SAA – Special Activity Airspace
- SID – Standard Instrument Departure Route
- STAR – Standard Arrival Route
- TFR – Temporary Flight Restriction
- VOR MON – Very High Frequency Omni-Directional Range Minimum Operating Network

Appendix C: FAA Tasking Letter



U.S. Department
of Transportation

**Federal Aviation
Administration**

Mission Support Services
800 Independence Avenue, SW.
Washington, DC 20591

JUL 10 2013

Ms. Margaret T. Jenny
President
RTCA, Inc.
1150 15th Street, NW
Suite 910
Washington, DC 20036

Dear Ms. Jenny:

In order to provide navigation services in a more efficient and cost effective manner and meet the goals of the Next Generation Air Transportation System (NextGen), a transition from the use of a very high frequency Omni-directional Range (VOR) based route structure to that of a Performance-Based Navigation (PBN) based route structure is necessary and underway. To meet the goals of NextGen, current processes for defining airways, routes, and developing procedures using VORs must give way to routes and procedures with improved accuracy, availability, integrity, and continuity using PBN. The VOR Minimum Operational Network (VOR MON) Implementation Program has been established and is one of a myriad of activities required to shift resources and operations from the legacy National Airspace System (NAS) into NextGen. The VOR MON Program is designed to be a collaborative effort, which includes various lines of business (LOBs) within the Federal Aviation Administration (FAA) as well as numerous aviation stakeholder groups, to provide the tactical and strategic planning and implementation guidance to safely and systematically transition from a legacy network of 967 VORs to a MON of approximately 500 VORs by January 1, 2020.

The timing of the VOR MON Program is critical. Our current operating system of Federal Airways is based on 546 VOR/tactical air navigation (TACAN)s and 421 VOR/distance measuring equipment (DME)s. All of these VORs are beyond their economic service life. By 2020, the FAA projects the widespread availability of PBN procedures and the mandate of Automatic Dependent Surveillance-Broadcast (ADS-B) Out will result in most operators having a global positioning system (GPS) or wide area augmentation system (WAAS) and flying both PBN and conventional procedures using PBN avionics. This transition to PBN as the primary means of navigation will result in a significant decrease in the reliance on VORs. The remaining VORs will serve as a backup navigation service to non-DME/DME/Inertial Reference Unit equipped aircraft but PBN functionality will be limited. The VOR MON will provide backup navigation services to non-GPS and non-WAAS equipped aircraft but it will not be as efficient.

The VOR MON is envisioned to allow an aircraft to safely navigate VOR to VOR to land at an airport with a GPS independent approach within 100 nautical miles (nm) of any location within the Continental United States (CONUS). Efforts are ongoing to identify Alternative

Position, Navigation, and Timing solutions that will provide a full-scale backup system to GPS and are separate from the VOR MON effort. The FAA developed the initial draft VOR MON criteria and published them in the Federal Register for comment in December 2011. Based on comments, the criteria were clarified and a draft candidate list was established. Based on the draft candidate list, the VOR MON Program Office worked with the Service Areas and various FAA Headquarters organizations and identified some preliminary implementation issues. We also held some early discussions with the Department of Defense (DoD) to facilitate future coordination and to assess any impacts to DoD CONUS operations. TACAN and DME are not considered by the VOR MON program. Several other stakeholder groups have also been briefed about the program but we are requesting the assistance of the Tactical Operations Committee (TOC), to provide recommendations in three key areas:

Task One – Review and validate the VOR MON selection criteria and assumptions and make additional recommendations as needed.

Task Two – Review and validate the draft candidate VOR MON list, based on the above criteria.

Task Three – Review implementation planning to date and make recommendations to the preliminary waterfall schedule developed by the FAA.

Task Four – Provide recommendations to the FAA on outreach and education that should be accomplished to prepare the industry for the VOR MON reduction. More detail on each task follows.

