

**Minutes of the Air Traffic Procedures Advisory Committee (ATPAC) Meeting #150 (REV2)  
February 9-10, 2015**

**CGH Technologies, Inc.  
600 Maryland Ave SW, Suite 800W, Washington, DC**

**1 Opening of the Meeting**

1.1 The 150<sup>th</sup> Meeting of the Air Traffic Procedures Advisory Committee (ATPAC) was called to order by Chair Lynette Jamison on Monday, February 9, 2015 at 12:30 p.m. The meeting was held at CGH Technologies, Inc., 600 Maryland Ave SW, Suite 800W, Washington, DC.

1.2 Representatives from the Federal Aviation Administration (FAA), Air Line Pilots Association (ALPA), Aircraft Owners and Pilots Association (AOPA), National Business National Aeronautics and Space Administration Aviation Safety Reporting System (NASA ASRS), US Department of Defense (DOD), National Air Traffic Control Association (NATCA), Helicopter Association International (HAI), United Airlines, and the public attended as follows:

Heather Hemdal, Executive Director	Victor Hinton, FAA/AJW-1C2
Lynette Jamison, Chair	Maurice Hoffman, FAA/AJV-8
David Allen, FAA/AJV-8	Christopher Jones, FAA/AJW-1C2
Jack Allen, FAA/AJV-8	Robert Lamond, NBAA
James Arrighi, FAA/AJI-15	David Maddox, FAA/AJV-11
Manny Avila, FAA/AJW-133	Andy Marosvari, NATCA
Preston Barber, FAA/AJM-232	Melissa McCaffrey, AOPA
Lawrence Beck, FAA/AJV-82	Leslie McCormick, CSSI/AJV-8
John Blair, FAA/AFS-410	Vince McMenemy, FAA/AJV-83
Mark Cato, ALPA	Glenn Morse, United Airlines
Alison Chavis, US Army	Gary Norek, FAA/AJV-11
Gary Christiansen, FAA/AJV-83	Mark Olsen, FAA/AJI-171
Larry Cole, US Air Force	Philip Saenger, FAA/AFS-410
John Collins, General Aviation Pilot	Scott Swain, US Navy
Linda Connell, NASA ASRS	David Swanson, FAA/AJV-82
DeeAnn Dehne, FAA/AJT-22	Jeffrey Tittsworth, FAA/AJV-82
Natking Estevez, FAA/AJV-8	Sydney Tutein, US Army
Marc Gittleman, ALPA	Patti Wilson, FAA/AJV-82
Russell Gold, FAA/AJV-14	Jeffrey Woods, NATCA
Kari Gonter, NASA ASRS	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: 3
- Deferred AOCs from Previous Meetings to Meeting #150 – 3
  - 145-2 - IFR Services in Class G Airspace
  - 148-01- ADS-B NOTAMS and Problem reporting
  - 148-02 - Clearances below published altitudes on procedures and airways
- New AOCs accepted at Meeting #149 – None
- Closed AOCs from Meeting #149: 1
  - AOC 141-1 Runway Guard Lights (RGL)

- b. Topics for discussion from Meeting #149:
  - Solar Farm Reflection – Linda Connell, NASA ASRS
  - Procedural Changes Resulting from ATO Safety Top 5 – Larry Beck, AJV-82
  - Proposed Change to CFR 91.117(c) Aircraft Speed – Gary Norek, AJV-11
  - Changes to Class B Airspace at Specific Airports – Gary Norek, AJV-11
- c. Briefings on new topics:
  - Runway Status Lights Program – Manny Avila, AJW-133
  - Update from 7110.65 Rewrite Team – Jack Allen/Patti Wilson, AJV-8
  - DME Coverage – Victor Hinton, AJM-324
  - NextGen ADS-B Capabilities, Implementation, and Benefits – Preston Barber, AJM-232
- d. FAA Update: The reorganization of Air Traffic Procedures (AJV-8) has been completed to consolidate and streamline procedures. The last two managers' positions were being filled. The organization was handling more than 200 Document Change Proposals (DCPs) and updating documents.

1.4 Lynette Jamison presented the Chair's Report, reminding representatives to be prepared to discuss the locations and dates of future meetings prior to the conclusion of the meeting.

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. Review of Changes to the Guidelines
- f. Corrections to ATPAC #149 Minutes
- g. Review of Agenda Items and Call for New Agenda Items
- h. Review of Deferred Safety Items/Call for Safety Items
- i. Introduction of New AOCs or Miscellaneous Items
- j. Status Updates to Existing AOCs
- k. Briefings
- l. Recurring Agenda Items
- m. Discussion on New Agenda Items
- n. Location and Dates for Future Meetings
- o. Adjourn

1.6 Review of Changes to the ATPAC Guidelines: Following the publication of the revised charter, FAA Order 1110.76V, concerns were raised by the US Air Force that the charter no longer listed specific organizations as members. The change was made based on a recommendation by the FAA Office of Rulemaking, which suggested removing the actual members and listing categories instead so that if the membership changed, the charter would not need to be amended. The meeting voted to add organizations from the previous version of the charter to the ATPAC Guidelines. The revised guidelines are provided at **Attachment A**.

1.7 Corrections to ATPAC #149 Minutes: The meeting had no changes to the ATPAC #149 Minutes.

## 1.8 Review of Agenda Items and Call for New Agenda Items

NASA ASRS raised two new items for discussion by the meeting.

- a. An Area of Concern (AOC) on the cancellation of takeoff clearance phraseology had been raised at a previous meeting. NASA ASRS has received reports relating to this topic and requested the status of the AOC.
- b. NASA ASRS has also received reports on problems with the CLIMB VIA procedure. This issue is being worked by the Performance-based Operations Aviation Rulemaking Committee (PARC) Pilot Controller Procedures System Integration group (PCPSI) sub group of PARC. It was suggested that the information be provided to that group.

## 2 **Review of Deferred Safety Items/Call for Safety Items**

### *Solar Farm Reflection*

2.1 As a follow up to the discussion on solar farm reflection, Linda Connell presented information on visual glare reports related to solar plant reflection received through the NASA ASRS. The first report was received in August 2013. Since that time, nine reports have been received. Details of the reports are provided in **Attachment B**.

2.2 Software updates were implemented in July 2014. NASA ASRS continued to receive reports until September 2014; however, no reports had been received since September. It was suggested that the position of the sun may have resulted in the reports stopping.

2.3 Suggested corrective measures included limiting the number of heliostats in standby mode, incorporating a glare shield near the receiver for heliostats in the standby mode, and increasing the number of aim points near the receiver during standby and have adjacent heliostats point to different locations to disperse the visible glare.

2.4 Another meeting is planned for summer 2015. Linda will provide an update to ATPAC #151.

## 3 **Introduction of New AOCs or Miscellaneous Items**

3.1 No new AOCs were submitted to the meeting.

3.2 Regarding the AOC on the cancellation of takeoff clearance phraseology (paragraph 1.8.b refers), the issue was researched and it was determined that *AOC 141-2, Subject: Cancellation of Takeoff Clearance "Phraseology" ... JO7110.65 para 3-9-10*, had been opened. (See **Attachment C**) A summary of the subsequent meeting reports on this AOC during was provided, concluding with the AOC closure by ATPAC #143. NASA ASRS will propose a new AOC on this subject for the next meeting.

## 4 **Status Updates to Existing AOCs**

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

4.1 The 7110.65 Rewrite Group has proposed to change the definition of Class G airspace in the Pilot/Controller Glossary (PCG). The current definition states "*CLASS G AIRSPACE – That airspace not designated as Class A, B, C, D or E.*" The proposed wording is "*CLASS G AIRSPACE – Uncontrolled*

*airspace within which ATC has neither the authority nor the responsibility for exercising control over air traffic. Safety alerts must be provided. Traffic advisories are provided, workload permitting.”*

4.2 Efforts are underway to eliminate Class G airspace above 1200 feet above ground level (AGL) by Air Route Traffic Control Centers. Changes will be published in the Federal Register. NBAA supported removing Class G airspace, noting that if air traffic control (ATC) reroutes an aircraft, the pilot may not know that he is entering Class G airspace. AOPA requested that the FAA provide outreach efforts to notify pilots of the changes. Once the definition is changed, the FAA will look into the need to provide additional information to pilots.

4.3 FAA will provide an update to ATPAC #151.

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

4.4 Lynette Jamison briefed the meeting that Lockheed currently has in place instructions for what to do in event of a reported outage. The instructions have been in place for two years. When in receipt of a report related to Traffic Information Service – Broadcast (TIS-B) and/or Flight Information Service – Broadcast (FIS-B) malfunctions, specialists should request the following information and forward to the appropriate Technical Operations Control Center (OCC) facility via telephone and notify the supervisor for recording incident on FAA Form 7230-4:

- a. Aircraft call sign and type aircraft
- b. Date and time of the occurrence
- c. Location of anomaly
- d. Altitude

4.5 As for the AIM, the Program office has made some progress and has the following observations/recommendations:

- a. Add a paragraph for “Reporting Malfunctions” for FIS-B & Automatic Dependent Surveillance – Rebroadcast (ADSR) to make it consistent with the procedures for reporting malfunctions with ADS-B & TIS-B; and
- b. Use verbiage similar to the verbiage that is used for Reporting TIS Malfunctions (not to be confused with TIS-B) and other malfunctions with surveillance systems.

*Reports of TIS Malfunctions*

*1. Users of TIS can render valuable assistance in the early correction of malfunctions by reporting their observations of undesirable performance. Reporters should identify the time of observation, location, type and identity of aircraft, and describe the condition observed; the type of transponder processor and software in use can also be useful information. Since TIS performance is monitored by maintenance personnel rather than ATC, it is suggested that malfunctions be reported by radio or telephone to the nearest Flight Service Station (FSS) facility.*

- c. Delete the following verbiage from Surveillance and Broadcast Services (SBS) products and services “Reporting Malfunctions” throughout the AIM:

*By reporting the failure directly to the FAA Safe Flight 21 program at 1-877-FLYADSB or <http://www.adsb.gov>.*

*By reporting the failure directly to the FAA Surveillance and Broadcast Services Program Office at 1-877-FLYADSB or <http://www.adsb.gov>.*

4.6 It will be important to fix the 1-877-FLYADSB number and the <http://www.adsb.gov> link, or to delete both references and work with the Automated Flight Service Stations and Flight Service Stations to ensure that they know what to do when a pilot calls them with SBS issues. The phone number and link (as reported by a pilot) were verified as being out of service.

4.7 It was noted that a DCP had been developed to amend the Aeronautical Information Manual (AIM). The Alaskan Flight Service Stations have procedures in place to collect information. Heather Hemdal asked that a DCP for the FAA 7110.10 also be prepared.

4.8 A meeting is planned for early 2015 to ensure progress. An update will be provided to the next ATPAC meeting.

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

4.9 Gary Christiansen provided an update to the meeting. (See **Attachment D**) Controllers assume responsibility for terrain clearance when assigning altitudes below published approach altitudes. Controllers must ensure aircraft are not cleared below the MVA or MIA in any area that will be traversed during the approach. The wording in the AIM is clear:

Paragraph 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 ...”

Paragraph 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 ...”

4.10 Regarding a concern raised about a controller issuing a clearance below an altitude on the approach chart, the procedure is that the pilot should be told to maintain an altitude until on a published segment of the approach that is at that altitude.

4.11 It was noted that the procedure is not flawed; however, there may be a need for additional training. The FAA is considering modifying the language in 7110.65 to make it clearer. An update will be presented to ATPAC #151.

## **5 Briefings**

### *Proposed Change to the Code of Federal Regulations (CFR) 91.117(c), Aircraft Speed*

5.1 Gary Norek informed the meeting that the change proposed was originally submitted to the Rulemaking Committee. FAA Flight Standards did not support the change to the original wording, which was promulgated in 1969, and the proposal was subsequently withdrawn. Industry participated in the Safety Risk Management (SRM) process.

5.2 The current language remains:

*No person may operate an aircraft in the airspace underlying a Class B airspace area designated for an airport or in a VFR corridor designated through such a Class B airspace area, at an indicated airspeed of more than 200 knots (230 mph).*

#### *Changes to Class B Airspace*

5.3 Gary Norek advised the meeting that there are no planned changes to Class B airspace.

#### *Procedural Changes Resulting from the FAA Air Traffic Organization (ATO) Safety Top 5*

5.4 Larry Beck briefed the meeting on the Fiscal Year 2015 Top 5 Corrective Action Plan. The following activities are underway:

- a. Inadequate Vectors: Use of adequate vectors to maintain separation associated with Opposite Direction Operations<sup>1</sup>. The DCP was sent out December 29, 2014 with comments due on February 12, 2015.
- b. Misjudgment: Use of proper judgment of an aircraft rate of climb, descent, or closure association with Opposite Direction Operations. (See Footnote 1 above) The DCP was sent out December 29, 2014 with comments due on February 12, 2015.
- c. Misapplied Visual Separation (tower visual and pilot-to-pilot): Proper utilization of visual separation. The DCP was sent out December 30, 2014 with comments due on February 13, 2015.
- d. Surface Memory Aids: Use of effective surface memory aids. A work group was formed, which will meet March 11-12, 2015 in Washington, DC.
- e. Weather Dissemination: Need to solicit and disseminate significant Pilot Weather Report information and/or to issue pertinent weather information. Meetings were held to discuss this on January 8 and February 10, 2015.

#### *Status of Runway Approach Hold Sign Test*

5.5 David Swanson presented an update on the status of the Runway Approach Hold Sign Test. (See **Attachment E**) The test was developed based on some airports not having adequate markings. The test is underway at Chicago O'Hare (ORD) and Cleveland Hopkins (CLE), with Nashville (BNA) scheduled to begin in March 2015.

5.6 The FAA Technical Center has been gathering data from pilots and vehicle operators at ORD and CLE. Feedback from the pilots has been generally positive concerning the signs, with the majority thinking the signs improve situational awareness. There was some mention of information overload. The reaction to the surface markings has been more mixed. Some vehicle operators perceived a conflict between the Pattern B markings and the signs. The conditional nature of the Pattern B markings sometimes created a need to modify the vehicle operator standard operating procedures.

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<sup>1</sup> The Safety Roundtable grouped the hazards of inadequate vectors and misjudgment under the system state of Opposite Director Operations. The five activities listed for each hazard are therefore the same, but address both hazards.

5.7 Maintenance concerns noted were that the installation of the six-module connected signs will be difficult for most airports, since a crane or similar device is needed to install or repair them if they are knocked over. Some airports will require grading or earthwork which will impose significant costs.

5.8 A further update will be provided to ATPAC #152.

#### *Update from FAA 7110.65 Rewrite Team*

5.9 Patti Wilson provided an update on the FAA ATC Handbook Revision Project. (See **Attachment F**) The following issues are being addressed under the project, as identified by the National Air Traffic Controllers Association (NATCA), Industry and FAA Management (Note: Items annotated with an asterisk were carried over from FY2014):

- a. NATCA
  - En Route Passing and Diverging
  - Application Expanding the Definition of RADAR\*
  - Pilot / Controller Glossary Class G Airspace\*
  - Transitional Separation
  - Tower Applied and Pilot Applied Visual Separation
- b. Industry
  - Descend Via Phraseology
  - RNAV/RNP for Adjacent Airports\*
  - Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach
  - PBN Capabilities Displayed to Controllers\*
  - Shortcutting RNAV Aircraft
- c. FAA Management
  - Triple Independent Approaches – No High Update RADAR
  - Reduction of Diagonal Separation for Parallel Dependent Approaches\*
  - Treat Go-around and Missed Approach Operation as a Normal Departure
  - Integrate ADS-B Procedural Guidance
  - Reorganize Approach Clearance Differentiations Paragraph

5.10 An update on the progress will be presented to ATPAC #151.

#### *Runway Status Lights Program*

5.11 Manuel Avila briefed the meeting on the Runway Status Lights (RWSL) program. (See **Attachment G**) RWSL integrates airport lighting equipment with approach and surface surveillance systems to provide a visual signal to pilots and vehicle operators indicating that it is unsafe to enter, cross, or begin takeoff on a runway.

5.12 The system consists of two subsystems: the RWSL Processor and the Field Lighting System (FLS). The processor provides real time analysis of airport surface operations to determine runway status based on Airport Surface Detection Equipment, Model X (ASDE-X) or Airport Surface Surveillance Capability (ASSC) surveillance data. The FLS provides physical interface to indicate runway status directly to pilots and vehicle operators.

5.13 Changes have been proposed for the FAA 7110.65 and 7210.3 to provide information and procedures for the use of these new systems.

5.14 The meeting remarked that there were concerns about the use of light-emitting diode (LED) lights that are used in this new system. NASA ASRS reports have been received on this issue as well. This is still under investigation.

5.15 Updates will be provided to future meetings as necessary.

#### *NextGen ADS-B Capabilities, Implementation and Benefits*

5.16 Preston Barber informed an overview on the FAA ADS-B program, providing information on the ground infrastructure, avionics upgrades, and available tools. (See **Attachment H**) The program office outlined the FY2015 planned activities, which will include the rollout of air traffic separation services at the last en route site and four additional terminal sites by September 2015.

#### *Distance Measuring Equipment (DME) Coverage*

5.17 Victor Hinton offered a presentation on the NextGen implementation to reduce VORs as part of transitioning navigation systems to space-based services. The DME network provides a secondary navigational system (RNAV capability) in the event that any space-based service interruptions or degradations occur.

5.18 Conclusions drawn from the analysis were:

- a. The current DME-DME network provides 100% coverage (with two or more signals) inside 27 of the 36 Class B terminal areas. The current DME-DME network provides 100% coverage inside 87 of the 118 Class C terminal areas. Signal conditions for Class D are unknown; creating continuous coverage 5,000-ft AGL may be severely limited by frequency availability and interference constraints.
- b. At least 33 new DMEs are required for continuous coverage at 14,500-ft, six sites are mandatory for Nevada for no signal areas. By expanding protection for eight DMEs in Nevada, the current network is capable of supporting RNAV at FL180 and up for the continental United States (CONUS).
- c. Alaska requires thirty-two new sites for coverage above 14,500-ft. Hawaii and US territories may require new sites, if traffic patterns support their legitimacy.

#### *Status Update on World Aeronautical Charts*

5.19 Guy Copeland, AJV-321 provided information that there had been no change in the status since ATPAC #149, which stated 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.

#### *Time Based Flow Management (TBFM) Update*

5.20 An update on TBFM was provided by Vince McMenemy. (See **Attachment I**) FAA AJV-8 is now the focal point for TBFM oversight, TBFM National Operations Team, defining priorities and coordinating implementation of the Vision across Service Units. AJV-85, Future Standards and

Procedures has responsibility for the TBFM Action Plan and coordination with Metroplex and SBS for oversight of TBFM related activities.

5.21 Policies and procedures have been updated and are being processed for publication. The changes will include definitions, roles and responsibilities, use policy, and will provide facility direction for support and maintenance to ensure the system provides optimum performance.

5.22 Information was provided on the status of TBFM tools to support metering. There is also a new chart depiction of RNAV routes and data. The meeting noted that the new approach plates contain a lot of information. NASA ASRS has received complaints that operators do not want different sheets of paper due to late runway changes.

#### *Wake Turbulence Update*

5.23 Jeffrey Tittsworth provided an update to the meeting.

5.24 Wake Turbulence Mitigation for Arrivals Procedures (WTMA-P) have been approved for Philadelphia (PHL) runways 9 and 27. WTRO is working with the facility to develop an implementation plan. WTMA-P were also approved for Detroit (DTW) and WTRO is supporting the development of an RNAV approach to Runway 3L/21R to enable WTMA-P. The Atlanta (ATL) analysis for WTMA-P will be due in June 2015.

5.25 The Wake Re-categorization Project (RECAT) implementations were completed for Houston Terminal Radar Approach Control (TRACON) (I90), George Bush Intercontinental (IAH) and Houston Hobby (HOU) Airports on Dec 18, 2014. Training is ongoing to meet a March 1, 2015 initial operational capability (IOC) date for New York TRACON (N90), Newark (EWR), LaGuardia (LGA), John F. Kennedy International (JFK), Teterboro (TEB) and White Plains (HPN) Airports. Charlotte (CLT) is scheduled for IOC by March 30, 2015; Chicago O'Hare (ORD) is scheduled for June 2015; and Northern California TRACON (NCT) is scheduled for fourth quarter 2015.

## **6 Discussion on New Agenda Items**

6.1 There were no new agenda items raised for discussion at the meeting.

## **7 Location and Dates for Future Meetings**

7.1 Discussion was held on dates and locations for **ATPAC #151**. It was tentatively agreed that the next meeting would be held at NASA Ames, Moffett Field, CA on Tuesday and Wednesday, July 28-29, 2015. Confirmation and additional information will be sent out as soon as it is available.

7.2 The **ATPAC #152** meeting will tentatively be held on Tuesday and Wednesday, October 20-21, 2015 at CGH Technologies or another location in the Washington, DC area.

## **8 Adjournment**

8.1 There being no further business, the meeting was adjourned on Tuesday, February 10 at 1:55pm.

## Guidelines

### **Air Traffic Procedures Advisory Committee (ATPAC)**

**Updated February 10, 2015**

1. **REFERENCE:** FAA Order 1110.76 establishes and constitutes the charter for ATPAC.
2. **MEMBERSHIP:**
  - a. Membership must consist of those categories of organizations identified in the current charter. The following organizations are considered essential:
    - i. FAA
    - ii. U.S. Army
    - iii. U.S. Navy
    - iv. U.S. Air Force
    - v. Aircraft Owners and Pilots Association
    - vi. Allied Pilots Association
    - vii. Air Line Pilots Association
    - viii. Air Traffic Control Association, Inc.
    - ix. National Business Aviation Association, Inc.
    - x. National Air Traffic Controllers Association
    - xi. Helicopter Association International
    - xii. Aviation Safety Reporting System Office
    - xiii. United Airlines
    - xiv. Professional Women Controllers, Inc.
    - xv. American Airlines
    - xvi. Airline Dispatchers Federation
    - xvii. Independent Pilots Association
  - b. Nominations for new membership can be made by current Committee members and the Federal Aviation Administration (FAA). The FAA, in consultation with the Committee, may grant tentative membership approval.
3. **CONSENSUS:**
  - a. All persons present, including members of the public, have the opportunity to provide input during discussions. However, only the designated representative of a member organization (excepting FAA) participates formally in the determination of consensus.
  - b. All recommendations and certain decisions, as outlined in these guidelines, require consensus of the approved member organizations' representatives present at the meeting. No minimum quorum of the full ATPAC membership is required for consensus, only consensus among the members present at the meeting who agree to move forward with a particular decision or recommendation.

- c. If a designated representative is willing to move forward with a decision or recommendation, but has particular comments or concerns regarding the consensus position, these comments can be included in the public record as a minority opinion or position.
  - d. If consensus cannot be reached on how to proceed with an Area of Concern (AOC) after all representatives have had the opportunity to speak on the topic, at the Chairperson's discretion, the discussion may be deferred until later in that meeting or to a later meeting.
  - e. If consensus cannot be reached on the resolution of an AOC, and additional research or information is not forthcoming from FAA or the sponsoring organization, then withdrawal of the AOC should be considered. The decision to withdraw an AOC must be reached by consensus in accordance with paragraph 3a.
4. **VOTING:** When voting is required, except as otherwise noted, all votes will be by a simple majority of the designated representatives from the member organizations who are present at the meeting. A member organization that expects both its primary and alternate representatives, as appointed in accordance with the ATPAC Charter, to be absent for an anticipated vote may designate another member organization as its proxy for that vote. The Chairperson must be notified of such proxy designation as soon as practicable, but prior to the vote. No one other than the Primary, Alternate or otherwise delegated representative may vote.
5. **COMMITTEE CHAIRPERSON:** The Chairperson must serve as the facilitator of discussions and ensure compliance with the procedures as described herein.
- a. The Chairperson (or designee in the absence of the Chairperson) must attend all Committee meetings.
  - b. Duties of the Chairperson:
    - i. Conduct a roll call at the beginning of every meeting to identify each member organization's designated (primary or alternate) representative present for the meeting and announce any non-primary or alternate representatives authorized to vote for a member organization in accordance with paragraph 4 above.
    - ii. Solicit opinions from Committee members as to whether an AOC is within the scope of the ATPAC charter and rule on the appropriateness of the topics.
    - iii. Run the meeting, including the determination of priority and time allowed for discussion of AOC's and other Committee business.
    - iv. Ensure that all opinions on a topic are heard and remain unbiased during the discussions.
    - v. Serve as a facilitator when building consensus on decisions and/or recommendations.
    - vi. Forward Committee recommendations for ATPAC charter changes to the FAA Administrator.
6. **ELECTION OF THE CHAIRPERSON:**
- a. Any Committee member or alternate member under the current charter is eligible to be Chairperson. Nominations for the new Chairperson must be made in writing to the Executive Director and must be received by the close of the next to the last meeting under the current Charter. Each member organization is permitted to submit one nomination for Chairperson.

- b. Announcements for nomination of Chairperson must be made as the final agenda item of the next to the last meeting under the current charter.
- c. Election of the Chairperson will be conducted by written ballot during the last meeting of the current charter, and determined by majority vote in accordance with paragraph 4.
- d. The term of office for the newly elected Chairperson will coincide with each new charter. The Chairperson begins serving his/her term of office at the first meeting under the new charter.
- e. The Chairperson can be recalled at any time during the term of office by a two-thirds vote of the full Committee designated representatives.

7. **EXECUTIVE DIRECTOR:**

- a. The Executive Director must attend all ATPAC meetings.
- b. Duties of the Executive Director:
  - i. Provide the Committee with information relative to ATPAC discussion issues and ensure coordination of safety issues through the ATO Safety Roundtable.
  - ii. Provide expertise and administrative support to the Committee. This support must not be limited to Air Traffic, and may include the appropriate representatives of other FAA services (lines of business) or external organizations, i.e. NASA, NWS, etc.
  - iii. Prepare the agenda and the minutes of all meetings and provide any other information pertinent to the function of the Committee.
  - iv. Publish minutes of each meeting in accordance with paragraph 8

8. **MEETINGS:**

- a. Meetings are held as needed, approximately two meetings per year. Meeting locations will be determined jointly between the Executive Director and the Chairperson based on the needs of the Committee work. The Chairperson and Executive Director must be jointly responsible for hotel and meeting space arrangements for the out-of-town meetings.
- b. The Chairperson and the Executive Director must be present for all discussions on AOCs. However, when necessary, the Chairperson may designate a primary or alternate ATPAC member to act as chairperson and the Executive Director may designate an FAA employee to act as Executive Director.
- c. Meeting dates and times will be set at least one meeting in advance, preferably two, where practical. The Chairperson will designate appropriate times for convening, breaks, adjourning, etc. at each meeting.
- d. The meeting agenda must include at a minimum:
  - i. Call to Order/Roll Call
  - ii. Recognition of Attendees
  - iii. Executive Director's Report
  - iv. Chair Report
  - v. Call for Safety Items
  - vi. Approval of minutes of the previous meeting

- vii. Review of Agenda Items
- viii. Introduction of New AOCs or Miscellaneous items
  - ix. Status updates to existing AOCs
    - x. Location, dates for future meetings.
    - xi. When required, announcements of nominations for new Chairperson.
    - xii. When required, election of new Chairperson.
- e. The minutes of each meeting will be posted on the ATPAC web site not later than 30 days after the close of the meeting. The minutes must include, but not be limited to:
  - i. Time and place of the meeting
  - ii. Attendees
  - iii. A list of outstanding AOCs, including those newly introduced at the meeting.
  - iv. A summary of each AOC and Agenda item discussion, and action taken on each item. The minutes shall NOT include references to individual Committee members. The term “member” must be used rather than “he” or “she.”
  - v. A summary of presentations or reports made to the Committee, Copies of handout materials may be attached or referenced, as appropriate.
  - vi. Copies of reports, statements, or recommendations issued or approved by the Committee.
  - vii. The schedule of planned future meetings, to the extent known.
  - viii. Election of a new Chairperson, when appropriate.

9. **AOC:**

- a. Any member may submit a proposed AOC. Where possible, proposed AOCs should be submitted to the Executive Director at least 30 days prior to the next scheduled meeting. Committee members should be provided an electronic copy of all proposed AOCs one week prior to the meeting. With the exception of an AOC that has been accepted by the Committee and determined to be a Safety Issue, the Chairperson may defer discussion of proposed AOCs submitted less than 30 days prior to a meeting until the following meeting to allow members time to research the issue. Any member submitting a proposed AOC within 30 days of the meeting should email the proposed AOC and associated references to the full Committee as soon as possible. The Chairperson, in consultation with the Executive Director, will determine the order in which proposed AOCs will be taken up and the time allotted to each discussion.
- b. Until the first meeting at which a proposed AOC is discussed, its status is solely up to the member who introduced it. After an AOC has been accepted by the Committee, the status of any action on the AOC is determined by the Committee by consensus.
- c. AOCs are subjects of marked interest concerning procedural matters or practices in the air traffic control system that member organization(s) believe need to be addressed or corrected by the FAA or system users.
- d. **Safety Issues.** The sponsor may identify an AOC as a potential safety issue when it represents a significant problem that needs to be addressed by ATPAC. If accepted by the committee, the safety issue must be referred to the ATO Safety Roundtable to ensure no

duplication of efforts. A safety issue must be given priority consideration by the Chairperson for discussion by the committee.

- e. A Safety issue must be allotted sufficient time to allow the sponsor to fully detail their specific concerns. At a minimum, the sponsor must provide the following information when identifying a potential safety issue:
  - i. Background and context that illustrates the safety concern and why it should be accepted by ATPAC for resolution;
  - ii. Demonstrate how the proposed safety issue is systemic and not a single event or only affects one particular entity; and,
  - iii. – Clearly identify the safety risk by providing quantitative data or examples.
- f. After the presentation, and discussion of the AOC by the Committee, a determination must be made on whether the AOC is a safety issue. This determination will be by consensus as described above in paragraph 3. Should the issue be accepted for ATPAC resolution, the assigned ATO safety representative shall conduct a due-diligence review to determine whether the issue is already being addressed by the FAA through programs such as: ATSAP, CSIP, AOV, DCP, AFS, etc. If there are activities ongoing to mitigate the issue, ATPAC will be provided a briefing of ongoing FAA actions for consideration and/or monitoring.
- g. If ATPAC determines that ongoing FAA safety mitigations are NOT sufficient and additional ATC work is needed, the Executive Director shall refer the safety issue to the ATO Safety Roundtable who will undertake corrective action as appropriate and ensure the Executive Director is kept informed.
- h. The status of an AOC must be recorded as follows:
  - i. Action completed when the AOC is resolved by Committee consensus. For example, an AOC may be considered Action Completed when one of the following occurs (not all inclusive):
    1. FAA adopts a Document Change Proposal
    2. FAA informs ATPAC that no action is being taken about the recommendation (see 9.e.iv below).
    3. FAA informs ATPAC that action is being taken to establish new procedure(s).
  - ii. Deferred when the Committee is continuing work on the AOC and wishes to keep it active from one meeting to the next.
  - iii. Withdrawn when the Committee no longer wishes to discuss an AOC that has been under consideration.
  - iv. Non-Adopted when recommendations are not adopted by the FAA. FAA will provide rationale for any decision to non-adopt recommendations of an AOC.

10. **RECOMMENDATION:**

- a. A Recommendation is a definitive statement generated by the Committee to address the issues in an AOC. It provides to the FAA a proposed course of action to correct, refine, or change the policies or procedures identified in the AOC.
- b. A Recommendation is forwarded to the FAA by the Executive Director

- c. If it is determined that a Recommendation has not been acted upon within a reasonable length of time or in a satisfactory manner as determined by the Committee members, the Committee Chairperson is responsible for assuring contact with the appropriate FAA office to seek a timely or appropriate response or resolution.
  - d. A Recommendation may be modified or withdrawn by Committee consensus upon receipt of new information or clarifying documentation from the FAA, members of the Committee, or interested public.
11. **AD HOC COMMITTEES/WORKING GROUPS:** Ad hoc committees or working groups are comprised of a number of Committee members or alternate members who meet between regularly scheduled meetings to work on projects, as directed by the Committee. The product of the ad hoc group will be presented to the full Committee for their review and action at the next scheduled meeting. Work products or advice from an ad hoc committee must not be presented directly to the Executive Director nor referred elsewhere until they have been considered by the full Committee.
12. **NUMBERING AOCs, AND RECOMMENDATIONS:** Each AOC will be recorded and numbered in numerical order prefixed by the meeting number in the order introduced during the meeting. For example, AOCs presented during the 107th ATPAC meeting will be numbered AOC 107-1, AOC 107-2, etc. Recommendations will be numbered sequentially under the AOC from which they stem.
13. **AGENDA ITEMS:**
- a. When an AOC is adopted or adopted with modification by the FAA, ATPAC may still have an interest in the subsequent actions related to the closed AOC. When this occurs, the subject AOC will become an Agenda item. Agenda item updates will be provided/scheduled by FAA as progress occurs.
  - b. An Item of Interest may be identified as an Agenda Item to enhance the awareness of ATPAC members. Members may suggest Agenda Items to the Chairperson. Briefings or updates on Agenda Items will be scheduled at the discretion of the Executive Director, based on the availability of FAA or industry subject matter experts. Areas of interest may include research projects or programs whose outcome may influence existing or future air traffic procedures, airport or airspace capacity and efficiency or other aviation enterprise safety improvements of interest to the Committee. Briefings often provide a dual benefit, such as:
    - i. Information related to ATPAC deliberations on the modification, elimination, or creation of air traffic procedures through technology or procedural improvements, and
    - ii. Feedback to the researcher or program representative from the perspective of the expertise and background of ATPAC members.
  - c. A member may request or suggest facility tours as part of an ATPAC Meeting Agenda to introduce ATPAC members to new technology or procedures. A suggested tour may form the basis of a future meeting venue.



# Visual Glare Reports Related to Solar Plant Reflection

February 2015

ATPAC, Washington DC



**Linda Connell**

NASA ASRS Program Director  
NASA Ames Research Center

**AVIATION SAFETY  
REPORTING SYSTEM**



# Pilot Reports: Visual Glare from Solar Plant Reflection



# Solar Array Inflight Visibility Glare

- **First report received at ASRS in August 2013**
- **Total of 9 reports have been received**

## **Characteristics of Reported Information**

- **Pilots Flying Various Aircraft**  
**Commercial, Corporate, and General Aviation**
- **Range of Altitudes Experienced Visual Glare**  
**Surface to 18,000 ft**
- **Distance Circle from Solar Array Plant**  
**Approximately 20 nautical miles**



**Mooney 20J**  
10,000 MSL Cruise  
Approaching WHIGG  
Intersection on V-21

**Mooney 20J**  
8,600 MSL Climbing  
near BOACH  
Intersection – 11 NM  
from the plant

**Sail Plane**  
0 AGL – 12,000 MSL  
Pilot all around plant

**B737**  
FL180 LAS SHEAD 8  
RNAV Departure -  
MINEY intersection  
through 20nm East of  
SHEAD

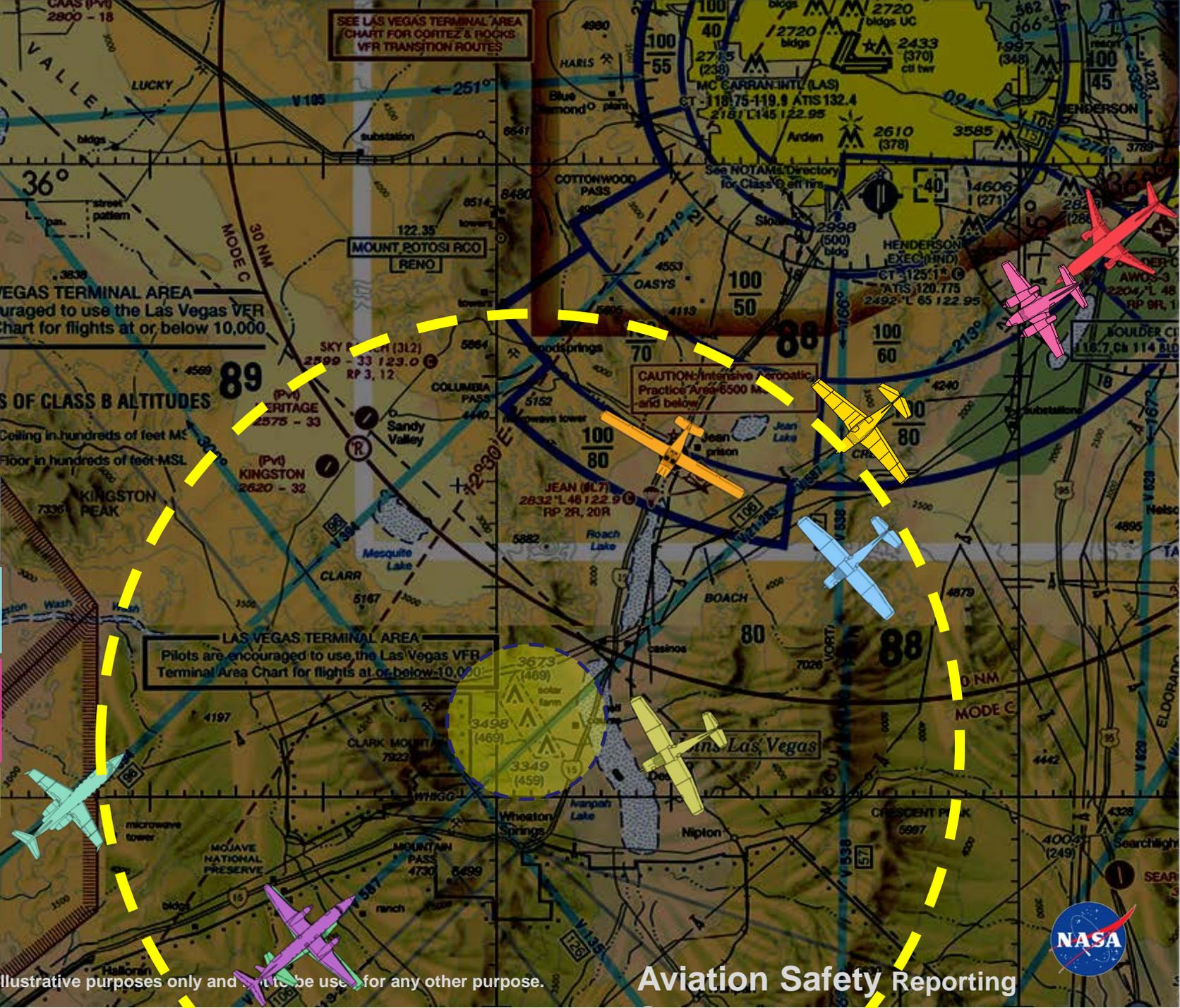
**Beech 1900**  
10,000 MSL CRESO3  
LAS Arrival

**Small Aircraft**  
12,000 MSL Cruise  
Vectored off of V-538  
Direct to HEC VOR

**Light Transport**  
13,000 MSL LAS  
KEPEC3 Arrival Over  
CLARR Intersection

**Small Transport**  
6,000 – 12,000 MSL  
BVU Departure -  
J60/V12 southwest of  
NATEE Intersection

**Cessna**  
9,500 MSL Cruise



This graphic is for illustrative purposes only and should not be used for any other purpose.

Aviation Safety Reporting



**Mooney 20J**  
10,000 MSL Cruise  
Approaching WHIGG  
Intersection on V-21

**Mooney 20J**  
8,600 MSL Climbing  
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Intersection – 11 NM  
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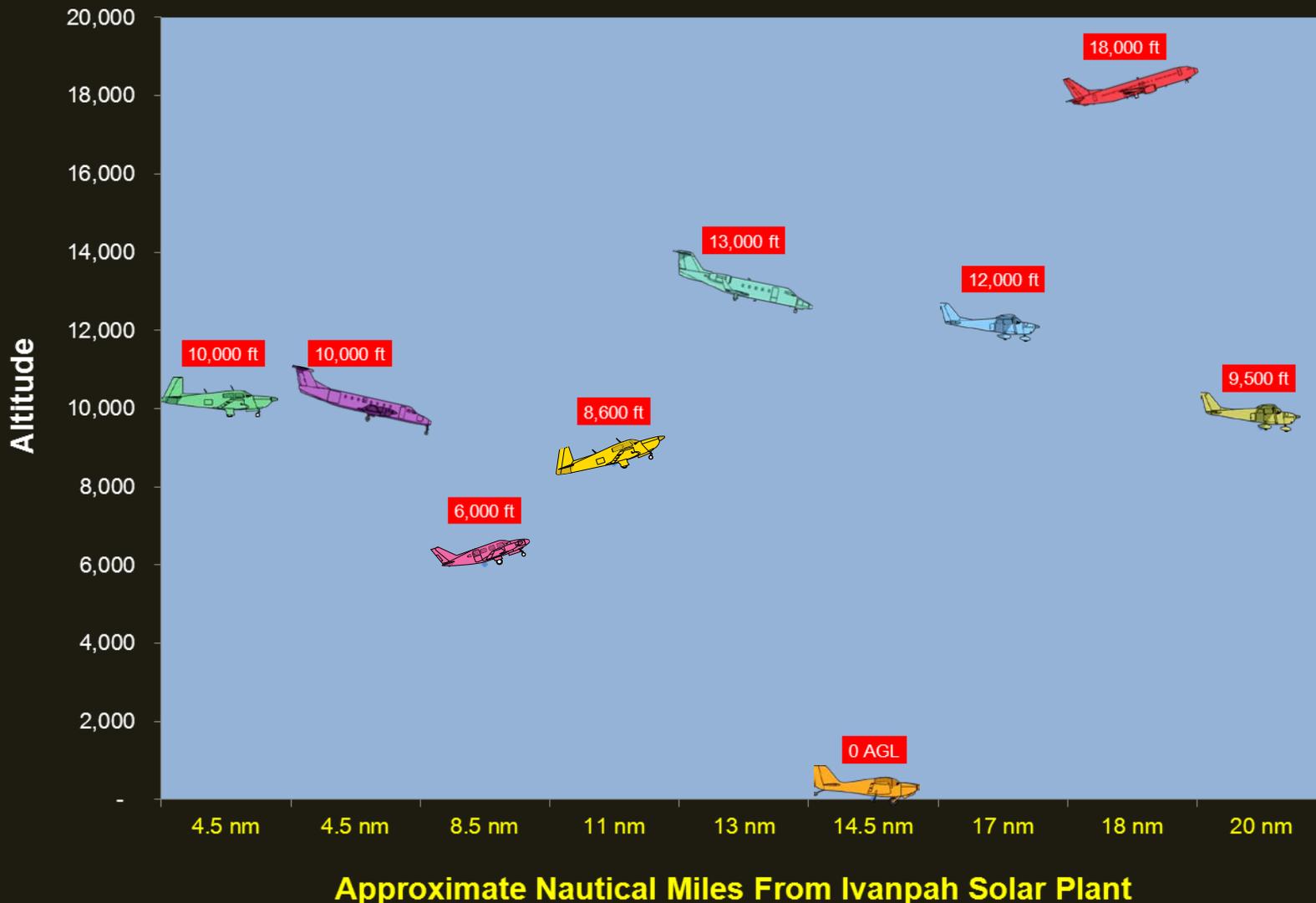


This graphic is for illustrative purposes only and not to be used for any other purpose.

Aviation Safety Reporting



# Reported Altitudes and Nautical Miles from Solar Plant



This graphic is for illustrative purposes only and not to be used for any other purpose.

Aviation Safety Reporting

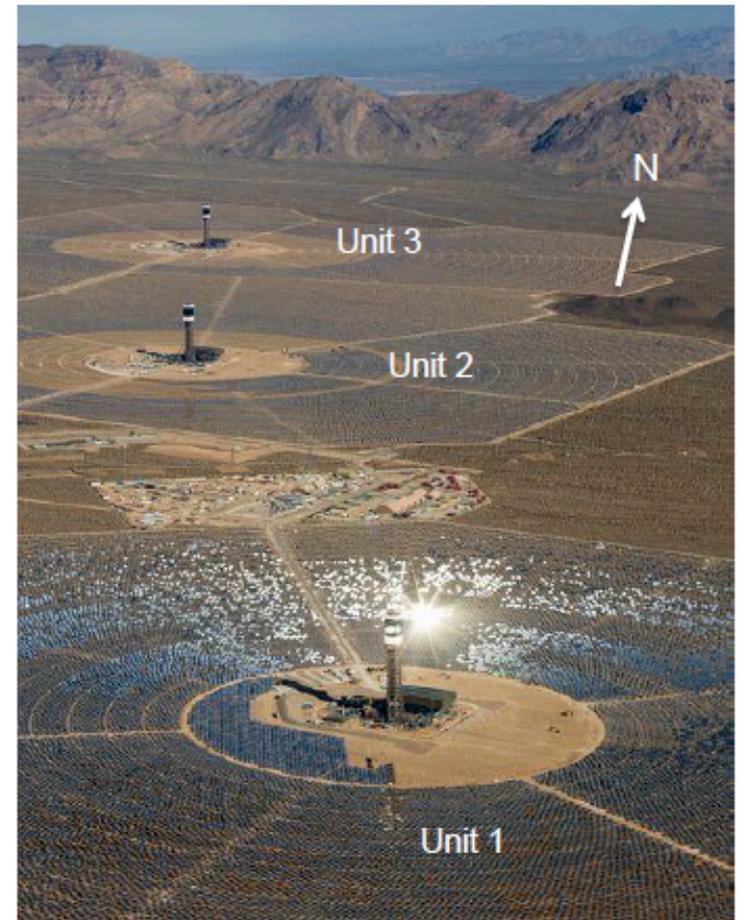
# Aerial Glare

April 24, 2014  
9:15 – 10:30 AM PDT



# Ivanpah Solar Electric Generating System

- Three power tower units  
(377 MW (net) / 392 MW (gross))
  - Unit 1: 126 MW
  - Unit 2: 133 MW
  - Unit 3: 133 MW
  - Each tower 140 m (459 ft) tall
- 173,500 heliostats
  - 2 mirrors/heliostat: 15.2 m<sup>2</sup>
- Direct steam receiver (22 m tall x 17 m wide + ~16 m of white shielding)
- Dry-cooling
- 14.2 km<sup>2</sup> (3500 acres) on public desert land in southern California
- Owners: NRG Energy, Google, and Brightsource Energy



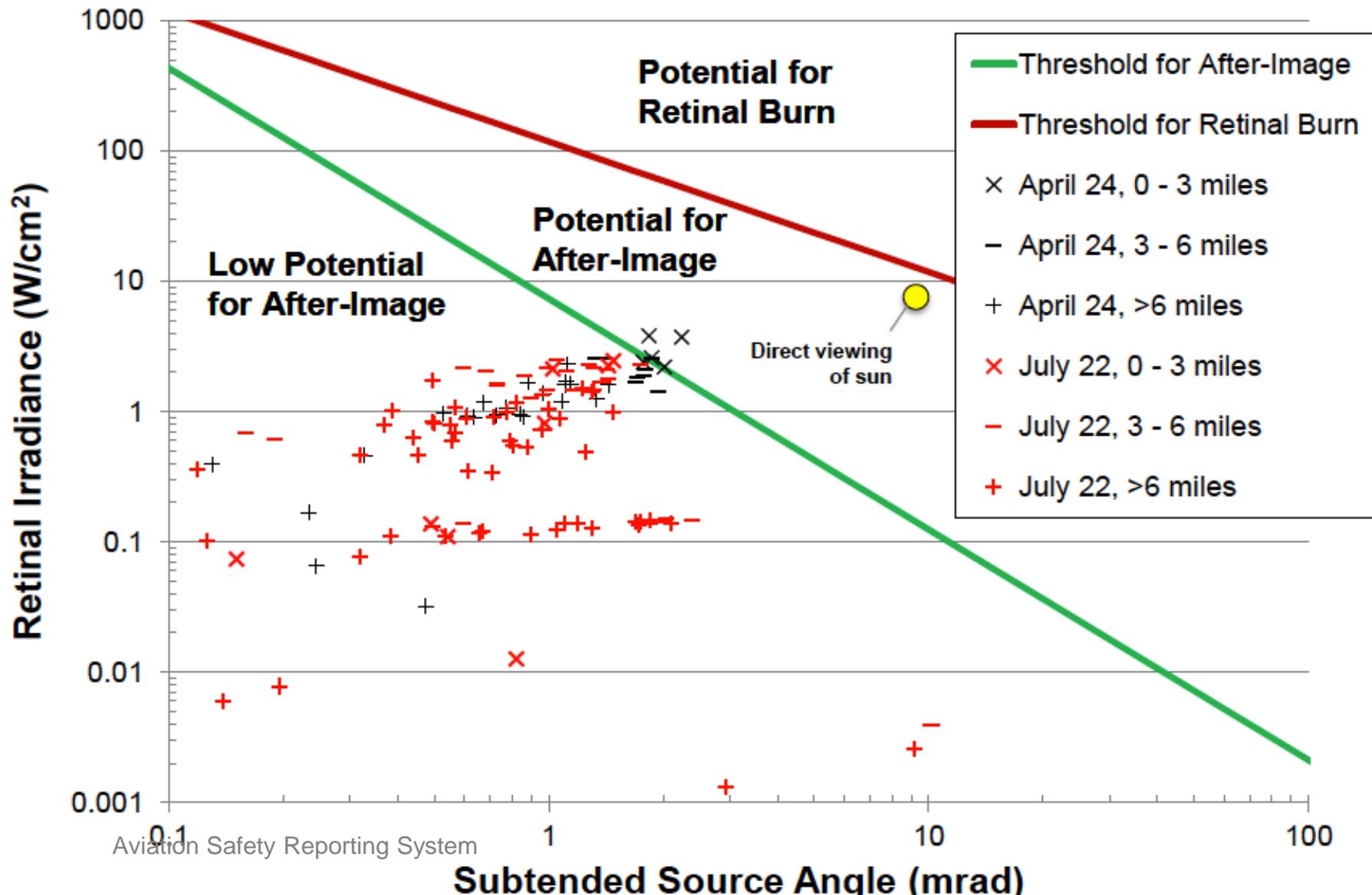
# Heliostats Reflective Panels



# Reports of Glare

- ACN: 1109473 (March 10, 2014)
  - “At its brightest neither the pilot nor co-pilot could look in that direction due to the intense brightness. From the pilot’s seat of my aircraft the brightness was like looking into the sun... In my opinion the reflection from these mirrors was a hazard to flight because for a brief time I could not scan the sky in that direction to look for other aircraft.”
- ACN: 1108698 (March 10, 2014)
  - “Daily, during the late morning and early afternoon hours we get complaints from pilots of aircraft flying from the northeast to the southwest about the brightness of this solar farm.”
- ACN: 1156120 (April 16, 2014)
  - “While on the KEPEC3 arrival into LAS we were temporary blinded by bright lights (reflections) from the ground. These reflections, coming from the new solar power station were so bright that any attempt to look outside the plane was met with pain and temporary blindness even when looking back inside.”

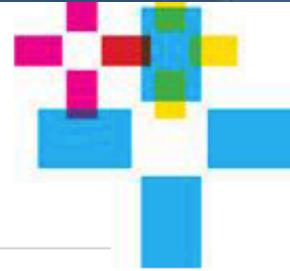
# Ocular Hazard Analysis



# Summary of Glare Monitoring

- Aerial Monitoring
  - Heliostats in standby mode can cause glare to aerial observers (pilots)
  - Glare from heliostats can cause after-image at far distances (up to 6 miles in our helicopter surveys)
  - Glare was visible from multiple heliostats in standby mode
  - The glare from the illuminated receiver was small compared to the glare from the standby heliostats
- Ground Monitoring
  - Drive-by surveys at three different times of the day did not reveal any ocular hazards
  - All data from receiver glare showed a low potential for after-image





# Adaptive Management Strategy

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- Ivanpah heliostats in the standby position are the remaining source of glare at the site and only affect aviation.
- Heliostats are individually programmable and heliostat positioning is adaptable through software.
- Software upgrades have reduced the glare as quantitatively measured by Sandia Labs.
- Further reductions are planned and Ivanpah continues to develop algorithms to decrease the glare from the facility.

# Suggested Corrective Measures

- Limit the number of heliostats in standby mode
  - Predict need for standby heliostats based on cloud cover or other factors
  - Position heliostats in standby to reflect light either vertically upward or toward the ground (minimize slew time)
  - Bring heliostats up to standby position near receiver sequentially only as needed
- Incorporate a glare shield near the receiver for heliostats in standby mode
  - Perhaps the shield can serve as a preheater for the water
- Increase the number of aim points near the receiver during standby and have adjacent heliostats point to different locations to disperse the visible glare

# Points of Contact

- **FAA ZLA-530, Los Angeles ARTC Center**  
**MacLean, Rex** ([Rex.MacLean@faa.gov](mailto:Rex.MacLean@faa.gov))  
**Pool, Kevin** ([kevin.pool@faa.gov](mailto:kevin.pool@faa.gov))
- **California Energy Commission (CEC)**  
**Adams, Jim** ([Jim.Adams@energy.ca.gov](mailto:Jim.Adams@energy.ca.gov))
- **NRG Energy**  
**Davis, Doug** ([Doug.Davis@NRGEnergy.com](mailto:Doug.Davis@NRGEnergy.com))  
Environmental Specialist III Ivanpah Solar Thermal
- **Sandia National Lab**  
**Ho, Clifford K** ([ckho@sandia.gov](mailto:ckho@sandia.gov))



# Contact Information

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Aviation Safety Reporting System





## AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

### AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

X Area of Concern → Safety Item?  Yes  No

Agenda Item

For Admin Use Only

AOC Number: AOC-

Date: \_\_\_\_\_

Recommendation

Number: R-\_\_\_\_\_

**SUBJECT: Cancellation of Takeoff Clearance “Phraseology”...JO7110.65 para: 3-9-10**

**DISCUSSION:** During a recent data search for information regarding “Rejected Take-off” reports identifying user confusion with the subject phraseology surfaced. The attached reports are not all inclusive but are a representative sample of the concerns reported to the NASA/ASRS program.

**SUGGESTED ATPAC ACTION:** Discuss the subject and present a draft definition to the FAA for coordination.

Sponsor: Harvey Hartmann

Name (Print)

NASA/ASRS

Organization

# Sample Reports

**ACN: 933677**

### **Narrative: 1**

We were cleared for take off from 19L. At approximately 90 KTS, the Tower said, "(Company flight number), cancel takeoff clearance." Another aircraft which was waiting for takeoff clearance on 19R transmitted something (frequency congestion). The Captain asked the Tower to confirm the takeoff clearance. The Tower replied, "Continue with takeoff." We continued the takeoff normally. After rotation, we noticed an Airbus had either departed or initiated a go-around from 25L. We crossed under the flight path of the Airbus by approximately 1000 FT. We did not receive a TCAS alert. We do not believe there was a loss of separation.

### **Narrative: 2**

The LAS Tower cleared us for takeoff on Runway 19L. Passing 95 KTS, the Tower sounded like they said for us to cancel our takeoff clearance. Being a full flight and passing 95 KTS, I was not sure of their instructions and another aircraft started talking. At that point, I did not see any reason to abort at such a high speed. Afterward, I asked what they wanted us to do and the Tower replied to continue our takeoff. Another aircraft on 25L apparently went missed approach. The flight continued and separation was maintained by both aircraft and ATC. The flight was completed without further incident.

### **Synopsis**

Air Carrier departure from LAS described a confused takeoff cancellation instruction from the Tower after reaching 95 knots, the reporter indicating the Tower's clearance was less than clear.

**ACN: 913294**

### **Narrative: 1**

The First Officer was making the takeoff on Runway 7L. Everything was normal until about 100 KTS [when] the Tower called "Air Carrier X cancel your takeoff clearance." It took a second to realize what he meant but I took command and aborted the takeoff. We came to a complete stop. I made announcements and we exited the runway. As we stopped we saw a blue and white Cessna, not sure of type, across the line at E7 Taxiway. The Tower and been trying to call him but no response. He did a 180 in front of us and taxied back to E6. We exited behind him and across the runway to return to takeoff. We had to check our fuel and wait for brakes to cool. Highest brake temp was around 430C. We contacted Dispatch but we still had the legal takeoff fuel when the brakes cooled so we departed for our destination. It appears the Cessna was attempting to cross Runway 7L without clearance or he was lost. We didn't notice him until we were at the taxiway due to line up of jets to that point on taxiway. The only problem I had was the Tower using the phrase, "cancel your takeoff clearance". I believe at that point in the takeoff they should have used a more urgent phrase like, "abort" or "reject your takeoff". The few seconds delay in understanding what he wanted could have been a problem if the Cessna had entered the runway. The Cessna was either on Ground or the wrong frequency but I don't know what could have been done to avoid that problem.

### **Synopsis**

Air Carrier on takeoff roll from PHX at approximately 100 KTS was instructed by the Tower to cancel takeoff clearance because of a runway incursion downfield, the reporter suggesting more urgent ATC phraseology be used such as "abort" or "reject takeoff" in these types of events.

**ACN: 880902**

### **Narrative: 1**

Aircraft Y was cleared to land Runway 12R. Aircraft X was cleared for take-off Runway 7, without delay. Aircraft Y did a very short approach and Aircraft X was immediately told to 'cancel takeoff clearance (He hadn't yet turn onto the runway) and to taxi across Runway 7, hold short of Runway 12R.' Aircraft X did not respond and continued to line up for a Runway 7 departure. Aircraft X was told to 'hold position, STOP.' Aircraft X failed to respond and departed Runway 7. Aircraft Y initiated a go-around for Runway 12R. The pilot of Aircraft X later said that he did not hear any instruction after his take-off clearance.

### **Synopsis**

When an arrival makes a shorter approach than expected, the VGT Tower Controller cancelled takeoff clearance for an aircraft departing a crossing runway. The departing aircraft failed to respond and departed, resulting in the arrival aircraft going around.

**ACN: 871437**

### **Narrative: 1**

We were departing Runway 19R and landing Runway 25L in the very beginning of a departure and arrival push. I cleared Aircraft X off of Runway 19R, and then I taxied Aircraft Y into position and hold on Runway 19R. I specifically remember seeing Aircraft X going through Taxiway Mike then I looked back to see Aircraft Y who was still taking the runway and not yet in position and I cleared him for takeoff. As I was scanning Runway 19R I heard the CIC yell that Aircraft X had aborted his take off. I told Aircraft X to turn right on Taxiway Sierra and turn right on Taxiway Romeo and hold short of Runway 25L and told Aircraft Y to cancel his takeoff clearance. Aircraft X asked what the instructions were, I repeated them. Aircraft Y asked to clarify that I aborted his takeoff clearance. I said, "Aircraft Y, affirmative, cancel your takeoff clearance." He read it back. I asked Aircraft X for a reason for the aborted takeoff. He responded that it was because of an Engine Indicator Light. I have no idea how much time elapsed before the pilot decided to abort his takeoff and the time it took us to notice that he aborted his takeoff. When I looked at him going past Taxiway Mike he was going very fast and I was under the impression that he had either already started rotating, or was about to, which is why I cleared the next aircraft for takeoff. I have to wonder why the pilot himself didn't tell me that he aborted his takeoff. The only recommendation I can think of is having pilots that abort their takeoff rolls tell the controller sooner.

### **Synopsis**

A MKE Local Controller cleared a second aircraft for takeoff not observing the preceding aircraft on the same runway aborting takeoff.

**ACN: 837364**

### **Narrative: 1**

We were cleared for takeoff by Tower. After starting the takeoff roll (my takeoff) we heard a partial radio transmission about aborting a takeoff. At this time the power was set. I said, "What did he just say?" The Captain only heard part of the transmission also. The Captain asked ATC. Tower replied, "Abort your takeoff if you can do so safely." The Captain immediately took control of the aircraft and accomplished our RTO procedure. We accelerated to about 70 KTS. After clearing the runway I asked Tower, "What was that all about?" They said they tried to cancel our takeoff clearance before we started our roll but we didn't respond. The Captain later called Tower on the phone and they said there was a traffic conflict at a near by airport that caused them to have to cancel our takeoff clearance. As a note: We were both wearing noise cancelling headsets, but in order to hear each other, we still have to have one ear uncovered. This obviously compromises the noise cancelling capabilities. I truly believe that if we had a hot mic interphone we could wear the headsets the way they were intended to be worn covering both ears and increasing our capability of hearing VHF radio transmissions much more clearly.

