Minutes of the Air Traffic Procedures Advisory Committee (ATPAC) Meeting #149
September 30 – October 1, 2014

National Harbor 15 Conference Room
Gaylord National Harbor Convention Center, National Harbor, MD

1 Opening of the Meeting

1.1 The 149th Meeting of the Air Traffic Procedures Advisory Committee (ATPAC) was called to order by Chair Lynette Jamison on Tuesday, September 30, 2014 at 9:00 a.m. The meeting was held at Gaylord National Harbor Convention Center, National Harbor, MD.

1.2 Representatives from the Federal Aviation Administration (FAA), Air Line Pilots Association (ALPA), National Aeronautics and Space Administration Aviation Safety Reporting System (NASA ASRS), US Department of Defense (DOD), National Air Traffic Control Association (NATCA), National Business Aircraft Association (NBAA), Allied Pilots Association (APA), Airline Dispatchers Federation (ADF), Air Traffic Control Association (ATCA), and Helicopter Association International (HAI) attended as follows:

Heather Hemdal, Executive Director
Lynette Jamison, Chair
Kevin Aurandt, FAA/AJV-83
Lawrence Beck, FAA/AJV-82
Andrew Burns, FAA/AFS-410
Mark Cato, ALPA
Keith Chandler, FAA/AJV-83
Gary Christiansen, FAA/AJV-83
John Collins, General Aviation Pilot
Linda Connell, NASA ASRS
Randy DeAngelis, FAA/AFS-410
DeeAnn Dehne, FAA/AJT-22
Gio DiPierro, FAA/AJV-82
Gary Fiske, FAA/AJV-8
Eric Fredricks, FAA/AJV-83
Sally Frodge, FAA/AJM-824
Marc Gittleman, ALPA
Russell Gold, FAA/AJV-14
Kari Gonter, NASA ASRS
Alison Hagar, US Army
Keith Henry, FAA/AJV-82
Richard Kagehiro, FAA/AJV-83
Ross Knoll, FAA/AJI-151
Robert Lamond, NBAA
Robert Law, FAA/AJV-8
Leslie McCormick, CSSI/AJV-8
Bruce McGray, FAA/AFS-410
Rowena Mendez, FAA/AJM-324
Ed Molloy, AJV-84
Glenn Morse, United Airlines
Mark Olsen, FAA
Lev Prichard, APA
Philip Saenger, FAA/AFS-410
John Schwoyer, ADF
Frederick Soechting, US Air Force
Jeffrey Tittsworth, FAA
Sydney Tutein, US Army
Jeffrey Williams, ATCA
Jeffrey Woods, NATCA
David York, HAI

1.3 Heather Hemdal presented the Executive Director's Report, providing the following information:

a. Status of Areas of Concern (AOC):

- Number of open AOCs: 4

- Deferred AOCs from Previous Meetings to Mtg #149 – 2
  - AOC 141-1 Runway Guard Lights (RGL)
  - AOC 145-2 IFR Services in Class G Airspace

- New AOCs accepted at Mtg #148 – 2

  - AOC 148-01- ADS-B NOTAMS and Problem reporting
  - AOC 148-02 - Clearances below published altitudes on procedures and airways

- Closed AOCs from Mtg #148: 3
  - AOC 116-3 - Glide Slope Critical Area Advisory
  - AOC 143-1 - Use of 'DESCEND VIA [STAR] and MAINTAIN [altitude]' phraseology in NAV CANADA Bulletin
  - AOC 146-4 - Availability of IFR departure clearance relative to ground based NAVAID proximity

- Proposed AOC: Change to Pilot/Controller Glossary – Ed Molloy
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- Topics for discussion:
  - Status of proposed AOC - Terrain Clearance - Bruce McGray, AFS-410
  - Proposed Change to CFR 91.117(c) Aircraft Speed – Gary Norek, AJV-11

- Briefings on new topics:
  - VOR Minimum Operational Network – Rowena Mendez, AJM-32
  - Optimization of Airspace and Procedures in the Metroplex (OAPM) - Mike Barnhart, AJV-121

- FAA Update on Chicago Center

1.4 Lynette Jamison presented the Chair's Report, providing information on meeting logistics and procedures for access to the ATCA Exhibit Hall.

1.5 The following agenda was presented to the meeting:

a. Call to Order/Roll Call
b. Recognition of Attendees
c. Executive Director's Report
d. Chair's Report
e. Call for Safety Items
f. Approval of ATPAC #148 Minutes
g. Review of Agenda Items and Call for New Agenda Items
h. Introduction of New AOCs or Miscellaneous Items
i. Briefings
j. Status Updates to Existing AOCs
k. Deferred AOCs
l. Recurring Agenda Items
m. Discussion on New Agenda Items
n. Location and Dates for Future Meetings
o. Adjourn

1.6 No new agenda items were identified.

1.7 The meeting reviewed the ATPAC #148 Minutes. It was noted that the presentation by Guy

Copeland on the discontinuation of the World Aeronautical Charts (WAC) had not been included in the minutes. Section 3 will be expanded to address this, and the PowerPoint will be added as an attachment to the report. The meeting approved the minutes with changes.

2 Call for Safety Items

LED Lights

2.1 Bruce McGray proposed that the meeting add a new safety item on the installation of Light Emitting Diodes (LED) lights on airports. (See **Attachment A**) The LED lights create problems for both natural vision as well as Enhanced Flight Vision Systems (EFVS). The lights do not emit heat, resulting in them not being seen on infrared cameras.

2.2 Bruce noted that *Aviation Week Magazine* had published an article on September 22, 2014 stating that "*…the FAA has not conducted testing to determine the potential effect of the lights on pilots at night and in different weather conditions including rain, fog, smoke, haze, and "break out effects" when a pilot descends below low cloud bases on an instrument approach."* The article went on to accuse the FAA of a "serious abrogation of regulatory responsibility to the traveling public" for not putting LED lights through the types of rigorous flight and human-factors testing that have been conducted with incandescent lights for decades.

2.3 As a result of these concerns, FAA Flight Standards had scheduled a symposium on LED lighting on October 7-8, 2014. ATPAC requested that the results of the symposium be distributed to members, and that an update be presented to ATPAC #150. It was agreed that a decision as to whether this item should be identified as a safety item would be deferred to the next meeting.

Solar farm reflection

2.4 Linda Connell proposed that the meeting consider whether the problems with reflections from mirrors located on solar farms was also a safety issue. The mirrors are used to reflect sunlight to towers. When the towers overheat, the sunlight is deflected in other directions, creating a hazard to aircraft. The reflected light is not damaging to the eye, but can cause temporary retinal blinding. The result is similar to that of lasers.

2.5 Although there is no requirement for pilots to report these incidents as is the case for lasers, two NOTAMs (FDC 4/1272 and 4/1273) have been published by Los Angeles Center to provide an awareness and to urge pilots to report incidents through the ASRS. Approximately 4-5 reports from pilots have been submitted through the ASRS.

2.6 It was also noted that there is no symbology on aeronautical charts to identify the solar farms. This was brought to the attention of the Aeronautical Charting Forum but no progress was made during the last meeting. This is a complex problem that requires technical expertise to resolve. The FAA has no authority to shut down the solar farms.

> *Note: Subsequent to the meeting, the following information was received from Rex MacLean, FAA Western Service Center: "While the LTA was being pursued, we initiated a request to the Aeronautical Charting Forum (ACF) to establish two charting actions. The charting of solar plants, and a hazard symbol of some sort for these "CSPs" Concentrated Solar Power plants. The ACF accepted the action to chart solar plants and are identified as "SOLAR FARM". We've charted our two known CSPs. The large*

number of "other" solar plants have not yet been identified. And, as the concerns deal with one of the CSP, CSPs were our priority.

For clarity, we have two known large CSPs and another proposed in California near Blythe. The Ivanpah site with three power towers and associated arrays, and the Tonopah site with what appears to be a much larger surface footprint array to a single power tower. Please note, I have no awareness of any concerns or complaints associated with the Tonopah site. However, it does have similar high altitude traffic. You'll see the Ivanpah site on the most recent Phoenix Sectional Aeronautical Chart (SAC), edition 92, and the Tonopah site was charted in August on the Las Vegas SAC edition 92."

2.7 ATPAC noted that there is a need to collect further data on these events. Linda provided data from ASRS that was distributed prior to the conclusion of the meeting. All members with data on these incidents should provide it to Leslie McCormick at LMcCormick@cssiinc.com so that it may be distributed to all members. The meeting agreed to defer identification of this as a safety item until the data can be reviewed. An update will be provided at the next meeting.

3 Introduction of New AOCs or Miscellaneous Items

Proposed AOC on Terrain Clearance - Bruce McGray, AFS-410

3.1 This was initially introduced at ATPAC #147 during which the meeting discussed whether a visual flight rules (VFR) pilot flying VFR asking for a vector to avoid traffic is responsible for his own terrain avoidance if he is below the minimum vectoring altitude (MVA). The issue was deferred to ATPAC #148, and again to ATPAC #149, to allow time for more research.

3.2 Bruce reported that the issue is being handled by the FAA Job Order (JO) 7110.65 Rewrite Group and the Safety Office through the normal channels. No further action is required by ATPAC, and no AOC will be submitted.

Proposed AOC 149-xx, Change to PILOT/CONTROLLER GLOSSARY – Ed Molloy, AJV-84

3.3 Ed Molloy briefed the meeting on the background and status of the Pilot/Controller Glossary (PCG). (See **Attachment B**) The purpose of the PCG is to promote a common understanding of the terms used in the Air Traffic Control (ATC) system. It includes those terms which are intended for pilot/controller communications. The definitions are primarily defined in an operational sense applicable to both users and operators of the National Airspace System (NAS). The PCG is revised as necessary to maintain a common understanding of the system.

3.4 AOC 149-xx was proposed suggesting that ATPAC conduct a review of the terms, definitions, and purpose of the PCG and recommend additions, deletions, and/or amendments to it. It was proposed that ATPAC develop and recommend to FAA ATO Mission Support Services a best practices guide to maintain and deliver the PCG.

3.5 ALPA made a motion to establish an ad hoc group to conduct this review. Following a brief discussion, it was recommended by NBAA that the FAA should handle this internally. The AOC was withdrawn and the FAA will provide information on the PCG update process to ATPAC #150.

4 Status Updates to Existing AOCs

AOC 141-1 Runway Guard Lights (RGL)

4.1 Gio DiPierro presented the meeting with information on the status of AOC 141-1. (See **Attachment D**) A Safety Risk Management (SRM) panel met in September 2012 to address approach hold procedures and markings throughout the NAS. Panel members included subject matter experts (SMEs) from Airports, Air Traffic, NATCA, Flight Standards, Runway Safety, the American Association of Airport Executives (AAAE), ALPA and others.

4.2 It was determined that approach hold guidance, procedures, and signs and markings were not standardized across FAA lines of business. There was no specific guidance in 7110.65, *Air Traffic Control*, regarding requirements, procedures, or phraseology for approach hold air traffic procedures. Inconsistencies in implementing approach hold signs, markings, and procedures existed among the nation's airports.

4.3 In order to ensure that approach hold areas were consistently identified and procedures were implemented for approach hold applications, the Runway Safety Group requested a Document Change Proposal (DCP) for FAA JO 7210.3, *Facility Operation and Administration*, paragraph 2-1-20, *OBSTACLE IDENTIFICATION SURFACES, OBSTACLE FREE ZONES, RUNWAY SAFETY AREAS, AND CLEARWAYS.*

4.4 Subsequent discussion of the changes led the SRM panel members to conclude that DCPs would also need to be submitted for 7110.65, paragraph 3 7 2, *TAXI AND GROUND MOVEMENT OPERATIONS* and the PCG.

4.5 These DCPs both established uniform procedures and phraseology for approach hold areas and addressed the lack of a data collection process related to approach hold area events. A tasking memo was to be sent to all facility managers in advance of the publication of the DCP providing a timeline for the implementation of new facility standard operating procedures (SOPs) and phraseology.

4.6 The DCP to 7110.65 would establish the new approach hold phraseology: "HOLD SHORT OF (runway) APPROACH." The DCP to the PCG defined approach hold areas as "*The locations on taxiways in the approach or departure areas of a runway designated to protect landing or departing aircraft. These locations are identified by signs and markings.*"

4.7 Along with the documentation changes proposed in the Safety Risk Management Document (SRMD), the FAA Office of Airports (ARP) is proposing new signs and markings to indicate approach hold areas. These proposed changes include the following:

a) For taxiways providing access to the runway, the mandatory holding position sign for taxiway/runway intersections and runway holding positions shall be used.

b) For taxiways that do not provide access to the runway, a new sign in conjunction with Instrument Landing System / Holding Position Marking, also known as ladder marking or conditional hold marking, shall be used.

c) To remedy confusion occurring when an approach hold is used for protection with departing traffic at the other end of a runway, the sign shall read, for example,

15 APCH – 33 DEP

4.8 Pending approval of the SRMD proposing these changes, the new signs and markings were installed for testing at select airports under the direction the FAA William J. Hughes Technical Center for

analysis prior to NAS-wide implementation. The new standards for these signs and markings will be evaluated and if the test and evaluation is favorable, the new signs and markings will be incorporated into the appropriate Advisory Circulars (ACs) as the new standard. The SRMD was signed on September 27, 2013.

4.9 Notice JO 7110.674 became effective May 22, 2014. This Notice is for test signage and new phraseology associated with the DCP's that resulted from the SRMD and applies to the Chicago O'Hare International Airport Traffic Control Tower (ORD), Cleveland-Hopkins International Airport Traffic Control Tower (CLE), Denver International Airport Control Tower (DEN), and Nashville International Airport Control Tower (BNA).

4.10 ORD was the first site to receive the new signs and CLE was scheduled to have the new signs installed on October 15, 2014. BNA will the new test signs in early November 2014. It was determined that DEN will not receive the new signs.

4.11 The DCPs to the 7110.65 and 7210.3 were adopted into Change 2 to both orders effective July 24, 2014.

4.12 The Airman's Information Manual (AIM) also contains information on approach hold. Once the tests are complete, this will be updated as needed.

4.13 ATPAC raised concerns that the color of the paint and the signage creating confusion. Since the new signage is still only a test at the four airports, the data collected will be taken into consideration and a decision will be made.

4.14 The AOC called for a change to the FAA JO 7110.65, and as that has been completed, it was **agreed to close AOC 141-1**. Updates on the status of the test will be presented at future ATPAC meetings.

AOC 145-2 Instrument Flight Rules (IFR) Services in Class G Airspace

4.15 This AOC was initially raised by NBAA based on their belief that the majority of US pilots operate under the assumption that if a controller issues them an IFR route clearance that they are being afforded IFR separation services. However, no separation services are provided by ATC to aircraft operating under IFR in Class G airspace.

4.16 Bob Lamond proposed the following change to the AIM 4-4-11, IFR Separation Standards to ATPAC #149 (text to be deleted is shown as strikeout, new text is shaded in gray):

> **b.** Separation will be provided between all aircraft operating on IFR flight plans except during that part of the flight (outside Class B airspace or a TRSA) being conducted on a VFR−on−top/VFR conditions clearance. In addition, pilots are reminded that ATC does not provide IFR separation service in Class G airspace and the filing of a random RNAV routing that transits Class G airspace is considered pilot acknowledgment that no IFR separation service will be provided in transited Class G airspace. Under these ~~conditions~~ circumstances, ATC may issue traffic advisories and safety alerts, but it is the sole responsibility of the pilot to be vigilant so as to see and avoid other aircraft.

4.17 Keith Chandler informed the meeting that the 7110.65 Rewrite Group has proposed to change the definition of Class G airspace, and this would affect the proposed wording. The issue is still being

worked and new wording will be put into the DCP process for publication in the AIM. An update will be presented to ATPAC 150.

AOC 148-01 – Automatic Dependent Surveillance – Broadcast (ADS-B) Notices to Airmen (NOTAMS) and Problem reporting

4.18 Lynette Jamison informed the meeting that the ADS-B Program Office will be setting up a briefing with Flight Service to identify the needs of the ADS-B Program Office and what Flight Service can do to assist pilots when they encounter ADS-B issues.

4.19 The Program Office is also working separately to update the AIM.

AOC 148-02- Clearances below published altitudes on procedures and airways

4.20 Gary Christiansen provided an update to the meeting. (See **Attachment E**) The presentation clarified the conditions under which ATC may clear an aircraft on a charted route or procedure at an altitude below the charted minimum. The current wording published in the AIM is:

> 5-4-5-a-5: A pilot adhering to the altitudes, flight paths, and weather minimums depicted on the IAP chart ***or vectors and altitudes issued by the radar controller***, is assured of terrain and obstruction clearance...
>
> 5-4-5-e-2: ...some MVAs may be lower than the non-radar Minimum En Route Altitudes (MEAs), Minimum Obstruction Clearance Altitudes (MOCAs) or other minimum altitudes depicted on charts for a given location. While being radar vectored, IFR altitude assignments by ATC will be at or above MVA.

4.21 John Collins expressed concerns that, based on his experiences, the clearances issued by ATC are not always correct, and presented examples for the meeting's review. (See **Attachment F**) ATC should not be issuing clearances that require a pilot to fly procedures below the charted altitudes. He also provided the meeting with a copy of an accident report which stated that the issuance of an ambiguous clearance was identified by the National Transportation Safety Board (NTSB) as a contributing factor in a fatal accident in Alaska. (See **Attachment G**). John asserted that it was a widespread practice, but this was not supported with any data presented at the meeting. Pilots do not have access to the Minimum Vectoring Altitude (MVA) charts to know what minimum altitudes are being applied. During the meeting, the FAA noted that the 7110.65 presented an example and agreed to report back to the next meeting as to where the policy can be found, or if there is no written policy, what steps are underway to clarify this matter.

5 Briefings

Climb Via

5.1 Keith Henry presented information on Climb Via to the meeting. (See **Attachment H**) Climb Via was originally scheduled to go into effect on August 15, 2012. The implementation was delayed when it was discovered that the controller and pilot training were different, and Pre-Departure Clearance (PDC) and speed issues were not addressed. On August 23, 2012 a new Climb Via group was formed. Climb Via was implemented on April 3, 2014.

5.2 Since then, there have been three main issues identified with the Climb Via:

a) ATC facilities doing one-offs with Climb Via;

b) difficulty locating the top altitude in the narrative; and

c) pilots not using the proper phraseology on check in.

5.3 In order to mitigate the problem with the difficulty in locating the top altitude, a memo was sent out to facilities on July 11, 2014 allowing them to place the top altitude in the PDC clearance, for example: **"CLIMB VIA SID RMK: TOP ALTITUDE 4000"**. This is a short-term solution until the top altitudes can be placed on the published Standard Instrument Departure Procedures (SIDs).

5.4 Team members have been reviewing more than 1450 SIDs and generating a database that AeroNav will use to place the top altitudes on the SID. The first chart cycle containing the new Top Altitude box is planned for Nov 13, 2014. It is expected to take 5-6 chart cycles to complete the changes.

5.5 Other efforts underway include: obstacle departure procedures (ODP) will not be used with Climb Via, publishing transition speeds on Standard Terminal Arrivals (STARs), vectoring aircraft off non-radar vector Climb Via SIDs, vectoring aircraft off radar vector Climb Via SIDs, and top altitudes that are below published altitude crossing restrictions.

5.6 The following altitude restrictions make a SID qualify for Climb Via: published crossing restrictions and/or top altitudes.

5.7 There is continuing discussion within the group on further changes to Climb Via in order to align with the International Civil Aviation Organization (ICAO). Most of these changes regard altitude reporting and phraseology.

5.8 Concerns were raised during the meeting that there are inconsistencies where the RNAV altitudes are not on the charts, but they are in the flight management system (FMS). The pilot consensus was that if there is not an RNAV engagement altitude, the procedure should not be a Climb Via SID. This will also be brought to the attention of the Aeronautical Charting Forum.

5.9 Larry Beck confirmed that if the clearance is to climb and maintain, do not comply with the SID restrictions; if it is Climb Via, DO comply with the SID restrictions. This may not be understood by everyone. There should not be any hybrid clearances issued, and pilots receiving them should contact Larry at Lawrence.Beck@faa.gov.

6 Recurring Agenda Items

Wake Turbulence Update

6.1 Jeffrey Tittsworth provided an update to the meeting. (See **Attachment I**) The Wake Turbulence Research Program's focus is safely improving capacity in the NAS. The program is built around three solutions sets. The first set is data driven procedural changes, with some of the changes requiring a controller display aid. Measured data are used to build the safety cases that support these changes to air traffic operational procedures, without the need of new meteorological sensors or other technology based solutions. The second set is procedural changes supported by real time data measuring specific meteorological conditions and simple technology solutions supporting those data measurements. The third set includes the most complex solutions requiring significant meteorological or technology inputs to achieve the capacity gains.

6.2 **1st Solution Set - JO7110.308** - The Wake Turbulence Research Program along with the Terminal Services Unit developed and received regulatory approval of the rule change, to allow simultaneous dependent instrument approaches, staggered 1.5NM, to runways separated by less than 2500 feet. There are currently seven airports approved for the procedure: Boston (BOS), CLE, Newark (EWR), Memphis (MEM), Philadelphia (PHL), St Louis (STL), and Seattle (SEA). San Francisco (SFO) and a change to EWR are the most recent additions established in the Change 3 addendum to JO7110.308 Appendix F. SFO implemented the procedures on or about October 1, 2013 and the called arrival rates have changed from 30 to 33 aircraft per hour. Achieved arrival rates have been observed up to 35 per hour as the facility is gaining experience with the procedure. The Wake Program has completed analysis for use of the procedure in Phoenix and Las Vegas, and the program is currently in discussion with the facilities regarding the operational need for completing the Change 4 addendum to the 7110.308 Appendix F to approve Phoenix and Las Vegas for use of the procedure. Additionally, the wake program is working with stakeholders for the addition of an RNAV approach to BOS runway 4L which, in conjunction with an update to the 7110.308 safety case and FAA Order, will enable use of the 7110.308 procedure. The program has also begun work on a request from SFO/Northern California Terminal Radar Approach Control Facility (NCT) for a review of 7110.308 for use on SFO runway 19's.

6.3 **2nd Solution Set - Wake Turbulence Mitigation for Departures (WTMD)** is a Closely Spaced Parallel Runway (CSPR) project incorporating existing meteorological data and simple technology to achieve additional departure capacity at ten constrained airports. A WTMD Operational Demonstration System has been implemented at SFO in March 2013, Houston Intercontinental (IAH) in May 2013, and MEM in Dec 2013. Operational feedback from the three facilities has been positive and early benefits assessments show promise. SFO has seen some valuable operational impacts, although the ATC staff would like to see the procedure available more often. The SFO 1's have been closed this summer and looking forward to the reopening, a joint team of FAA Air Traffic Procedures (AJV), Program Management Organization (AJM), MITRE Center for Advanced Aviation System Development (CAASD) and Volpe are working on enhancing the availability of WTMD at SFO and increasing the supervisor awareness of availability and thus increasing the usage there. IAH experience has been affected by runway closures that have had an impact on its use when it has been otherwise operationally available, but for these operational staff with WTMD experience, there has been significant delay savings during times with large queues, as well as a similar desire for availability improvement that has been seen in SFO. With only about 8 months of WTMD operations in MEM, the results are still preliminary. It is clear though, that with the use of the Wake Re-categorization Project (RECAT) and the unique fleet mix at MEM, RECAT has provided some of the benefits that WTMD was expected to provide. This is due to the departure capability from MEM closely spaced parallel runways that are wake independent when a Cat C aircraft departs first and any Heavy aircraft departs from the parallel runway. For all sites another more fundamental change to the procedures is envisioned to enhance the availability of reduced separations. The transition will be to paired departures where the trailing aircraft will depart ahead of the wake of the lead aircraft and will include modifications to the controller decision support tool and the wind forecast algorithm to support new procedure. This change, if achievable, is 2-3 or more years away. After one year of data collection at all three sites, the WTMD system benefits will be assessed and the FAA investment analysis decision will be made whether to continue fielding the WTMD capability to the remaining seven potential WTMD sites. Enhancements will be applied as P3I for the solution.

6.4 **2nd Solution Set - Wake Turbulence Mitigation for Arrivals (WTMA)** - The Wake Turbulence Research Program is collecting data and developing the concept definition for WTMA. This effort expands on the procedures-only solutions to include more types of aircraft and increases the number of airports that can realize increased arrival capacity in less than visual conditions. WTMA is made up of two mitigation solutions, WTMA Procedure (WTMA-P) and WTMA System (WTMA-S). WTMA-P expands upon the 7110.308 procedure by allowing Heavy and B757 aircraft to participate in reduced wake separation procedures to CSPRs spaced less than 2500'. The safety analysis for this

procedure is complete and should be in the hands of the Air Traffic Safety Oversight Service (AOV) by the date of this meeting. Preliminary discussions with PHL will be held shortly to identify implementation activities and a tentative implementation in 2015. The WTMA-S project is a wind-dependent wake mitigation solution for arrivals, which expands on the technology and meteorological data used by WTMD to address the longer planning horizons and larger airspace with reduced separation that is necessary for the arrival solution. Automated Terminal Proximity Alert (ATPA) is a capability that WTMA-P and WTMA-S will likely use as the decision support tool to aid controllers in their situational awareness needs for dependent instrument approaches to CSPR. The ATPA single runway application is currently running at select US sites. The dependent solution version, ATPA Phase II requirements are nearing completion. Phase II will be useful for WTMA-P, but not a requirement. ATPA Phase III is envisioned as a requirement for WTMA-S.

6.5 **3rd Solution Set - The Wake Turbulence Research Program is no longer supporting Crosswind-Reduced Separation for Departure Operations (CREDOS) but is pursuing Wake Turbulence Mitigation for Single Runway (WTMSR)**. WTMSR is currently in the research phase where potential system and procedural concepts are being explored and defined. It will likely incorporate and build off of the technology developed for the wake turbulence mitigations used for CSPRs.

6.6 **The Wake Re-categorization project (RECAT)** is an international effort undertaking a re-categorization of current wake categories. This is a multi-phased effort which is seeking capacity gains in each phase and has application in all three solution sets. After more than seven years of joint effort with Eurocontrol, the FAA presented the joint proposal for a static six category system called RECAT Phase I to ICAO in December 2010 for review by the ICAO Wake Turbulence Study Group (WTSG). The effort to harmonize based on this recommendation was focused on optimizing on a compromise fleet mix demand based on traffic in the US and Europe. Some member States of Eurocontrol believed the joint recommendation did not optimize sufficiently for their specific fleet mix. In turn, Eurocontrol has chosen to work with few European air navigation service providers (ANSPs) to develop a regional, Eurocentric modification of the joint proposal in hopes of providing improved benefit for some of the member states. The US has chosen to implement the joint recommendation in an effort to promote harmonization and to demonstrate safe implementation. MEM implemented initial operating capability (IOC) with RECAT on Nov 1, 2012, Louisville International (SDF) in Sep 2013, Cincinnati/Northern Kentucky International (CVG) in March 2014 and Atlanta (ATL) in June 2014. Operational experience with the new standards has resulted in the removal of several operational constraints. Departure metering was eliminated by FedEx, arrival flow control programs have been eliminated for the most part, and additional arrival gates have been implemented such that En Route can feed more traffic to MEM. Called arrival and departure rates have been raised from 77 to 99 per hour. FedEx is reporting a monthly savings of $1.8M per month due to RECAT. UPS has reported a nightly savings of 53,000 lbs of fuel on arrivals. While early, we have seen nearly a two minute reduction in taxi out times at ATL and the called arrival rate will be raised by about 6% in a go slow approach. Air Traffic Services (AJT) has worked with the NextGen Advisory Committee to develop a waterfall for five more sites in FY14/15 (IAH, Charlotte (CLT), New York TRACON (N90), Chicago TRACON (C90) and NCT). The RECAT Order 7110.659A has been signed.

6.7 The FAA is trying again to pursue an international solution, RECAT Phase II, based on harmonization of pairwise wake separation standards. FAA is working again with Eurocontrol. One risk to this effort is a desire by some Eurocontrol member States for a regional RECAT solution. Such a regional solution will likely eliminate some ICAO member States from supporting an international harmonization effort. While other risks also exist, the fallback position by the FAA is to implement the RECAT II standards in the US if international support is again affected. RECAT II will expand upon the benefits of RECAT I by allowing for wake separation matrices that are customized to the TRACON fleet mix. Implementation will transition seamlessly from RECAT I to RECAT II in FY16/17.

6.8 **Aircraft Standards** - During CY2010, the FAA approved and implemented a revision to its current wake separation standards that places all Boeing 757 aircraft in the same wake separation category. Work is continuing by international groups (including the manufacturer, the FAA Air Traffic Operations and Flight Standards, the European Aviation Safety Agency (EASA) and Eurocontrol) in reviewing the wake separations associated with the Airbus 380. An assessment was recently concluded of the new Boeing 747-8 series aircraft through flight tests conducted in a manner similar to that used for the A380. During 1st quarter calendar year (CY) 2011, the Wake Program, working with FAA Aviation Safety (AVS), Boeing, and ATO Terminal Procedures developed an SRMD for the introduction of the new B787 series 8 and 9 aircraft into commercial service and received European Aviation Safety Agency (EASA) concurrence on the proposed wake turbulence separations. As a result of those efforts, the assessments for both the B787 and B748 aircraft were completed prior to the Environmental Impact Statement (EIS) and both have been categorized as Heavy aircraft. The separation standards were placed into the 7110.65 for use by Air Traffic. In FY2013, the Wake Program completed initial analysis in preparation for the introduction of the Airbus A350 into commercial service. EASA and FAA are working on a bilateral agreement to document the 3 acceptable methods of compliance for setting wake separations for new Heavy aircraft and documenting areas of research that may lead to additional acceptable methods in the future.

Time Based Flow Management (TBFM) Procedures

6.9 An update on TBFM was provided by Kevin Aurandt. (See **Attachment J**) The current capabilities are Arrival Management (Situational Awareness), Departure Scheduling, Airborne Metering and En Route Departure Capability (EDC). Arrival Management is being used by 14 Centers and several large TRACONs; Departure Scheduling is being used by 11 Centers, two TRACONs and select towers; Airborne Metering is in use at 15 Centers; and EDC is in use at 11 Centers.

6.10 The findings of these implementations are that situational awareness has been improved, Departure Scheduling and EDC are being widely used, and metering has benefits including reduced airborne holding, reduced vectoring, improved delivery to the runway and reduced reliance on miles-in-trail.

6.11 Operational challenges still exist and further work is underway on policy and procedures. The impact is lack of connectivity, inconsistent use and application, and a perception of lack of importance. The TBFM capabilities used, duration of use, procedures used, and level of expertise vary extensively between facilities. The identified challenges require timely and effective attention for TBFM to adequately support NextGen initiatives. However, optimistic attitudes and a desire to see TBFM move forward exist at many locations.

6.12 The vision for TBFM is the expanded use of time based metering to enable gate-to-gate improvements in both fuel and throughput efficiencies by: applying spacing only where needed, allowing for the routine use of Performance Based Operations (PBO) to capitalize on advanced aircraft FMS capabilities, and adding more predictability to the ATC system.

Discontinuation of World Aeronautical Charts (WAC)

6.13 Guy Copeland, FAA AeroNav Products briefed the last meeting on the plans for discontinuation of the WAC. At that time, Guy indicated that a Federal Register Notice would go out (soon) on the Proposed Policy for Discontinuance of the World Aeronautical Chart Series. Unfortunately the timing of that notice has been delayed beyond what was anticipated. As soon as there is movement on this issue, he

will submit an update.

Very High Frequency Omni Directional Radio (VOR) Minimum Operational Network (MON)

6.14 Rowena Mendez briefed the meeting on the FAA program to transition to Performance-Based Navigation (PBN) from the conventional VOR-defined routes and procedures. (See **Attachment K**)

6.15 PBN provides an opportunity to reduce the aging infrastructure. The FAA currently has about 967 federally-owned and operated VORs (including VOR/Tactical Aircraft Navigation (VORTACs) and VOR/Distance Measuring Equipment (VOR/DMEs)). Most are more than 30 years old. The VOR MON Program will implement the MON by discontinuing approximately 50% of the VORs in the NAS. VOR MON will still provide backup coverage during a global positioning system (GPS) outage as well as basic navigation capability.

6.16 Detailed program planning is ongoing. Final Investment Decision (FID) artifacts are being initiated and the approach is being coordinated with focal points though continuing internal and external outreach. FAA, MITRE, and the Department of Defense (DOD) are engaged in identifying necessary VORs for DOD use. The DOD resolution is anticipated in late 2014. Discussions with the US Coast Guard continue as well.

6.17 The general criteria is to retain sufficient instrument landing systems (ILSs), localizers (LOCs), and VORs to support "safe-landing" at a suitable destination with a GPS-independent approach (ILS, LOC or VOR) within 100 NM of any location within the Continental United States. Most VORs in western designated mountainous area and outside of CONUS will be retained, as well as VORs to support international arrival airways from the Atlantic, Pacific, the Caribbean, and at the Core 30 airports. VORs will continue to provide seamless coverage at and above 5000 ft AGL. Substantial coverage will also exist below 5000 ft AGL

6.18 Only FAA owned/operated VORs will be considered for elimination. DMEs and TACANS will generally be retained (and/or enhanced), and DME/Tactical Aircraft Navigation (TACAN) service would, in general, be retained if VOR service is removed. There will be support for VOR-to-VOR navigation capability, and the VOR standard service volume (SSV) will become 77 NM radius at 5000 ft AGL

6.19 Conventional navigation VOR-to-VOR direct without airways will exist, and the FAA will retain existing VORs and airways in the western mountain area.

6.20 A number of challenges exist, including Instrument Flight Procedure (IFP) development and removal, routes, engineering analysis, stakeholder coordination, co-located facilities (Hazardous Inflight Weather Advisory Service (HIWAS), Remote Communications Outlet (RCO), Automatic Terminal Information Service (ATIS), and DME) and rulemaking.

6.21 The next steps will be to continue detailed program planning, make the Final Investment Decision (around March 2015), finalize coordination with DOD and the Department of Homeland Security, and continue stakeholder outreach.

6.22 Following the briefing, a number of questions and issues were raised. It was confirmed that DME will not be affected. Approaches affected by the VOR MON may use GPS or a different VOR. John Collins expressed concern on behalf of general aviation pilots operating without DME and the availability of VORs for those operators. Rowena agreed to provide further information on that concern following the meeting.

6.23 The program is still in the process of being approved and funded. Currently, VORs are being eliminated due to damage from storms, loss of leased land, etc. This is providing the opportunity for lessons learned.

6.24 RTCA recommended that the FAA publish the entire list of affected VORs in an Advisory Circular in order to keep it out of the Federal Register. All of the procedures and airways that will be affected also need to be identified. All of these suggestions will be taken into consideration.

7 Discussion on New Agenda Items

7.1 There were no new agenda items raised for discussion at the meeting; however, suggestions for topics for the ATPAC #150 meeting were solicited. The following topics were suggested:

a) NextGen ADS-B capabilities, implementation and benefits;

b) Runway status lights program;

c) DME coverage;

d) Low visibility operations;

e) Diverse vector angles/areas; and

f) Update from the 7110.65 Rewrite Team.

7.2 These suggestions will be taken into consideration during the planning for ATPAC #150.

8 Location and Dates for Future Meetings

8.1 Discussion was held on dates for ATPAC #150. It was agreed that the next meeting would **begin at 12:00 noon on Monday, February 9 and conclude at 4:30pm on Tuesday, February 10, 2015.** The meeting will be held at CGH, Inc., 600 Maryland Ave., SW, Suite 800W, Washington, DC 20024.

8.2 It was agreed that **ATPAC #151** would be held in July 2015. Suggested locations were NASA Ames at Moffett Field, CA or San Diego, CA. A decision on the ATPAC #150 meeting location and dates will be made at ATPAC #149.

8.3 It was suggested that the **ATPAC #152** meeting be separated from the ATCA Convention and held at another time and location. Further discussions will be held at the next meeting.

9 Adjournment

9.1 There being no further business, the meeting was adjourned on Wednesday, October 1 at 11:15am.

Atch A

Federal Aviation Administration

LED Lighting Issues for Aviation

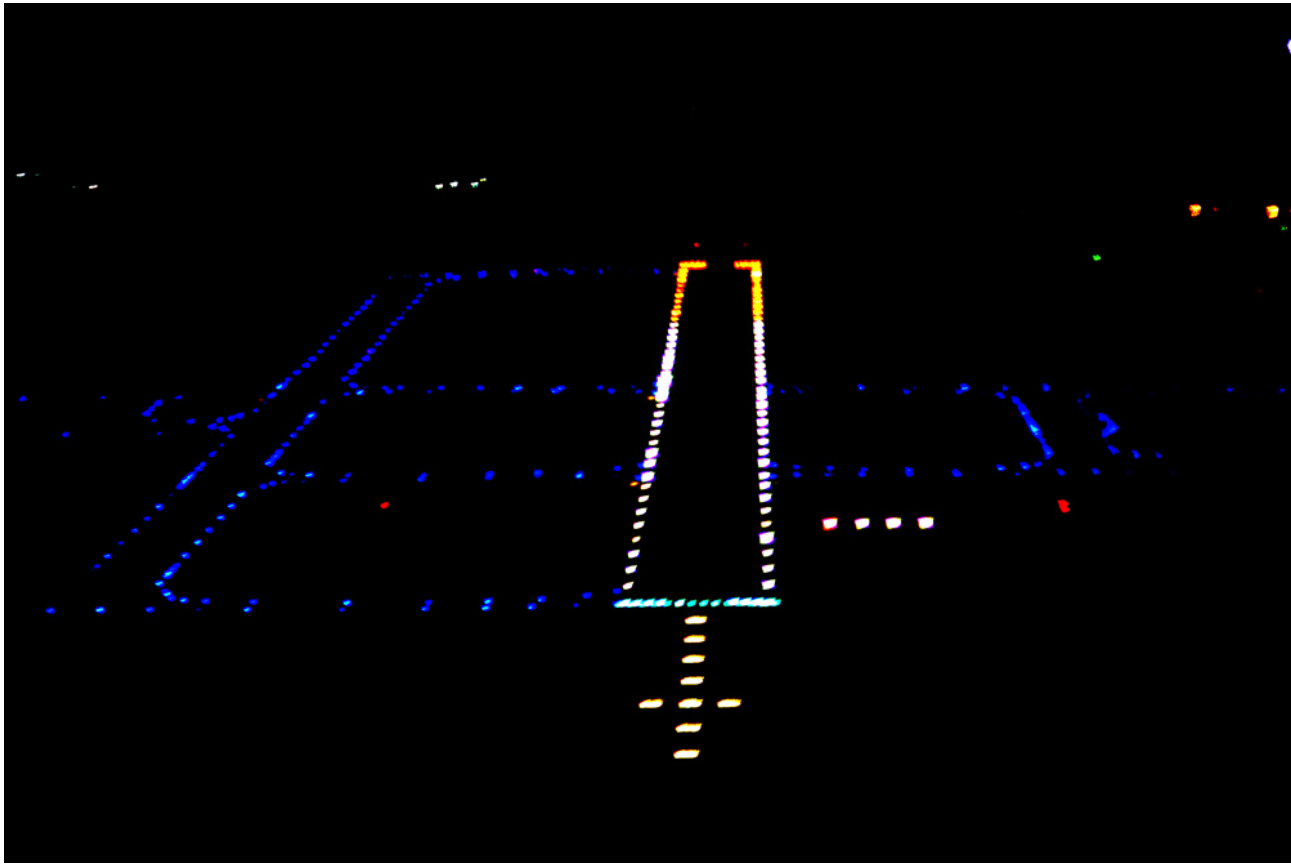
Presented to: ATPAC

By: Bruce McGray

Date: September 30, 2014

Lights? We got lots of them!

Approach, Taxi way edge and Centerline, Runway edge and centerline, obstruction, signage, clearance bar, stop bar, PAPI, Runway Guard Lights…..



Light Emitting Diodes (LED)

Issues with:

1. Natural Vision

2.Enhanced Flight Vision Systems

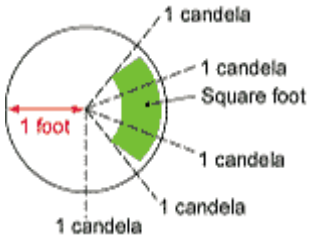
Atlantic City LED Approach Lights with Natural Vision

EFVS Issues: No heat means LED won't show up via infrared camera (these are incandescent lights)

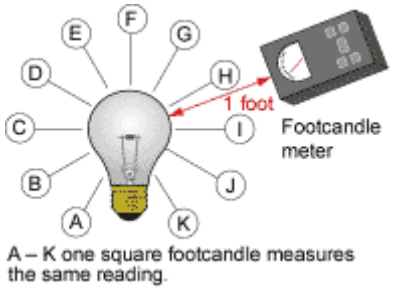
EFVS

Natural Vision

Testing: Lumens, Chromaticity, and Candelas (Lions, Tigers, and Bears. Oh My!)

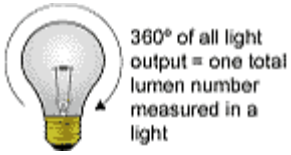


Candela

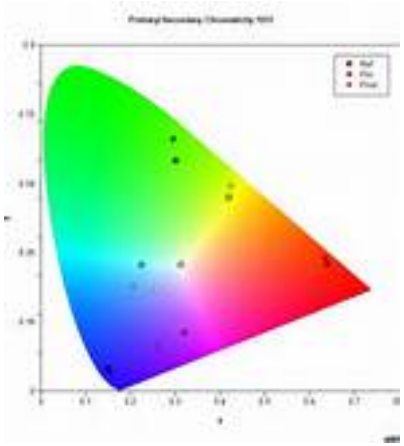


A – K one square footcandle measures the same reading.

Foot-candle



Lumens



Chromaticity

Quantity	S.I unit
Luminous energy	Lumen second (lm s)
Luminous Flux	Lumen (lm)
Luminous Intensity	Candela (Cd)
Luminance	Candela per meter square (Cd/m^2)
illuminance	lux (lx)
Luminous emittance	lux (lx)
Luminous exposure	lux second (lx s)
Luminous energy density	Lumen second per meter cube ($lm\ s\ /m^3$)
Luminous efficacy	Lumen per Watt (lm / W)

Photometry measures and units

Quote from Aviation Week Magazine 22 Sep 2014 concerning FedEx letter on LED lights

…the FAA has not conducted testing to determine the potential effect of the lights on pilots *at night and in different weather conditions including rain, fog, smoke, haze, and "break out effects"* when a pilot descends below low cloud bases on an instrument approach.

Quote from Aviation Week Magazine 22 Sep 2014 concerning FedEx letter on LED lights

Accuses the FAA of a "serious abrogation of regulatory responsibility to the traveling public" for not putting LED lights through the types of rigorous flight and human-factors testing that have been conducted with incandescent lights for decades.

FAA response to FedEx Letter

AFS-400 LED lighting conference 7-8 Oct 2014

ALPA, CAMI, FAA Airports, FAA Tech Center, Volpe, FAA Nav Services

Possible Options for ATPAC

Monitor 7-8 Oct 2014 AFS-400 Lighting conference (Bruce McGray will send report to ATPAC)

Ensure ATPAC concerns are addressed

Submit a Safety Concern to the FAA Administrator

Questions?

Atch B

Federal Aviation Administration

PILOT CONTROLLER GLOSSARY P/CG

ATPAC Meeting #149

September 30 – October 1, 2014

PILOT CONTROLLER GLOSSARY

- **Background**
  - History
  - Current Status
  - Publication and Distribution
- **Objectives**
  - Define/redefine Purpose
  - Enhance efficacy
- **The next transformation**

History

- **Little is known about the document prior to 1978.**
- **ICAO definitions were added prior to 1978.**
- **In January 1990 contractions were added to the document.**

Current Status

- **The P/CG is an FAA stand alone document initiated by ATO Mission Support Services.**
- **The document is addenda to:**
  - Aeronautical Information Manual (AIM)
  - Order JO 7110.10 Flight Services
  - Order JO 7110.65 Air Traffic Control

Publication and Distribution

- **The document is published online at:**
  http://www.faa.gov/air_traffic/publications/atpubs/PCG/INDEX.HTM
  http://www.faa.gov/air_traffic/publications/media/pcg.pdf
- **FAA version (outdated) is available on Amazon.com™.**
- **Many organizations link to FAA versions or provide a copy downloaded from FAA Web Site.**
- **Some organizations provided an indexed Boolean searchable listing online.**

Purpose

a. This Glossary was compiled to promote a common understanding of the terms used in the Air Traffic Control system. It includes those terms which are intended for pilot/controller communications. Those terms most frequently used in pilot/controller communications are printed in ***bold italics***. The definitions are primarily defined in an operational sense applicable to both users and operators of the National Airspace System. Use of the Glossary will preclude any misunderstandings concerning the system's design, function, and purpose.

Purpose

b. Because of the international nature of flying, terms used in the Lexicon, published by the International Civil Aviation Organization (ICAO), are included when they differ from FAA definitions. These terms are followed by “[ICAO].” For the reader’s convenience, there are also cross references to related terms in other parts of the Glossary and to other documents, such as the Code of Federal Regulations (CFR) and the Aeronautical Information Manual (AIM).

Purpose

c. This Glossary will be revised, as necessary, to maintain a common understanding of the system.

Purpose

1. **Does the stated Purpose fulfill the documents desired mission?**
2. **Does the document fulfill the stated Purpose?**
3. **Is there a need to redefine the Purpose?**
   A. Can the document be changed without sacrificing “lessons learned”?
   B. Can the document be changed without confusing established customers?

Examples

Contractions which are not part of Pilot/Controller lexicon

AAI − (See ARRIVAL AIRCRAFT INTERVAL.)

AAR − (See AIRPORT ARRIVAL RATE.)

ACL− (See AIRCRAFT LIST.)

ACLT− (See ACTUAL CALCULATED LANDING TIME.)

ADS−B− (See AUTOMATIC DEPENDENT SURVEILLANCE−BROADCAST.)

Examples

Terms which are *not* different

AIR TRAFFIC– Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas. (See ICAO term AIR TRAFFIC.)

AIR TRAFFIC [ICAO]– All aircraft in flight or operating on the maneuvering area of an aerodrome.

LANDING DISTANCE AVAILABLE (LDA)– The runway length declared available and suitable for a landing airplane. (See ICAO term LANDING DISTANCE AVAILABLE.)

LANDING DISTANCE AVAILABLE [ICAO]– The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Examples

Terms which may cause confusion

DETRESFA (DISTRESS PHASE) [ICAO]− The code word used to designate an emergency phase wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

Efficacy

- **How can we make the document more valuable?**
- **How can we make the document more accessible?**

The next transformation

What can ATPAC do?

- **Recommend a redefined Purpose**
- **Recommend adding/deleting/modifying terms**
  - ICAO
  - Acronyms
  - Contractions
- **Recommend ancillary publication and distribution methods**

Questions

AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

Atch C

AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

☒ Area of Concern → Safety Item? ☐ Yes ☒ No

☒ Agenda Item

For Admin Use Only
AOC Number: 149-xx
Date: 09/22/2014
Recommendation Number: R-_____

SUBJECT: Change to PILOT/CONTROLLER GLOSSARY

DISCUSSION: In preparation for upcoming changes to the PILOT/CONTROLLER GLOSSARY (P/CG), FAA ATO Mission Support Services invites stakeholder input in developing a "best practice" guide for adding and/or deleting information contained in the PILOT/CONTROLLER GLOSSARY.

A living document for more than thirty-five years, the P/CG has gone through many changes, e.g., inclusion of ICAO definitions, acronyms, and terms not used by pilot/controllers, and may no longer be serving its audience as intended. Yet the P/CG continues as the preeminent resource for explanations of verbiage used by pilots and controllers. Precise subject matter that is in accord with the original intent, continued publication, and improved availability of the P/CG is crucial to a common understanding during communications between pilots and controllers. (See Attachment A)

Although the P/CG is under constant scrutiny and review by ATO Mission Support Services and individual terms and definitions are added, amended, or deleted during each publication cycle, its purpose and reach will be better served with input from its intended users.

SUGGESTED ATPAC ACTION: Conduct a review of the terms, definitions, and purpose of the PILOT/CONTROLLER GLOSSARY and recommend additions, deletions, and/or amendments to it. Develop and recommend to FAA ATO Mission Support Services a best practices guide to maintain and deliver the PILOT/CONTROLLER GLOSSARY.

Sponsor: Edward Molloy

Name (Print)

FAA/AJV-84

Organization

Sept 22, 2014

Date

1. Introduction

1.1. The PILOT/CONTROLLER GLOSSARY (P/CG) was compiled to promote a common understanding of the terms used in the Air Traffic Control system.

1.2. FAA ATO Mission Support Services is tasked with custody of the P/CG.

2. Discussion

2.1. The primary purpose of the P/CG is to promote a common understanding of the terms used in the Air Traffic Control system.

2.2. The P/CG has been published by FAA for more than thirty-five years.

2.2.1. Definitions may have been included as a result of recommendations of investigatory groups after system mishaps.

2.2.1.1. Historical documentation is becoming increasingly more difficult to research and maintain.

2.2.2. ICAO definitions were added to the P/CG in certain instances where the FAA and ICAO definitions differ so as to avoid confusion.

2.2.2.1. Several ICAO definitions are virtually identical to FAA definitions.

2.2.2.2. Possibility of confusion exists as to which definition is prescribed when more than one version is listed.

2.2.3. In 1990, contractions were added to the P/CG.

2.2.3.1. Most of these contractions are not part of the pilot/controller lexicon.

2.3. The P/CG is a stand-alone document, initiated by FAA ATO Mission Support Services.

2.3.1. The P/CG is addenda to the Aeronautical Information Manual (AIM), FAA Order JO 7110.10 Flight Services, and FAA order JO 7110.65 Air Traffic Control.

2.3.2. The P/CG is available online
at http://www.faa.gov/air_traffic/publications/atpubs/pcg/index.htm
and http://www.faa.gov/air_traffic/publications/media/pcg.pdf

2.3.3. FAA versions of the P/CG are available for sale in paperback and Kindle™ editions.

2.3.4. Several unauthenticated versions of the P/CG may be available online.

2.4. The primary purpose of the P/CG is to promote a common understanding of the terms used in the Air Traffic Control system.

3. CONCLUSION

3.1. FAA ATO Mission Support Services invites the Committee to develop and present a best practices guide to enhance, maintain, and distribute the PILOT/CONTROLLER GLOSSARY.

Atch D

Approach Hold Lines

Signs and Markings

Federal Aviation Administration

Presented to: ATPAC

By: AJV-82 Terminal Standards and Procedures

Date: September 30, 2014

Signage and Marking for Approach Hold Areas and RS R&D Project

- **Initiated (Feb. 2013)**
- **Objectives:**
  - Identify any existing approach hold issues at airports by collecting information from airports.
  - Evaluate the effectiveness of the existing traditional runway holding position signs and markings versus the installation of the new proposed signs/marking for approach holds.
  - Provide any conclusions and recommendations derived from the results of the field evaluations. These will include sign specifications such as sizes for the signs and legends as well as installations, retrofitting and maintenance recommendations.
- **Selected test airports: ORD, CLE, BNA**

Related Changes to FAA Order JO 7210.3 *Facility Operations and Administration*

- **Paragraph 2-1-20(c) "At locations where potential for conflict exists, take action to rectify the situation by collaboratively developing proposed solutions and establishing local procedures to define conditions when the approach and departure areas and other surfaces must be protected. The procedures must be included in a facility directive and must, at a minimum, specify phraseology to utilize when issuing holding instructions at locations marked by approach hold signs: HOLD SHORT OF (runway) APPROACH. The phraseology must be consistent with the signage at the intended hold position."**
- **Paragraph 2-1-20(d) "Consult with the airport authority, Flight Standards, Airports, and the Regional Runway Safety Program Manager (RSPM) when developing proposed solutions and establishing local procedures. The RSPM will assist the Air Traffic Manager, as needed, in initiating contact with Flight Standards and Airports."**

Related Changes to FAA Order JO 7110.65 *Air Traffic Control*

- **Paragraph 3-7-2 add sub-paragraph (i): Issue instructions to aircraft/vehicle to hold short of an approach hold area.**

  PHRASEOLOGY – HOLD SHORT OF (runway) APPROACH

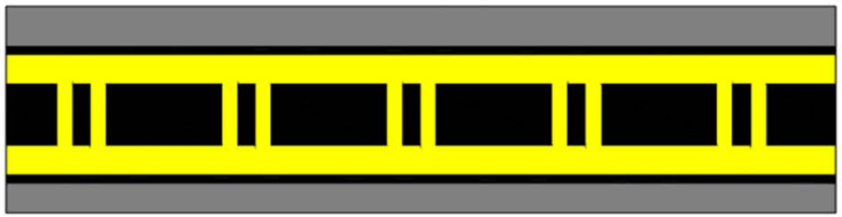
- **Pilot Controller Glossary add: APPROACH HOLD AREA – The locations on taxiways in the approach or departure areas of a runway designated to protect landing or departing aircraft. These locations are identified by signs and markings.**

Sign/Marking Examples

Stacking Display of Approach Hold Sign

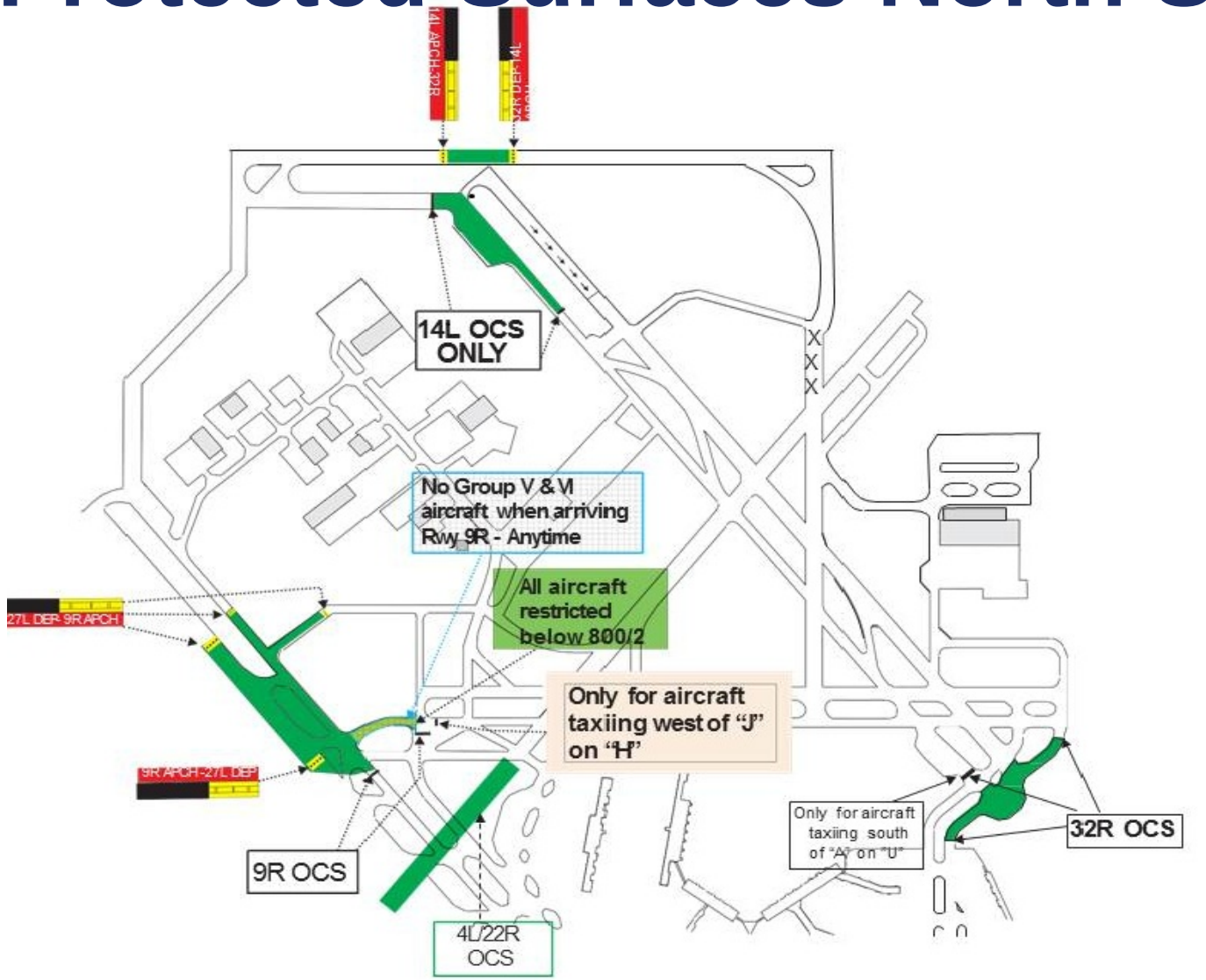
Horizontal Display of Approach Hold Sign with Smaller Legend Height

Horizontal Display of Approach Hold Sign on Size 3 Sign with Size 3 Legend Height

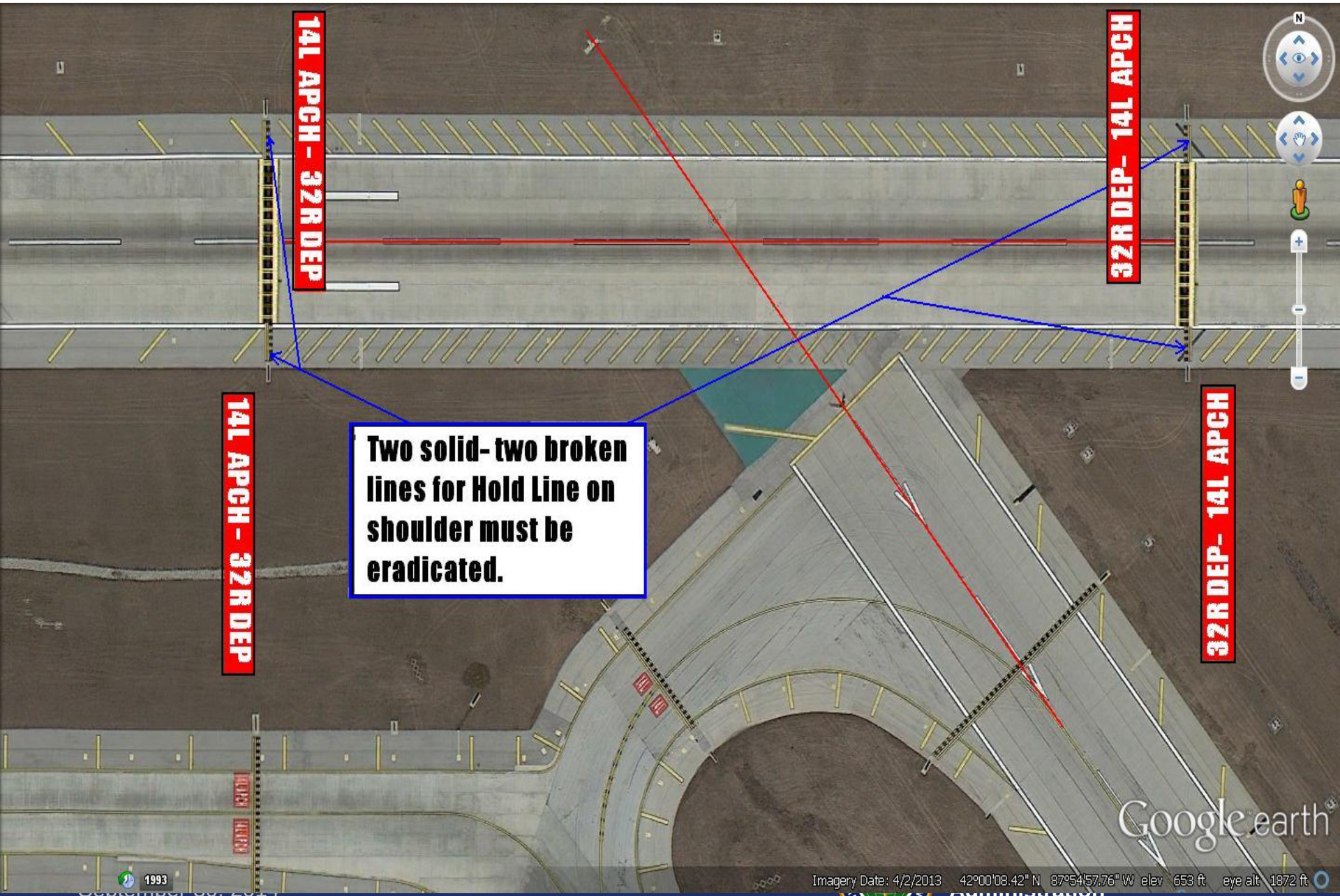


ILS/MLS Holding Position Sign Marking

Protected Surfaces North Side




ILS
ILS
Two solid- two broken lines for Hold Line on shoulder must be eradicated.
27L DEP- 9R APCH
27L DEP- 9R APCH
Google earth
1993
Imagery Date: 4/2/2013 41°59'07.55" N 87°55'27.89" W elev 661 ft eye alt 2037 ft


14L APCH- 32R DEP
32R DEP- 14L APCH
14L APCH- 32R DEP
32R DEP- 14L APCH
Two solid- two broken lines for Hold Line on shoulder must be eradicated.
Google earth
Imagery Date: 4/2/2013 42°00'08.42" N 87°54'57.76" W elev 653 ft eye alt 1872 ft

ORD AOA Safety Alert

Changes to Specific AOA Locations for OCS Crossings and Runway Approach Crossings

ISSUE: **Effective: July 8, 2014**

CDA is currently working with the FAA Airports Division, ATCT and the FAA Tech Center in a test and evaluation program to identify alternate methods of identifying and creating procedures for "RSA" intersections as well as runway approach and departure (APCH - DEP) critical areas. Significant changes regarding airfield markings and signs are currently in progress for 3 specific taxiway and/or runway crossings. The signs and markings you will see at the referenced 3 locations and the specific procedures for each, ONLY apply to those areas.

THE FOLLOWING DETAILS ARE INCREDIBLY IMPORTANT AND GO AGAINST WHAT HAS BEEN TAUGHT IN THE PAST REGARDING VEHICLE AND AIRCRAFT MOVEMENTS AROUND SPECIFIC SIGNS AND MARKINGS. AS THIS IS AN EVALUATION, THESE RULES ONLY APPLY TO THE IDENTIFIED LOCATIONS BELOW.

*****DRIVERS EXTREME ATTENTION IS REQUIRED*****

What are the changes.....

OCS of Runway 14L-32R on Runway 9L-27R

RSA becomes **OCS**

As part of the evaluation; The OCS intersection for 14L-32R on runway 9L-27R will incorporate new signage and markings to identify the OCS location. The procedures for driving through the OCS are the same as before, ONLY the signs and markings have changed. STOP at the 14L APCH - 32R DEP sign and ILS Hold Bar and contact ATC as you would with all other RSA's

New signs and markings for this RSA ONLY! All other OSC's will have the normal hold sign and mandatory hold bar

REMEMBER: The OCS of runway 14L-32R is a test area. This location will have non-standard markings and signs protecting the OCS.

ORD AOA Safety Alert

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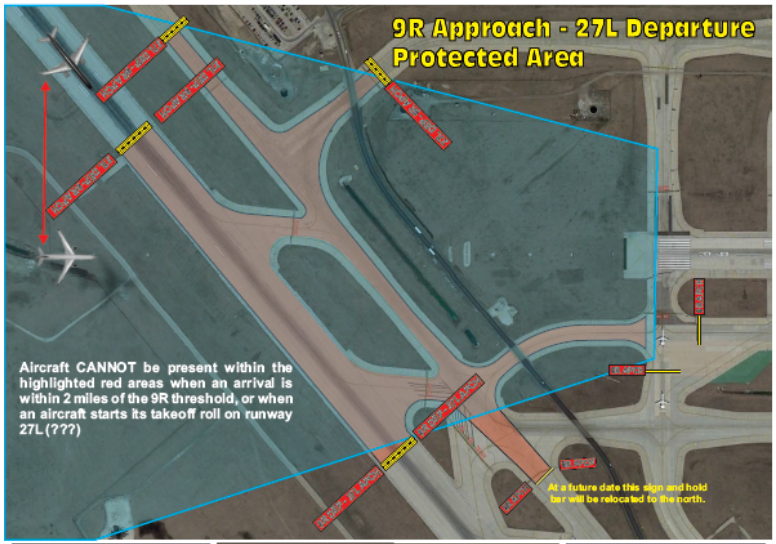
*****TAXI MECHANIC EXTREME ATTENTION IS REQUIRED*****

What are the changes.....

Protection of Runway 9R Approach and 27 Departure Surfaces



27L DEP - 9R APCH | 27L DEP - 9R APCH

New Apch-Dep Sign | ILS Type Hold Bar. Mandatory hold position when instructed by ATC | New Apch-Dep Sign

The protection of the 9R Approach and 27L Departure surfaces only applies to taxiing aircraft and aircraft under tow and will have no affect on vehicles driving on "T", "G" or 14R-32L either NW or SE bound. Even in inclement weather conditions ONLY vehicles can drive through these SPECIFIC "APCH" or "APCH-DEP" Hold Signs and ILS Holding Position Marking with out calling for clearance. At all other ILS Hold Signs and ILS Holding Position Markings, vehicles must either avoid the ILS critical area or hold short and coordinate with ATC to enter into the area when weather conditions are below 800' ceiling and/or less than 2 miles visibility. REMEMBER specific to this area on "T", "G" and 14R-32L we are not protecting navigational equipment, we are protecting approach and departure surfaces.

Approach or Departure surfaces MUST be protected whenever the specific runway is in use, regardless of weather conditions. ILS surface must be protected only in inclement weather conditions (below 800' ceiling and/or less than 2 miles visibility).

Atch E

Federal Aviation Administration

ATPAC 149
AOC 148-02
Clearances Below Published Altitudes

AJV-83
September 30, 2014

AOC 148-02
Suggested ATPAC action

- Clarify the conditions under which ATC may clear an aircraft on a charted route or procedure at an altitude below the charted minimum. Update the AIM to provide guidance to pilots and if needed, clarify 7110.65V

On Airways

JO 7110.65. Paragraph 4-5-6(a), Minimum En Route Altitudes:

- "An aircraft may be cleared below the MEA (Minimum En Route Altitude) but not below the MOCA (Minimum Obstruction Clearance Altitude)…"

On Direct Routes

JO 7110.65. Paragraph 4-5-6(e), Minimum En Route Altitudes:

- "Where MEAs have not been established, clear an aircraft at or above the minimum altitude for IFR operations"

Approach Clearances

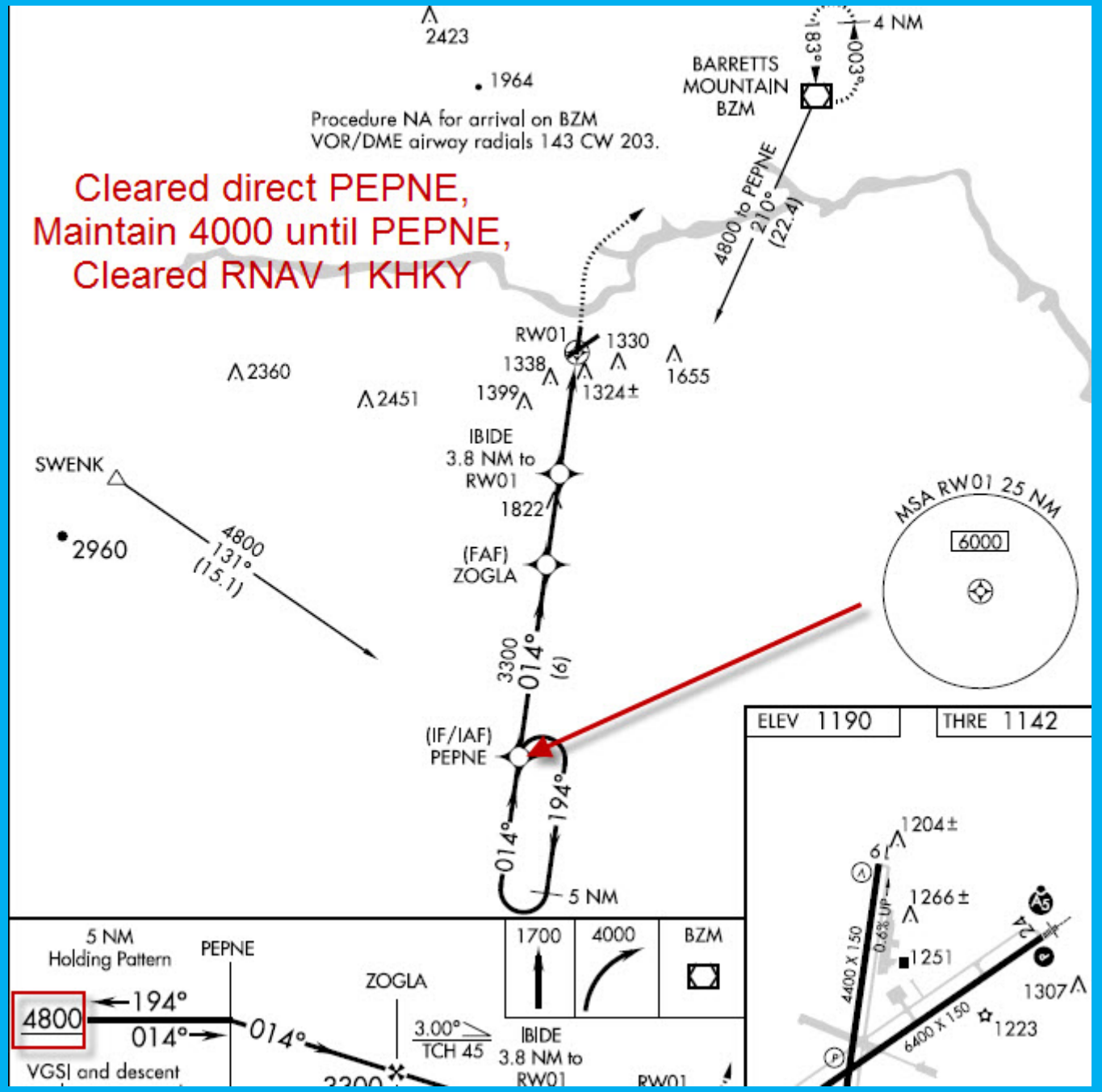
JO 7110.65. Paragraph 4-8-1(b), Approach Clearance:

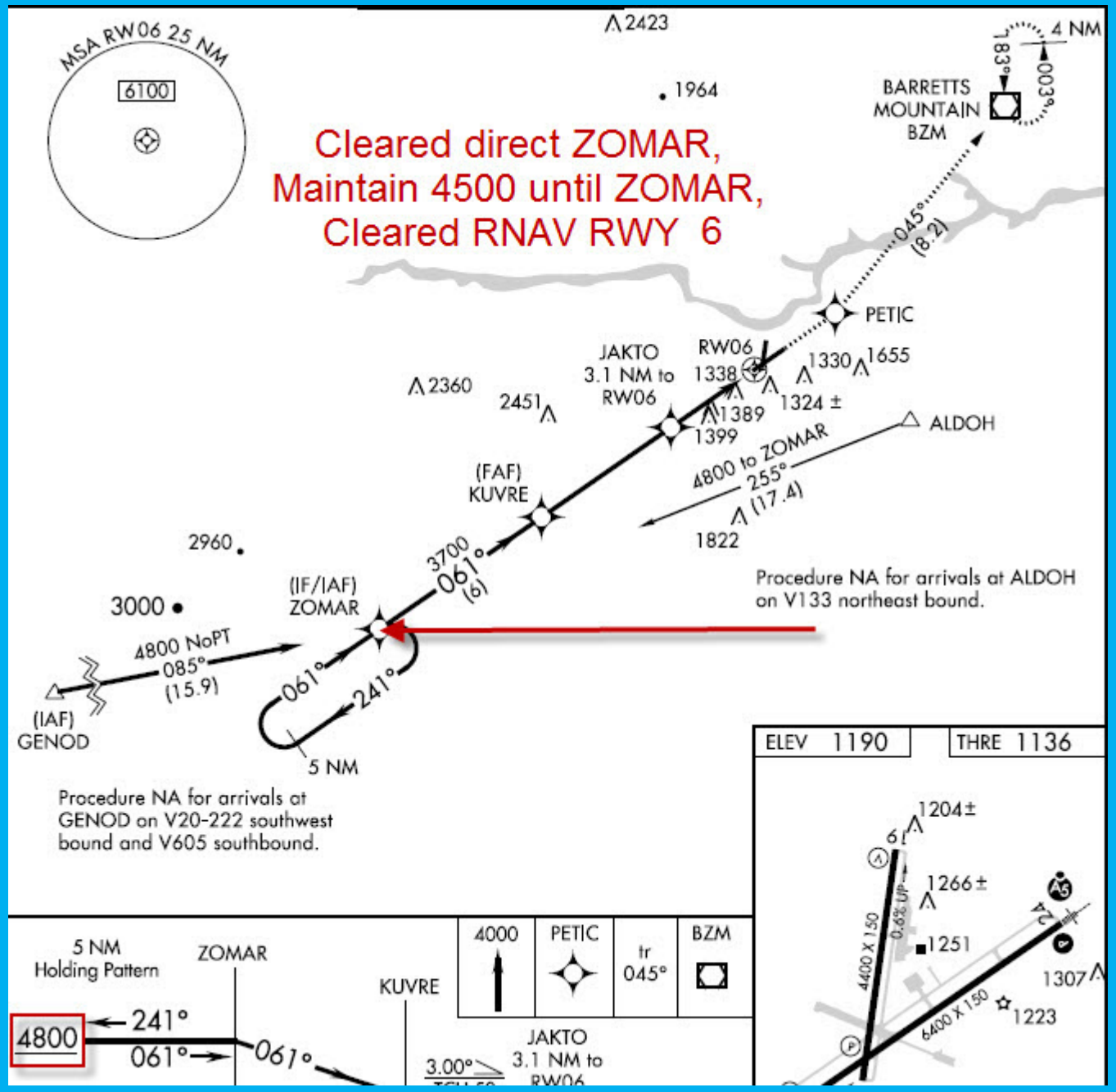
- "For aircraft operating on unpublished routes…assign an altitude to maintain until the aircraft is established on a segment of a published route or instrument approach procedure"

AIM

5-4-5-a-5: A pilot adhering to the altitudes, flight paths, and weather minimums depicted on the IAP chart ***or vectors and altitudes issued by the radar controller***, is assured of terrain and obstruction clearance...

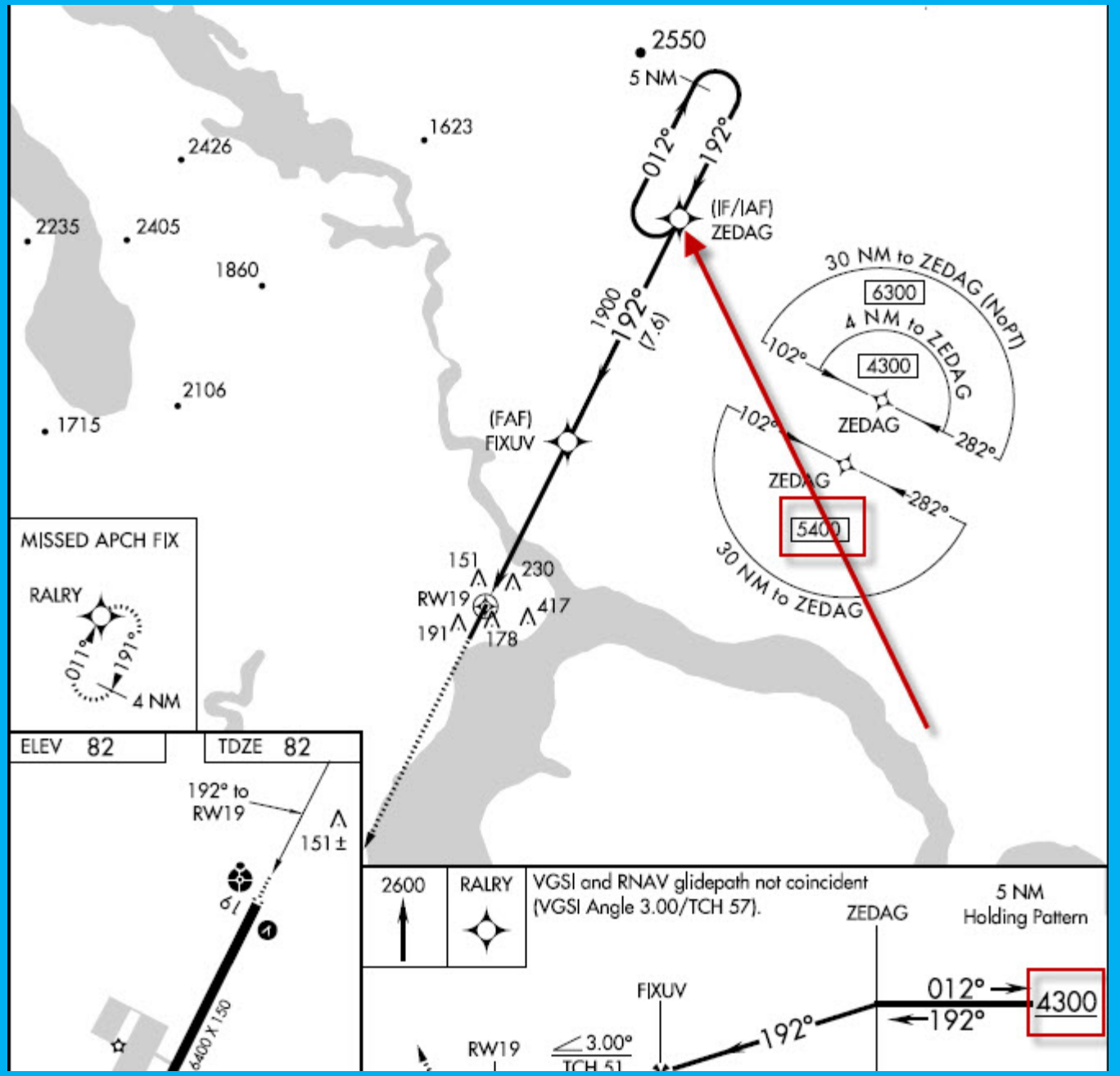
5-4-5-e-2: ...some MVAs may be lower than the non-radar Minimum En Route Altitudes (MEAs), Minimum Obstruction Clearance Altitudes (MOCAs) or other minimum altitudes depicted on charts for a given location. While being radar vectored, IFR altitude assignments by ATC will be at or above MVA.


Cleared direct PEPNE,
Maintain 4000 until PEPNE,
Cleared RNAV 1 KHKY
Procedure NA for arrival on BZM
VOR/DME airway radials 143 CW 203.
BARRETTS MOUNTAIN BZM
4 NM
183°
003°
4800 to PEPNE
210°
(22.4)
2423
1964
2360
2451
1399
1338
1330
1324±
1655
RW01
IBIDE
3.8 NM to RW01
1822
(FAF)
ZOGLA
SWENK
2960
4800
131°
(15.1)
3300
014°
(6)
(IF/IAF)
PEPNE
194°
014°
5 NM
MSA RW01 25 NM
6000
ELEV 1190
THRE 1142
1204±
1266±
1251
1307
1223
4400 X 150
6400 X 150
0.6% UP
5 NM
Holding Pattern
PEPNE
ZOGLA
4800
194°
014°
014°
3.00°
TCH 45
IBIDE
3.8 NM to RW01
1700
4000
BZM
VGSI and descent


MSA RW06 25 NM
6100
2423
1964
4 NM
183°
003°
BARRETTS MOUNTAIN BZM
Cleared direct ZOMAR,
Maintain 4500 until ZOMAR,
Cleared RNAV RWY 6
045°
(8.2)
PETIC
JAKTO
3.1 NM to RW06
RW06
1338
1330
1655
2360
2451
1389
1324 ±
1399
ALDOH
4800 to ZOMAR
255°
(17.4)
1822
(FAF)
KUVRE
2960
3700
061°
(6)
(IF/IAF)
ZOMAR
3000
4800 NoPT
085°
(15.9)
061°
241°
(IAF)
GENOD
5 NM
Procedure NA for arrivals at ALDOH on V133 northeast bound.
Procedure NA for arrivals at GENOD on V20-222 southwest bound and V605 southbound.
ELEV 1190
THRE 1136
1204±
1266±
1251
1307
1223
4400 X 150
6400 X 150
0.6% UP
5 NM
Holding Pattern
ZOMAR
KUVRE
4800
241°
061°
061°
4000
PETIC
tr
045°
BZM
JAKTO
3.1 NM to
RW06
3.00°

NTSB ANC13FA030 CFIT
Beech 1900C N116AX
Alaska Central Express Flight 51

ARTCC: Ace Air fifty one cleared direct to the Dillingham Airport via direct ZEDAG ZEDAG transition. Maintain ah maintain at or above two thousand until established on a published segment of the approach. Cleared RNAV runway one niner approach to Dillingham Airport. Remain this frequency.


2550
5 NM
012°
192°
(IF/IAF)
ZEDAG
1623
2426
2235
2405
1860
2106
1715
1900
192°
(7.6)
(FAF)
FIXUV
30 NM to ZEDAG (NoPT)
6300
4 NM to ZEDAG
4300
102°
282°
ZEDAG
5400
MISSED APCH FIX
RALRY
011°
191°
4 NM
151
230
RW19
417
191
178
ELEV 82
TDZE 82
192° to RW19
151±
6400 X 150
2600
RALRY
VGSI and RNAV glidepath not coincident
(VGSI Angle 3.00/TCH 57).
5 NM
Holding Pattern
ZEDAG
FIXUV
012°
192°
4300
RW19
3.00°
TCH 51

Atch G

NTSB Identification: **ANC13FA030**
Nonscheduled 14 CFR Part 135: Air Taxi & Commuter
Accident occurred Friday, March 08, 2013 in Aleknagik, AK
Probable Cause Approval Date: 08/11/2014
Aircraft: BEECH 1900C, registration: N116AX
Injuries: 2 Fatal.

NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report.

The airplane was operating in instrument meteorological conditions and, as it approached the destination airport, the pilot requested the RNAV/GPS runway 19 approach and asked for routing directly to ZEDAG, the initial approach fix (IAF). At the time of the pilot's request, the airplane was about 30 miles southeast of the IAF at an altitude of about 5,900 feet mean sea level (msl). The air traffic controller cleared the airplane to fly directly to the IAF followed by the ZEDAG transition and the RNAV/GPS runway 19 approach, stating, "maintain at or above 2,000" feet until established on a published segment of the approach. The flight crewmembers repeated the clearance back to the controller as "maintain 2,000" feet until established, and they began descending the airplane toward the IAF. About 6 minutes later, the pilot requested to enter the holding pattern while they checked on runway conditions on another radio frequency, and the controller cleared them to hold "as published." At the time of the pilot's request, the airplane was at an altitude of about 2,200 feet msl.

As depicted on the published instrument approach procedure, the terminal arrival area (TAA) minimum altitude when approaching the IAF from the southeast (the direction from which the accident flight approached) is 5,400 feet msl, and the published holding pattern at the IAF is 4,300 feet msl due to rising terrain in the area.Therefore, the flight crewmember's acceptance of what they believed to be a clearance to 2,000 feet, their descent to that altitude, and their initiation of a hold at that altitude indicates a lack of awareness of the information contained on the published procedure. Such a lack of awareness is inconsistent with pilot-in-command responsibilities and company procedures that require an instrument approach briefing during the descent and approach phases of flight. If the flight crewmembers had reviewed the published approach procedure and briefed it per the company's descent and approach checklist, they should have noticed that the minimum safe altitude in the TAA southeast of the IAF was 5,400 feet msl and that the minimum altitude for the hold was 4,300 feet msl. Examination of the wreckage and debris path evidence is consistent with the airplane having collided with rising terrain at 2,000 feet msl while flying in a wings-level attitude on the outbound leg of the holding pattern, which the flight crew should have flown at 4,300 feet msl.

However, the air traffic controller did not adhere to guidance contained in Federal Aviation Administration Order 7110.65, and his approach clearance to "maintain at or above 2,000 feet" msl until established on a published segment of the approach was ambiguous. The controller's approach clearance should have instructed the pilot to "proceed direct to ZEDAG, enter the TAA at or above 5,400 feet, cleared RNAV runway 19 approach." Instead, he instructed the pilot without specifying the segment of the approach that should be flown at 2,000 feet. Further, the controller did not notice the pilot's incorrect readback of the clearance in which he indicated that he intended to "maintain 2,000 feet" until established on the approach. Further, he did not appropriately monitor the flight's progress and intervene when the airplane descended to 2,000 feet msl. As a result, the airplane was permitted to descend below the minimum instrument altitudes applicable to the route of flight and enter the holding pattern well below the published minimum holding altitude.

Air traffic control (ATC) recorded automation data showed that the airplane's trajectory generated aural and visual minimum safe altitude warnings on the controller's radar display. However, the controller did not issue

any terrain warnings or climb instructions to the flight crew. The controller said that he was not consciously aware of any such warnings from his display. These automated warnings should have been sufficient to prompt the controller to evaluate the airplane's position and altitude, provide a safety alert to the pilot in a timely manner, and instruct the pilot to climb to a safe altitude; it could not be determined why the controller was unaware of the warnings. The airplane was equipped with three pieces of navigation equipment that should have provided visual and aural terrain warnings to the flight crewmembers if they had not inhibited the function and if the units were operating properly. Damage precluded testing the equipment or determining the preaccident configuration of the units; however, the flight crew reported no equipment anomalies predeparture.

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The flight crew's failure to maintain terrain clearance, which resulted in controlled flight into terrain in instrument meteorological conditions. Contributing to the accident were the flight crew's failure to correctly read back and interpret clearance altitudes issued by the air traffic controller, their failure to adhere to minimum altitudes depicted on the published instrument approach chart, and their failure to adhere to company checklists.

Also contributing to the accident were the air traffic controller's issuance of an ambiguous clearance to the flight crew, which resulted in the airplane's premature descent, his failure to address the pilot's incorrect read back of the assigned clearance altitudes, and his failure to monitor the flight and address the altitude violations and issue terrain-based safety alerts.

Full narrative available

Index for Mar2013 | Index of months

Atch H

Climb Via Briefing

Federal Aviation Administration

Presented to: Air Traffic Procedures Advisory Committee

By: Keith Henry, AJV-82

Date: September 30, 2014

Climb Via

- **Background**
- **Identified Issues**
- **Top Altitude Mitigation**
- **Other Work**

Climb Via Background

- **Climb Via was originally scheduled to go into effect on August 15, 2012. The implementation was delayed when it was discovered that controller and pilot training was different, PDC and speed issues were not addressed.**
- **On August 23, 2012 a new Climb Via group was formed.**
- **Climb Via was implemented on April 3, 2014**

The Top Three Identified Issues

- Facilities doing one-offs with Climb Via
- Difficulty locating the Top Altitude in the narrative
- Pilots not using the proper phraseology on check in

Top Altitude Mitigation

- **In early July 2014, HQ had received over 60 reports from I90 and C90 about pilots missing the top altitudes.**
- **On July 11, 2014, a memo was sent out to facilities allowing them to place the top altitude in the PDC clearance.**

“CLIMB VIA SID RMK: TOP ALTITUDE 4000”

Top Altitude Mitigation

- **This is a short term solution until the Top Altitudes can be placed on the SIDs**
- **CV workgroup has been working with AFS-420 and Aeronav to place a Top Altitude box on the front page of the SID.**
- **AFS-420 has a draft memo which should be signed soon giving guidance to placing the Top Altitude box on the SID.**

Top Altitude Mitigation

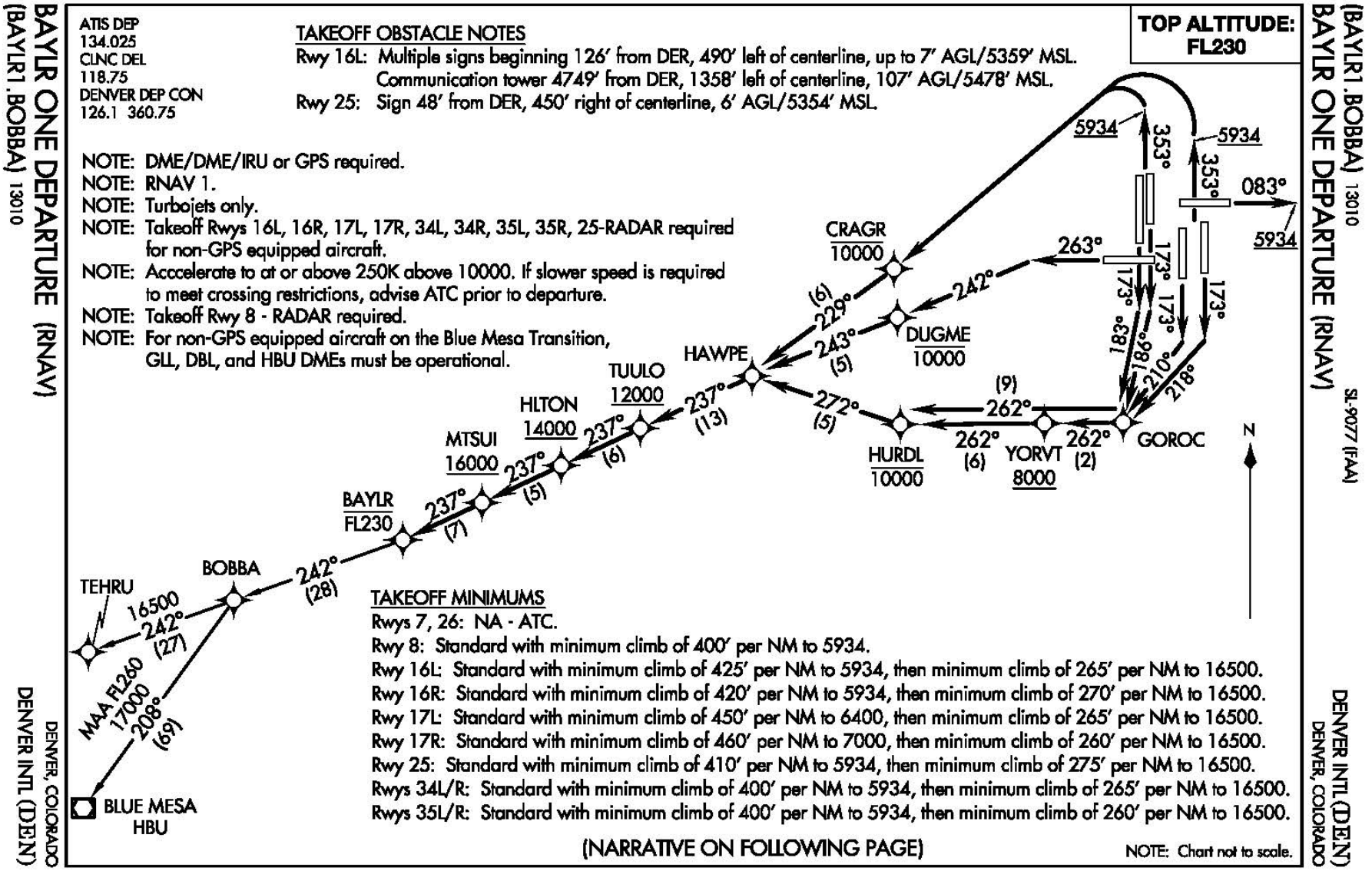
- **Team members have been reviewing the 1450+ SIDs and generating a database that AeroNav will use to place the Top Altitudes on the SID.**
- **First chart cycle containing the new Top Altitude box is planned for Nov 13, 2014.**
- **It will take 5-6 chart cycles to complete**
- **No changes, other than adding the Top Altitude box will be done at this time.**

Other Work

- **ODPs will not be used with Climb Via.**
  - They are not SIDS by definition
- **Published Transition speeds on STARS**
  - “Descend via Mach number until transition to 290K”
- **Vectoring aircraft off of Non RADAR vector CV SIDS**
- **Vectoring aircraft off of RADAR vector CV SIDS**
- **Top Altitudes that are below published altitude crossing restrictions.**

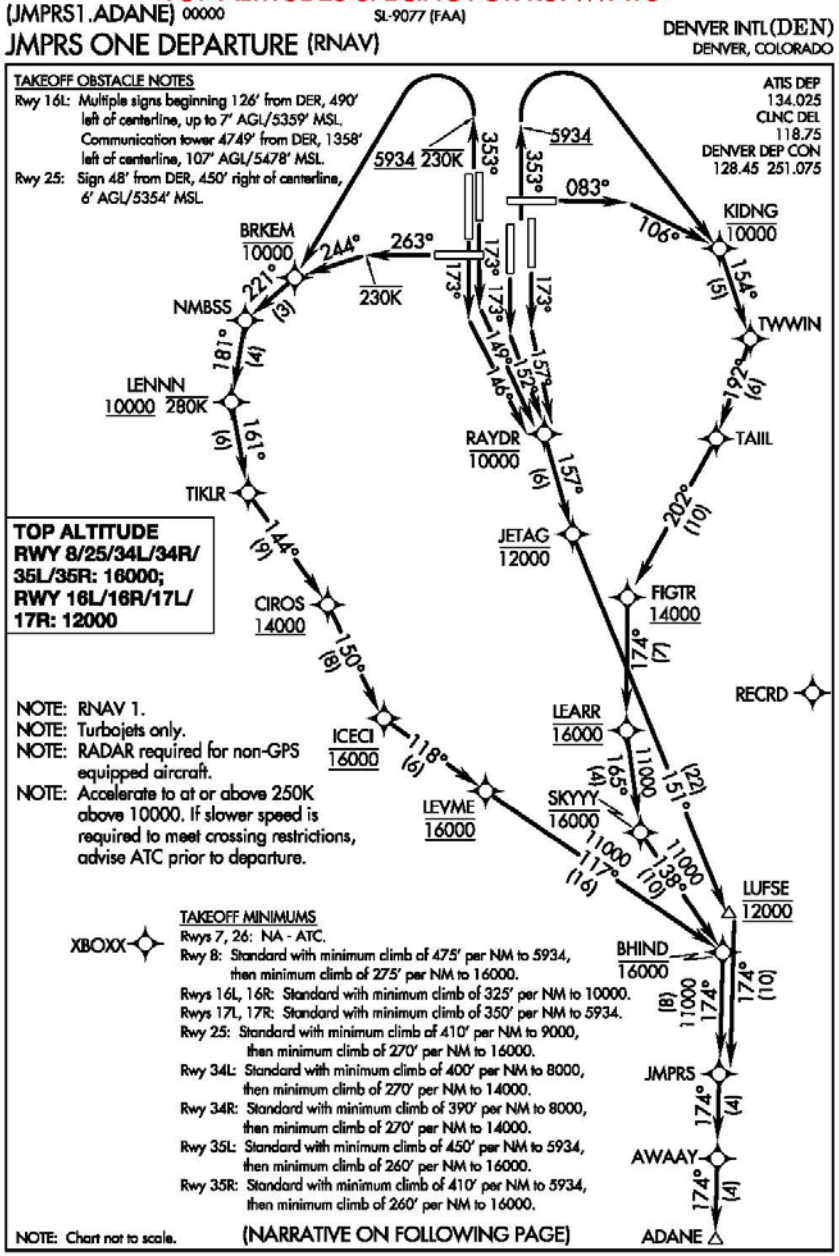
Other Work

- **What altitude restrictions make a SID qualify for climb via.**
  - Published crossing restrictions
  - RNAV engagement altitudes
  - Top Altitudes (this is also IAW ICAO procedures)



SINGLE TOP ALTITUDE

TOP ALTITUDES SPECIFIC FOR RUNWAYS



TOP ALTITUDES SPECIFIC FOR AIRCRAFT TYPE

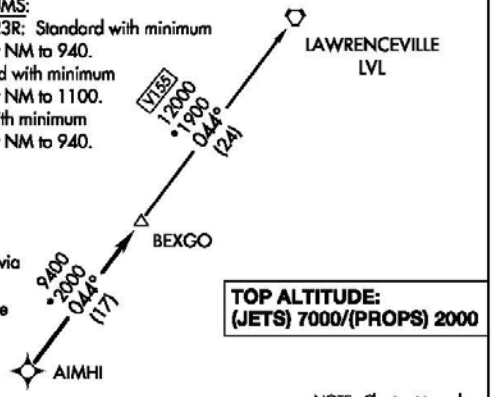
(BEXGO1.BEXGO) 13010 SL-516 (FAA)

BEXGO ONE DEPARTURE (RNAV)

RALEIGH-DURHAM INTL (RDU)
RALEIGH-DURHAM, NORTH CAROLINA

ATIS 123.8
CLNC DEL 120.1
GND CON
121.9 348.6 (EAST)
(Rwys 5R-23L, 14-32)
121.7 348.6 (WEST)
(Rwy 5L-23R)
RALEIGH TOWER
127.45 257.8 (EAST)
(Rwys 5R-23L, 14-32)
119.3 257.8 (WEST)
(Rwy 5L-23R)
RALEIGH DEP CON
132.35 256.9

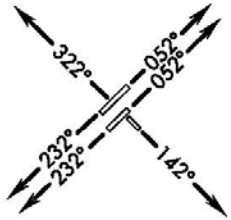
TAKEOFF MINIMUMS:
Rwys 5L, 5R, 14, 23R: Standard with minimum climb of 500' per NM to 940.
Rwy 23L: Standard with minimum climb of 500' per NM to 1100.
Rwy 32: 300-1 with minimum climb of 500' per NM to 940.



NOTE: Transponder code will be assigned via PDC or Raleigh clearance delivery.
NOTE: If unable to accept climb rate, advise ATC on initial contact.
NOTE: RNAV-1.
NOTE: DME/DME/IRU or GPS required.
NOTE: RADAR required.

TOP ALTITUDE:
(JETS) 7000/(PROPS) 2000

NOTE: Chart not to scale.



DEPARTURE ROUTE DESCRIPTION

TAKEOFF RWYS 5L/5R: Climb heading 052° or as assigned by ATC, expect radar vectors to AIMHI, thence...
TAKEOFF RWY 14: Climb heading 142° or as assigned by ATC, expect radar vectors to AIMHI, thence...
TAKEOFF RWYS 23L/23R: Climb heading 232° or as assigned by ATC, expect radar vectors to AIMHI, thence...
TAKEOFF RWY 32: Climb heading 322° or as assigned by ATC, expect radar vectors to AIMHI, thence...

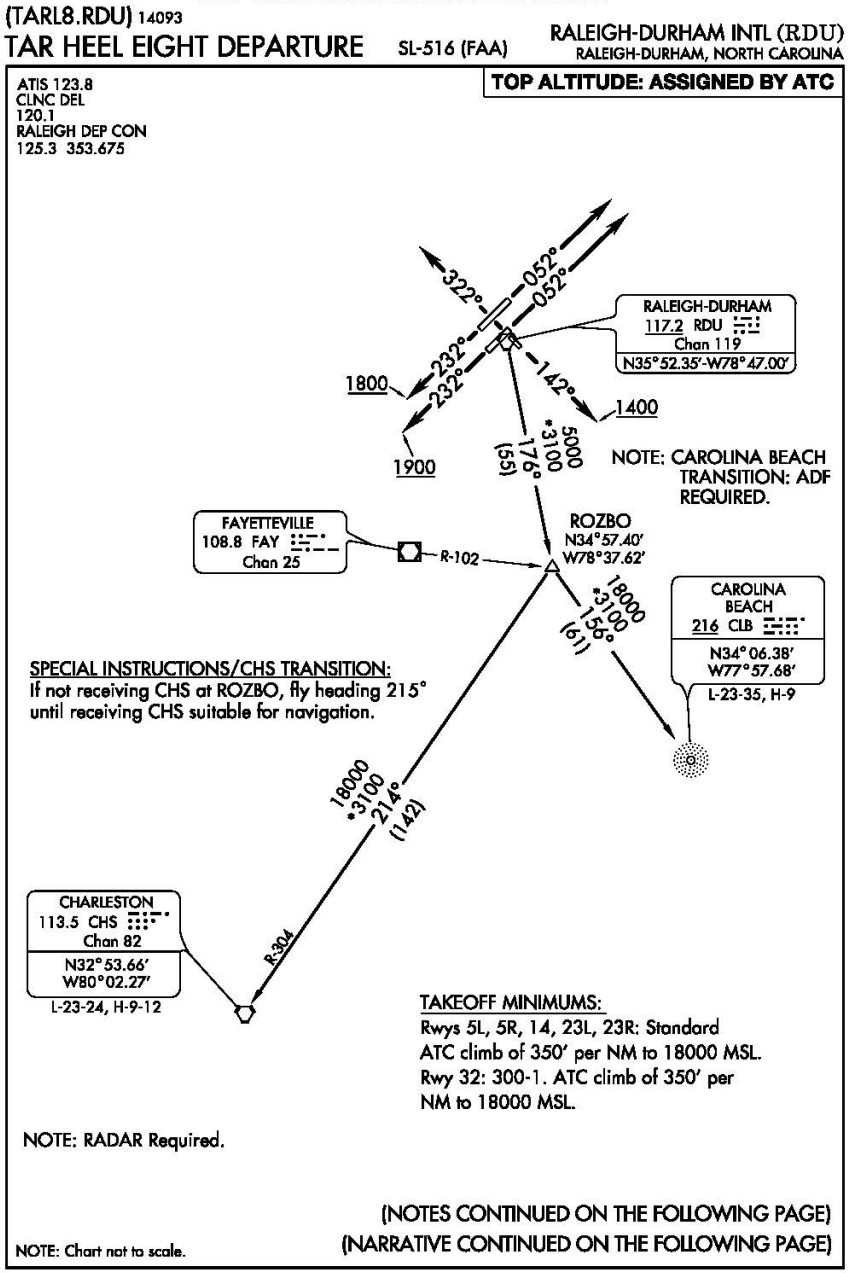
...on track 044° to BEXGO, turbojets maintain 7000, propellers maintain 2000. Expect clearance to filed altitude within ten minutes after departure.

LAWRENCEVILLE TRANSITION (BEXGO1.LVL):

TAKEOFF OBSTACLE NOTES:
Rwy 5L: Trees beginning 3802' from DER, 1237' left of centerline, up to 77' AGL/506' MSL.
Tank and trees beginning 2011' from DER, 948' right of centerline, up to 138' AGL/547' MSL.
Rwy 5R: Trees beginning 1436' from DER, 803' right of centerline, up to 80' AGL/469' MSL.
Rwy 14: Trees beginning 2021' from DER, 510' left of centerline, up to 116' AGL/545' MSL.
Trees beginning 2467' from DER, 2' right of centerline, up to 122' AGL/571' MSL.
Rwy 23L: Trees beginning 1495' from DER, 797' left of centerline, up to 58' AGL/447' MSL.
Light pole 1457' from DER, 878' right of centerline, 93' AGL/452' MSL.
Rwy 32: Light poles beginning 1170' from DER, 618' left of centerline, up to 55' AGL/486' MSL.
Hangar 1242' from DER, 753' right of centerline, 34' AGL/473' MSL.
Control tower 2207' from DER, 910' right of centerline, 231' AGL/660' MSL.

BEXGO ONE DEPARTURE (RNAV)
(BEXGO1.BEXGO) 13010
RALEIGH-DURHAM, NORTH CAROLINA
RALEIGH-DURHAM INTL (RDU)

TOP ALTITUDE ASSIGNED BY ATC

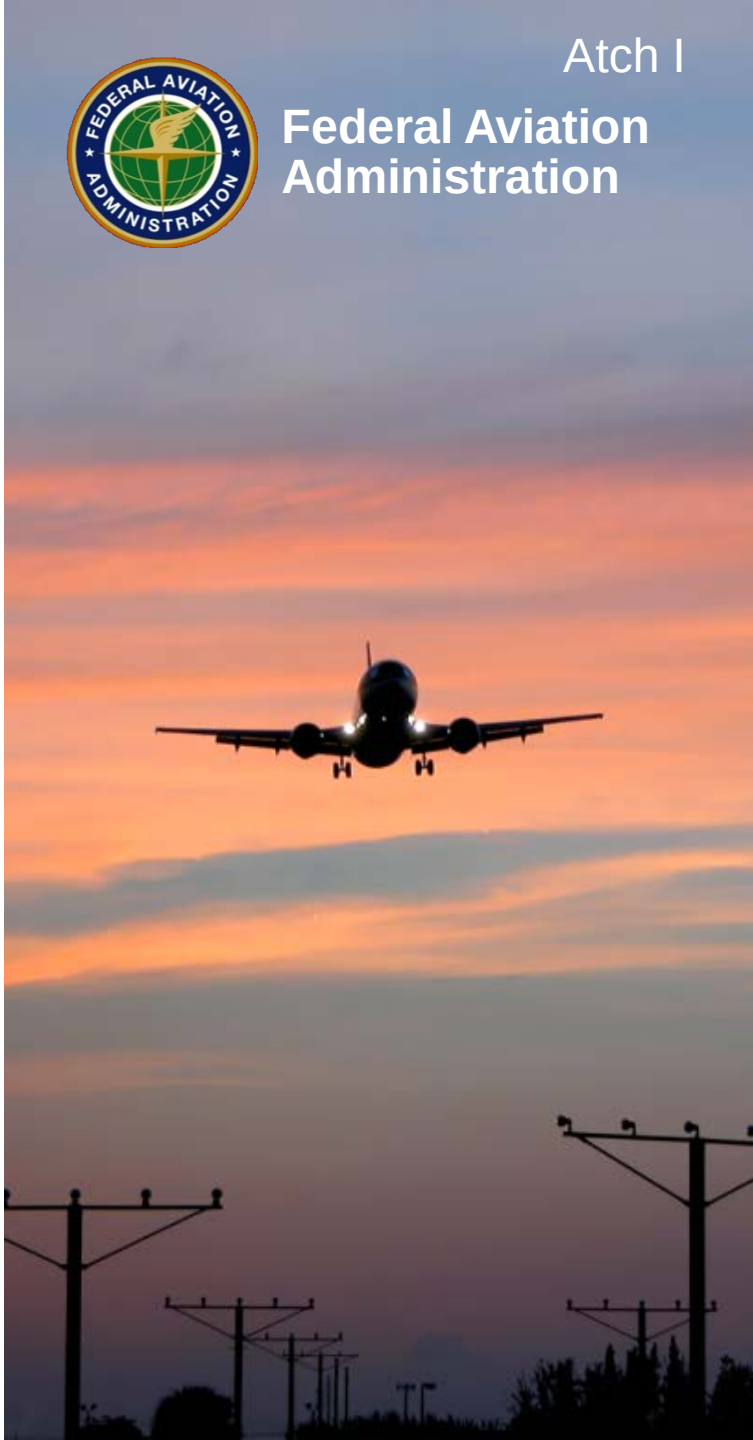


Questions ?

Atch I

Federal Aviation Administration

Wake Turbulence Update



Presented to: ATPAC

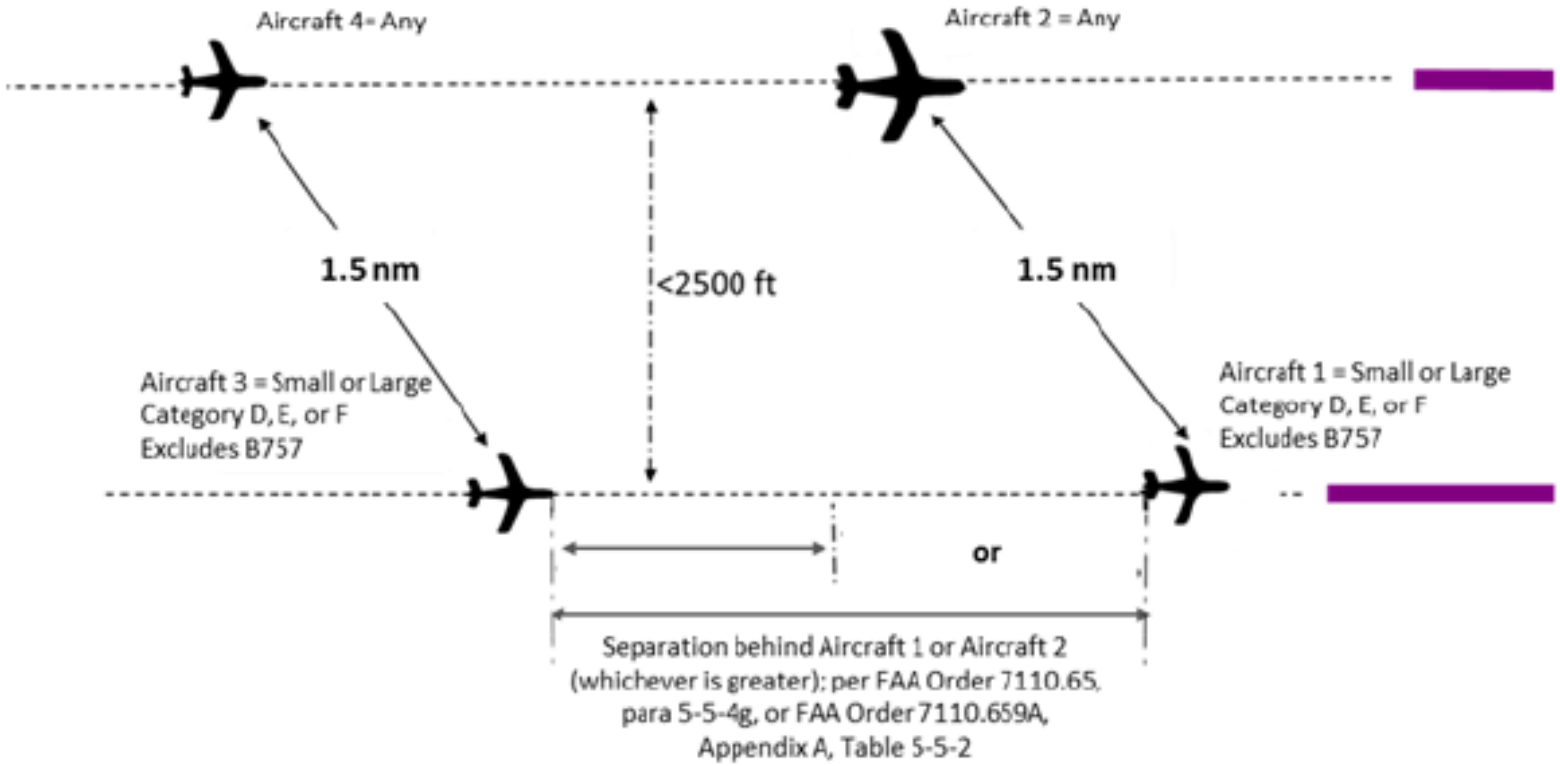
By: Jeff Tittsworth, FAA

Date: October 1, 2014

Update Scope

- 7110.308 (Potential Closeout)
- WTMD
- WTMA
- CREDOS (Proposed Closeout)
- RECAT Phase I and II
- Aircraft Standards

7110.308


Aircraft 4= Any
Aircraft 2 = Any
1.5 nm
<2500 ft
1.5 nm
Aircraft 3 = Small or Large
Category D, E, or F
Excludes B757
Aircraft 1 = Small or Large
Category D, E, or F
Excludes B757
or
Separation behind Aircraft 1 or Aircraft 2
(whichever is greater): per FAA Order 7110.65,
para 5-5-4g, or FAA Order 7110.659A,
Appendix A, Table 5-5-2

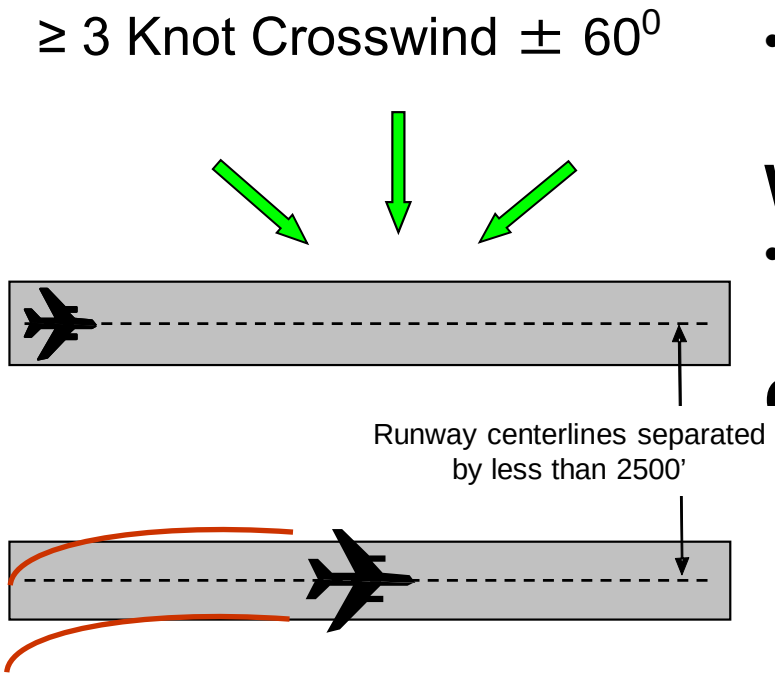
7110.308

- **Approved for 8 airports (BOS, CLE, EWR, MEM, SEA, SFO, STL)**
- **SFO**
  - Called arrival rate for 28's went from 30/hr to 33 or 34/hr
  - Based on that success, NAC requested analysis of 19's
  - Analysis of 19's is complete, coordination with ATC is necessary to verify need
- **RTCA TF5 recommendations (completed from practical standpoint)**
  - Analysis of PHX and LAS is complete, coordination with ATC is necessary to verify need
  - Other potential airports/runway ends are even less likely to have need substantiated by ATC
- **WTMA is subsuming 7110.308 (see status slides)**
- **Propose closeout of 7110.308 after SFO/LAS/PHX decision**

Wake Turbulence Mitigation for Departures

- **Operational Demonstrations at IAH, MEM and SFO**
  - SFO shows the most promise
    - AT and users would like to see it available more often
    - Wake Office and Program Office would like to see it used more often when available
  - MEM benefits from RECAT have absorbed much of the WTMD benefits there
  - IAH needs it to be available more often
- **AJV-822 has joined with AJM-24 to manage this project**

WTMD Capability and Constraints



WTMD Wind Requirements

- A direct crosswind plus or minus 60 degrees, and wind velocity of 3 knots or greater

WTMD Weather Minima

- Ceiling 1,000’ above ground level or higher, and visibility 3 miles or greater

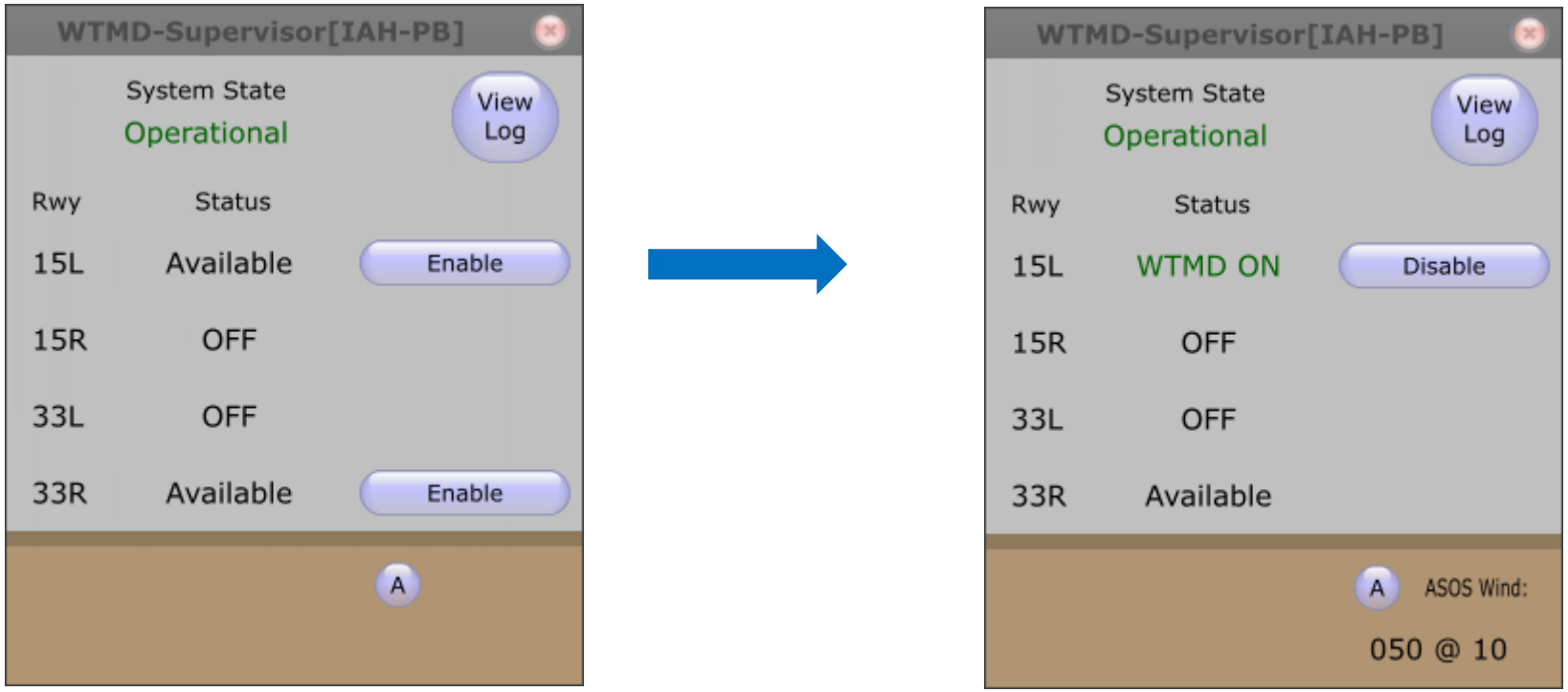
Controller – Computer Interface

Green Light / Red Light and aural alerts will notify controllers when standard wake turbulence separation for departures can or cannot be waived.

- Supervisors will have the capability to authorize or terminate wake independent departure operations via the WTMD interface

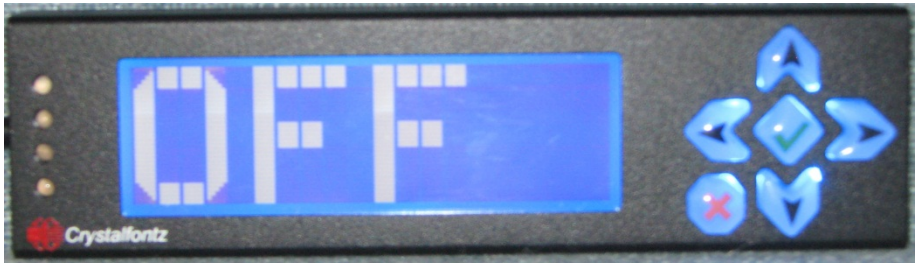
WTMD ATC Displays

- Supervisor is informed when WTMS is available for use
- At SFO, this display cannot be placed in a location easily seen from the Supervisor position
- As a result, WTMD is not enabled as often as it could be



WTMD ATC Displays (continued)

- Prior to Supervisor enabling, Local controller display shows WTMD off



- Once Supervisor enables WTDM, local controller display shows enabled

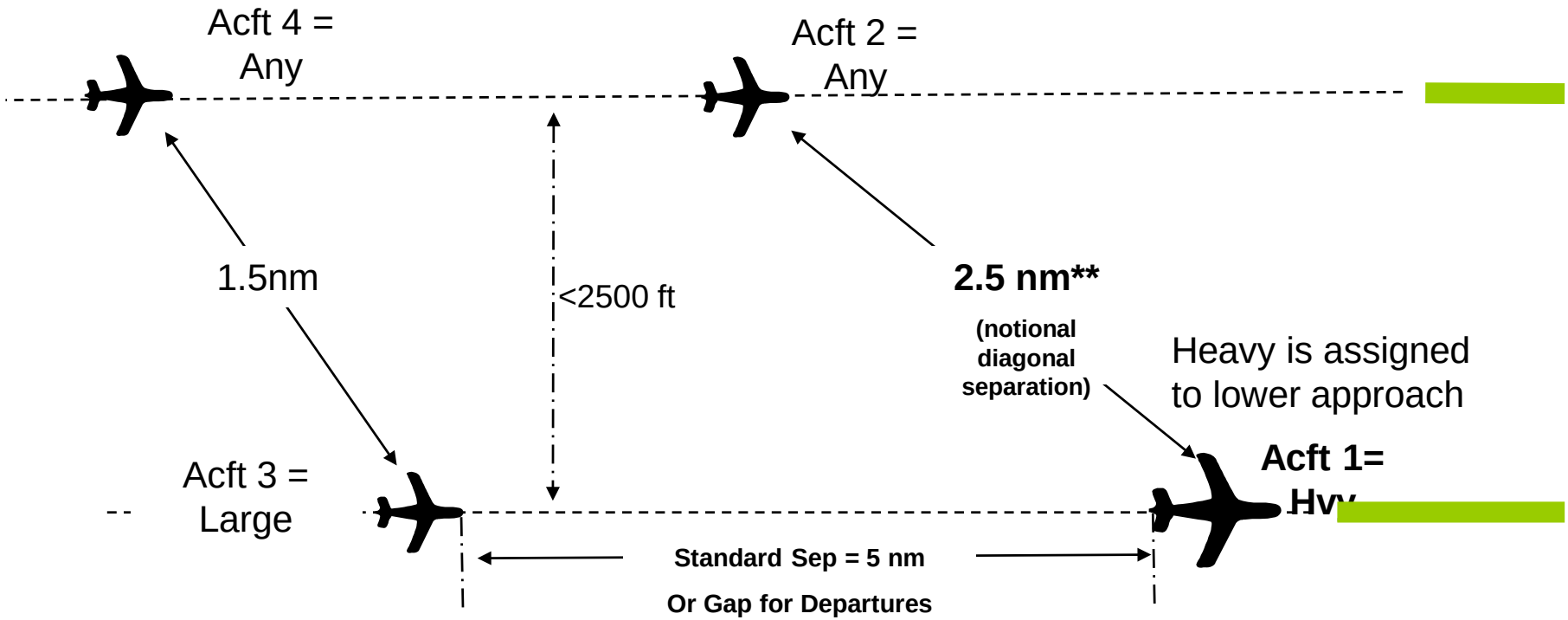
- An additional ribbon display could alter Local Controller to availability of WTMD

Wake Turbulence Mitigation for Departures Next Steps

- **Address SFO shortfalls**
  - Modification of Wind Forecast Algorithm should increase availability at SFO
  - Additional ribbon display at Local Controller position should increase enabled rates
- **Expand the application to more airports**
  - Concept modification toward a paired departure application underway
  - Wake mitigation will be to ‘stay ahead of the wake’
  - Availability time will increase significantly to > 50% of the time
  - WFA modifications are being developed to support this concept
- **AJV-822 and AJM-24 will make joint proposal for stepwise improvements for potential additional funding**

WTMA-P High Level Concept

Parallel Dependent ILS/MLS
or other approved Precision Approach
Example: Heavy Leading



Separation per single runway approach requirements, par 5-5-4 e,f,g, FAA Order 7110.65S (either on same runway or on diagonal runway, whichever is more restrictive)

Wake Turbulence Mitigation for Arrivals

- **Similar to 7110.308 but with Heavy and B757 aircraft leading**
- **SRMD completed for PHL and DTW**
- **PHL**
  - AT has confirmed operational need
  - Operational implementation FY15
- **DTW**
  - Will be authorized with RNAV approach
  - RNAV approach will have temperature limits
    - vertical mitigation important for WTMA
    - Most RNAV equipped aircraft will not have temperature compensation
  - Temperature ranges and associated glide slope angle will be revised with DTW and finalized later in FY15
- **ATL is next airport to be analyzed**

Wake Turbulence Recategorization Phase I

- **MEM, SDF, CVG and ATL implemented**
- **Available funding has limited implementations in FY15-17**
- **User priorities and facility readiness were important factors in establishing current waterfall**
- **In a "go slow approach" on B757,**
  - modifications to RECAT separations have been proposed and an SRMD has been completed
  - If approved, reduced separation for Cat F (small) behind Cat D (upper large) will be reduced on approach, operating directly behind and will permit 500 ft crossing for Cat F below Cat D

Wake ReCat Recommendation Response

- **FAA received recommendation for Wake Recat Phase 1**
  - Analysis determined seven (7) sites will be implemented in 2014 – 2015 timeframe without impacting other NAC recommended priorities for CSPO
    - Prior
      - MEM - COMPLETE
      - SDF - COMPLETE
    - FY2014
      - CVG - COMPLETE
      - ATL - COMPLETE
    - FY2015
      - IAH/HOU (1st Qtr.)
      - CLT (2nd Qtr.)
      - JFK/EWR/LGA (2nd Qtr.)
      - ORD/MDW (3rd QTR.)
      - SFO (4th Qtr.)
    - FY2016
      - LAX (2nd Qtr.)
      - HNL (4th Qtr.)
    - FY2017
      - MIA (2nd Qtr.)
      - IND (3rd Qtr.)
      - IAD (4th Qtr.)

Recategorization Phase II

- **Pairwise static separation**
- **Optimization to a 6 category system on a TRACON by TRACON basis, based on local traffic demand**
- **International effort FAA/EUROCONTROL/EASA**
- **Some concerns about A388 separations have been voiced by our European partners**
- **FAA will work the international issues through FAA/EASA efforts, while continuing to make progress on RECAT II separations**
- **Wake office goals is for NCT to be first RECAT II implementation**

Aircraft Standards

- **Historically we have used 3 means of establishing safe wake turbulence separation for new Heavy aircraft**
  - Prior to EIS, 10 NM in front and behind
  - Simple modeling of wake turbulence behavior and sensitivity analysis (A388, B748, B787 and recently A350)
  - If manufacturer believes the modeling results are too conservative, they will conduct back to back lidar flight tests (A388 and B748)
- **Effort underway to document this process**
  - FAA/EASA bilateral agreement
  - Closure of NTSB A-94-56 recommendation
  - Additional means to be added to these processes as technology, modeling, etc improve and agreement is reached

Atch J

Time-Based Flow Management

Assessment of TBFM in the NAS today

Federal Aviation Administration

Presented to: Air Traffic Procedures Action Committee
By: Future Standards & Procedures – AJV-85
Date: October 1, 2014

Background

Overall: Three phased approach leading to the routine use TBFM

1) Initial Assessment - Complete
2) Capture recommendations for the action plan - Complete
3) Build and Implement the action plan – In process

Outcome of the overall approach is for the NAS to realize enhanced TBFM use and to ensure TBFM foundational elements are in place to compliment future enhancements

Initial Assessment

- **Assess current status of TBFM in the NAS today**
  - Current use
  - Examine the tool as a building block for NextGen Initiatives
  - Holistic view across facilities and Service Units

- **Timeframe: 8 weeks for study and report**

TBFM Current Capabilities

Function	Description
Arrival Management (Situational Awareness)	Monitoring timeline; facilitate communication with area supervisors
Departure Scheduling	Supports time-based arrival schedule
Airborne Metering	Metering information is sent to Center controllers to meet a scheduled time of arrival
EDC – En route Departure Capability	Scheduling departures to pre-defined points in en route airspace for MIT restrictions

Current TBFM Use

TBFM level of use and type of use varies by facility

- Arrival Management (Situational Awareness): 14 Centers, several large TRACONs
- Departure Scheduling: 11 Centers, 2 TRACONS, select towers
- Airborne Metering: 15 Centers
- EDC: 11 Centers

Findings: What's Working Well

- **Improved Situational Awareness**
- **Departure Scheduling and EDC functions are widely used**
- **Broad perception that metering has benefits**
  - Reduced airborne holding
  - Reduced vectoring
  - Improved delivery to the runway
  - Reduces reliance on MIT

Findings: Operational Challenges

- Vision
- Unified Direction
- Policy and Procedures
- Training
- Culture and Communication
- System Management
- Outcome Analysis

Policy and Procedures

- **Use policy not in place**
  - Traffic management initiative
  - Support of NextGen Initiatives (e.g., OPDs)
- **Lack of procedures caused field facilities to develop local methods of use**
- **Procedures not published until January 2013**
- **Current procedures are not adhered to consistently**
  - Unaware of procedures
  - Entrenched in old habits
  - Lack of sufficient resources
  - Lack of confidence in TBFM technology
- **Unable to evaluate adequacy of current procedures.**

Impact: Lack of connectivity, inconsistent use and application, perception of lack of importance

Summary

- **TBFM capabilities used, duration of use, procedures used, and level of expertise vary extensively between facilities.**

- **All identified *challenges* require timely and effective attention for TBFM to adequately support NextGen initiatives**

- **Optimistic attitudes and desire to see TBFM move forward existed at many locations**

Where are we now?

- **45 Recommendations documented to address gaps**
- **Action Plan developed and in progress with the following objectives:**
  - more closely align TBFM with other facility processes
  - Consistent application and across the NAS
  - Improve communication to our customers
  - Ensure a firm foundation to support PBN and Nextgen needs

TBFM Vision

- **The vision for TBFM is the expanded use of time based metering to enable gate-to-gate improvements in both fuel and throughput efficiencies by: applying spacing only where needed, allowing for the routine use of Performance Based Operations (PBO) to capitalize on advanced aircraft Flight Management System (FMS) capabilities, and adding more predictability to the ATC system.**

TBFM Tool (To Support PBN and Nextgen)

Function	Availability	Description
TMA – Traffic Management Advisor	Now	A NAS automation DST that enables the use of time-based metering (TBM) to optimize the flow of aircraft into congested terminal airspace and airports. 200-250 NM radius
ACM – Adjacent Center Metering	Now	Provides TBM capabilities to neighboring centers to better manage arrival operations. Extends up to 300NM+ radius
EDC – Enroute Departure Capability	Now	Scheduling departures to pre-defined points in enroute airspace
Extended Metering (RNAV/RNP)	ZAB/PHX IOC 9-22-14 12/2014	Allows the extension of the scheduling capabilities that will reduce the build-up of error that occurs when ETAs are predicted over long distances. Adjacent facilities will pre-condition the flows by metering to points further out.
GIM – Ground-based Interval Management	IOC 9-22-14 ZAB/PHX	Minimize the use of vectoring for problem resolutions. Improve trajectory modeler performance with ADS-B data. Provide speed advisories to assist in the delivery of aircraft to a Meter Point/Meter fix. Increase opportunities for OPDs.
IDAC – Integrated Departure/Arrival Capability	Fall 2014	Automation of the coordination and management of departures to meet the en route slots
TSS – Terminal Sequencing and Spacing	2018 **FID 12/2014**	Continues TBFM plan into the TRACON. Enables a more routine use of advanced PBN procedures by providing spacing and sequence information to the terminal controller via STARS.

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Federal Aviation Administration

VOR MON Program

Presented to: Air Traffic Procedures Advisory Committee (ATPAC)

Presented by: Rowena Mendez (AJM-324)

Date: September 30, 2014

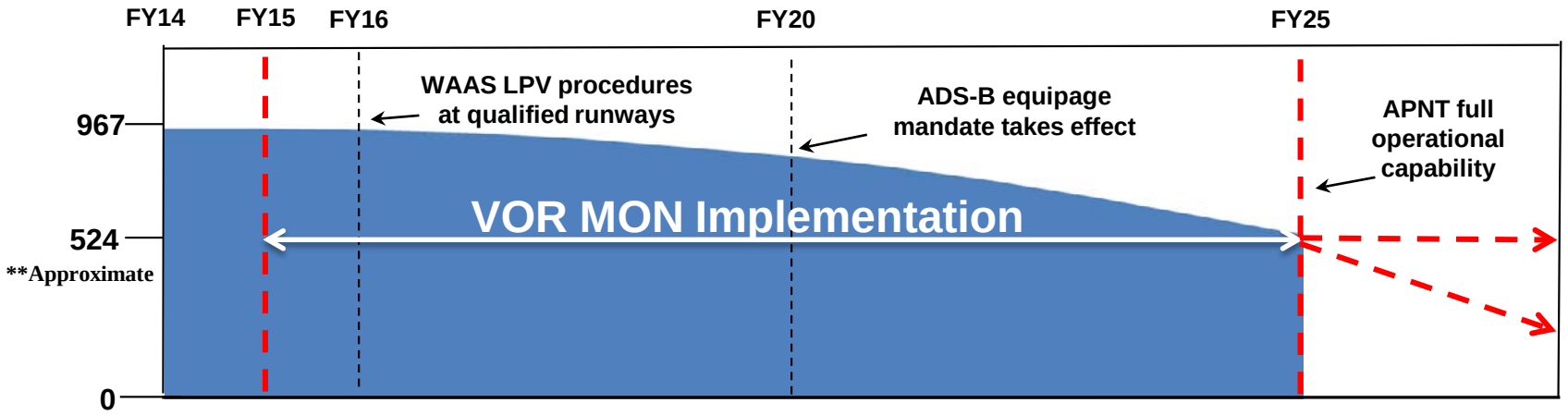
Agenda

- Program Goals
- Notional Timeline & Dependencies on VORs
- Program Accomplishments
- Program Status
- External Coordination
- VOR MON Selection Criteria
- Current ATS Routes & Routes Affected by VOR MON
- Dependencies & Touch Points
- VOR MON Challenges
- IAP Impacts
- Affected SIDs/STARs/ODPs
- Efficient Implementation Dependencies
- Next Steps
- Summary

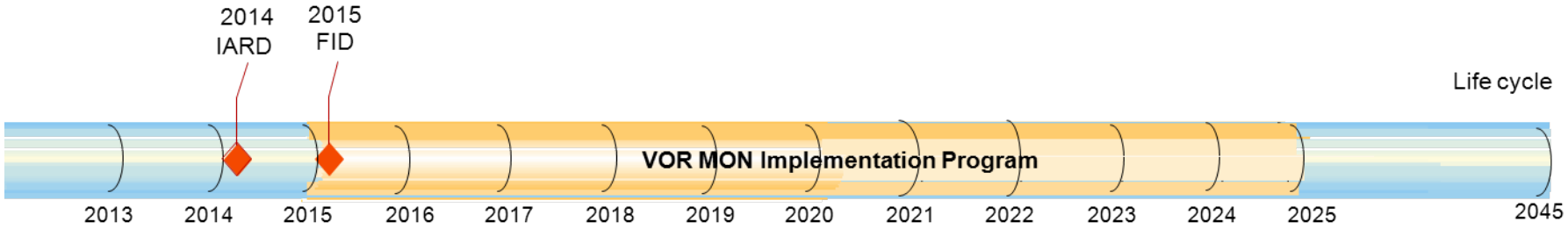
VOR MON Program Goals

- **The FAA will transition to Performance-Based Navigation (PBN) from the conventional VOR-defined routes and procedures**
- **PBN provides an opportunity to reduce the aging infrastructure**
  - The FAA currently has ~967 federally-owned and operated VORs (including VORTACs and VOR/DMEs)
    - Most are **30+** years old
- **The VOR MON Program will implement the MON by discontinuing approximately 50% of the VORs in the NAS**
  - VOR MON will provide backup coverage during a GPS outage as well as basic navigation capability
  - Support Right Sizing Initiatives

VOR MON Strategy and Notional Timeline



** The number of VORs comprising the MON may increase or decrease depending on the requirements for DoD / TOC



Program Accomplishments

- **FRN Released – 2011**
  - Volume 76, Number 241, December 15, 2011
- **Final FRN – 2012**
  - Volume 77, Number 162, August 21, 2012
- **VOR MON Analysis - July 2012**
- **Concept of Operations - January 2014**
- **Investment Analysis Readiness Decision (IARD) – March 2014**
- **Signed Charter – April 2014**

Program Status

- **Detailed program planning on going**
- **Final Investment Decision (FID) artifacts are being initiated and approach coordinated with focal points**
- **Continuing internal and external outreach**
    - Supporting TOC tasking
    - Coordinating with DOD

External VOR MON Coordination

- **FAA, MITRE, and DoD engaged in identifying necessary VORs for DoD use.**
  - DoD resolution anticipated for late 2014
- **Continued discussion with the US Coast Guard**
- **RTCA/TOC Tasks**
  - Task 1 Review and validate selection criteria - Completed
  - Task 2 Review and validate draft MON list - Completed
  - Task 3 Recommendations to waterfall schedule
  - Task 4 Recommendations on education and outreach - Completed

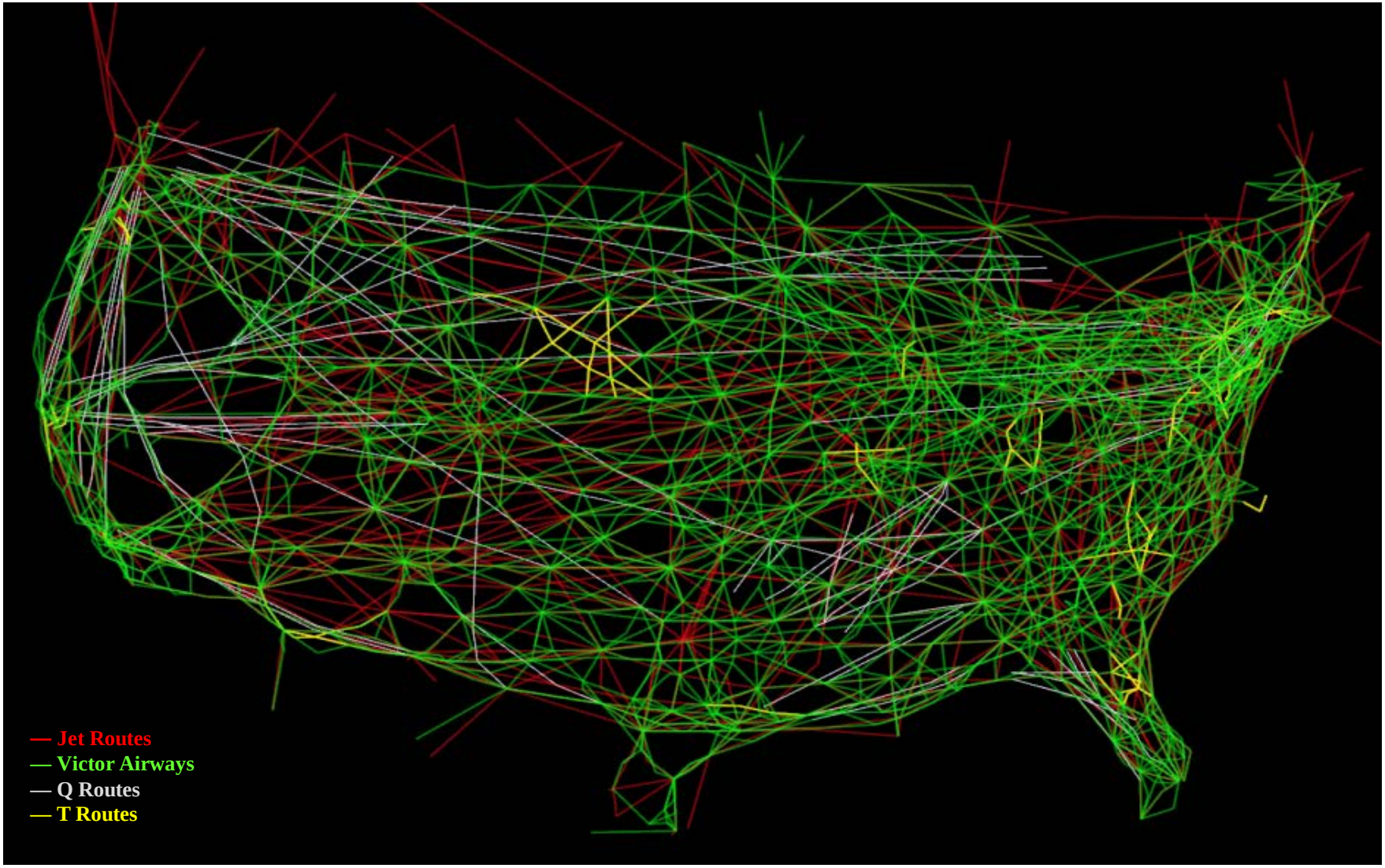
VOR MON Selection Criteria

- **General Criteria**
  - Retain sufficient ILSs, LOCs, and VORs to support “safe-landing” at a suitable destination with a GPS-independent approach (ILS, LOC or VOR) within 100 NM of any location within CONUS
  - Retain most VORs in western designated mountainous area and outside of CONUS
  - Retain VORs to support international arrival airways from the Atlantic, Pacific, the Caribbean, and at the Core 30 airports
  - Provide seamless coverage at and above 5000 ft AGL
    - Note: Substantial coverage will exist below 5000 ft AGL

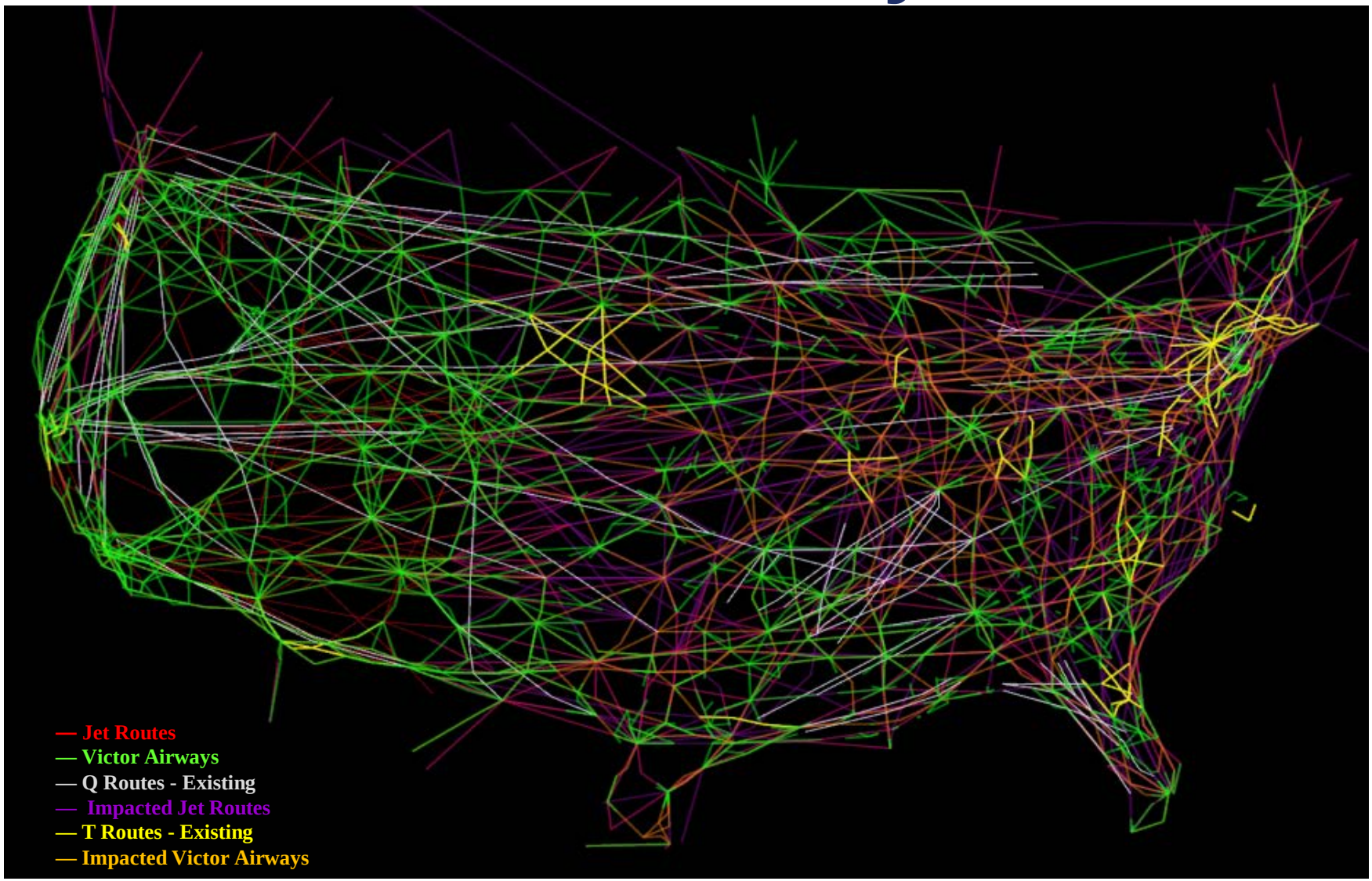
VOR MON Selection Criteria - Continued

- **Other Considerations**
  - Only FAA owned/operated VORs will be considered
  - DMEs and TACANS will generally be retained (and/or enhanced)
    - DME/TACAN service would, in general, be retained if VOR service is removed
  - Support for VOR-to-VOR navigation capability
    - VOR standard service volume (SSV) will become 77 NM radius at 5000 ft AGL
    - Conventional navigation VOR-to-VOR direct without airways
    - Retain existing VORs and airways in the western mountain area

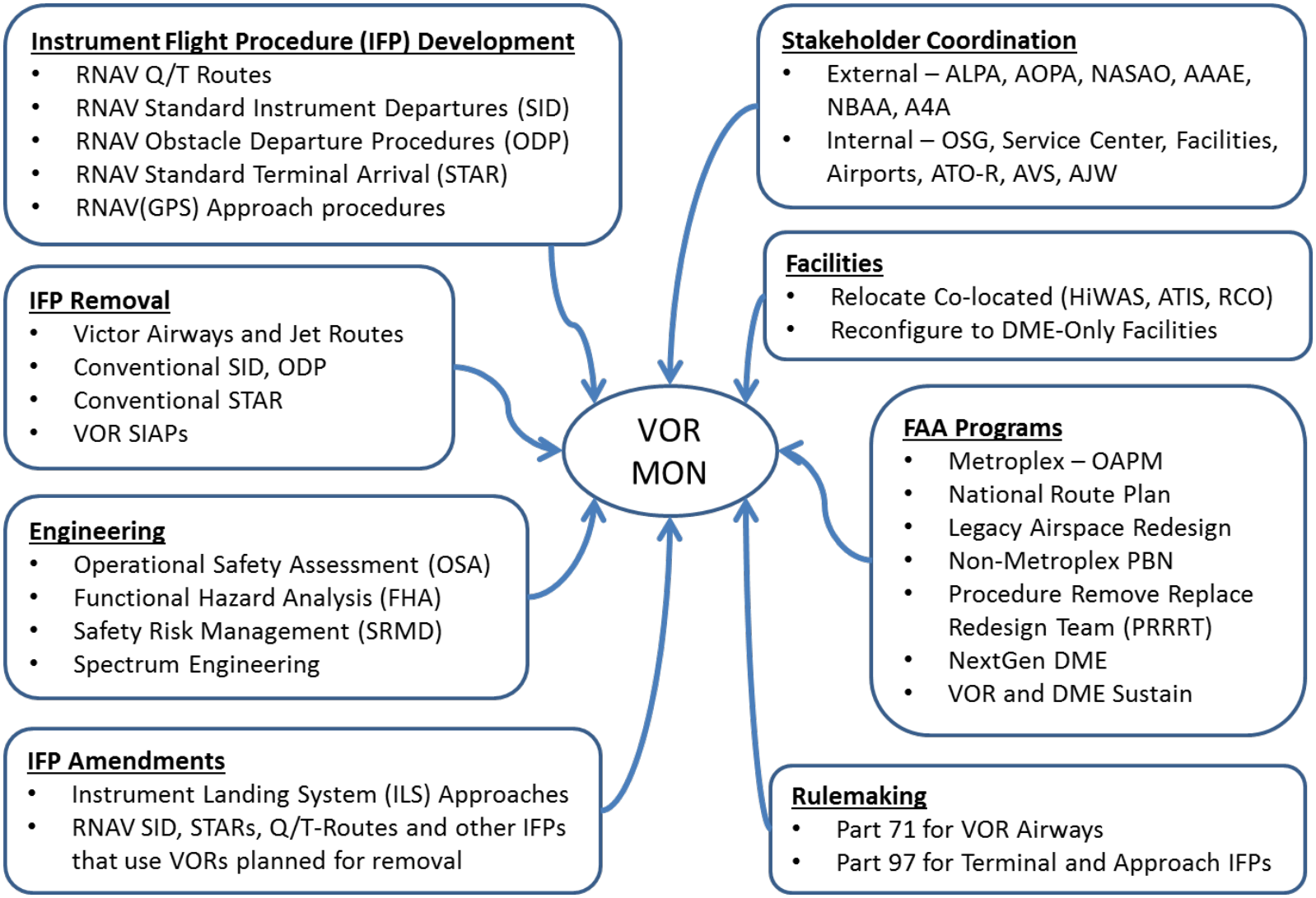
Current ATS Routes



ATS Routes Affected by VOR MON



Dependencies and Touch Points



VOR MON Challenges

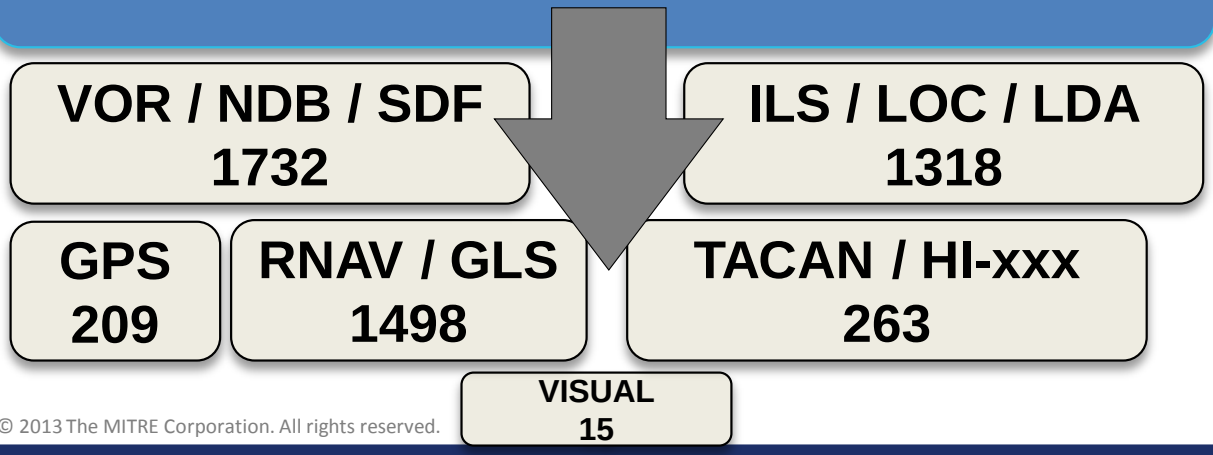
- **Instrument Flight Procedure (IFP) Development**
- **IFP Removal**
- **Routes**
- **Engineering Analysis**
- **Stakeholder Coordination**
- **Co-Located Facilities (HIWAS,RCO, ATIS, DME)**
- **Rulemaking**

Overall Instrument Approach Procedure (IAP) Impact Summary

11798 IAPs identified in CONUS*

5035 IAPs may be affected by VOR MON

6763 IAPs are unaffected by VOR MON



*From digital - Terminal Procedures Publication (d-TPP) Volume 1310

Affected SIDs/STARs/ODPs

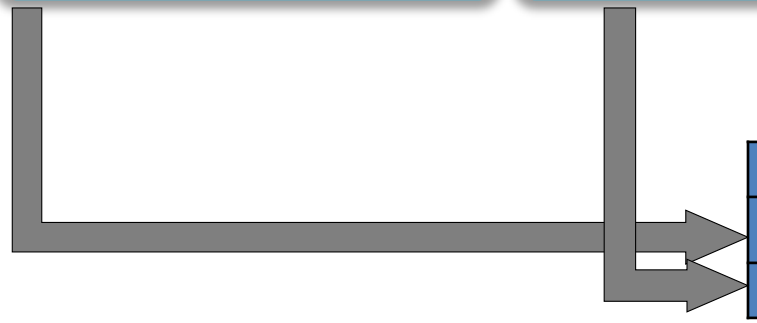
2084 ODPs/SIDs/STARs identified in CONUS*

1287 may be affected by VOR MON

997 are unaffected by VOR MON

893 SIDs & ODPs

394 STARs**



* From digital - Terminal Procedures Publication (d-TPP) Volume 1405

** Duplicate STAR listings removed as single graphic and textual plate serves multiple airports

Category	Conventional	RNAV
Affected SIDs & ODPs	691	202
Affected STARs	239	155

Efficient Implementation is Dependent on:

- **Collaboration**
  - National Route Structure Plan (NRSP) Concept
  - PBN Programs
    - METROPLEX, non-METROPLEX, Procedure Review Refine Remove Team (PRRRT), Review Refine and Remove (RRR)
  - Airspace Regulations
  - Aeronav Products
  - Flight Inspection Services
  - Service Areas
- **Coordination during planning and implementation**
  - National strategy
- **Communication and Outreach**
  - Internal and external

Next Steps

- **Continue detailed program planning**
- **Final Investment Decision ~ March 2015**
- **Finalize coordination with DoD/DHS**
- **Continue stakeholder outreach**

Summary

- **The VOR MON Program will discontinue approximately 50% of the VORs in the NAS while providing backup coverage during GPS outages**
  - Support Right Sizing Initiatives
- **Challenges exist with the implementation of the VOR MON:**
  - Coordination with multiple lines of business
  - Route redesign
  - Procedure removal and development
- **The VOR MON team is working these challenges**