Task 1: Review and validate the VOR MON selection criteria and assumptions

We plan to transition from VOR defined route structures as the primary means of navigation to PBN using Area Navigation (RNAV) and Required Navigation Performance (RNP) by January 1, 2020. Since VORs do not enable advanced RNAV, RNP, or ADS-B operations, FAA will reduce operating costs by reducing the number of FAA-provided VORs and associated conventional procedures and routes. Reductions in VORs will be limited to the CONUS. Most VORs in the western mountains and all FAA- owned VORs outside CONUS will be retained. Remaining VORs will form the VOR MON and will accomplish the following:

- Provide navigation coverage above 5000 feet above ground level.
- Allow an aircraft in the CONUS to fly safely VOR to VOR or to a safe landing site with a GPS-independent approach within 100 nm of any location in CONUS.
- Support international arrival routes and operations at the Core 30 airports.
- Support Hazardous In-Flight Weather Advisory and Flight Service Station voice services.

We request the TOC:

- Review and validate the basic program assumptions made to date concerning the selection criteria. We will ensure the TOC has complete information on studies and analysis done to date as well as access to subject matter experts within the FAA.
- If amendments are recommended, please provide specific details with the recommendations to include the range of options and/or alternatives discussed.

We request this tasking be complete by January 2014 with an interim report in October 2013.

Task 2: Review and validate the draft candidate VOR MON list

Based on the criteria noted above, we have developed a preliminary candidate list for the VOR MON. Those VORs not on the list would be slated for discontinuance. FAA Service Areas have reviewed the lists and commented based on the criteria above. We request the TOC:

- Review and validate the candidate VOR MON list based on the criteria and, if the TOC recommends amending the criteria, update the candidate list based on the amendments as appropriate. If specific options were considered but not adopted via consensus, please provide the range of options and/or alternatives considered.
- Advise the FAA from a stakeholder perspective on why, how, and whether exceptions should be made to valid criteria. Again, please provide specific details to include the range of options and/or alternatives discussed.

We request this tasking be complete by April 2014 with an interim report in January 2014.

Task 3: Review implementation planning to date and make recommendations to the preliminary waterfall schedule developed by the FAA

We have identified the need to develop a waterfall schedule taking into account instrument procedures cancellation activities, Optimization of Airspace and Procedures in the Metrolises, and the development of high altitude (Q) and low altitude (T) area navigation routes. Clearly the effort has to be carefully coordinated with other activities which result in the development and charting of instrument flight procedures and routes in the NAS. Each VOR not on the candidate MON will likely have numerous conventional procedures or routes associated with the VOR. These procedures and routes will either need to be replaced or canceled. The order or timing of VOR cancellations must not reduce safety in the NAS. For example, Victor 3 extends from Maine to Florida and has 14 VORs identified for discontinuance/decommissioning. Should we implement based on an entire route like this?

Should we transition the entire route to a PBN based route structure first and retain end to end flight planning capability and minimize automation issues? We request the TOC:

- Examine and analyze the PBN Route Strategy in light of the VOR MON Program and recommend up to three possible implementation/waterfall scenarios. Advise the FAA of the pros and cons of each. If incremental actions are needed in any of the scenarios, please identify those with specificity. Please include the range of options and/or alternatives discussed in the documentation. We will provide the TOC with a draft copy of the PBN Route Strategy.
- Provide recommendations on which victor and jet routes should be retained in the 2013-2020 timeframe and why. Please include the range of options and/or alternatives discussed in the documentation.
- Provide high level industry perspective on the feasibility and actions needed to completely retire the legacy route structure after 2020.

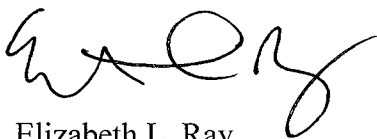
We request this tasking be complete by July 2014 with an interim report in April 2014.

Task 4: Provide recommendations to the FAA on outreach and education that should be accomplished to prepare stakeholders for the VOR MON reduction

- Advise the FAA, from an external stakeholder perspective, of what existing policies, processes, procedures or training will need to be modified to successfully implement the VOR MON.
- Advise the FAA on an outreach strategy to include modes of outreach, timelines, etc. and provide recommendations on how the industry can assist the FAA in outreach efforts.

We request this tasking be complete by July 2014 with an interim report in April 2014.

Sincerely,



Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization