Meeting Summary, February 6, 2014
Tactical Operations Committee (TOC)

The fourth meeting of the Tactical Operations Committee (TOC), held February 6, 2014 at RTCA Headquarters in Washington, DC, 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 November 7, 2013 TOC Meeting
Attachment 4 – NOTAM Success Criteria and Metrics recommendation
Attachment 5 – 20:1 Visual Area Surface Task Group recommendation
Attachment 6 – VOR MON Prioritization recommendation
Attachment 7 – Industry White Paper on Lemoore ATCAA
Attachment 8 – Navy White Paper on Lemoore ATCAA

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. Mr. Bowman began by introducing Mr. Dale Wright of the National Air Traffic Controller Association as the new Co-Chair for the Tactical Operations Committee. All TOC members and attendees from the public were asked to introduce themselves (TOC members and General Public Attendees are identified in Attachment 1).

The Chairs reviewed the agenda and began the proceedings of the meeting.

Designated Federal Official Statement
Ms. Elizabeth “Lynn” Ray, Vice President of Mission Support at the FAA, and the Designated Federal Official of the TOC, read the Federal Advisory Committee Act notice governing the open meeting.
Approval of November 7, 2013 Meeting Summary

The Chairs asked for and received approval of the written Summary for the November 7, 2013 meeting (Attachment 3).

FAA Report

Ms. Ray provided the FAA report. She began by noting that the budget situation for the FAA continues to be an important topic. She stated that the budget for FY14 was better than expected and did not include the significant cuts discussed previously related to the sequester. The FAA is awaiting feedback (referred to as the “passback”) from the Office of Management and Budget on plans for the FY15 budget. The FAA also plans to hire 3,000 new air traffic controllers in FY14 and FY15. A committee member noted that hiring that many new controllers was a positive direction but still lagged the pace of retirements of controllers.

Ms. Ray spoke about a new directorate, Air Traffic Procedures, that was established in the Air Traffic Organization. The Procedures organization will be developing operational policies and procedures around Traffic Management Advisor (TMA) and Time Based Flow Management (TBFM). Ms. Ray spoke about how these use policies will be a foundational aspect of Terminal Sequencing and Spacing (TSS) which must be in place for rolling out PBN broadly. A committee member inquired about what industry forums will be utilized to gather industry input into the operational policies and procedures. Ms. Ray commented that the FAA has not yet made a decision on how to incorporate input from stakeholders. The TOC members had extensive conversation about what the right forum might be for incorporating stakeholder input on these subjects.

Ms. Ray commented that the FAA’s commitments to Optimization of Airspace and Procedures in the Metroplex (OAPM) and WAAS remain in place. Additionally, the FAA has initiatives underway focused on “right sizing” the NAS on services and infrastructure such as the number of VORs, procedures, etc.

Notice to Airmen (NOTAM) Success Criteria and Metrics

Mr. Tom Kramer, AOPA, and Mr. Mark Cardwell, FedEx Express, Co-Chairs of the Notice to Airman (NOTAM) Task Group, briefed the Committee on its recommendations on success criteria and metrics for the NOTAM Improvement Program (NIP). The NIP is an FAA initiative to modernize the NOTAM system by digitizing the information and making it more easily sorted and filtered. This enhances safety and increases the overall value of the information provided by NOTAMs to the aviation industry.

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.

The Task Group recommended the following success criteria as drawn from the Pilot’s Bill of Rights. The NIP is successful if NOTAMs are:
• In useable format
• Pertinent / specific / relevant
• Timely
• Filterable
• Can be prioritized for flight safety info
• Searchable
• Decreased in volume
• Archived

Mr. Cardwell then reviewed the recommendations from the NOTAM Task Group:

• The Task Group agrees with FAA that future success of the NOTAM improvement effort relies heavily on conversion of all NOTAMs to digital format and encourages the FAA to continue to collect and share metrics describing progress made towards an ultimate goal of 100%.
• A survey option should be designed for the Future NOTAM System (FNS) website to elicit feedback from users as to what features are most valuable and this information should be organized and reviewed periodically. This data should be used to develop a metric reflecting customer satisfaction.
• The Task Group recommends that the various filtering and sorting options selected by users of the FNS website be recorded and reviewed periodically to gain insight into features most popular so as to assist in making decisions about where to allocate resources for the future.
• As Working Group of the TOC/NOTAM Improvement Panel, the Task Group should be used as an ongoing resource for the FAA in support of future NOTAM improvement efforts.

Finally, since the NOTAM Task Group had completed its requested tasks, the group offered a set of suggestions on how the Task Group could be utilized moving forward:

• Address issues or questions from FAA response to Task 1 document
• Identification of right sequence of NOTAM categories to focus on for digitization efforts
• Identification of the appropriate outreach, training, education or requirements to industry to improve NOTAM digitization towards 100%
• Evaluation of early iterations of the FAA-provided interface on NOTAMs
• Periodic review of metrics related to the NOTAM Modernization

Discussion followed the Task Group’s presentation, and a Committee member asked how the Task Group’s recommendations handle the subject of reduction of volume of NOTAMs, as this was a significant aspect of the PBoR. The Task Group noted that measuring reduction in NOTAM volume would be challenging as there would be no reliable data to capture data on the volume of NOTAMs before the NIP and the volume after the NIP. The Group pointed out that there are a number of subjective success criteria and these are addressed by the second recommendation about having a survey option in the FNS. For the subject of NOTAM volume, a survey could ask to what extent the NOTAM system provides irrelevant NOTAMs or whether the volume of NOTAMs provided has improved from the past.
On NOTAM volume, Mr. Cardwell also pointed out that the current NOTAM database includes NOTAMs that are obsolete and there may be opportunities to reduce the overall volume of NOTAMs that exist in the system. Mr. Joshua Gustin, FAA Director of Aeronautical Information Management, also spoke, pointing out to the TOC that digitizing NOTAMs may not reduce the absolute volume of NOTAMs. Mr. Gustin noted that by making digital data entry easier in the FNS, the overall volume of available NOTAM information may actually increase. Editor’s note: digitizing NOTAMs is a foundational step to assist users in more effectively sorting and filtering NOTAMs, thereby making them useful regardless of the absolute number.

The TOC had discussion on whether to keep the Task Group sitting since the requested tasks were complete. Given the TOC is a relatively new committee, the TOC had questions as to whether it was acceptable to keep the committee in place. Mr. Andy Cebula of RTCA pointed out that since the Task Group recommended to keep itself standing, TOC acceptance of the recommendations would effectively keep the group in tact. Mr. Cebula also noted that there were precedents from other Federal Advisory Committees at RTCA for doing so.

Committee Action: The Committee agreed by consensus to approve the NOTAM Success Criteria and Metrics recommendation (Attachment 4).

NextGen Advisory Committee (NAC)

Mr. Andy Cebula briefed the TOC on the upcoming NAC Meeting scheduled for February 20th in Phoenix, Arizona. Mr. Cebula also spoke about a new “Blue Print” Task Group established in the NAC focused on establishing a blue print for successful PBN implementations. A committee member inquired what the role of the TOC was with respect to the PBN Blue Print Task Group. Ms. Ray said that PBN was a distinct possibility for future TOC Tasking. However, the Blue Print work was at a policy level at the moment which implied NAC ownership. In the future, Ms. Ray expected that the FAA would need additional insight and engagement on implementation of the PBN Blue Print and suggested that TOC participation would be warranted when that time arose.

Visual Area Surface 20:1 Obstacle Clearance

Mr. Chris Baum, ALPA, and Mr. Chris Oswald, ACI-NA, Co-Chairs of the Visual Area Surface Task Group, briefed the Committee on its recommendations on the FAA Memo “Mitigation of obstructions within the 20:1 Visual Area Surface”. The Memorandum follows a risk-based approach in providing clear vertical descent paths into airports (referred to as a 20:1 surface) to ensure safety through the verification of obstructions, planning and actions to mitigate risk.

The Task Group made a series of recommendations to the TOC. With respect to the sufficiency of time and clarity of expectations in the verification stage, the Task Group recommended:

- In the context of “ASAP” as a goal, 30 days is appropriate for airport operator to verify existence
• Reevaluate timeliness of compliance after 180-days
• Provide for special circumstances in Alaska, other unique small airports
• No survey data required in verification stage – verify existence and general characteristics
• Enumerate specific information needed during verification process
  o Object existence/non-existence
  o Location, height, type of object, etc without survey data
• Plain language guidance for submitting information
• Clear guidance on the availability and access to 20:1 obstacle visualization tool

With respect to improving the planning and mitigation stages, the Task Group recommended:

• Compliance plans should include full range of mitigations
  o Eliminating/lowering, lighting, visual aids, infrastructure modifications, procedural restrictions
• Guidance on compliance plan, contents, scope, etc.
• Preferred priorities for removal or other mitigations
• Iterative process for developing compliance plans, may require more time
• Evaluate all other mitigations before restrictions on category C and D operations
• Provide mechanism for extending mitigation stage deadlines for special circumstances in Alaska, other unique small airports
• Clear guidance on the availability and access to 20:1 obstacle visualization tool
• Reevaluate timeliness of compliance after 180-days

With respect to providing clear guidance for actions to mitigate risk regarding visibility and night operations, the Task Group recommended:

• Guidance to airport operators on expectations for maintenance of 20:1 surfaces following mitigation actions and new approaches
• Fleet mix and frequency of operations important risk mitigation factors to resolve a penetration
• Unusual circumstances may require an alternative assessment of risk

With respect to communicating the process to key stakeholders, the Task Group recommended:

• Utilize industry associations – airport & aircraft operators:
  o ALPA, AOPA, A4A, ACI-NA, CAA, IATA, NASAO, NBAA, RAA, etc.
• Communications should leverage FAA and other organization’s communications web/webinars, template/guidance documents, and Office of Airports presentations
• Message elements:
  o Rationale behind the FAA’s current focus on 20:1 obstacle clearance
  o Scope and scale of 20:1 penetration issues within the NAS
  o Safety and access impacts of 20:1 penetrations
  o Verification, compliance, and mitigation requirements outlined in FAA’s memo
Finally, the Task Group provided additional recommendations which were beyond the scope of the tasking request. The recommendations stated that the FAA should:

- Continue its safety risk assessment of the 20:1 visual surface area using recent flight track dispersion data to determine if the geometry of the area should be modified.
- Provide data requested by the VAS Task Group regarding the number of 20:1 visual surface area penetrations in the NAS and the details regarding them as requested by the VAS Task Group co-chairs to the FAA. These data are important to provide industry with insight into the scale and scope of 20:1 penetration issues.

During Discussion, a Committee member mentioned that early feedback on use of the 20:1 obstacle visualization tool is positive.

The TOC had extensive discussion on the data available for 20:1 visual surface area penetrations. One committee member noted that uncertainty remains as to how widespread the 20:1 penetration issue is and that a data-driven assessment is important. Ms. Ray stated that since early January when the Memo went into effect, the FAA was seeing data on obstacle penetrations but also seeing quick resolution of the problems. Ms. Ray pointed out that it is helpful for airport operators to know that other airport facilities have been able to resolve their issues quickly. The Committee found this information helpful but reiterated the desire for macro level data and understanding of the scale of the problem.

For the Recommendation regarding communication of the process, Mr. Andy Cebula noted that the language should imply that the list of organizations is not exhaustive. Mr. Cebula suggested amending the wording in the recommendation to include the words “such as” when stating a list of suggested organizations. Additionally, the example list of organizations include two important oversights, and Mr. Cebula requested to include the Airport Association of Airport Executives (AAAE) and National Air Transportation Association (NATA) on the example list. The TOC accepted these changes to the language in the recommendation.

The TOC discussed the timing of notification that an obstacle has taken a procedure offline. One committee member noted that if an operator had a two-week lookahead that a procedure may go offline, the operator could adjust its operational plans and respond accordingly. Operators noted that their most significant challenges occur when changes occur overnight, and the operator must react immediately to a procedure going offline. The TOC suggested to the FAA that when an airport receives a notice of an obstacle, it may help to provide the same notice to industry organizations that represent operators. The FAA stated that it could support providing an advanced operator notification when a 20:1 obstacle is found.

One committee member inquired about obstacle databases, noting that there are three primary databases today and there are differences between them. Ms. Ray noted that the NavLean program continues to work on alignment of all navigation data into one database but that errors do remain. The TOC noted that having a solid foundation of data to work from is paramount for this effort.
This recommendation was the only task requested of this Task Group, and it will sunset after this TOC meeting. The Chairs thanked Mr. Baum and Mr. Oswald for their leadership in working collaboratively on a challenging issue and turning around the final recommendations in a short time frame.

Committee Action: The Committee agreed by consensus to approve the 20:1 Visual Area Surface Task Group recommendation (Attachment 5) with wording changes in the section on communicating the process to key stakeholders.

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

Mr. Don Dillman, Airlines for America, and Mr. Bob Lamond, National Business Aviation Association, Co-Chairs of the VOR MON Task Group, outlined the recommendations for prioritization of criteria to evaluate the MON. Although it was to be an interim report, the Task Group made significant progress and presented this as a final recommendation for this component of the VOR MON Tasking.

The FAA estimates it will decrease the current 967 VOR ground-based nav aids to approximately 500 by 2020. The Task Group recommended evaluation criteria for the MON include both the FAA’s original criteria as well as additional criteria the Task Group identified in its Task 1 recommendations.

The Task Group shared results of a prioritization exercise in which it ranked the collective set of FAA and Task Group criteria. The relative weights of the criteria were as follows:

- Retain VORs to enable navigation to a “safe landing” airport within 100 NM – 32% weight
- Retain VORs that are in a known GPS “jamming” location – 19%
- Retain VORs to enable adequate IFR navigation for non-RNAV capable aircraft – 19%
- Provide full en-route coverage at or above 5,000 ft AGL – 16%
- Ensure ability to hold for Core 30 airports – 9%
- Retain VORs necessary for training – 6%

The Task Group considered two criteria as givens and outside the scope of the prioritization:

- Retain VORs in Western Mountainous region
- Retain Oceanic VORs

Mr. Dillman and Mr. Lamond then reviewed a series of recommendations. On the subject of Criteria for MON Evaluation, the Task Group said:

- The Task Group validates FAA’s original selection criteria in development of the MON
  - Nearly all criteria originally used were either assumed as given or rated highly in prioritization exercise
- The Task Group recommends inclusion of three additional criteria for evaluation of the MON:
  - Retain VORs that are in a known GPS “jamming” location
  - Retain VORs to enable adequate navigation for non-RNAV capable aircraft
  - Retain VORs necessary for training
On the subject of the process of MON evaluation, the Task Group recommended the FAA iterate through the current MON based on weighted criteria results for the combined set of original FAA and Task Group criteria. A proposed process was suggested to examine VORs outside the MON that score highly on prioritized criteria for consideration of being Swapped or Added into the MON.

Finally, on the subject of handling exceptions to the process, the Task Group recommended:

- Weighted criteria provide basis for a VOR MON exception process
- Any VOR re-evaluated for decommissioning can be measured against weighted criteria and compared on these measures to other VORs in its peer group. Such criteria provide a structured way in which the FAA can evaluate individual exceptions
- The Task Group recommends FAA utilize a rigorous and transparent process with NAS users and local communities to evaluate exceptions

During Discussion, the TOC expressed concern that the definition of the Training criteria was too broad and may be too open for any flight school, large or small, to request to retain their VOR due to training needs. The Co-Chairs pointed out from the prioritization activity that the criteria “Retain VORs necessary for training” was last on the list and weighted at only 6%. That implied that the criteria may be a tie-breaker between two equal options, but it was not significant enough to be the only factor that drove a VOR to be included in the MON. The TOC was satisfied that the 6% weight for training addressed the concern. However, the TOC requested that the definition of the training criteria include language focusing on “high volume” flight schools to add additional clarity.

One committee member inquired about how the Task Group was considering the impact to an airfield, like missed approach procedures or raised minimums, of decommissioning a VOR. Mr. Lamond referred to the Task 1 recommendations in which the Task Group offered a series of recommendations of evaluating the impact of a decommissioning and what mitigations must be done. Also, Mr. Dale Courtney of the FAA suggested that swaps between VORs in and out of the MON may be used to focus on retaining VORs with high mitigation impact and decommissioning VORs with low mitigation impact when possible.

Ms. Ray inquired about the Task Group’s ideas on what a “rigorous and transparent process” of engagement on the MON implied. Mr. Dillman noted that the VOR MON Task Group will offer additional detail on this during its future requested tasks.

**Committee Action:** The Committee agreed by consensus to approve the VOR MON Prioritization recommendation with the additional clarification in the definition of the training criteria (Attachment 6).

### Regional Task Groups (RTGs)

The Committee received briefings on regional airspace issues from representatives of the RTGs.

Eastern – Mr. Bill Cranor, JetBlue, informed the TOC the next Eastern Regional Task Group meeting will be in March. One subject of discussion will be the increasing traffic in Miami, San Juan and the
Caribbean in general. The increasing traffic is creating some very busy sectors that consistently reach their MAP values. The group sees an opportunity to focus on Miami Center as ERAM and ADS-B both come online there.

Mr. Glenn Morse, United Airlines, spoke about the New York airspace redesign work. The work was put on hold in 2013 and there is uncertainty about it for 2014. Primary concerns include the freshness of the environmental document as well as the official forecasts which have evolved in recent years. Ms. Ray commented that a closer look is necessary at the forecast work and the design work remains paused for the time being.

Central – Mike O’Brien, American Airlines, spoke on behalf of the Central Regional Task Group. The primary issues of concern to this group include two Special Activity Airspace (SAA) issues, including the Powder River Training Complex, as well as the OAPM Implementation in North Texas. Mr. O’Brien said that no meetings are scheduled at the moment for this group.

Western – Mr. Bob Lamond, NBAA, informed the TOC that the Western group will be meeting on February 19th and 20th in Los Angeles. The anticipated subjects of discussion include LAX construction, Metroplex, 20:1 surface penetration and a template of best practices with respect to runway construction.

The discussion then turned to the Lemoore ATCAA for which some members of the Western RTG had written a white paper that spoke to the impact of Phase III of Lemoore on operator fuel burn. This document, included as Attachment 7, is the Industry White Paper on Lemoore ATCAA. The Western RTG communicated an interest to use the RTG forum as a mechanism to respond to SAA issues. One Committee member raised concern about whether any and all SAA issues should be the responsibility of the TOC as the volume of such issues could become unmanageable. Another committee member suggested that the Regional Task Groups had the right representation to respond to SAA issues and that it was the appropriate forum.

Ms. Ray of the FAA stated that the RTGs and TOC need to identify the appropriate process to have the RTGs respond on SAA issues. Those which are larger and perhaps more controversial would likely be appropriate for the RTGs to work on. However, those which are smaller may not belong on the agenda of the RTGs and the TOC. This lead to identification of the need to determine the criteria that decide which SAA issues should come before the TOC.

A committee member commented that the predecessors to the Regional Task Groups have been valuable forums in which to have discussions on SAA issues in the past. The member commented that discussions about Special Activity Airspace arise in multiple forums currently and, as a result, there is no consistent output. The individual offered that the RTG would be an appropriate place in which to consolidate these discussions.

Given the DoD is a member of the TOC, Ms. Ray raised the question of the challenge of driving to consensus within the TOC on matters of Special Activity Airspace. To this, members of the DoD suggested that consensus was a feasible outcome even with participation of the DoD. Committee members pointed to a collaborative model used to make decisions on the GRASI SAA in which the
participants, which included both industry and DoD, did reach consensus and decision on how to structure and utilize GRASI.

As a next step, the TOC requested RTCA to work with the interested parties to develop a draft of criteria that determines which SAA proposals come before the TOC as well as a proposed process by which the TOC can consider new SAA issues.

Representatives of the Navy that attended the TOC provided a white paper communicating the Navy’s perspective on the Lemoore ATCAA. They requested the document be included in the record of the TOC meeting and the request was approved by the Committee members. This document is included as Attachment 8, Navy White Paper on Lemoore ATCAA.

**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 Bowman ended the meeting of the Committee at 2:00 p.m.

**Next Meeting**

The next meeting of the TOC is May 16, 2014 in Washington, DC.
Attendees:
February 6, 2014 Meeting of the Tactical Operations Committee
Washington, DC

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¹Committee member names appear in italics.
RTCA Tactical Operations Committee

Fourth Meeting
February 6, 2014
RTCA Headquarters

Welcome and Introduction

Co-Chairs:
Jim Bowman, FedEx Express
Dale Wright, NATCA
Topical Agenda

- Approval of November 7 Meeting Summary
- FAA Report
- Notice to Airmen (NOTAM) Criteria & Metrics
- Visual Area Surface 20:1 Obstacle Clearance
- VHF Omni-directional Range (VOR) Minimum Operating Network
- Regional Task Groups (RTGs)
- NextGen Advisory Committee (NAC)

PUBLIC MEETING ANNOUNCEMENT
Read by: Designated Federal Official Elizabeth Ray
Tactical Operations Committee (TOC)
February 6, 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:

January 15, 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.
Review and Approval of:

November 7, 2013 Meeting Summary

FAA Report

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization
# NOTAM Success Criteria & Metrics

**Co-Chairs:**
Mark Cardwell, FedEx Express  
Tom Kramer, AOPA

## NOTAM Tasking 2

| Task 1 – Establish the NOTAM Improvement Panel as a chartered function of the TOC and review recent and planned future NOTAM modernization efforts of the FAA | Provide a report documenting the following actions:  
1. Ensure needed stakeholders are identified and participate in any task groups formed.  
2. Examine and make recommendations/comments on recent and planned/future NOTAM modernization activities underway at FAA and offer possible additional recommendations (this may include education and outreach).  
3. Assess the interoperability of FAA NOTAM improvement efforts with the United States Department of Defense (DoD) and international stakeholders and provide feedback and recommendations on any actions needed. | Establish NOTAM Improvement Panel and Develop Final Report October 2013  
Interim Report October 2013  
Final Report January 2014 |
|---|---|---|
| Task 2 – Provide input and recommendations for success criteria and compliance metrics. | Provide a report documenting the following actions:  
1. Recommend the criteria FAA needs to follow to successfully comply with the Pilot’s Bill of Rights with regards to NOTAM.  
2. Recommend one or more metrics for success to ensure continued compliance and to enable reporting to outside entities. | Interim Report October 2013  
Final Report January 2014 |

Attachment 2 - Presentations for the Committee
### Methodology for Task 2

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<th>Identified success criteria directly from PBoR language</th>
<th>Developed a “laundry list” of metric options that link to success criteria</th>
<th>Evaluated metric options and developed recommendations</th>
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#### NOTAM Task Group

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<td>Kai Bala</td>
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<td>Chris Baum</td>
<td>Federal Aviation Administration</td>
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<td>Ernie Bilotto</td>
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<tr>
<td>Ashish Solanki</td>
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<td>Harold Summers</td>
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<td>Brandi Teel</td>
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<td>David von Hinteln</td>
<td>Hewlett Packard</td>
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<td>Michael Williams</td>
<td>Hewlett Packard</td>
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<tr>
<td>Diane Young</td>
<td>FAA Administration</td>
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</table>
**Success Criteria from PBoR**

**NOTAM Improvement Program a success if NOTAMs are:**
- Pertinent / specific / relevant
- Timely
- Archived
- Filterable
- Prioritized for flight safety info
- Decreased in volume
- In useable format
- Searchable

**Two Levels of Metrics Generated**

- **Level 1:** low level metrics that address performance of NOTAM Modernization on all success criteria of PBoR
- **Level 2:** high level metrics for outside reporting. Summary view of 2-3 metrics that tell modernization status
Recommendations

- TG agrees with FAA that future success of NOTAM improvement effort relies heavily on conversion of all NOTAMs to digital format and encourages the FAA to continue to collect and share metrics describing progress made towards an ultimate goal of 100%.
- A survey option should be designed for FNS website to elicit feedback from users as to what features are most valuable and that this information be organized and reviewed periodically. This data should be used to develop a metric reflecting customer satisfaction.
- TG recommends that the various filtering and sorting options selected by users of the FNS website be recorded and reviewed periodically to gain insight into features most popular so as to assist in making decisions about where to allocate resources for future.
- As Working Group of the TOC/NOTAM Improvement Panel and with the approval of the TOC, the Task Group should be used as an ongoing resource for the FAA in support of future NOTAM improvement efforts.

Moving Forward

With TOC approval, the following suggestions represent areas in which the Task Group may offer ongoing support to the FAA and its NOTAM effort:

- Address issues or questions from FAA response to Task 1 document
- Identification of right sequence of NOTAM categories to focus on for digitization efforts
- Identification of the appropriate outreach, training, education or requirements to industry to improve NOTAM digitization towards 100%
- Evaluation of early iterations of the FAA-provided interface on NOTAMs
- Periodic review of metrics related to the NOTAM Modernization
DISCUSSION

TOC Action

Consider Recommendation on:

NOTAM Success Criteria & Metrics

and Transmit to FAA
Break

Visual Area Surface 20:1 Obstacle Clearance

Co-Chairs:
Chris Baum, ALPA
Christopher Oswald, ACI-NA
Goals

- Review FAA Policy Memo
- Provide feedback
- Answer specific questions from FAA

FAA Memo

- Provides process to address FAA identified obstacle penetrations of 20:1 visual area surfaces
- Provides deadlines for obstacle verification and mitigation using a risk-based methodology
- Intended to enable more flexible response to identified obstacles than immediate “NOTAMing out”
20:1 Visual Area Surface

- Protects visual segment of instrument approaches
- Geometry varies based on aircraft approach category
- Unmitigated obstacles in the 20:1 surface can mean:
  - Nighttime restrictions
  - Increases in approach minima
- Typical obstacle mitigations removal, lowering, and lighting

20:1 Tasking: Background of Issue

Attachment 1. 20:1 RISK ASSESSMENT

- HIGH RISK (more than 11 feet):
  - Immediate restriction of safe VFR operations (i.e., use a Notice to Airmen [NOTAM] or a Procedure Amendment)
  - Submit compliance plan as soon as possible but no later than 30 days
  - RPV restrictions will remain until penetration(s) are mitigated

- MEDIUM RISK (more than 3 feet and up to 11 feet):
  - No immediate NOTAM actions
  - Submit compliance plan as soon as possible but no later than 90 days
  - Multiple penetrations as soon as possible but not to exceed 90 days

- LOW RISK (3 feet or less):
  - No immediate NOTAM actions
  - Submit compliance plan as soon as possible but no later than 5 days
  - Multiple penetrations as soon as possible but not to exceed one week
## 20:1 Tasking

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>Review and develop recommendations related to the FAA Memorandum,</td>
<td>Provide a report documenting comments on the following areas: (1) The sufficiency of time and clarity of expectations in the verification stage. (2) Improving the planning and mitigation stages. (3) Providing clear guidance for what actions must be taken to mitigate risk regarding visibility and night operations. The FAA also is requesting recommendations for the best mechanism(s) to communicate the process to key stakeholders.</td>
<td>Final Report January 2014</td>
</tr>
<tr>
<td>“Mitigation of obstructions within the 20:1 Visual Area Surface”</td>
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</table>

## VAS Task Group

- **Baum, Chris** - Air Line Pilots Association International
- **Boll, Rich** - National Business Aviation Association
- **Bowman, Jim** - FedEx Express
- **Cebula, Andy** - RTCA, Inc.
- **Davis, Bill** - Federal Aviation Administration
- **DeCleene, Bruce** - Federal Aviation Administration
- **Dillman, Don** - Airlines for America
- **Goldman, Rob** - Delta Air Lines, Inc.
- **Hines, Mike** - Metropolitan Washington Airports Authority
- **Kast, Christian** - United Parcel Service
- **Kramer, Tom** - Aircraft Owners and Pilots Association
- **Lamond, Bob** - National Business Aviation Association
- **McMahon, Scott** - Morristown Municipal Airport
- **Morse, Glenn** - United Airlines, Inc.
- **O’Donnell, Michael** - Federal Aviation Administration
- **Oswald, Chris** - Airports Council International – North America
- **Powell, Gary** - Federal Aviation Administration
- **Smith, Abigail** - Federal Aviation Administration
- **Towles, Justin** - American Association of Airport Executives
- **Worrall, Jeremy** - State of Alaska
Task Work Flow

- Agreed on scope to guide deliberations
- Received briefings and discussed FAA policy and regulatory requirements
- Established assumptions and guiding principles
- Discussed & responded to FAA questions
- Identified policy issues beyond the scope of Task Group but relevant to mitigation of obstructions
- Developed consensus recommendation

Guiding Principles

- Discussion must remain focused on the questions of the FAA’s tasking letter.
- Changing TERPS criteria is outside the scope of the FAA Tasking.
- Goal is to achieve unanimous consensus for the recommendations regarding the topics addressed in the tasking letter. In the unlikely event that consensus cannot be reached, dissenting opinions will be documented in materials submitted to the TOC.
Guiding Principles (Cont.)

- Both safety and airport access should be considered when evaluating the need for, extent of, and timeline for implementation of hazard mitigations.
  - Mitigating risk of 20:1 penetrations should not lead to increased risk (e.g. increased use of circling approaches).

- TERPS criteria exist as one of several mitigations to address the collision hazard posed by an obstacle (man-made or natural) in the final approach area (and others not pertinent to the 20:1 discussion).

- The location, height and number/surface area (individual or clusters) of obstacles should be considered in evaluating the risk they pose to aircraft.

Assumptions

- FAA considers penetrations of the 20:1 VAS represent a hazard to aircraft in flight.

- For faster, high-performance aircraft, 1 statute mile of visibility provides as little as 20 seconds of flight time in which to visually acquire and maneuver to avoid an obstacle penetrating the 20:1 surface.

- 20:1 VAS is a surface to enhance safety by protecting instrument approach procedures from obstacles and also provides a safety benefit for visual approach procedures.
Assumptions (Cont.)

- A risk-based analysis considers the likelihood of encountering a hazard although the severity of an encounter with an object is assumed to be catastrophic.
- The FAA will retain the capability to take immediate action in the event that an immediate or unanticipated threat to safety of flight is identified.

Recommendations (1)

Question: Sufficiency of time and clarity of expectation in the verification stage

- In the context of “ASAP” as a goal, 30 days is appropriate for airport operator to verify existence
- Reevaluate timeless of compliance after 180-days
- Provide for special circumstances in Alaska, other unique small airports
- No survey data required in verification stage – verify existence and general characteristics
-Enumerate specific information needed during verification process
  • Object existence/non-existence
  • Location, height, type of object, etc without survey data
- Plain language guidance for submitting information
- Clear guidance on the availability and access to 20:1 obstacle visualization tool
Recommendations (2)

Question: Improving the planning and mitigation stages

- Compliance plans should include full range of mitigations
  - Eliminating/lowering, lighting, visual aids, infrastructure modifications, procedural restrictions
- Guidance on compliance plan, contents, scope, etc.
- Preferred priorities for removal or other mitigations
- Iterative process for developing compliance plans, may require more time
- Evaluate all other mitigations before restrictions on category C and D operations
- Provide mechanism for extending mitigation stage deadlines for special circumstances in Alaska, other unique small airports
- Clear guidance on the availability and access to 20:1 obstacle visualization tool
- Reevaluate timeliness of compliance after 180-days

Recommendations (3)

Question: Providing clear guidance for actions to mitigate risk regarding visibility and night operations.

- Guidance to airport operators on expectations for maintenance of 20:1 surfaces following mitigation actions and new approaches
- Fleet mix and frequency of operations important risk mitigation factors to resolve a penetration
- Unusual circumstances may require an alternative assessment of risk
Recommendations (4)

Question: Communicating the process to key stakeholders

- Utilize industry associations – airport & aircraft operators key
  ALPA, AOPA, A4A, ACI-NA, CAA, IATA, NASAO, NBAA, RAA
- Communications should leverage FAA and other organization’s communications web/webinars, template/guidance documents, and Office of Airports presentations
- Message elements:
  - Rationale behind the FAA’s current focus on 20:1 obstacle clearance
  - Scope and scale of 20:1 penetration issues within the NAS
  - Safety and access impacts of 20:1 penetrations
  - Verification, compliance, and mitigation requirements outlined in FAA’s memo

Additional Recommendations

- The FAA Should:
  - Continue its safety risk assessment of the 20:1 visual surface area using recent flight track dispersion data to determine if the geometry of the area should be modified.
  - Provide data requested by the VAS Task Group regarding the number of 20:1 visual surface area penetrations in the NAS and the details regarding them as requested by the VAS Task Group co-chairs to the FAA. These data are important to provide industry with insight into the scale and scope of 20:1 penetration issues.
DISCUSSION

TOC Action

Consider Recommendation on:

*Mitigation of Obstructions within the 20:1 Visual Area Surface*

and Transmit to FAA
Lunch

VHF Omni-directional Range (VOR)
Minimum Operating Network

Co-Chairs:
Don Dillman, Airlines for America
Bob Lamond, NBAA
VOR MON Tasking

| 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 |
| 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 |

Methodology

- TG providing input on the criteria that should be used to create and evaluate the MON and not MON itself

- Task Group focus:
  1) Refine high-level set of criteria FAA can use to produce a MON
  2) Recommend a process for FAA to work with constituents to approve exceptions to the MON justified based on local priorities

- TG prioritized the combined set of original FAA and Task Group recommended criteria
  - Prioritized criteria may be used to evaluate members of MON
  - Prioritized criteria may be used with various stakeholder and community groups to evaluate exceptions
**VOR MON Task Group**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization/Role</th>
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<tbody>
<tr>
<td>Kai Bala</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Phillip Basso</td>
<td>DoD Policy Board on Federal Aviation</td>
</tr>
<tr>
<td>Mark Boquiski</td>
<td>Thales ATM US</td>
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<tr>
<td>Rich Boll</td>
<td>National Business Aviation Association</td>
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<tr>
<td>Andy Cebula</td>
<td>RTCA, Inc.</td>
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<tr>
<td>Dale Courtney</td>
<td>Federal Aviation Administration (Subject Matter Expert)</td>
</tr>
<tr>
<td>Donald Dillman</td>
<td>Airlines for America (Co-Chair)</td>
</tr>
<tr>
<td>Bob Ferguson</td>
<td>NetJets Association of Shared Aircraft Pilots</td>
</tr>
<tr>
<td>Jens Hennig</td>
<td>General Aviation Manufacturers Association</td>
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<tr>
<td>Mark Hopkins</td>
<td>Delta Air Lines, Inc.</td>
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<tr>
<td>Tom Kramer</td>
<td>Aircraft Owners and Pilots Association</td>
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<td>Bob Lamond</td>
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<tr>
<td>Deborah Lawrence</td>
<td>Federal Aviation Administration (Subject Matter Expert)</td>
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<tr>
<td>David Manville</td>
<td>U.S. Army</td>
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<tr>
<td>Vince Massimini</td>
<td>The MITRE Corporation</td>
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<tr>
<td>Don McClure</td>
<td>Air Line Pilots Association</td>
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<td>Trin Mitra</td>
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<td>Rick Niles</td>
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<td>National Air Traffic Controllers Association</td>
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<td>David Vogt</td>
<td>Delta Air Lines, Inc.</td>
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**Evaluation Criteria for MON**

**Original FAA Criteria**
- Retain VORs in Western Mountainous region *
- Retain Oceanic VORs *
- Retain VORs to enable navigation to a “safe landing” airport within 100 NM
- Provide full en-route coverage at or above 5,000 ft AGL
- Ensure ability to hold for Core 30 airports

**Additional Criteria Task 1**
- Retain VORs that are in a known GPS “jamming” location
- Retain VORs to enable adequate IFR navigation for non-RNAV capable aircraft
- Retain VORs necessary for training

* Criteria were assumed as givens and not included in prioritization
Results of Prioritization

<table>
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<tr>
<th>VOR MON Task Group Relative Weights for MON Evaluation Criteria</th>
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<tr>
<td>Return VORs to enable navigation to a &quot;safe landing&quot; airport within 100 NM: 32%</td>
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<tr>
<td>Retain VORs that are in a known GPS “jamming” location: 19%</td>
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<tr>
<td>Retain VORs to enable adequate navigation for non-RNAV capable aircraft: 19%</td>
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<tr>
<td>Provide full en-route coverage at or above 5,000 ft AGL: 16%</td>
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<tr>
<td>Ensure ability to hold for Core 32 airports: 9%</td>
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<tr>
<td>Retain VORs necessary for training: 6%</td>
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Recommendations – Criteria

- Task Group validates FAA’s original selection criteria in development of the MON
  - Nearly all criteria originally used were either assumed as given or rated highly in prioritization

- The Task Group recommends inclusion of three additional criteria for evaluation of the MON:
  - Retain VORs that are in a known GPS “jamming” location
  - Retain VORs to enable adequate navigation for non-RNAV capable aircraft
  - Retain VORs necessary for training
Recommendations – MON Evaluation

- TG recommends FAA iterate through current MON based on weighted criteria results for the combined set of original FAA and Task Group criteria.

- One approach: examine VORs outside MON that score highly on prioritized criteria to identify SWAPs or ADDs:

Recommendations – Exceptions

- Weighted criteria provide basis for a VOR MON exception process.

- Any VOR re-evaluated for decommissioning can be measured against weighted criteria and compared on these measures to other VORs in its peer group. Such criteria provide a structured way in which the FAA can evaluate individual exceptions.

- TG recommends FAA utilize a rigorous and transparent process with NAS users and local communities to evaluate exceptions.
DISCUSSION

TOC Action

Consider Recommendation on:

VOR MON Prioritization

and Transmit to FAA
Break

Regional Task Groups
Attachment 2 - Presentations for the Committee

2/10/2014

TOC Eastern Regional Task Group

Co-Chairs
Bill Cranor, JetBlue
Glenn Morse, United Airlines

TOC Central Regional Task Group

Co-Chairs
Mike O’Brien, American Airlines
Edwin Solley, Southwest Airlines
TOC Western Regional Task Group

Co-Chairs
Dan Allen, FedEx Express
Bob Lamond, NBAA
FAA Rep: Kim Stover

DISCUSSION
NextGen Advisory Committee (NAC)

Key NAC Agenda Topics
February 20th Phoenix, AZ

- Hosted by Honeywell – Continues NAC Site Visits
- FAA Report/FAA Responses to Previous Recommendations
  - NextGen Prioritization
  - Fuel Data Sharing for Measuring NextGen Performance
  - CatEx 2
  - PBN Implementation
- FAA/SESAR Presentation
- PBN Industry Barriers Recommendation
- Blueprint for PBN Implementation
Blue Print Tasking

Background

- NAC has identified the need for building on successful implementation
- Emphasized the importance of community outreach
- Builds on work of OCWG/BCPWG, Cat Ex 2 Task Group
- Co-Chairs: Jim Crites, DFW & Brian Townsend, American Airlines/US Airways
- NAC Working Session on Outcomes & Metrics for Success
  February 20th
- First Meeting late February
- June Deadline

Tasking Elements

- Identify all stakeholders needed and define their roles
- Describe specific outreach strategies associated with each stakeholder to include development of a process/method to ensure stakeholder buy-in of project goals
- Describe specific possible outcomes and identify metrics for success
- Review existing process and incorporate lessons learned from previous and ongoing PBN initiatives, both domestic and international
- Develop a methodology to ensure lessons learned and expertise are captured and incorporated into future efforts
DISCUSSION

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

Co-Chairs:
Jim Bowman, FedEx Express
Dale Wright, NATCA

Designated Federal Official:
Lynn Ray, Federal Aviation Administration

Next Meetings:
May 16, 2014 (half day)
September 3, 2014

Washington, DC
Adjournment
Meeting Summary, November 7, 2013

Tactical Operations Committee (TOC)

The third meeting of the Tactical Operations Committee (TOC) held November 7, 2013 at RTCA Headquarters in Washington, DC, convened at 9:00 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 July 23, 2013 TOC Meeting
Attachment 4 – 20:1 Visual Area Surface Task Group Terms of Reference
Attachment 5 – VOR MON Prioritization report
Attachment 6 - NOTAM Activity Prioritization report

Welcome and Introductions

Committee 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 member and General Public Attendees are identified in Attachment 1).

Mr. Bowman read a letter from Ms. Heidi Williams, former Co-Chair of the TOC, announcing her departure from AOPA and thanking members of the Committee and Task Groups for their support of the work of the TOC. He also expressed his thanks for Heidi’s efforts that were also echoed by Designated Federal Official (DFO), Ms. Elizabeth “Lynn” Ray, Vice President Mission Support, Air Traffic Organization (ATO), Federal Aviation Administration (FAA).

The Chair reviewed the agenda and acknowledged the work of the Notice to Airman (NOTAM) and VOR Minimum Operating Network (MON) Task Groups in developing recommendations to be discussed and considered later in the meeting.
Designated Federal Official Statement
Ms. Ray read the Federal Advisory Committee Act notice governing the open meeting.

Approval of July 23, 2013 Meeting Summary
The Chair asked for and received approval of the written Summary for the July 23, 2013 meeting (Attachment 3).

FAA Report
Ms. Ray provided an overview of the FAA Air Traffic Organization (ATO), including an explanation of the recent changes from the merging of the Terminal and Enroute functions. In response to a comment from a committee member, Ms. Ray commented that the merging of the organizations should simplify the design and implementation of procedures. She also explained that Dennis Roberts continues to be the lead for the Metroplex Optimization initiative (Optimization of Airspace and Procedures in the Metroplex or OAPM).

She then briefed the TOC on the schedules of the OAPM effort, pointing out the importance of aligning the implementation schedules for OAPM and En Route Automation Modernization (ERAM). The furlough in FY 2013 caused delays due to the lack of controller participation in the study teams.

A committee member asked about the effects of the furlough and government shutdown on controller staffing. Ms Ray responded that training at the FAA Academy has been suspended and the FAA is evaluating the relationship between staffing and the ability to bring in new controllers.

Ms. Ray concluded her report by explaining that FAA Administrator, Michael Huerta, is conducting an evaluation of the FAA’s resources and developing a strategic plan that will include “right sizing the National Airspace System (NAS)”. This is relevant to the work of the TOC because it includes VOR MON, accelerating NextGen benefits and integrating Unmanned Aircraft Systems (UAS) into the NAS. The goal is to align the Agency’s assets, people and infrastructure.

Mitigation of Obstructions within the 20:1 Visual Area Surface
Mr. Bill Davis, Deputy Mission Support, FAA ATO, provided a briefing of the new Tasking from the FAA requesting TOC recommendations in response to the FAA’s recently issued internal policy guidance following a risk-based approach in providing clear vertical descent paths into airports (referred to as a 20:1 surface). The goal of the policy issued by the FAA’s safety (AVS), Airports (ARP) and air traffic organizations (ATOs) is to ensure safety while allowing additional flexibility in time frames available for completing mitigations prior to affecting operations.
Mr. Davis explained that the purpose is to validate and update the FAA’s database on approaches to ensure that it is accurate and reliable. Doing so is a key part of supporting the implementation of NextGen. The policy is attempting to reconcile legacy issues of validating the existence of an obstacle, ensuring appropriate mitigations are in place and/or documenting the removal of an obstacle. Mr. DeCleene of the FAA’s Office of Aviation Safety also commented that this is a critical issue necessary to maintain a clear path for aircraft operators. The FAA is also looking at the possible use of RNP as a mitigation for obstacles.

Several committee members commented in support of the FAA’s overall risk based approach to this issue, although they also recognized that the memo will likely trigger actions affecting existing procedures. This will require cooperation between the FAA, airport and aircraft operators as obstructions are evaluated and mitigations are developed and implemented.

**Committee Action:** The Committee agreed by consensus to approve the 20:1 Visual Area Surface Task Group Terms of Reference (Attachment 4) that identified Chris Baum, ALPA, and Chris Oswald, ACI-NA, as the Co-Chairs.

### Regional Task Groups (RTGs)

The Committee received briefings on regional airspace issues from representatives of the RTGs.

Central - Mike O’Brien, American Airlines, covered issues related to the pending expiration of the Wright Amendment, removing current geographical limits on airline operations at Dallas Love Field; changes in the airport and airspace at Chicago O’Hare International Airport; airspace evaluation of the potential airport at Peotone in the Chicago area; Powder River special use airspace; and the OAPM activities in North Texas and Houston.

Eastern - Bill Cranor, JetBlue, addressed the challenges on operations associated with both the government sequestration and recent government shutdown; the commitment by the FAA to implement ERAM at Miami Center, pending the new runway becoming operational at Ft. Lauderdale International Airport; New York-New Jersey-Philadelphia airspace redesign; OAPM in South Florida; and Q routes linking Cleveland Center and New York.

Western - Dan Allen, FedEx Express, and Bob Lamond, National Business Aviation Association, discussed numerous military areas in the west including Lemoore MOA/ATCAA; the 20:1 Visual Area Surface; OAPM initiatives in Northern and Southern California, Phoenix and Denver; the availability of approach procedures at San Francisco and Oakland during airport construction; and Seattle Greener Skies.

The Committee also discussed the next steps for the Groups including how best to assist the FAA with industry consensus on local issues. Several committee members emphasized the need for ensuring good coordination on the localized implementation of national issues. Other committee members stressed the need to avoid duplication between the work of the NextGen Advisory Committee and the TOC.
VHF Omni-directional Range (VOR) Minimum Operating Network (MON)

Mr. Don Dillman, Airlines for America, and Co-Chair of the VOR MON Task Group, outlined the recommendation developed to review and validate the VOR MON selection criteria and make any additions as deemed necessary. The FAA estimates it will decrease the current 967 VOR ground based nav-aids to approximately 567 by 2020. The Industry endorsed the FAA’s overall approach based on the transition to PBN and GPS-based navigation, and the transition plan that provides a basic level of coverage for users of VORs, and the back-up capability for navigation in the event of a GPS outage.

The Task Group recommended:

- **Additional Criteria / Considerations**
  - Proximity to areas of periodic GPS interference
  - Necessity of the VOR MON
    - To enable adequate IFR navigation for non-RNAV aircraft (GPS outage or aircraft equipage)
    - For training
  - Disposition of functions associated with the VOR
    - STARS, SIDS, IAPS, ODPs, holding patterns, preferred routes, fixes, airways, VOR CHKPs
    - Non-navigation
    - AeroNav Chart products
  - Retain VORs outside CONUS & western mountainous areas
  - Allow local, state, municipality to assume ownership & maintenance
  - Measure adequacy of VOR MON
    - Mixed equipage
    - Capability to navigate by VOR to an alternate within 100 NM
    - Need for specific stakeholders to maintain mission capability sub fleets
    - Ability to navigate known GPS jamming locations
  - Service Volume Expansion
    - 70NM at 4000’ AGL
    - 62NM at 3000’ AGL

In response to a question about the FAA’s ability to incorporate the service volume expansion being recommended by the Task Group, Mr. Dale Courtney from the FAA responded that this was consistent with their plans to meet the 77 NM coverage. A committee member asked a question
about the FAA’s ability to develop and produce the needed changes to procedures or other navigational procedure references required by implementing the VOR MON. Mr. Ray responded that this is always an area that is considered by the FAA and will be an important determinate in moving forward.

Committee Action: The Committee agreed by consensus to approve the VOR MON Prioritization report (Attachment 5).

Notice to Airmen (NOTAM)

Mr. Tom Kramer, AOPA, and Mr. Mark Cardwell, FedEx Express, Co-Chairs of the Notice to Airman (NOTAM) Task Group, briefed the Committee on its recommendation providing industry comments on the FAA’s initiative to modernize the NOTAM system by digitizing the information and making it more easily sorted and filtered, enhancing safety and increasing the overall value of the information provided by NOTAMs to the aviation industry.

The Task Group recommended the following:

- Continue existing efforts to improve NOTAMs through AIM
- Offer “Route of Flight” search/filter
- Basic system with beta user testing
- Continue to educate potential third party vendors
- Develop education plan for system users
- Promote NOTAM Manager for originators & Flight Service Stations
- Expedite digitization of all NOTAMs
- Funding for geo-referenced airport data
- Develop comprehensive flight information data

Mr. Joshua Gustin, FAA Director of Aeronautical Information Management, expressed his appreciation for the recommendation and indicated that these will be helpful as the FAA moves forward with its modernization effort. He also explained that receiving the information from airports digitally is a key component for the FAA to achieve its goals of having a database that is capable of being sorted and filtered.

In response to a question from a committee member, Mr. Cardwell explained that graphical display is an important area to the aviation user community. Ms. Ray also commented that she would like the TOC, in its role as the NOTAM Improvement Panel, to serve as a “Beta” tester to help analyze the FAA program. A committee member requested that the report reflect the importance of the NOTAM system for aviation safety. While implied in several areas, the member requested this be further explained. Other members of the Committee endorsed this suggestion. Committee members also discussed the need for a definition of “route of flight”. 
Committee Action: The Committee agreed by consensus to approve the NOTAM Activity Prioritization report (Attachment 6) based on the addition of safety wording recommended by the Committee.

Anticipated issues for TOC consideration and action at the next meeting

At the next meeting, the Committee will receive recommendations for consideration from the NOTAM, VOR MON and Visual Area Surface Task Groups, and reports from the RTGs.

Other business

No other business was raised.

Adjourn

Chairman Bowman ended the meeting of the Committee at 3:00 p.m.

Next Meeting

The next meeting of the TOC is February 6, 2014 in Washington, DC.
Approved by the Tactical Operations Committee February 2014

NOTAM Success Criteria and Metrics

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

January 2014
NOTAM Success Criteria and Metrics

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**Background/Introduction**

The Federal Aviation Administration (FAA) is required under Section 3(c) of Public Law 112-153, also known as the 2012 Pilot’s Bill of Rights (“PBoR”), to “establish a NOTAM Improvement Panel, which shall be comprised of representatives of relevant nonprofit and not-for-profit general aviation pilot groups, to advise the Administrator in carrying out the goals of the NOTAM Improvement Program.” The FAA would like to build on the progress already derived from previously established efforts to digitize NOTAMs to comply with the provisions of this law.\(^1\)

The Tactical Operations Committee (TOC) will serve as the NOTAM Improvement Panel to further assist the Administration in crafting specific goals and priorities to meet the law’s intent and make needed enhancements to the NOTAM program. In this capacity, the TOC is relying on the NOTAM Task Group (TG) to provide specific recommendations on issues related to the NOTAM program.

The work of the panel will yield an increasing amount of standardized digital NOTAMs that can be more easily filtered, sorted, and prioritized. This should result in a significant reduction in the volume of NOTAMs pilots must currently review and allow pilots to focus only on those NOTAMs relevant to their flight plan/path. As a result, pilots will be more confident in the quality and accuracy of this focused NOTAM information, and the safety of the National Airspace System (NAS) will be improved.

During the fall of 2013, the NOTAM Task Group completed Task #1 which focused on establishing the NOTAM Improvement Panel and reviewing and responding to recent and planned NOTAM modernization efforts. A report was provided and approved during the November 2013 TOC meeting.

The current document summarizes the TG’s response on Task #2. This task focuses on providing input and recommendations for success criteria and compliance metrics.

**Executive Summary**

Given the value placed on metrics and reporting by the Pilot’s Bill of Rights and the subsequent Tasking Request by the FAA, the NOTAM Task Group conducted a detailed review of the characteristics that the NOTAM Task Group had originally used to define the concept of NOTAM improvement. Doing so ensured that all aspects of the NOTAM improvement effort would ultimately find representation in one or more metric. Once completed, the Task Group set about creating recommendations that were subject to two fundamental requirements:

1. Broad enough to encompass all aspects of the NOTAM improvement effort.
2. Basic enough to fit within current technologies and limitations of staff resources.

While the Task Group discussed various sophisticated measurement recommendations, most were discarded in favor of more basic (and more quickly adaptable) options. This point of view does not preclude the integration of new and more specific measurement initiatives as the program develops and

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\(^1\) Letter from Elizabeth L. Ray (Vice President, Mission Support Services) to Margaret Jenny (RTCA President) dated July 10, 2013.
more is known about the interaction between the FAA and its NOTAM customers. The Task Group extends an offer to remain engaged with the FAA as the Working Group of the TOC/NOTAM Improvement Panel, supporting future NOTAM improvement developments (see Moving Forward section).

**Methodology**

Task #2 for the NOTAM Task Group requested the group’s perspective on two issues:

1. Success criteria the FAA needs to follow to comply with the Pilot’s Bill of Rights regarding NOTAMs.
2. Recommendation of metrics to ensure continued compliance and reporting to outside entities.

The Task Group addressed the first item above in Task #1. During Task #1, the group responded to specific FAA questions relating to capabilities under consideration in the NOTAM Modernization Effort. The Task Group’s documented responses to these questions constitute a definition of success for the NOTAM effort.

However, as the language of Task #2 specifies success criteria to comply with the Pilot’s Bill of Rights, the Task Group did examine the language of the Bill with a focus on definition of success criteria for NOTAMs. Success criteria identified from the Pilot’s Bill of Rights aligned well with the Task Group’s success criteria for NOTAMs identified during Task #1. This examination and the Task Group’s resulting definition of success criteria is detailed in the section titled “Success Criteria for NOTAMs from the Pilot’s Bill of Rights.”

The following two sections, “Metrics Background” and “Metrics Results,” focus on detailed development of metrics. The section titled “Metrics Background” provides the Task Group’s general perspective on metrics. Topics covered include the concept of use for metrics, criteria for metrics development and a brief review of the actual process the Task Group went through. “Metrics Results” presents the full set of metrics developed.

**Success Criteria for NOTAMs from the Pilot’s Bill of Rights**

The Task Group examined the language of the PBoR to identify success criteria for NOTAMs. The language of the Bill is presented below. In Section 3(a)(2) Improvements and Section 3(b) Goals of the Program, text relating to success criteria for NOTAMs were identified and highlighted.
Based on this analysis of the language of the Bill, the following list of success criteria were identified for NOTAMs:

- In useable format
- Pertinent / specific / relevant
- Timely
- Filterable
- Can be prioritized for flight safety info
- Searchable
- Decreased in volume
- Archived

Relationship of Success Criteria to Task #1

As noted earlier, there is strong linkage between the criteria drawn from the PBoR and the response of the NOTAM Task Group to Task #1. The Task Group specifically referred to nearly all of these issues previously, with the exception of “Timely” and “Decreased in volume.” The Task Group is enhancing its previous set of success criteria with these two additional ones drawn from the PBoR.
Metrics Background

Concept of Use for Metrics

The language of the tasking indicates the Task Group should develop metrics “to ensure continued compliance and to enable reporting to outside entities.” This suggests two levels of use for the metrics. The first level relates to ensuring compliance of the NOTAM Modernization Effort with the language of the Pilot’s Bill of Rights. This level of metrics is a lower level, detailed set of metrics that address performance on the PBoR success criteria that were discussed earlier. The second level of metrics is a higher level set for reporting to outside entities. In this case, reporting outside of the NOTAM Modernization Effort necessitates a more condensed and summary view. Hence, the Task Group views this second level of metrics as being one or two metrics that provide a high-level summary of modernization status.

Relevant Criteria in Considering Metrics

The Task Group considered the following criteria when developing metrics

- Direct link to success criteria – measure to understand performance on success criteria
- Something that can be measured and has clear levels of measurement
- Data is available
- Unambiguous metrics
- Well understood by the stakeholder community
- Not cost prohibitive to collect

Generally speaking, the Task Group looked to provide the FAA with a practical set of metrics upon which the FAA could actually gather data and provide measurements. A full set of metrics options are included with some additional recommendations included below.

Process for Development of Metrics

During Task Group deliberations on metrics, it became clear that there were two very different categories of users envisioned for the future NOTAM system. Simultaneous consideration of both user types confounded the deliberations on metrics. Some users are expected to utilize the FAA-provided basic system for gathering, filtering and searching NOTAMs. Other users are expected to utilize third party software tools that access the raw data provided by the Federal NOTAM System (FNS) and provide their own capabilities for NOTAM data management and integration with other operational systems.

To depict different user types, the Task Group developed the following simple model of the Future NOTAM System based on the FNS Concept of Operations presented to the TOC in July 2013.
In addition to different user types, the Task Group observed two macro aspects of NOTAM modernization: improving Data Gathering (collection and management) and improving Data Utilization (distribution and interface capabilities). It appeared to the Task Group that the steps associated with Data Gathering were primarily FAA-focused objectives, while Data Utilization was more the NAS User’s focus.

The Task Group then developed metrics at each step of this model by considering the types of metrics that would capture the overall success criteria and relate to each step in the model.

**Metrics Results**

In each subsection below, recommended metrics are discussed. The first four sections – NOTAM Collection, NOTAM Management, End Users and Third Party Systems – relate to metrics that are used to evaluate performance on all success criteria from the PBoR. The final section – High Level Summary for Outside Reporting – presents summary-level metrics that address the metric use for reporting progress on NOTAM Modernization outside of the NOTAMs community.

**NOTAM Collection**

<table>
<thead>
<tr>
<th>Metric Idea(s)</th>
<th>Link to Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Total number of NOTAMs</td>
<td>Useable format</td>
</tr>
<tr>
<td>• Percent NOTAMs that are available as digital NOTAMs</td>
<td>Filterable</td>
</tr>
<tr>
<td>• Percent NOTAMs that originated digitally</td>
<td>Pertinent</td>
</tr>
<tr>
<td>• Percent NOTAMs that were transformed to digital</td>
<td>Searchable</td>
</tr>
<tr>
<td>Note: digital NOTAM is defined as machine-readable containing all 4D characteristics.</td>
<td>Timely</td>
</tr>
<tr>
<td>“Available” as digital is the sum of NOTAMs entered digitally or transformed to digital.</td>
<td>Can be prioritized</td>
</tr>
</tbody>
</table>

---

2 While the graphic depicts the *Future* NOTAM System, the Task Group notes that some capabilities of this future system are already operational. For example, some aspects of NOTAM search and filtering functionality are in place.
## NOTAM Management

<table>
<thead>
<tr>
<th>Metric Idea(s)</th>
<th>Link to Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Are NOTAMs archived and available according to the recommendations of Task #1? (Y/N)</td>
<td>Archived</td>
</tr>
<tr>
<td>• Satisfaction measure of how easy it is to access archived NOTAMs</td>
<td></td>
</tr>
</tbody>
</table>

## End Users

<table>
<thead>
<tr>
<th>Metric Idea(s)</th>
<th>Link to Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Is the filtering function (for Class, Dates/Times, Procedures, Altitude, Flight Level, Route, Keyword, Q codes, etc.) made available in FAA interface? (Y/N)</td>
<td>Filterable</td>
</tr>
<tr>
<td>• Satisfaction measure of how easy it is to filter NOTAMs</td>
<td></td>
</tr>
<tr>
<td>• Satisfaction measure of how accurate filtered NOTAM data are</td>
<td></td>
</tr>
<tr>
<td>• Satisfaction measure of how relevant the filters are</td>
<td>Pertinent</td>
</tr>
<tr>
<td>(with input option for user to indicate what additional filter(s) would be useful to filter pertinent information)</td>
<td></td>
</tr>
<tr>
<td>• Average or median latency between NOTAM entry and receipt of NOTAM by a user</td>
<td>Timely</td>
</tr>
<tr>
<td>• Satisfaction measure of how timely the NOTAM data are</td>
<td></td>
</tr>
<tr>
<td>• Satisfaction measure of how useable the NOTAM data from the interface are for the end user</td>
<td>Useable</td>
</tr>
<tr>
<td>• Is the prioritization function made available in FAA interface (Y/N)</td>
<td>Can be prioritized</td>
</tr>
<tr>
<td>• Satisfaction measure of how easy it is to prioritize NOTAMs based on user criteria (with input option for user to indicate what additional prioritization criteria would be useful)</td>
<td></td>
</tr>
<tr>
<td>• Is the search function made available in FAA interface (Y/N)</td>
<td>Searchable</td>
</tr>
<tr>
<td>• Satisfaction measure of how easy it is to search NOTAMs based on user criteria (with input option for user to indicate what additional search criteria would be useful)</td>
<td></td>
</tr>
<tr>
<td>• Agree / disagree scaled measure with statement that NOTAM system provides me with only relevant NOTAMs</td>
<td>Decreased volume</td>
</tr>
<tr>
<td>• Agree / disagree scaled measure with statement that NOTAM system provides me a complete set of NOTAMs (i.e., nothing missing)</td>
<td></td>
</tr>
</tbody>
</table>

## Third Party Systems

<table>
<thead>
<tr>
<th>Metric Idea(s)</th>
<th>Link to Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Can 3rd parties access and use the data? (Y/N)</td>
<td>Useable</td>
</tr>
<tr>
<td>• Satisfaction measure of how easy or difficult it is to use the data</td>
<td></td>
</tr>
<tr>
<td>• Number of parties that access the data</td>
<td></td>
</tr>
<tr>
<td>• Average / median latency from time data are requested by 3rd</td>
<td>Timely</td>
</tr>
</tbody>
</table>
The set of metrics above generally organize into three categories:

- Measurements of the data in the NOTAM system (% digital, latencies)
- Binary assessments of whether certain capabilities exist
- Satisfaction measurements from users

Additionally, the set of metrics above completely addresses all success criteria identified from the PBoR.

**High Level Summary for Outside Reporting**

The list of metrics above provides a menu of options from which to select a short list of metrics for high-level outside reporting.

First, the **percent of NOTAMs available as digital NOTAMs** is the root from which multiple other capabilities grow. When a NOTAM is available digitally, it can be filtered, sorted, prioritized and timeliness is enhanced. Transitioning to most or all NOTAMs in digital format is essentially a prerequisite to a highly successful Future NOTAM System. So, the Task Group recommends this metric for high level reporting.

Second, there are a number of areas of functionality associated with the NOTAM data that are implicit in the success criteria of the PBoR. For example, there must be capabilities in the FAA interface to filter, prioritize and search NOTAMs. All NOTAMs must be archived, and the FAA must make raw NOTAM data accessible to 3rd parties for development of private solutions for NOTAM data management and integration. A second measure for high level reporting is a **binary measure of whether the FAA has created all of the functionality required** given the language of the PBoR.

Finally, a number of metrics mentioned above relate to user satisfaction of how easy it is to access data from the FAA interface, how relevant the data are and how timely. The Task Group recommends a **synthetic measure of user satisfaction** created by averaging all satisfaction measures recommended above.
**Recommendations**

The Task Group makes the following recommendations. The Task Group recommends that those metrics collected in this effort be made available to the public at a frequency of not less than once per quarter.

1. The Task Group agrees with the FAA that future success of the NOTAM improvement effort relies heavily on the conversion of all NOTAMs to digital format and encourages the FAA to continue to collect and share metrics describing progress made towards an ultimate goal of 100%.

2. In addition to the "Feedback" feature already envisioned for the FNS website, a survey selection should also be designed to elicit feedback from users as to what features are most valuable and that this information be organized and reviewed periodically. This data should be used to develop a metric reflecting customer satisfaction.

3. The Task Group recommends that the various filtering and sorting options selected by users of the FNS website be recorded and reviewed periodically to gain insight into those features that are most popular so as to assist in making decisions about where to allocate resources for future developments and improvements.

4. As the TOC serves as the NOTAM Improvement Panel, the Task Group should be used as an ongoing resource for the FAA in support of future NOTAM improvement efforts.

**Moving Forward**

With the acceptance by the TOC of this report, the NOTAM Task Group will have completed those efforts to which it was assigned. The Task Group offers its ongoing support of the FAA’s NOTAM improvement efforts in the following ways:

- Address any issues or questions from FAA response to Task 1 document
- Identification of the right sequence of NOTAM categories to focus on for digitization efforts
- Identification of the appropriate outreach, training, education or requirements to industry to improve NOTAM digitization towards 100%
- Evaluation of early iterations of the FAA-provided interface on NOTAMs
- Periodic review of metrics related to the NOTAM Modernization Effort
## Appendix A: Members of the NOTAM Task Group

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization/Position</th>
<th>Name</th>
<th>Organization/Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kal Bala</td>
<td>RTCA, Inc.</td>
<td>Bob Lamond</td>
<td>National Business Aviation Association</td>
</tr>
<tr>
<td>Chris Baum</td>
<td>Air Line Pilots Association</td>
<td>Christopher Langone</td>
<td>ARINC Incorporated</td>
</tr>
<tr>
<td>Ernie Bilotto</td>
<td>Federal Aviation Administration</td>
<td>Jeffrey Miller</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>Mark Cardwell</td>
<td>FedEx Express (Co-Chair)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andy Cebula</td>
<td>RTCA, Inc.</td>
<td>Jim Mills</td>
<td>U.S. Air Force</td>
</tr>
<tr>
<td>Adam Gerhardt</td>
<td>TASC, Inc.</td>
<td>Trin Mitra</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Matt Griffin</td>
<td>Airports Council International – North America</td>
<td>David Newton</td>
<td>Southwest Airlines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steve Serur</td>
<td>Air Line Pilots Association</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glenn Sigley</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>Steve Habicht</td>
<td>Federal Aviation Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Ashish Solanki</td>
<td>Maryland Aviation Administration</td>
</tr>
<tr>
<td>Shaelynn Hales</td>
<td>CNA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kathlyn Hoekstra</td>
<td>Federal Aviation Administration</td>
<td>Edwin Solley</td>
<td>Southwest Airlines</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Harold Summers</td>
<td>Helicopter International Association</td>
</tr>
<tr>
<td>Jack Hurley</td>
<td>Delta Air Lines, Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ezra Jalleta</td>
<td>The MITRE Corporation</td>
<td>Brandi Teel</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Christian Kast</td>
<td>United Parcel Service</td>
<td>Robert Utley</td>
<td>National Air Traffic Controllers Association</td>
</tr>
<tr>
<td>Des Keany</td>
<td>American Airlines, Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tom Kramer</td>
<td>Aircraft Owners and Pilots Association (Co-Chair)</td>
<td>David von Rinteln</td>
<td>Hewlett Packard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Michael Williams</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: FAA Tasking Letter
Ms. Margaret T. Jenny  
President  
RTCA, Inc.  
1150 15th Street, NW  
Suite 910  
Washington, DC 20036

Dear Ms. Jenny:

The Federal Aviation Administration (FAA) is required under Section 3(c) of Public Law 112-153, also known as the 2012 Pilot’s Bill of Rights, to “establish a NOTAM Improvement Panel, which shall be comprised of representatives of relevant nonprofit and not-for-profit general aviation pilot groups, to advise the Administrator in carrying out the goals of the NOTAM Improvement Program.” The FAA would like to build on the progress already made with “digital NOTAMs” to comply with the provisions of this law. We believe having the Tactical Operations Committee (TOC) serve as the NOTAM Improvement Panel will further assist the Agency in crafting specific goals and priorities to meet the law’s intent and make needed enhancements to the NOTAM program.

We believe the work of the panel will yield an increasing amount of standardized digital NOTAMs that can be more easily filtered, sorted, and prioritized. This result should yield significant reductions in the volume of NOTAMs pilots must currently review and allow pilots to focus only on those NOTAMs relevant to their flight plan/path. As a result, pilots will be more confident in the quality and accuracy of this focused NOTAM information and the safety of the NAS will be improved.

We request the Tactical Operations Committee complete the following tasks:

**Task 1 – Establish the NOTAM Improvement Panel as a chartered function of the TOC and review recent and planned future NOTAM modernization efforts of the FAA**

We will provide documentation as needed as well as subject matter expertise to assist the TOC and task groups in its deliberations.

- To ensure needed stakeholders are identified and participate in any task groups formed.

- To examine and make recommendations/comments on recent and planned /future NOTAM modernization activities underway at FAA.
• To assess the interoperability of FAA NOTAM improvement efforts with the United States Department of Defense (DoD) and international stakeholders to provide feedback and recommendations on any actions needed.

FAA requests completion of this task by October 2013.

**Task 2 – Provide input and recommendations for success criteria and compliance metrics**

As stated in Section 3(b) of Public Law 112-153, the goals of the NOTAM Improvement Program are:

1. To decrease the overwhelming volume of NOTAMs an airman receives when retrieving airman information prior to a flight in the national airspace system.
2. To make the NOTAMs more specific and relevant to the airman’s route and in a format that is more useable to the airman.
3. To provide a full set of NOTAM results in addition to specific information requested by airmen.
4. To provide a document that is easily searchable.
5. To provide a filtering mechanism similar to that provided by the DoD Notices to Airmen.

The FAA and industry stakeholders need to understand what criteria need to be established to ensure compliance under the law and there needs to be common metrics to easily ascertain whether FAA is successful in achieving the above listed goals. We request that the TOC:

• Recommend the criteria that the FAA needs to follow to successfully comply with the Pilot’s Bill of Rights with regards to NOTAMs.

• Recommend one or more metrics for success to ensure continued compliance and to enable reporting to outside entities.

We request the TOC provide an interim report on this tasking in October 2013 with completion of this task in January 2014.

We believe there could be additional opportunities to involve the TOC in taskings to make improvements to the FAA’s NOTAM system but initial efforts will focus on those related to the mandates in the Pilot’s Bill of Rights.

Sincerely,

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization
Appendix C: Pilot’s Bill of Rights Public Law 112-153
Public Law 112–153
112th Congress

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

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.

(a) In general.—Any proceeding conducted under subpart C, D, or F of part 821 of title 49, Code of Federal Regulations, relating to denial, amendment, modification, suspension, or revocation of an airman certificate, shall be conducted, to the extent practicable, in accordance with the Federal Rules of Civil Procedure and the Federal Rules of Evidence.

(b) Access to information.—
(1) In general.—Except as provided under paragraph (3), the Administrator of the Federal Aviation Administration (referred to in this section as the “Administrator”) shall provide timely, written notification to an individual who is the subject of an investigation relating to the approval, denial, suspension, modification, or revocation of an airman certificate under chapter 447 of title 49, United States Code.

(2) Information required.—The notification required under paragraph (1) shall inform the individual—
(A) of the nature of the investigation;
(B) that an oral or written response to a Letter of Investigation from the Administrator is not required;
(C) that no action or adverse inference can be taken against the individual for declining to respond to a Letter of Investigation from the Administrator;
(D) that any response to a Letter of Investigation from the Administrator or to an inquiry made by a representative of the Administrator by the individual may be used as evidence against the individual;
(E) that the releasable portions of the Administrator’s investigative report will be available to the individual; and
(F) that the individual is entitled to access or otherwise obtain air traffic data described in paragraph (4).
(3) EXCEPTION.—The Administrator may delay timely notification under paragraph (1) if the Administrator determines that such notification may threaten the integrity of the investigation.

(4) ACCESS TO AIR TRAFFIC DATA.—
(A) FAA AIR TRAFFIC DATA.—The Administrator shall provide an individual described in paragraph (1) with timely access to any air traffic data in the possession of the Federal Aviation Administration that would facilitate the individual's ability to productively participate in a proceeding relating to an investigation described in such paragraph.

(B) AIR TRAFFIC DATA DEFINED.—As used in subparagraph (A), the term “air traffic data” includes—
(i) relevant air traffic communication tapes;
(ii) radar information;
(iii) air traffic controller statements;
(iv) flight data;
(v) investigative reports; and
(vi) any other air traffic or flight data in the Federal Aviation Administration's possession that would facilitate the individual's ability to productively participate in the proceeding.

(C) GOVERNMENT CONTRACTOR AIR TRAFFIC DATA.—
(i) IN GENERAL.—Any individual described in paragraph (1) is entitled to obtain any air traffic data that would facilitate the individual's ability to productively participate in a proceeding relating to an investigation described in such paragraph from a government contractor that provides operational services to the Federal Aviation Administration, including control towers and flight service stations.

(ii) REQUIRED INFORMATION FROM INDIVIDUAL.—
The individual may obtain the information described in clause (i) by submitting a request to the Administrator that—
(I) describes the facility at which such information is located; and
(II) identifies the date on which such information was generated.

(iii) PROVISION OF INFORMATION TO INDIVIDUAL.—
If the Administrator receives a request under this subparagraph, the Administrator shall—
(I) request the contractor to provide the requested information; and
(II) upon receiving such information, transmitting the information to the requesting individual in a timely manner.

(5) TIMING.—Except when the Administrator determines that an emergency exists under section 44709(c)(2) or 46105(c), the Administrator may not proceed against an individual that is the subject of an investigation described in paragraph (1) during the 30-day period beginning on the date on which the air traffic data required under paragraph (4) is made available to the individual.

49 USC 44703. (c) AMENDMENTS TO TITLE 49.—
(1) AIRMAN CERTIFICATES.—Section 44703(d)(2) of title 49, United States Code, is amended by striking “but is bound by all validly adopted interpretations of laws and regulations the Administrator carries out unless the Board finds an interpretation is arbitrary, capricious, or otherwise not according to law”.

(2) AMENDMENTS, MODIFICATIONS, SUSPENSIONS, AND REVOCA TIONS OF CERTIFICATES.—Section 44709(d)(3) of such title is amended by striking “but is bound by all validly adopted interpretations of laws and regulations the Administrator carries out and of written agency policy guidance available to the public related to sanctions to be imposed under this section unless the Board finds an interpretation is arbitrary, capricious, or otherwise not according to law”.

(3) REVOCATION OF AIRMAN CERTIFICATES FOR CONTROLLED SUBSTANCE VIOLATIONS.—Section 44710(d)(1) of such title is amended by striking “but shall be bound by all validly adopted interpretations of laws and regulations the Administrator carries out and of written agency policy guidance available to the public related to sanctions to be imposed under this section unless the Board finds an interpretation is arbitrary, capricious, or otherwise not according to law”.

(d) APPEAL FROM CERTIFICATE ACTIONS.—

(1) IN GENERAL.—Upon a decision by the National Transportation Safety Board upholding an order or a final decision by the Administrator denying an airman certificate under section 44703(d) of title 49, United States Code, or imposing a punitive civil action or an emergency order of revocation under subsections (d) and (e) of section 44709 of such title, an individual substantially affected by an order of the Board may, at the individual’s election, file an appeal in the United States district court in which the individual resides or in which the action in question occurred, or in the United States District Court for the District of Columbia. If the individual substantially affected by an order of the Board elects not to file an appeal in a United States district court, the individual may file an appeal in an appropriate United States court of appeals.

(2) EMERGENCY ORDER PENDING JUDICIAL REVIEW.—Subsequent to a decision by the Board to uphold an Administrator’s emergency order under section 44709(e)(2) of title 49, United States Code, and absent a stay of the enforcement of that order by the Board, the emergency order of amendment, modification, suspension, or revocation of a certificate shall remain in effect, pending the exhaustion of an appeal to a Federal district court as provided in this Act.

(e) STANDARD OF REVIEW.—

(1) IN GENERAL.—In an appeal filed under subsection (d) in a United States district court, the district court shall give full independent review of a denial, suspension, or revocation ordered by the Administrator, including substantive independent and expedited review of any decision by the Administrator to make such order effective immediately.

(2) EVIDENCE.—A United States district court’s review under paragraph (1) shall include in evidence any record of the proceeding before the Administrator and any record of the proceeding before the National Transportation Safety
SEC. 3. 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;

(B) to archive, in a public central location, all NOTAMs, including the original content and form of the notices, the original date of publication, and any amendments to such notices with the date of each amendment; and

(C) to apply filters so that pilots can prioritize critical flight safety information from other airspace system information.

(b) GOALS OF PROGRAM.—The goals of the NOTAM Improvement Program are—

(1) to decrease the overwhelming volume of NOTAMs an airmen receives when retrieving airman information prior to a flight in the national airspace system;

(2) make the NOTAMs more specific and relevant to the airman’s route and in a format that is more usable to the airman;

(3) to provide a full set of NOTAM results in addition to specific information requested by airmen;

(4) to provide a document that is easily searchable; and

(5) to provide a filtering mechanism similar to that provided by the Department of Defense Notices to Airmen.

(c) ADVICE FROM PRIVATE SECTOR GROUPS.—The Administrator shall establish a NOTAM Improvement Panel, which shall be comprised of representatives of relevant nonprofit and not-for-profit general aviation pilot groups, to advise the Administrator in carrying out the goals of the NOTAM Improvement Program under this section.

(d) PHASE-IN AND COMPLETION.—The improvements required by this section shall be phased in as quickly as practicable and shall be completed not later than the date that is 1 year after the date of the enactment of this Act.

SEC. 4. MEDICAL CERTIFICATION.

(a) ASSESSMENT.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Comptroller General of the United States shall initiate an assessment of the Federal Aviation Administration’s medical certification process and the associated medical standards and forms.

(2) REPORT.—The Comptroller General shall submit a report to Congress based on the assessment required under paragraph (1) that examines—

(A) revisions to the medical application form that would provide greater clarity and guidance to applicants;
(B) the alignment of medical qualification policies with present-day qualified medical judgment and practices, as applied to an individual's medically relevant circumstances; and

(C) steps that could be taken to promote the public's understanding of the medical requirements that determine an airman's medical certificate eligibility.

(b) GOALS OF THE FEDERAL AVIATION ADMINISTRATION'S MEDICAL CERTIFICATION PROCESS.—The goals of the Federal Aviation Administration's medical certification process are—

(1) to provide questions in the medical application form that—

(A) are appropriate without being overly broad;

(B) are subject to a minimum amount of misinterpretation and mistaken responses;

(C) allow for consistent treatment and responses during the medical application process; and

(D) avoid unnecessary allegations that an individual has intentionally falsified answers on the form;

(2) to provide questions that elicit information that is relevant to making a determination of an individual's medical qualifications within the standards identified in the Administrator's regulations;

(3) to give medical standards greater meaning by ensuring the information requested aligns with present-day medical judgment and practices; and

(4) to ensure that—

(A) the application of such medical standards provides an appropriate and fair evaluation of an individual's qualifications; and

(B) the individual understands the basis for determining medical qualifications.

(c) ADVICE FROM PRIVATE SECTOR GROUPS.—The Administrator shall establish a panel, which shall be comprised of representatives of relevant nonprofit and not-for-profit general aviation pilot groups, aviation medical examiners, and other qualified medical experts, to advise the Administrator in carrying out the goals of the assessment required under this section.

(d) FEDERAL AVIATION ADMINISTRATION RESPONSE.—Not later than 1 year after the issuance of the report by the Comptroller...
General pursuant to subsection (a)(2), the Administrator shall take appropriate actions to respond to such report.

Approved August 3, 2012.
Approved by the Tactical Operations Committee February 2014

Mitigation of Obstructions within the 20:1 Visual Area Surface

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

January 2014
Mitigation of Obstructions within the 20:1 Visual Area Surface

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Background/Introduction

The FAA is responsible for the safety of civil aviation and it sets standards, evaluates effects, and ensures compliance in the area of obstacle penetration of protected runway surfaces. Several FAA Lines of Business have defined roles in this effort including the Office of Airports, Flight Standards, and the Air Traffic Organization.

The FAA is exploring a risk-based approach to assess and mitigate penetrations of the 20:1 visual area surface to ensure safety while allowing additional flexibility in the time frames available for completing mitigations prior to affecting operations at a given aerodrome.

The 20:1 visual area surface is described in Section 3.3.2.c of FAA Order 8260.3B, United States Standard for Terminal Instrument Procedures (TERPS). Figure 1 below depicts the “straight-in” configuration of the surface, which is aligned with and centered on the runway centerline. It has vertical slope of 20:1 (a 2.87 degree slope), beginning from the runway’s threshold elevation. The surface begins 200 feet prior to the runway threshold and extends until reaching the decision altitude of the approach procedure it serves.

Figure 1: Straight-in Visual Area Surface

For approach procedures applicable to Approach Category A and B aircraft (generally lower performance prop, turboprop, smaller turbo-jet aircraft), the initial half-width of the surface, “k”, is 200 feet; for approach procedures applicable to Approach Category C & D aircraft (high performance turbojet aircraft), the initial half-width is 400 feet. Different dimensional standards are applicable to visual area surfaces serving offset and circling approach procedures.

When this surface is free from penetrations, there are no visibility limitations on instrument approaches. However, when there are obstacles that penetrate this surface the pilot must be able to see and avoid those obstacles. This is accomplished by restricting operations to times when the visibility is at least 1 mile, and by lighting the obstacle for night operations. If the obstacle is not lit, then there is no assurance that the pilot will be able to see and avoid the obstacle at night and therefore, night minima are not authorized.

During periodic inspection of procedures, sometimes new obstacles are identified which penetrate this 20:1 visual area surface. Because of FAA requirements, the discovery of these apparent obstacles leads to FAA restrictions resulting in loss of airport access. This occurs because of visibility reduction or loss of night instrument operations if the obstacle is not lit. A variety of factors has contributed to this situation, such as
inaccurate obstacle data in the FAA database, airport operators not being aware of their responsibilities, and a lack of consistent enforcement of this requirement.

In order to improve the situation in the short term, the FAA issued a Memorandum titled, *Mitigation of obstructions within the 20:1 Visual Area Surface* on November 15, 2013. The Memorandum, which became effective on January 6, 2014, outlines the steps airport operators must take in the event FAA determines an object in its obstruction database penetrates 20:1 visual area surfaces associated with instrument approach procedures.

The goal of the Memorandum was to establish a process in which mitigations are commensurate with risk, that facilitates compliance and establishes clear expectations between FAA and the airport community regarding the need to verify, plan, and implement approved mitigations for obstacle hazards.

Concurrent with issuance of the memorandum, the FAA requested the Tactical Operations Committee (TOC) to perform the following activities related to the mitigation of obstructions within the 20:1 Visual Area Surface:

a. Review and develop recommendations related to the FAA Memorandum, "*Mitigation of Obstructions within the 20:1 Visual Area Surface*" (FAA 20:1 Memorandum). Provide a report covering the following areas outlined in detail in the memorandum:
   i. The sufficiency of time and clarity of expectations in the verification stage.
   ii. Improving the planning and mitigation stages.
   iii. Providing clear guidance for what actions must be taken to mitigate risk regarding visibility and night operations.
   iv. The FAA is also requesting recommendations for the best mechanism(s) to communicate the process to key stakeholders.

The TOC established a 20:1 Visual Approach Surface Task Group (the VAS Task Group) in early December 2013 to develop the requested report.

**Executive Summary**

This document enumerates the Task Group’s assumptions and guiding principles used for deliberations. It then presents recommendations regarding the FAA 20:1 Memorandum. It includes recommendations regarding all four areas requested by the FAA in its tasking letter to the TOC.

With respect to our assumptions, the VAS Task Group agreed that our work should not focus on the underlying justification and safety purpose of the 20:1 visual area, but rather more narrowly on the

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1 In addition to release of the Memorandum, the FAA is also collecting data on the flight paths of aircraft in the visual segment and will evaluate whether an update to the obstacle identification surfaces is appropriate. The FAA will also initiate an education campaign to the airport owners and operators to assist them in identifying and mitigating obstacles before they become an issue.
specific requests articulated in the FAA’s tasking letter. Key among our guiding principles was that actions to mitigate 20:1 surface penetrations should not lead to unintended increases in safety hazards elsewhere in the system, for example eliminating straight-in instrument approach procedures leads to increased use of less stable circling approach procedures.

The VAS Task Group’s recommendations are organized according to the four specific issue areas identified by the FAA and include the following:

- Absent special circumstances, the listed timeframes for verification, planning, and mitigation of obstacles penetrating the 20:1 surface appear to be appropriate as limits to bound FAA’s basic direction of “as soon as possible,” but should be reassessed within 180 days of the effective date of the FAA 20:1 Memorandum.
- New obstacle surveys should not be required in the verification phase.
- The FAA should provide guidance on compliance plan contents, scope, etc. Ideally, this would be in the form of a sample compliance plan. These plans should be able to include a full range of options for obstacle mitigation including obstacle elimination/lowering, obstacle lighting, use of visual aids (e.g., Vertical Glide Scope Indicator, infrastructure modifications), and acceptance of procedural restrictions.
- Outreach efforts regarding 20:1 surface clearance requirements are critical to successful implementation of a risk-based mitigation strategy and should include stakeholder organizations such as: Air Line Pilots Association (ALPA), Aircraft Owners and Pilots Association (AOPA), Airlines for America (A4A), Airports Council International-North America (ACI-NA), American Association of Airport Executives (AAAE), Cargo Airline Association (CAA), International Air Transport Association (IATA), National Association of State Aviation Officials (NASAO), National Business Aviation Association (NBAA), National Air Transportation Association (NATA), and Regional Airline Association (RAA) as recipients of FAA messaging and as potential partners in the outreach efforts. Key messages that need to be included in these outreach efforts include (1) the rationale behind the FAA’s current focus on 20:1 obstacle clearance, (2) the scope and scale of 20:1 penetration issues within the NAS, (3) the safety and access impacts of 20:1 penetrations; and (4) verification, compliance, and mitigation requirements outlined in FAA’s 20:1 Memorandum.

Although outside of the scope of the FAA’s tasking letter, the Task Group also recognized that airport operators should be encouraged to notify the FAA if there is an approach at their airport that is no longer needed—which may reduce the need to protect unnecessary 20:1 surfaces. The VAS Task Group also encourages the FAA to continue with its ongoing flight track analyses to assess whether the current size and shape of the 20:1 surface is appropriate.
Methodology
To complete this initiative, the VAS Task Group took the following steps in creating the recommendation:

1. Determined and reached consensus on the scope of the task that guided the process of deliberations and subsequent outcome of the VAS Task Group recommendation.
2. Received informational briefings on FAA policy and regulatory requirements associated with the 20:1 Visual Area Surface, along with recent and planned FAA efforts. This included a discussion and review of available FAA data on obstructions.
3. Established a set of assumptions which in turn led to the development of guiding principles from which recommendations were established for the purpose of this report.
4. Discussed and responded to questions received from the FAA.
5. Identified issues that the VAS Task Group determined were beyond the scope of the FAA Tasking, but relevant for policy actions related to the mitigation of obstructions within the 20:1 Visual Area Surface.
6. Developed the final recommendations.

Assumptions
The VAS Task Group established the following assumptions as a common understanding for its subsequent recommendations:

- The FAA considers that penetrations of the 20:1 visual area surface represent a hazard to aircraft in flight.
- The 20:1 visual surface is a surface to enhance safety by protecting instrument approach procedures from obstacles and also provides a safety benefit for visual approach procedures.
- A risk-based analysis considers the likelihood of encountering a hazard although the severity of an encounter with an object is assumed to be catastrophic.
- The FAA will retain the capability to take immediate action in the event that an immediate or unanticipated threat to safety of flight is identified.

Guiding Principles
The Visual Area Surface Task Group established the following principles to provide the FAA with responses to the questions and issues requested by the Tasking letter and Terms of Reference:

- The VAS Task Group’s discussion must remain focused on the specifics of the FAA’s tasking letter, specifically the questions posed by the tasking letter.

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2 For faster, high-performance aircraft, 1 statute mile of visibility provides as little as 20 seconds of flight time in which to visually acquire and maneuver to avoid an obstacle penetrating the 20:1 surface.
- Changing TERPS criteria is outside the scope of the FAA Tasking.
- The VAS Task Group goal is to achieve unanimous consensus for the recommendations regarding the topics addressed in the tasking letter. In the unlikely event that consensus cannot be reached, dissenting opinions will be documented in materials submitted to the Technical Operations Committee.
- Both safety and airport access should be considered when evaluating the need for, extent of, and timeline for implementation of hazard mitigations.
  - Mitigating risk of 20:1 penetrations should not lead to increased risk (e.g. increased use of circling approaches).
- TERPS criteria exist as one of several mitigations to address the collision hazard posed by an obstacle (man-made or natural) in the final approach area (and others not pertinent to the 20:1 discussion).
- The location, height and number/surface area (individual or clusters) of obstacles should be considered in evaluating the risk they pose to aircraft.

Response to Questions
The Visual Area Surface Task Group developed the following responses to the four areas requested by the FAA related to the memorandum covering Mitigation of Obstructions within the 20:1 Visual Area Surface.

The FAA has requested comments on the sufficiency of time and clarity of expectations in the verification stage.

Task Group Response:

Time
- 30 days is an appropriate deadline for airport operators to verify the existence of object penetrations after receiving notification from the FAA with the understanding that airport operators will do so as soon as possible (i.e., sooner than 30 days) whenever practicable. The VAS Task Group recommends that the FAA reevaluate the timeliness of compliance with the 30 day verification deadline within 180-days of implementation of the FAA’s Interim Guidance.
- Special circumstances: Some airports in Alaska and potentially other smaller airports are challenged by 30 day deadline due to circumstances that may be beyond their control (staffing, budget for engineering services, technical expertise, local political/social considerations and environmental conditions).

Clarity
For airport operators, no new survey data should be required to respond to the FAA in the verification phase; instead, the intent of the verification phase is only to verify the existence and general characteristics of penetrating objects.

Consistent with the preceding recommendation, the VAS Task Group recommends that the FAA enumerate the specific information it wants to receive during the verification process and further recommends enumeration of the following two items:

- Object existence or non-existence
- Location, height, type of object, etc., insofar as these can be determined without new survey data

The VAS Task Group also recommends that the FAA provide plain language guidance regarding how it wants airport operators to submit verification information (e.g., development of a standard verification form airport operators can complete).

Finally, the VAS Task Group recommends that the memorandum provide clear guidance regarding the availability of and access to the 20:1 obstacle visualization tool when this tool becomes available for use.

The FAA has requested comments on improving the planning and mitigation stages.

Task Group Response:

Planning Stage Recommendations

Compliance plans should be able to include a full range of options for obstacle mitigation including obstacle elimination/lowering, obstacle lighting, use of visual aids (e.g., VGSI), infrastructure modifications), and acceptance of procedural restrictions.

- The FAA should provide guidance on compliance plan contents, scope, etc. Ideally, this would be in the form of a sample compliance plan.
- Airports need guidance on preferred priorities for removal or other mitigations.
- Compliance plan development will be iterative processes requiring ongoing collaboration among airport operators, the FAA, aircraft operators, and in many cases (e.g., where obstacles are located off airport property), local communities and/or property owners. Accordingly, the FAA should understand that development and implementation of some compliance plans will be

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3 The FAA, in issuing guidance explaining the full range of obstacle mitigation options, must clarify the priority and preferred methods for airports to follow. In doing so the FAA Division of Airports, National Priority System (NPS) and associated National Priority Ratings (NPR) must be brought in line with the priority of other FAA divisions. The current NPR ranks Obstructions at airport differently based on airport reference code and location of obstruction. By the FAA’s definition all obstructions represent some hazard to navigation and should be dealt with equally. Additionally, the past and current NPR rank easement/land acquisition for the protection of approaches at roughly 50% of the obstruction removal itself; this does not permit the airport to deal with obstructions that are outside of its existing property or access rights. Neither the NPS nor the NPR directly address funding to protect approaches prior to the Obstruction existing as an Obstruction; in some cases this forces the FAA and operators to allow obstructions to develop in order to be eligible for funding.
complex and may require more time to fully implement than currently allowed in the FAA 20:1 Memorandum. The VAS Task Group recommends that the FAA provide procedural mechanisms to extend compliance plan development deadlines in the event special circumstances exist.

**Mitigation Stage Recommendations**

- All other mitigation strategies should be evaluated before restrictions are placed on category C and D operations.
- Similar to the last planning stage recommendation, there should be procedural mechanisms to extend mitigation stage deadlines in the event special circumstances exist.

Excepting the special circumstance recommendations above, the time frames for planning and mitigation stages are appropriate, with the understanding that airport operators will do so as soon as possible whenever practicable. The VAS Task Group recommends that the FAA reevaluate the timeliness of compliance within 180 days of implementation of the FAA’s Interim Guidance.

The FAA has requested comments on providing clear guidance for what actions must be taken to mitigate risk regarding visibility and night operations.

**Task Group Response:**

- We recommend that FAA work with industry to provide guidance to airport operators regarding its expectations for maintenance of 20:1 surfaces following mitigation actions. The FAA needs to clearly communicate the responsibilities for identifying and mitigating obstructions associated with new approaches (especially in those instances where WAAS approach procedures were developed without involvement of the airport operator). This will help manage expectations and can help minimize the obstructions in the future.
- The fleet mix using the airport and frequency of operations, are important factors for risk mitigation leading to the resolution of a penetration.
- Unusual circumstances may require an alternative assessment of risk.

The FAA has requested recommendations for the best mechanism(s) to communicate the process to key stakeholders.

**Task Group Response:**

- The VAS Task Group recommends utilizing key industry associations to facilitate outreach to key stakeholders, particularly airport operators and aircraft operators.
- Key messages that need to be included in the FAA and other organization’s communications include (1) the rationale behind the FAA’s current focus on 20:1 obstacle clearance, (2) the scope and scale of 20:1 penetration issues within the NAS, (3) the safety and access impacts of

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4 Airports should be aware that loss of category C and D minimums, especially at single runway airports, can have negative impacts on the ability of large numbers of turbojet aircraft to operate at their airport impacting both based aircraft operators and viability of Fixed Base Operators (FBOs).

5 The principle is that this would be very limited; for example, a natural disaster, or unique weather event.
20:1 penetrations, and (4) verification, compliance, and mitigation requirements outlined in FAA’s memo.

- Outreach efforts should include stakeholder organizations such as: Air Line Pilots Association (ALPA), Aircraft Owners and Pilots Association (AOPA), Airlines for America (A4A), Airports Council International-North America (ACI-NA), American Association of Airport Executives (AAAE), Cargo Airline Association (CAA), International Air Transport Association (IATA), National Association of State Aviation Officials (NASAO), National Business Aviation Association (NBAA), National Air Transportation Association (NATA), and Regional Airline Association (RAA).

Outreach can be conducted via FAA and other organization’s communications web/webinars, template/guidance documents, and Office of Airports presentations. This should also include relevant federal and state agencies.

**Additional Recommendations**

The following two recommendations were not directly covered in the FAA’s Tasking Letter to the TOC, but were identified by the Task Group.

The FAA should:

- Continue its safety risk assessment of the 20:1 visual surface area using recent flight track dispersion data to determine if the geometry of the area should be modified.
- Provide data requested by the VAS Task Group regarding the number of 20:1 visual surface area penetrations in the NAS and the details regarding them as requested by the VAS Task Group co-chairs to the FAA. These data are important to provide industry with insight into the scale and scope of 20:1 penetration issues.
# Appendix A: Members of the 20:1 Visual Area Surface Task Group

Members of the VAS Task Group

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<thead>
<tr>
<th>Name</th>
<th>Organization/Position</th>
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<tbody>
<tr>
<td>Chris Baum</td>
<td>Air Line Pilots Association, International (Co-Chair)</td>
<td>Bob Lamond</td>
<td>National Business Aviation Association</td>
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<tr>
<td>Rich Boll</td>
<td>National Business Aviation Association</td>
<td>Scott McMahon</td>
<td>Morristown Municipal Airport</td>
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<td>Jim Bowman</td>
<td>FedEx Express</td>
<td>Glenn Morse</td>
<td>United Airlines, Inc.</td>
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<td>Andy Cebula</td>
<td>RTCA, Inc.</td>
<td>Michael O’Donnel</td>
<td>Federal Aviation Administration</td>
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<td>Bill Davis</td>
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<td>Bruce DeCleene</td>
<td>Federal Aviation Administration</td>
<td>Chris Oswald</td>
<td>Airports Council International – North America (Co-Chair)</td>
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<tr>
<td>Don Dillman</td>
<td>Airlines for America</td>
<td>Gary Powell</td>
<td>Federal Aviation Administration</td>
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<tr>
<td>Rob Goldman</td>
<td>Delta Air Lines, Inc.</td>
<td>Abigail Smith</td>
<td>Federal Aviation Administration</td>
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<td>Mike Hines</td>
<td>Metropolitan Washington Airports Authority</td>
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<td>Christian Kast</td>
<td>United Parcel Service</td>
<td>Justin Towles</td>
<td>American Association of Airport Executives</td>
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<tr>
<td>Tom Kramer</td>
<td>Aircraft Owners and Pilots Association</td>
<td>Jeremy Worrall</td>
<td>State of Alaska</td>
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Appendix B: FAA Tasking Letter
Ms. Margaret T. Jenny  
President  
RTCA, Inc.  
1150 15th Street, NW  
Suite 910  
Washington, DC 20036

Dear Ms. Jenny:

As you know, FAA is responsible for the safety of civil aviation and it sets standards, evaluates effects, and ensures compliance in the area of obstacle penetration of protected runway surfaces. Standards are set under Terminal Instrument Procedures (TERPs) requirements; evaluations of the effect of construction or alternations are done under Part 77, and compliance is ensured, in part, through Advisory Circulars. Several FAA Lines of Business have defined roles in this effort including the Office of Airports, Flight Standards, and the Air Traffic Organization.

The FAA is exploring a risk-based approach in providing clear vertical descent paths (referred to as a 20:1 surface) to ensure safety while allowing additional flexibility in the time frames available for completing mitigations prior to effecting operations at a given aerodrome. Normal vertical descent paths are protected through an obstacle identification surface, which originates 200' from the runway threshold and rises at 1 foot for every 20 feet laterally (a 2.87 degree slope). When this surface is free from penetrations, there are no visibility limitations on instrument approaches. However, when there are obstacles that penetrate this surface the pilot must be able to see and avoid those obstacles. This is accomplished by restricting operations to times when the visibility to at least 1 mile, and by lighting the obstacle for night operations. If the obstacle is not lit, then there is no assurance that the pilot will be able to see and avoid the obstacle and night minimums are not authorized.

During periodic inspection of procedures, sometimes new obstacles are identified which penetrate this 20:1 obstacle identification surface. Because of FAA requirements, the discovery of these apparent obstacles leads to FAA restrictions resulting in loss of airport access. This occurs because of visibility reduction or loss of night instrument operations if the obstacle is not lit. A variety of factors has contributed to this situation, such as inaccurate obstacle data in the FAA database, airport operators not being aware of their responsibilities, and a lack of consistent enforcement of this requirement.

In order to improve the situation in the short term, the FAA is developing a process to address these penetrations, taking into account that some obstacle data is inaccurate and that not all penetrations pose the same level of risk to operations. The proposed new process is outlined in an attached draft memorandum.
The goal is to establish a process in which mitigations are commensurate with risk, that facilitates compliance and establishes clear expectations between FAA and the airport community regarding the need to verify, plan, and implement approved mitigations for obstacle hazards. We believe the Tactical Operations Committee (TOC) could provide valuable feedback to help ensure that our new process meets the above goals is clearly communicated and can be effectively implemented. The purpose of the Tasking is limited in scope to recommendations related to the draft memorandum. Specifically the FAA request comments on the following areas:

1. The sufficiency of time and clarity of expectations in the verification stage.
2. Improving the planning and mitigation stages.
3. Providing clear guidance for what actions must be taken to mitigate risk regarding visibility and night operations.

The FAA also is requesting the TOC to identify the best mechanism(s) to communicate the process to key stakeholders.

In addition to release of the interim policy guidance, the FAA is also collecting data on the flight paths of aircraft in the visual segment and will update the obstacle identification surfaces accordingly. The FAA will also initiate an education campaign to the airport owners and operators to assist them in identifying and mitigating obstacles before they become an issue.

The FAA will provide needed subject matter expertise to work this task. To ensure that the TOC considers all relevant issues, the Task Group should, at a minimum, include representatives from airports, aircraft operators (airlines, pilots, and general aviation), state aviation officials.

FAA seeks the TOC’s recommendations no later than January 31, 2014.

Sincerely,

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

cc: AJV-0
Edited by AJV-0:V Smith:vs:(202) 267-8261:11/01/2013
WP:\P:AJV-6 Administration\Correspondence\AJV Non-controlled correspondence\November 2013\TOC Tasking RTCAJenny.doc
Appendix C: FAA Memorandum, “Mitigation of obstructions within the 20:1 Visual Area Surface”
Memorandum

Date: NOV 15 2013

To: Bruce DeCleene, Manager, Flight Technologies and Procedures Division, AFS-400
Michael J. O’Donnell, Director, Office of Airports Safety and Standards, AAS-001

From: William S. Davis, Deputy Vice President, Mission Support Services, AJV-0

Subject: Interim Policy Guidance for Mitigation of Penetrations to the 20:1 Visual Area Surface

PURPOSE: To provide consolidated interim policy guidance for FAA staff to address the process related to the discovery, verification, risk assessment, and mitigation of obstacles identified as penetrations to the 20:1 Visual Area Surface (20:1 surface) of instrument approach procedures (IAP).

ACTION: When 20:1 surface obstacle/terrain penetrations (penetrations) are discovered within the Visual Area Surface of an IAP (see attachment 1-20:1 Risk Assessment), action will be taken to evaluate the entire airport to ensure that all 20:1 penetrations for every IAP have been identified. Effective January 6, 2014, use the following process (see attachment 2-20:1 Mitigation Flow Chart) for the notification, verification, risk assessment, and mitigation of each penetration:

1. Notification and Verification. The Operations Support Group (OSG) Flight Procedures Team (FPT) will notify the airport owner/sponsor and the Airports District Office (ADO) within three business days of being informed of a potential penetration of an IAP. The OSG FPT will request the airport owner/sponsor to verify the validity of each penetration as soon as possible but not to exceed 30 calendar days after notification. The airport owner/sponsor must respond in writing to the OSG FPT with a copy to the ADO (scanned documents are acceptable). This reply is due as soon as possible and shall not be delayed to address mitigation, which is addressed through the compliance process (below). The preferred methods for an airport owner/sponsor to update data regarding trees that have been trimmed are contained in the Office of Airports (ARP) Engineering Brief (EB) #91: Management of Vegetation in the Airport Environment. EB #91 is available at the FAA website link: http://www.faa.gov/airports/engineering/engineering_briefs/. If no response is received within the prescribed timeframe, actions must be taken to restrict the IAP visibility minima/night operations as appropriate.
2. **20:1 Penetration Determined Invalid.** If the 20:1 penetration(s) at issue have been determined to be invalid by an airport owner/sponsor, the OSG FPT will notify AeroNav Products and the Aeronautical Information Management Terrain and Obstacle Data (TOD) Team. AeroNav products will update the documentation on the periodic review sheet. The TOD Team will update the obstacle database within 10 business days. No action is required to restrict or modify the subject IAP.

3. **20:1 Penetration Determined Valid.** If the 20:1 penetration(s) at issue is/are valid, one or more of the actions specified in paragraphs 3.1 through 3.3 below is/are required (see attachment 3-Timelines and IAP Restrictions). If any of the timelines are not met, or the airport compliance plan does not remove, light, or lower the obstacle, or if no compliance plan is contemplated (e.g., the airport operator/sponsor elects to not mitigate the obstacle risk), AeroNav Products must restrict the IAP accordingly (e.g., using a Notice to Airmen (NOTAM) or a Procedure Amendment).

3.1 **High Risk.** If the penetration(s) are verified as more than 11.0 feet above the 20:1 surface they are considered as high risk and **immediate action** is required to restrict the IAP visibility to at least 1 statute mile (SM) and if the obstacle is unlighted, restrict night operations. The airport operator/sponsor must submit a compliance plan as soon as possible but no later than 30 calendar days from the date of obstacle validation (by the airport owner/sponsor) to the OSG FPT with a copy to the ADO. The compliance plan must indicate actions to remove, light, or lower the obstruction as soon as possible for FAA to review the removal of restrictions. Appropriate IAP restrictions (above) must remain in force on subject IAP(s) until the Visual Area Surface penetration risk is mitigated.

3.2 **Medium Risk.** If the penetrations are verified as more than 3 feet and up to 11.0 feet above the 20:1 surface they are considered as medium risk and no immediate action is required to restrict the IAP. The airport operator/sponsor must submit a compliance plan as soon as possible but no later than 30 calendar days from the date of obstacle validation (by the airport owner/sponsor) to the OSG FPT with a copy to the ADO. The compliance plan must indicate actions to remove, light, or lower the obstruction as soon as possible but not to exceed 180 calendar days. If the penetrations are not mitigated within the prescribed timeframe, appropriate action must be taken to restrict the IAP.

3.3 **Low Risk.** If the penetration(s) are verified as 3 feet or less above the 20:1 surface, they are considered as low risk and no immediate action is required to restrict the IAP. The airport operator/sponsor must submit a compliance plan as soon as possible but no later than 30 calendar days from the date of obstacle validation (by the airport operator/sponsor) to the OSG (FPT) with a copy to the ADO. The compliance plan must indicate actions to remove, light, or lower the obstruction as soon as possible but not to exceed one year. If the penetrations are not mitigated within the prescribed timeframe, appropriate action must be taken to restrict the IAP.
4. **Alternate Mitigation.** The actions specified above do not preclude application of currently approved methods to mitigate 20:1 penetrations (e.g., use of Visual Glideslope Indicator (VGSI) or mitigation based on full-scale deflection, etc.).

5. **Additional Guidance.** This memo applies only to penetrations to existing IAP identified as of the effective date of this memo and is not intended to be used to revise or invalidate previously issued guidance restricting IAP. Obstacles/penetrations reported by FAA Flight Inspection Services aircrews are considered as outside the scope of this memorandum. Penetrations reported by FAA Flight Inspection Services are considered as having been verified and assessed; thus, may result in immediate action to restrict an IAP.

6. **Unusual Circumstances.** Unusual circumstances which prevent compliance with timelines (above) must be submitted by the airport operator/sponsor in writing to the OSG FPT with a copy to the ADO within 10 business days of initial notification. Approval to deviate from the timelines may be granted with consensus of the signatories to this memorandum or their designees. The OSG FPT in coordination with the ADO will respond to airport owner/sponsor submittals no later than 30 calendar days from receipt.

7. **Compliance.** The OSG FPT in coordination with the ADO will monitor the compliance plan and will brief the status during monthly Regional Airspace and Procedures Teams (RAPT) meetings. A standardized report will be used by the OSG FPT and included on the AeroNav Products IFP Gateway. As improved survey data is provided or notification is received that the obstacle is removed, lighted, or lowered to a height below the surface, the OSG FPT will notify AeroNav Products and Aeronautical Information Management Terrain and Obstacle Data (TOD) Team. AeroNav Products will update the documentation on the periodic review sheet. The TOD Team will update the obstacle database within 10 business days. Restrictions imposed on the respective IAP will be removed as appropriate.

**Implementation:** This guidance will be effective on January 6, 2014. Further, this guidance will be reevaluated within 180 calendar days and adjusted as necessary. For the period from the date of this memorandum until January 6, 2014, a national review team will determine the appropriate action for each penetrating case and advise accordingly. Our long term goal is to work with airports to achieve and sustain compliance to the required obstacle surfaces by January 2016.
Attachment 5 - 20:1 Visual Area Surface Task Group recommendation

Approval/Disapproval:

Approve: ☑
Disapprove: ☐

Bruce DeCleene, Manager,
Flight Technologies and Procedures Division
Date: 11/15/13

Approve: ☑
Disapprove: ☐

Michael J. O’Donnell, Director,
Office of Airport Safety and Standards
Date: 11/15/13

Attachments:
Attachment 1 – 20:1 Risk Assessment
Attachment 2 – 20:1 Mitigation Flow Chart
Attachment 3 – Timelines and IAP Restrictions
LOW RISK

- Mitigate penetrations as soon as possible but not to exceed one year
- Submit compliance plan as soon as possible but no later than 30 days
- No immediate IF actions

(3 feet or less)

MEDIUM RISK

- Mitigate penetrations as soon as possible but not to exceed 180 days
- Submit compliance plan as soon as possible but no later than 30 days
- No immediate IF actions

(more than 3 feet and up to 11 feet)

HIGH RISK

- Immediate restrict IF visibility to at least 500 feet if unilluminated
- Restrict right of operations (e.g., using a Notice to Airmen (NOTAM) or a
- Procedure Amendment
- Immediate restrict IF visibility to at least 1 SM and if unilluminated

200'

3 FT

More than 3 FT and up to 11 FT

More than 11 FT

20:1 Visual Area Surface Task Group recommendation

Attachment 5 - 20:1 Visual Area Surface Task Group recommendation

Attachment I. 20:1 Risk Assessment

11/15/13
Attachment 2. 20:1 Mitigation Flow Chart

Discovery of 20:1 Penetrations

Request Verification

Valid

NO

Coordinate with AeroNav Products and TOD. TOD will update database within 10 days

YES

Airport submits Compliance Plan

RAPT Monitors Compliance Plan

20:1 lighted, lowered or removed

YES

Coordinates with AeroNav Products and TOD. TOD will update database within 10 days
No restrictions to IAPs

NO

Take action to restrict the IAPs
### Visibility - Instrument Approach Procedure (IAP)

<table>
<thead>
<tr>
<th>Amendment (NOTAM) or a Procedure OPERATIONS (E.G., USING A NOTICE TO AIP RESTRICTIONS WILL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediate</strong></td>
</tr>
<tr>
<td><strong>Immediate</strong></td>
</tr>
<tr>
<td><strong>Immediate</strong></td>
</tr>
</tbody>
</table>

#### Timelines

- If 20.1 are valid
- IAP Restrictions
- Verification
- Obstacles

**Categories**: Risk

---

**NOTE**: Verification and Compliance Timelines should be completed as soon as possible but not to exceed the appropriate number of calendar days. If any of the timelines are not met or the obstacles cannot be removed, the IAP will be restricted immediately.
Approved by the Tactical Operations Committee February 2014

VOR MON Criteria Prioritization

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

January 2014
VOR MON Prioritization

Contents

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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 that of a Performance-Based Navigation (PBN), the VOR Minimum Operational Network (VOR MON) Implementation Program was established by the FAA. It is one of a myriad of 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 Program\(^1\) so as to meet the target date of January 1, 2020.

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 and addressed in a subsequent notice in August of 2012\(^2\). Efforts separate from the VOR MON are ongoing to identify Alternative Position, Navigation, and Timing (APNT) solutions that will provide a full-scale backup system to GPS. In addition, TACAN and DME are not considered by the VOR MON program.

In Fall of 2013, the Task Group completed Task #1 which was “to review and validate the VOR MON selection criteria and assumptions and make additional recommendations as needed.” The VOR MON Task Group limited its review of criteria for the decommissioning of domestic, FAA-owned VORs. The Task Group also limited its efforts to establishing and validating criteria only for operators flying IFR.

This report responds to Task #2 which is focused on review and validation of the draft candidate VOR MON list. Completion of Task #2 was requested by April 2014 but the Task Group has completed the task early and is submitting its report in February 2014.

Executive Summary

This document provides the Task Group’s response to Task #2 of the FAA tasking letter and is focused on review and validation of the draft candidate VOR MON list. It enumerates the methodology the Task Group undertook to evaluate and comment on the FAA’s proposed criteria for retaining VORs under the VOR MON concept.

The VOR MON TG had a choice to either provide feedback on the MON or provide feedback on the criteria used to evaluate the MON. The TG determined that FAA would be the definitive source for selecting individual VORs for inclusion in the MON after considering the TG’s input on criteria. The TG itself would not be involved in a VOR by VOR evaluation for the MON. The Task Group also limited its efforts to establishing and validating criteria only for operators flying IFR.

The VOR MON TG identified two categories of criteria for evaluation of the VOR MON. The first set of criteria is from the FAA’s existing work on the MON. The second group of criteria were those identified during Task #1 of the VOR MON TG. In addition, the TG consolidated two criteria referencing GPS interference (jamming and “other”) into one criterion. The TG then undertook a prioritization effort of the remaining eight criteria. The TG decided not to prioritize “Retain Oceanic VORs” and “Retain VORs in Western Mountainous regions” since retention of these were considered a given by the TG.

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

\(^2\) Federal Register notice, August 21, 2012
The TG recommends that the FAA apply this updated, weighted criteria against the current MON. The TG detailed a process by which the FAA could accomplish this through evaluation of VORs outside of the current MON. The FAA could then identify VORs that rate highly on the prioritized criteria for consideration to be swapped with VORs in the MON or selectively added into the MON.

Finally, the Task Group believes that the weighted criteria provide the basis for an exception process for the FAA to use. The Task Group targeted its criteria evaluation on a national level, recognizing that local circumstances may drive a different weighting of criteria for select VORs. The Task Group recommends the FAA utilize a rigorous and transparent process with NAS users and local communities to evaluate exceptions. Then, as the FAA receives feedback from NAS users and local communities on individual VORs slated for decommissioning, the weighted criteria will provide a basis for orderly exception processing. Any VOR that is re-evaluated for decommissioning can be measured against the weighted criteria and compared on these measures to other VORs in its peer group.

**Methodology**

The FAA’s Task #2 for the VOR MON Task Group was to review and validate the draft candidate VOR MON list. Specifically, the Task Group was requested to do the following:

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.

The Task Group made a distinction in its work between providing feedback on the MON and providing feedback on criteria used to evaluate the MON. The Task Group is providing input on the criteria that should be used to create and evaluate the MON and not on the MON itself. The Task Group membership did not have the correct technical resources to evaluate VOR by VOR against all of the criteria. Rather the Task Group felt it should focus on two things: 1) refine a high-level set of criteria with which the FAA can produce an initial MON, and 2) recommend a process with which the FAA can work with appropriate constituents to approve minor exceptions to the MON (additions or subtractions) based on local priorities.

To provide recommendations on these two areas, the Task Group prioritized the combined set of original FAA and Task Group recommended criteria. Prioritization of criteria addressed both of the focal areas mentioned above. A prioritized set of criteria may be used to evaluate members of an initial MON. Additionally, prioritized criteria may be used with various stakeholder and community groups to evaluate exceptions. The Task Group utilized an analytical process, known as the Analytical Hierarchy Process, to develop relative weightings of the full set of criteria.
Criteria Definitions

The VOR MON Task Group identified two categories of criteria for evaluation of the VOR MON. The first set of criteria are those original criteria from the FAA’s work on the MON. This set of criteria is as follows (full definition below):

- Retain VORs in Western Mountainous region
- Retain Oceanic VORs
- Retain VORs to enable navigation to a “safe landing” airport within 100 NM (nautical miles)
- Provide full en-route coverage at or above 5,000 ft AGL
- Ensure ability to hold for Core 30 airports

The second category of criteria were those identified during Task #1 of the VOR MON Task Group. This set of criteria includes:

- Retain VORs that are in a known GPS “jamming” location
- Retain VORs in proximity to areas of GPS interference
- Retain VORs to enable adequate navigation for non-RNAV capable aircraft
- Retain VORs necessary for training

Given redundancy between the first two criteria above, the Task Group combined the criteria “Retain VORs in proximity to areas of GPS interference” into the criteria “Retain VORs that are in a known GPS “jamming” location”.

The Task Group then defined each of the remaining eight criteria before prioritization. The following table includes the final definitions used by the Task Group:
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retain VORs in Western Mountainous regions</td>
<td>Retain VORs that define Victor air routes in which the route crosses terrain that has a minimum elevation figure of 12,000 feet or above.</td>
</tr>
<tr>
<td>Retain Oceanic VORs</td>
<td>Retain VORs that support international arrival airways from the Atlantic, Pacific and the Caribbean.</td>
</tr>
<tr>
<td>Retain VORs to enable navigation to a “safe landing” airport within 100 NM</td>
<td>The capability to navigate by VOR to an airport within 100 NM of any point in the CONUS where that capability exists today.</td>
</tr>
<tr>
<td>Provide full en-route coverage at or above 5,000 ft AGL</td>
<td>Support VOR-to-VOR navigation capability. To support full en-route coverage, service volume needs to extend to a 77 NM radius at 5,000 ft AGL. VOR service volume may be modified below 5,000 ft.</td>
</tr>
<tr>
<td>Ensure ability to hold for Core 30 airports</td>
<td>Ensure ability for ATC to hold aircraft for the Core 30 airports when GPS is unavailable.</td>
</tr>
<tr>
<td>Retain VORs that are in a known GPS “jamming” location</td>
<td>Ensuring there remains an ability to navigate in known GPS “jamming” locations. For instance, the DOD has several known areas throughout the country where routine GPS jamming is conducted.</td>
</tr>
<tr>
<td>Retain VORs to enable adequate navigation for non-RNAV capable aircraft</td>
<td>Provide reduced network for navigation throughout the NAS</td>
</tr>
<tr>
<td>Retain VORs necessary for training</td>
<td>Retain VORs that are heavily used by DoD training aircraft or high-volume local flight schools to learn or practice VOR operations.</td>
</tr>
</tbody>
</table>

During the process of defining criteria, the Task Group made some additional observations about the criteria:

- The Task Group elected to not prioritize two criteria: “Retain Oceanic VORs” and “Retain VORs in Western Mountainous regions”. The group agreed with these criteria and took these as given.
- Clarification of the criteria “Necessity of the VOR to enable adequate navigation for non-RNAV capable aircraft” was required. This criterion addresses the operators that will be unable to upgrade to RNAV or will require additional time to do so, necessitating VORs for navigation. This

---

3 Most DoD aircraft will not be IFR RNAV capable until after 2025.
4 VORs are heavily used by Army helicopters, necessary for Air Force and Navy initial flight training and for currency and proficiency requirements for many DoD pilots.
issue was of particular importance to the Department of Defense and certain General Aviation
operators.

- The definition for “Western Mountainous regions” generated discussion amongst the Task
  Group. Some participants felt that the minimum elevation of 12,000 feet for terrain was too
  low. An alternative of 10,000 feet was mentioned. The group elected to retain the 12,000 foot
  figure with the recognition that there may be exception cases in which terrain is a relevant
  consideration of VOR retention even if the terrain is not 12,000 feet.

Criteria Evaluation Results

After the final vetting and discussion of the criteria, there were six criteria considered in the
prioritization analysis:

1. Retain VORs to enable navigation to a “safe landing” airport within 100 NM
2. Provide full en-route coverage at or above 5,000 ft AGL
3. Ensure ability to hold for Core 30 airports
4. Retain VORs that are in a known GPS “jamming” location
5. Retain VORs to enable adequate navigation for non-RNAV capable aircraft
6. Retain VORs necessary for training

A cross section of operators, airports, manufacturers and the Military participated in the criteria
evaluation. The overall results of the prioritization are presented in the chart below:

The Task Group observed that the criteria fit into three tiers of importance. First, the criteria “Retain
VORs to enable navigation to a “safe landing” airport within 100 NM” was the clear first priority. The
Task Group observed that it was not surprising to see the most safety critical criteria at the top of the
list.

The next three criteria form a second tier:

- Retain VORs that are in a known GPS “jamming” location
• Retain VORs to enable adequate navigation for non-RNAV capable aircraft
• Provide full en-route coverage at or above 5,000 ft AGL

Finally, “Ensure ability to hold for Core airports” and “Retain VORs necessary for training” were in the third tier of importance.

Metrics that evaluate the rating process were provided from the software utilized in the analytical process. A measure of “Alignment” of the prioritization process was 67%. Too high of a measure of Alignment (such as 90%) would suggest the group had too much “group think” in its responses. Too low of a measure (such as 30%) would suggest the group’s responses were so scattered that no meaningful pattern could be discerned from the data. A result of 67% is a strong result for a group analytical process like the one conducted by the Task Group.

Additionally, the software measured “Inconsistency” of responses. Any individual respondent may rate criteria A higher than B and B higher than C. If the respondent then does not rate A higher than C, there is a level of inconsistency in the response. The overall group Inconsistency was 3.5%. A measure of 10% or less indicates a reliable prioritization process.

Recommendations

Given the results of the criteria prioritization, the Task Group can validate the FAA’s original selection criteria in development of the MON. The following are the original criteria used by the FAA:

• Retain VORs in Western Mountainous region
• Retain Oceanic VORs
• Retain VORs to enable navigation to a “safe landing” airport within 100 NM
• Provide full en-route coverage at or above 5,000 ft AGL
• Ensure ability to hold for Core 30 airports

In the prioritization process, the Task Group agreed with the first two criteria and considered them as given. The criteria of navigation to a “safe landing” airport was the most important criteria in the analysis and the en-route coverage was in the second tier. The only criterion used originally that raises any questions was “Ensure ability to hold for Core 30 airports”. This criteria, while in the third tier, remains a relevant criteria so long as it was not overemphasized in importance in development of the MON.

The Task Group also recommends inclusion of three additional criteria for evaluation of the VOR MON:

• Retain VORs that are in a known GPS “jamming” location
• Retain VORs to enable adequate navigation for non-RNAV capable aircraft
• Retain VORs necessary for training

The Task Group recommends that the FAA iterate through the current MON based on the weighted criteria results for the combined set of original FAA and Task Group criteria. The following diagram indicates a possible process by which the FAA could accomplish this: through evaluation of VORs outside of the current MON, the FAA may identify VORs that rate highly on the prioritized criteria for
consideration to be Swapped or Added into the MON. The Task Group does not recommend recreating a new initial MON.

Finally, the Task Group believes that the weighted criteria provide the basis for a VOR exception process for the FAA. The Task Group targeted its criteria evaluation on a national level, recognizing that local circumstances may drive a different weighting of criteria for select VORs. Going forward, as the FAA receives feedback from NAS users and local communities on individual VORs slated for decommissioning, the weighted criteria provide a basis for orderly exception processing. The Task Group recommends the FAA utilize a rigorous and transparent process with NAS users and local communities to evaluate exceptions. Any VOR that is re-evaluated for decommissioning can be measured against the weighted criteria and compared on these measures to other VORs in its peer group. Such criteria provide a structured way in which the FAA can evaluate individual exceptions.
# Appendix A: Members of the VOR MON Task Group

## Members of the VOR MON Task Group

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kal Bala</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Phillip Basso</td>
<td>DoD Policy Board on Federal Aviation</td>
</tr>
<tr>
<td>Mark Boquski</td>
<td>Thales ATM US</td>
</tr>
<tr>
<td>Rich Boll</td>
<td>National Business Aviation Association</td>
</tr>
<tr>
<td>Andy Cebula</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Dale Courtney</td>
<td>Federal Aviation Administration (Subject Matter Expert)</td>
</tr>
<tr>
<td><strong>Donald Dillman</strong></td>
<td>Airlines for America (Co-Chair)</td>
</tr>
<tr>
<td>Bob Ferguson</td>
<td>NetJets Association of Shared Aircraft Pilots</td>
</tr>
<tr>
<td>Jens Hennig</td>
<td>General Aviation Manufacturers Association</td>
</tr>
<tr>
<td>Mark Hopkins</td>
<td>Delta Air Lines, Inc.</td>
</tr>
<tr>
<td>Tom Kramer</td>
<td>Aircraft Owners and Pilots Association</td>
</tr>
<tr>
<td><strong>Bob Lamond</strong></td>
<td>National Business Aviation Association (Co-Chair)</td>
</tr>
<tr>
<td>Deborah Lawrence</td>
<td>Federal Aviation Administration (Subject Matter Expert)</td>
</tr>
<tr>
<td>David Manville</td>
<td>U.S. Army</td>
</tr>
<tr>
<td>Vince Massimini</td>
<td>The MITRE Corporation</td>
</tr>
<tr>
<td>Don McClure</td>
<td>Air Line Pilots Association</td>
</tr>
<tr>
<td>Trin Mitra</td>
<td>RTCA, Inc.</td>
</tr>
<tr>
<td>Rick Niles</td>
<td>The MITRE Corporation</td>
</tr>
<tr>
<td>Matthew Ross</td>
<td>Real NewEnergy</td>
</tr>
<tr>
<td>Edwin Solley</td>
<td>Southwest Airlines</td>
</tr>
<tr>
<td>Stephen Sorkness</td>
<td>SkyWest Airlines</td>
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<tr>
<td>Greg Tennille</td>
<td>The MITRE Corporation</td>
</tr>
<tr>
<td>Robert Utley</td>
<td>National Air Traffic Controllers Association</td>
</tr>
<tr>
<td>David Vogt</td>
<td>Delta Air Lines, Inc.</td>
</tr>
</tbody>
</table>
Appendix B: FAA Tasking Letter
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 Metropolises, 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
RTCA TOC Western Regional Work Group
Response to request from FAA Manager Operations Support Group, Western Service Center

Overview

At the November meeting of the RTCA Tactical Operations Committee (TOC) Western Regional Task Group (WRTG), the FAA Manager of Operations Support, Western Service Center, Clark Desing requested input from civil members of the RTCA TOC WRTG reference the US Navy’s proposal to raise the ceiling of the Lemoore ATCAA to FL 290 (Phase III implementation). Realizing that the DoD is a member of the TOC WRTG as well as the TOC itself, the following reflects input from the civil members of the WRTG with the plain understanding the DoD will dissent from this input as they are the proponents of the request to raise the Lemoore ATCAA ceiling.

Background

Commissioned in 1961, Naval Air Station Lemoore is the Navy’s largest and only west coast master jet base. The principal mission of the station, the R2508 MOA complex and the Lemoore ATCAA is to support the Strike Fighter Wing of the U.S. Pacific Fleet. Centered in the heart of California’s San Joaquin Valley, the Station encompasses almost 30,000 acres of land and airspace.

The Navy has undertaken efforts to improve their ability to train Naval Aviators by raising the ceiling of the Lemoore ATCAA to as high as FL350 date back to 2005.

Discussion

The civil aviation community is appreciative and supportive of the necessity for the various branches of the US Armed Forces to “train like they’ll fight” and realizes that an environment that allows for that with the NAS is essential for the protection of our United States. In order for the Armed Forces to continue to be funded to accomplish their wartime missions, a robust and viable tax base must continue to be fostered in the United States to provide tax dollars for the military. One of the key sources of tax dollars and overall economic growth (GDP) in the US has been, and continues to be, the civil aviation sector. At the end of day, a balance needs to be found between military training/preparedness and the needs of civil commercial operators to make a profit or civil non-commercial operators to operate efficiently to meet the needs of their business models. In addition, non-participating military/State aircraft are impacted by all SUA/ATCAA activations and the military is responsible to be good stewards of tax payer dollars in support of those missions as well.

As it relates to the Navy’s current proposal to raise the ceiling of the Lemoore ATCAA to FL290, overall the TOC believes the utilization of the existing Lemoore ATCAA up to FL260 has proven to be beneficial to the Navy's training program, and we applaud the military's efforts to increase efficiencies, particularly where there can be a balanced use of the airspace. The current airspace above Flight Level 230 has caused disruption of civilian use of the NAS and raising the top altitude from FL260 to FL290 onlyacerbates this situation.

Phase III Impact
Rerouting traffic around the Lemoore airspace increases congestion in a narrow corridor available for non-participating aircraft use (commercial, general aviation, and military). The domino effect will be far more costly than the values attached to the mileage to reroute around the airspace. With an industry average of 33 commercial flights per day operating through the 260-290 altitudes of the proposed ATCAA expansion, and another 148 commercial flights per day in the 15 nm buffer area, the only result for non-participating operators is costly delay.

Starting with direct costs a study of flights (FAA supplied data) considered activity over the Lemoore MOA/ATCAA complex, with and without a 15 mile buffer, during four 7 day periods and the altitude band of 260 to 290. Without the buffer, Southwest Airlines alone operated 283 flights for an average of 10 a day. With the buffer to capture flights already pushed to the perimeter, Southwest Airlines had an average of 55 flights in 260-290 band. Assume each flight would add 15 additional miles and two minutes of flight time. The 2012 A4A estimate of industry cost per minute is $78.17. Putting that all together:

For 260-290 with the buffer:

\[
55 \text{ flights/day} \times 365 \text{ days/year} \times 2 \text{ minutes/flight} \times \$78.17/\text{minute} = \$3,138,525.50/\text{year} \text{ for Southwest}
\]

and the total for industry is \$10,385,666.20/year.

Without the buffer the numbers are \$570.641.00/year for Southwest and \$1,883,115.30/year for the industry.

For United Airlines a review of data that shows the amount of flights that currently fly through the proposed airspace, it appears SkyWest Airlines (United Express) definitely will have the tremendous direct impact to their flights. These flights will fly more miles, burn more fuel, and be in the air a longer amount of time. All the non-participating traffic that currently uses that airspace has to go somewhere else, and as a result, will be compressed into a smaller area between the SFO Bay Area/PAC NW and LAX Basin. The airspace has the potential to become overwhelmed. To keep the controlling sectors in ZOA from becoming unmanageable with this loss of airspace, there will be Traffic Management Initiative’s (TMI) routinely placed on the traffic within this airspace as this is an extremely busy air traffic corridor. Currently, due to existing demand, there are TMI’s between 10-15 Miles In Trail placed on traffic from ZOA to LAX. This is likely to increase significantly if the traffic is compressed into fewer flight levels, or is required to reroute around the congestion. While cost of these TMI’s are hard to estimate, they will undoubtedly have an even worse impact on Part 121 operators with the implementation of the new FAR 117 Crew Duty requirements in January 2014.

Additionally, much of the work of the SOCAL and NOCAL OAPMs would be negated by the expansion of the ATCAA. As one example, traffic that does fly over Lemoore will be too high to make an Optimum Profile Descent into northern and southern California destinations which will cost additional fuel.

**Conclusion**

Indirect increases in congestion on the California corridor may be even worse than direct costs with concomitant negative impacts in fuel burned, increased environmental impacts, and delays. To truly
understand the potential cascading negative effects of this proposal, a more detailed study by users and Air Traffic Control would need to be conducted.

The Navy has stated raising the ATCAA will result in a $3.2 million a year benefit. While that is a commendable goal, it pales in comparison to the numbers above (and those numbers only reflect a limited number of non-participating operations that will be affected).

Based on the data available thus far, the cost to non-participating aircraft will be far greater than the projected benefit to the Navy’s proposed expansion of the Lemoore ATCAA. The civil operators on the TOC believe, based on the data available thus far, the cost to non-participating aircraft will be far greater than the projected benefit to the Navy’s proposed expansion of the Lemoore ATCAA. The civil operators on the TOC believe that, while any altitude above FL 230 has been disruptive, raising the altitude to FL 290 from FL 260 would be damaging to the economy and NAS. A good balance between cost and benefit should be the goal and recommend Lemoore ATCAA FL260 remain the cap.
Mr. Andy Cebula  
Vice President, Strategy & Programs  
RTCA Inc  
1150 18th Street, NW, Suite 910  
Washington, DC 20036  

Mr. Cebula:  

The attached documents are provided for the record and discussion at the RTCA Tactical Operations Committee (TOC). After review of "RTCA TOC Western Regional Working Group" Response regarding Lemoore ATCAA Phase III Implementation, both documents challenge the analysis and determination that the impacts to non-participants is far greater than if the expansion were to take effect.  

The Navy recommends "Return to Working Group for coordination with DOD" with intent to validate the data points used in the analysis. Using "All-In Airport Cost per Enplanement", allowing the DOD to participant in the Working Group, and capturing DOD's planned use data to complete the analysis will achieve consistent and defendable conclusions.  

There is a reachable and mutually agreeable solution for both DOD and industry which should not be discarded before full and unbiased joint analysis takes place.  

My point of contact in this issue is Mr. William Reabe (N980A), (703) 614-2638 or william.d.reabe@navy.mil.  

B. K. EASLER  
Captain, U.S. Navy  

Enclosures: 1. Navy Analysis of Western Regional WG  
2. Commander Strike Fighter Wing Pacific Reply  

Copy to:  
NAVREP western Service Area (ANM-903)
Navy Reclama to Western Service Area Input to RTCA TOC

BLUF: Recommend "Non-Concurrence with findings" or "Return to Working Group for coordination with DOD" of the "RTCA TOC Western Regional Working Group Response to request from FAA Manager Operations Support group, Western Service Area" due to critical flaws in baseline data used in analysis. The use of multiple flawed data points is the result of the decision by the Working Group to not include DOD data critical in achieving accurate analysis and conclusions.

Supporting information:

1. DON response to RTCA Working Group (WG) impact to industry cost analysis: Below is analysis, utilizing the "September 22, 2013 All-in Airport Cost per Enplanement" brief analysis, which uses the same "2012 A4A" estimate of industry cost per minute. This analysis contradicts statements and conclusions in the "Response to Phase III Lemoore" WG document. The WG response shows a significantly higher (~500% higher) difference from the DON's worst case scenario, using the analysis. See below:

   a. Actual estimated number of commercial flights through proposed ATCAA altitudes (specifically FL260-290) is "Unknown".
      - Archival DOD/ARTCC activation data was not used by WG.
      - WG used 33, 55, 181, and an unknown number, based on 24 hours per day
      - The DON uses the WG estimate of 33 per day for "worst case scenario" calculation only. The actual percentage of this number, within ATCAA activation time, has not been analyzed.

   b. Timeframe used by WG to calculate impact to non-participating aircraft is ~400% higher than current and projected DON activation data. Therefore, timeframe and associated flights impacted are not representative of real impact.
      - Published hours not utilized by WG. WG used 7 days a week/24 hours a day/365 days per year.
      - DON actual archival data shows 274 days per year maximum and less than 4 hrs/day of ATCAA activation (927 hrs/274 days=3.4 hrs/day). If we extrapolate the increased utilization that can be expected with an increase in the ATCAA ceiling to FL290, we end up with 4.2 hrs/day (1,148 hrs/274 days).
      - The DON uses the WG estimate of 24 hours per day for "worst case scenario" calculation only. The actual number of aircraft, within ATCAA activation time, has not been analyzed. DON will use 274 days per year in analysis.

   c. Actual cost per minute numbers from A4A site as briefed by "Airports Council International/North America" to their Financial Committee 22Sep13 are:
      - For airborne delays: $68.63 total ($29.72 fuel, $16.26 crew, $12.02 Maintenance, $7.92 aircraft ownership, $2.71 misc)
      - For ground delays: Taxi estimate; $49.69 total ($10.78 fuel, $16.26 crew, $12.02 Maintenance, $7.92 aircraft ownership, $2.71 misc)
      - Note: Both airborne and ground delays include; $16.26 crew, $12.02 Maintenance, $7.92 aircraft ownership, and $2.71 misc are derived from a constant overall cost
not negatively impacted or increased as a result of the "2 minute per impacted flight increase" assumption.

d. DON assumption is as follows:
TBD flights/avg through FL260-290 of activated ATCAA per day (will use industry estimate of 33 aircraft) x 274 days/year ATCAA activated x 2 minutes/flight x $29.72 additional airborne cost (or $10.78 additional taxi cost if ground delay) for a total per year increase to industry of: Airborne delay cost = $537,456.48 per year -or- Ground/Taxi delay cost = $194,945.52 per year.

e. "15NM buffer area" data was not analyzed as it is considered "not applicable or representative" of airspace or aircraft negatively affected by the proposed ATCAA altitude increase.

2. DON cost savings analysis and supporting data: The Navy will save at least $3.5M/yr in operating & TAD costs if the Lemoore MOA/ATCAA ceiling is raised from the current FL260 to FL290. Further raising the ceiling to the eventual goal of FL350 would result in an additional savings of $3.6M, for a total savings of $7.1M compared to the status quo. In addition to the cost savings, it's equally important to note that the increased ceilings will provide the Navy & other military airspace users with intangible benefits in terms of increased training quality and greater airspace flexibility (e.g., ability to train above lower-level cloud decks).

a. Analysis 1: Assumptions behind previously reported $3.2M Navy savings if ATCAA ceiling is raised from FL260 to FL290:
   - F/A-18 operating cost of $8,885/hour (based on FY12 data; FY14 cost is now $9,575/hr)
   - Avg F/A-18 sorties/yr in MOA/ATCAA (FY12 & 13 data, first two full FYs with FL260 & below): 4,041
   - Projected sorties/yr in MOA/ATCAA with FL290 ceiling: 5,000 (reflects ~24% increase/see CSFWP Ltr dtd 19 Dec 12 for rationale)
   - Reduction in overall F/A-18 hrs/yr due to reduced transit times: 364 (959 sorties x 0.38 hrs/sortie)
   - $3.2M Navy savings/yr (959 sorties x 0.38 hrs/sortie x $8,885/hr)
   - CONCLUSION: $3.5M Navy savings/yr (based on FY14 F/A-18 cost of $9,575/hr)

b. Analysis 2: Breakdown of MOA/ATCAA published hours vs. scheduled hours vs. activated hours
   - Maximum number of days/year that the MOA/ATCAA can be used: 274 (assumes 52 5-day weeks and 1 weekend per month, less 10 Federal Holidays)
   - Maximum number of published MOA/ATCAA hrs/yr (i.e., "core hours"): 3,672 (assumes 0800-2300 on Mon-Thu, 0800-1800 on Fri, 1200-2000 on Sat/Sun)
   - Avg scheduled hrs/yr for FY2012 & FY2013: 1,470 (Available to non-participating aircraft for 7290 hrs/yr or 83% of the time)
   - Avg activated hrs/yr for FY2012 & FY2013: 927 (Available to non-participating aircraft for 7833 hrs/yr or 89% of the time)
• Estimate of scheduled hrs/yr with FL290 ceiling: 1,820 (Available to non-participating aircraft for 6940 hrs/yr or 79% of the time)
• Estimate of activated hrs/yr with FL290 ceiling: 1,148 (Available to non-participating aircraft for 7612 hrs/yr or 87% of the time)
• TAKEAWAY: The DON only schedules and activates delegated airspace when required.

3. Conclusion: The DON believes the development of the Lemoore ATCAA is a local issue and could be coordinated and agreed upon, via Letters of Agreement, between NAS Lemoore and affected ARTCCs and TRACONS. We also believe subdivision of the requested airspace, along with real-time operational coordination (ATC to ATC point-outs) would even further mitigate any potential impact to non-participating aircraft. In the best interest and stewardship of the National Airspace System it is imperative we make the proposed airspace available to all aircraft to the extent possible. Finally, it is our belief that increasing the Lemoore ATCAA to the requested final altitude of FL350 will have minimal impact to the National Airspace System and the flying public. Additional analysis by the DON is contained in enclosure (2).
Federal Aviation Administration  
Western Service Area, Operations Support Group  
Mr. John Warner, Manager  
1601 Lind Avenue Southwest  
Renton, WA 98057  

Dear Mr. Warner:  

SUBJECT: NAS LEMOORE MOA/ATCAA SUA PHASE III CEILING INCREASE  

This is offered to facilitate the implementation of the Phase III ceiling increase for the Naval Air Station (NAS) Lemoore Military Operating Area (MOA)/Air Traffic Control Assigned Airspace (ATCAA) Special Use Airspace (SUA). In the interest of continuing the process toward achieving a Flight Level (FL) 290 ceiling for the Lemoore MOA/ATCAA, with expansion of the ceiling to FL 350 remaining the ultimate goal, I provide the following additional information.

Lemoore MOA/ATCAA airspace utilization for Fiscal Year (FY) 2012 (October 2011-September 2012) amounted to 4,052 sorties, a 15% increase over FY 2011, with NAS Lemoore-based squadrons accounting for over 95% of these sorties. By executing these training missions in the Lemoore MOA/ATCAA rather than the R-2508 Complex, the Navy saved 1,540 flight hours and $13.7 million in reduced transit costs, while simultaneously increasing the quality of training in both SUAs due to reduced congestion.¹  

Regarding reduction data for R-2508 usage, the effect is essentially a “one for one” swap. While both the R-2508 Complex and the Hunter MOA/ATCAA are ready SUA alternatives to the Lemoore MOA/ATCAA, Hunter MOA/ATCAA usage has remained constant at approximately 1,400 sorties per year both before and after establishment of the Lemoore MOA/ATCAA, supporting the conclusion that the Hunter MOA/ATCAA is operating at the capacity that its lateral and vertical confines allow.² While the aggregate number of training sorties flown by Commander, Strike Fighter Wing Pacific (CSFWP) aircraft varies from year to year.

¹ Executing missions in the Lemoore MOA/ATCAA vice R-2508 reduces transit time by 0.4 hours per sortie. Cost savings was calculated utilizing the current average F/A-18 operating cost of $8,885.48 per hour.

² Based on FY 2004-2012 Annual Usage Reports.
year, dependent largely on the number and length of operational deployments by Lemoore-based Fleet F/A-18 squadrons, the following chart supports the analysis that Lemoore MOA/ATCAA sorties directly reduce overall R-2508 Complex usage:

**Figure 1: Sorties flown by Lemoore-based F/A-18 squadrons**

<table>
<thead>
<tr>
<th>Year</th>
<th>Lemoore MOA/ATCAA</th>
<th>R-2508 Complex</th>
<th>Hunter MOA/ATCAA</th>
<th>Combined Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2006</td>
<td>N/A</td>
<td>14,569</td>
<td>1,379</td>
<td>15,948</td>
</tr>
<tr>
<td>FY 2007</td>
<td>N/A</td>
<td>12,857</td>
<td>1,514</td>
<td>14,371</td>
</tr>
<tr>
<td>FY 2008</td>
<td>1,714(^4)</td>
<td>12,764</td>
<td>1,518</td>
<td>15,996</td>
</tr>
<tr>
<td>FY 2009</td>
<td>2,877</td>
<td>13,240</td>
<td>1,518</td>
<td>17,635</td>
</tr>
<tr>
<td>FY 2010</td>
<td>2,699</td>
<td>14,753</td>
<td>1,490</td>
<td>18,942</td>
</tr>
<tr>
<td>FY 2011</td>
<td>3,513(^5)</td>
<td>10,150</td>
<td>1,155</td>
<td>14,818</td>
</tr>
<tr>
<td>FY 2012</td>
<td>4,052</td>
<td>11,129</td>
<td>1,362</td>
<td>16,543</td>
</tr>
</tbody>
</table>

Furthermore, growth in Lemoore MOA/ATCAA usage since its inception has remained consistent with CSFPWP’s original analysis of training objectives versus altitudes, as depicted below:

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\(^3\) Lemoore MOA/ATCAA sortie figures include a small percentage from other users, including the California Air National Guard 144th Fighter Wing, which on average account for less than 5% of total sorties.

\(^4\) Represents less than full FY, since Lemoore MOA/ATCAA operations commenced February 2008.

\(^5\) Lemoore MOA/ATCAA Phase II ceiling increase from FL 230 to FL 260 was effective June 2011.
Figure 2: Training Objectives by Altitude

<table>
<thead>
<tr>
<th>ATCAA Ceiling</th>
<th>% Total Objective</th>
<th>Sorties</th>
<th>Average Annual Cost Avoidance</th>
<th>Average Annual F/A-18 Flight Hours Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL 230</td>
<td>40%</td>
<td>2,788</td>
<td>$9.4 million</td>
<td>1,059</td>
</tr>
<tr>
<td>FL 260</td>
<td>65%</td>
<td>4,052(^7)</td>
<td>$13.7 million</td>
<td>1,540</td>
</tr>
<tr>
<td>FL 290</td>
<td>80%</td>
<td>5,000</td>
<td>$16.9 million</td>
<td>1,900</td>
</tr>
<tr>
<td>FL 350</td>
<td>95%</td>
<td>6,000</td>
<td>$20.3 million</td>
<td>2,280</td>
</tr>
</tbody>
</table>

Consistent with this analysis, the 30% increase in Lemoore MOA/ATCAA sorties for FY 2011 as compared to FY 2010 can be attributed largely to the effect of the ceiling increase from FL 230 to FL 260 that occurred in June 2011, which expanded the range of missions that could be executed in the airspace. When one considers the overall increase in Lemoore MOA/ATCAA sorties from FY 2010 (the last full year with a FL 230 ceiling) to FY 2012 (the first full year with a FL 260 ceiling), the approximate 50% increase is consistent with CSFWP's original analysis of mission sets versus ATCAA ceiling (i.e., 40% vs. 65% of training objectives).

Based on this analysis, we anticipate that raising the Lemoore MOA/ATCAA ceiling to FL 290 will increase annual sorties by approximately 20% above current levels. Using FY 2012 numbers as a reference, and assuming Fleet operational tempo (OPTEMPO) remains at current levels, we expect the number of sorties in the Lemoore MOA/ATCAA to rise to roughly 5,000. This would represent an additional savings to the Navy of $3.2 million and 360 flight hours over what was realized in FY 2012, not to mention further gains in training fidelity due to reduced airspace congestion in the R-2508 Complex. Taking this analysis further, we anticipate that a fully mature Lemoore MOA/ATCAA with a FL 350 ceiling would see annual usage on the order of 6,000 sorties, representing total average annual savings of 2,280 flight hours and $20.3 million (based on FY 2012 data).

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\(^6\) Based on FY 2008-2012 data, utilizing the current average F/A-18 operating cost of $8,885.48 per hour. Projections may change based on operational deployments of Fleet F/A-18 squadrons.

\(^7\) Average values, based on FY 2008-11 usage.

\(^8\) FY 2012 usage, reflecting first full FY with FL 260 ceiling.
When Fleet OPTEMPO ultimately returns to peacetime levels, we expect to see sorties increase by a further 15%, to approximately 7,000 sorties per year.

Mission requirements remain consistent with the original rationale underlying the establishment of the Lemoore MOA/ATCAA. Missions conducted by CSFWP aircraft in the Lemoore MOA/ATCAA include basic transition and air-to-air training for Fleet Replacement aircrew, and basic proficiency flying and air-to-air training for Fleet aircrew. Increasing the ceiling to FL 290 will provide aircrew with a more realistic and flexible vertical environment in which to train, and will also help to eliminate the first of two weeks of Fleet Replacement Squadron (FRS) Fighter Weapons Training (FWT) detachments, securing additional benefits in terms of quality of life for personnel (i.e., less time away from homestation) and savings in travel costs.\(^9\)

Before concluding, I would like to expand a bit on the importance of reduced transit time that the Lemoore MOA/ATCAA provides, as depicted in Figure 2 above. Due to the high demand for Carrier Strike Groups and the striking power and deterrence that the Navy’s strike fighter aircraft provide, CSFWP F/A-18 utilization rates over the past decade have been consistently greater than the Navy originally programmed. For example, in the case of the F/A-18C/D Hornet, 74% of CSFWP assets are currently flying beyond their original 6,000 flight hour life limit, with 12% now flying beyond the initial extension limit of 8,000 flight hours. These high flight hour aircraft require more frequent and extensive maintenance inspections, making every flight hour saved on these airframes particularly valuable.

In the case of the newer F/A-18 Super Hornet, the past decade’s high OPTEMPO has resulted in utilization rates approximately 30% greater than originally programmed, with nearly 10% of our aircraft approaching their original 6,000 flight hour design limit after less than 10 years of service. While Navy engineers are developing plans to extend the life of these aircraft out to 9,000 flight hours, doing so will require more frequent and extensive maintenance inspections. As a result, any flight hours that CSFWP aircraft are able to save by training in the Lemoore MOA/ATCAA rather than the R-2508 Complex directly increases the longevity of these national assets.

\(^9\) VFA-122 currently conducts five annual FRS FWT detachments of two weeks each to NAS Key West, FL.
3000
Ser N30/383
19 Dec 12

I am confident that working together, we will be able to identify a way forward that will accommodate the concerns of civil and commercial aviation, while at the same time allowing Naval Aviation and other military users to safely maximize the training value of available SUA, thereby saving taxpayer dollars by eliminating unwarranted transit flight time and unnecessary wear and tear on our aircraft.

If you should have any further questions, or require additional information to develop a plan of action and milestones that will enable us to implement the Phase III process for the NAS Lemoore MOA/ATCAA SUA, please do not hesitate to contact me. Alternatively, you can contact my Operations Officer, Commander Dave Buonerba, at (559) 998-1043 or david.buonerba@navy.mil.

Sincerely,

/s/
M. E. BLACK
Commander

Copy to:
Navy Representative, FAA Western Service Area
CO, FACSPAC San Diego
CO, NAS Lemoore
Adjutant General, California National Guard
144th Fighter Wing, California Air National Guard