### **Synopsis**

B737 First Officer reports missed instruction to cancel takeoff prior to and during takeoff roll. Reporter believes noise canceling headsets with one ear uncovered for cockpit communication is the reason for the missed communication.

**ACN: 802892**

**Narrative: 1**

FROM A STATIC TKOF AT THE TKOF POS TWR CLRED US FOR TKOF. AT APPROX 50 KTS AND ABEAM TXWY M TWR XMITTED 'ACR X CANCEL YOUR TKOF CLRNC.' CAPT (PLT MONITORING) XMITTED, 'NEGATIVE, WE'VE BEGUN OUR TKOF ROLL.' TWR THEN DIRECTS AN ACR Y RJ ON ABOUT A 2 MI FINAL FOR XING RWY TO GO AROUND. ON DEP TWR DIRECTED US TO CONTACT THEM REGARDING 'POSSIBLE PLTDEV.' PLTS OF ACR X CONTEND THAT TKOF ROLL WAS COMMENCED (TKOF MANEUVER WAS IN PROGRESS), IF TWR WANTED US TO 'ABORT' TKOF, THAT COMMAND SHOULD HAVE BEEN ISSUED FOR THAT PHASE OF 'FLT.' TKOF CLRNC WAS GIVEN AND RECEIVED AND COMMENCED. A SAFETY OF FLT ISSUE WAS A CONCERN WHEREAS WE WERE APCHING THE SPD AT WHICH THE RTO FEATURE WOULD ACTIVATE AT THROTTLE REDUCTION. IT SHOULD BE NOTED WE WERE WITHIN APPROX 8000 LBS OF OUR MAX ALLOWABLE TKOF WT. THIS IS A FLT OPS ISSUE VERSUS CTLR TIMING OF A LNDG CLRNC GIVEN FOR TFC ON XING RWY AND TKOF CLRNC OUR RWY. PLTS OF ACR X FLT DID HAVE THE TFC IN SIGHT. VISIBILITY WAS UNLIMITED. SUPPLEMENTAL INFO FROM ACN 802888: I SET TKOF PWR, TKOF ROLL COMMENCED. SHORTLY INTO TKOF ROLL, THE SAME TWR CTLR STATES 'ACR X TKOF CLRNC CANCELED.' CAPT RESPONDS 'NEGATIVE WE'VE BEGUN OUR TKOF ROLL,' I HAD REDUCED PWR SLIGHTLY AWAITING THE CAPT'S INPUT AND HE INDICATED TO CONTINUE THE TKOF. FULL PWR REESTABLISHED AND TKOF CONTINUED.

**Synopsis**

ACR ON TKOF ROLL ELECTS NOT TO COMPLY WITH TWR CLRNC TO CANCEL TKOF CLRNC, XING RWY ARR IS ISSUED GAR.

**ACN: 747557**

### **Narrative: 1**

WE WERE CLRED INTO POS AND TOLD TO HOLD BY TWR ON RWY 15. WE WERE ADVISED OF A 3 MIN DELAY FOR SPACING BY BUR TWR. AFTER ABOUT 2 MINS, TWR CLRED US FOR TKOF WITH NO DELAY, TFC 4 MI FINAL. WE IMMEDIATELY ADVANCED THE THRUST LEVERS AND STARTED THE TKOF ROLL. AFTER 5-7 SECONDS, TWR AGAIN ADVISED US, 'NO DELAY -- START THE ROLL.' OUR SPD ON THIS SECOND CALL WAS ABOUT 60 KTS. PAST 100 KIAS BUT PRIOR TO V1, ESTIMATE 105-110 KTS, TWR USED THE FOLLOWING VERBIAGE (NORMAL TONE OF VOICE, NO URGENCY), 'COMPANY FLT NUMBER, PAUSE, UNH, CANCEL TKOF CLRNC.' I INITIATED THE REJECT AT THE SAME TIME THE FO CALLED, 'ABORT.' REACTION TIME ESTIMATED AT 1-1.5 SECONDS. WHILE WE WERE IN THE MIDDLE OF THE REJECT WE SAW ANOTHER CARRIER'S AIRBUS TOUCHING DOWN ON RWY 8. WE STOPPED ADJACENT TO A4 AS THE AIRBUS WENT PAST. WE CLRED THE RWY AFTER ACCOMPLISHING OUR PROCS AND WAITED OUT OUR BRAKE COOLING TIME. ATC SHOULD HAVE SENT THE ACFT IN THE APCH AROUND INSTEAD OF HAVING THE ACFT ON THE GND PERFORM A RISKY HIGH SPD REJECT. CALLBACK CONVERSATION WITH RPTR REVEALED THE FOLLOWING INFO: THE REPORTER WAS SO INVOLVED AFTER THE INCIDENT WITH TALKING TO THE PASSENGERS AND COORDINATING WITH THE COMPANY THAT HE FAILED TO GET AN EXPLANATION FROM THE TOWER AS TO WHAT CAUSED THE INCIDENT. BUILDINGS TO THE RIGHT OF RWY 15 AT BUR MAKE IT IMPOSSIBLE FOR THE FLT CREW TO CLEAR THE APPROACH END OF RWY 8.

### **Synopsis**

B737 FLT CREW IS CLEARED FOR TKOF ON RWY 15 BY BUR TOWER WHO THEN CANCELS TKOF CLEARANCE AT 105 KNOTS. ACFT STOPS ABEAM A4 AS LANDING A320 ROLLS THROUGH INTERSECTION ON RWY 8.

**ACN: 680507**

**Narrative: 1**

AFTER BEING CLRED 'POS AND HOLD' ON RWY 18L, AN ACFT CLRING RWY 18R WAS TOLD TO HOLD SHORT OF RWY 18L. HE DID NOT GIVE THE CORRECT RESPONSE TO THE TWR AND THERE WERE 3-4 RADIO XMISSIONS BTWN THEM. PRIOR TO THIS, WE HAD BEEN CLRED FOR TKOF ON RWY 18L. THE FO HAD CALLED '80 KTS' AND WE BOTH HEARD A 'TKOF CLRNC CANCELED' RADIO CALL BUT HEARD NO CALL SIGN WITH IT. (THE TWR WAS CTLING BOTH SIDES OF THE ARPT USING SEPARATE FREQS). I WAS WATCHING THE AIRPLANE TO MAKE SURE HE WAS INDEED HOLDING SHORT OF OUR RWY AND MADE A COMMENT TO THAT EFFECT. AFTER TKOF, THE TWR CALLED US FOR A RADIO CHK AND TOLD US 'I HAD CANCELED YOUR TKOF CLRNC AND I WAS TRYING TO GET A HOLD OF YOU SEVERAL TIMES.' HE THEN SENT US TO DEP CTL WITHOUT FURTHER COMMENT. SUPPLEMENTAL INFO FROM ACN 680506: I DID HEAR SOMETIME DURING THE ROLL, AFTER 80 KTS, A CALL TO CANCEL TKOF CLRNC. I DID NOT HEAR OUR CALL SIGN. FRANKLY, I THINK I DISMISSED THIS BECAUSE I DID NOT HEAR OUR CALL SIGN OR THE TWR HAD NO URGENCY IN HIS VOICE AND WE WERE ALREADY GOING FAST ENOUGH THAT I WOULD EXPECT TO HEAR THE WORDS 'ABORT' OR 'REJECT.' A CALM VOICE SAYING, 'CANCEL TKOF CLRNC' JUST DOES NOT REGISTER, IN A HIGH SPD, HIGH NOISE ACFT. 'ABORT, ABORT' WOULD HAVE BEEN AN APPROPRIATE TWR CALL DURING THIS NOISY VERY BUSY TIME IN THE COCKPIT.

**Synopsis**

A320 DEP FROM MCO FAILED TO CANCEL TKOF AS INSTRUCTED BY ATC BECAUSE OF UNCERTAINTY AS TO ATC INTENTIONS.

**ACN: 671726**

### **Narrative: 1**

TWR CLRED US FOR TKOF. WE HAD BEEN HOLDING SHORT. I APPLIED NORMAL PWR AND WE MADE THE TURN AND COMPLETED ALL CHKLIST ITEMS AND EXECUTED A NORMAL ROLLING TKOF. AT TKOF PWR, AROUND 60 KTS, TWR CALLED AND ASKED, 'XX XXXX CAN YOU TURN OFF OF THE RWY?' AT THIS CALL, I PULLED THE PWR BACK, WONDERING WHETHER WE HAD INADVERTENTLY BEGUN THE TKOF ROLL WITHOUT CLRNC AND IN CONFLICT WITH LNDG TFC. TWR THEN SENT THE LNDG ACFT AROUND, THEN TOLD US TO CONTINUE. INSTEAD, I TURNED OFF THE RWY AS WE'D USED UP A SIGNIFICANT PART OF THE AVAILABLE RWY AND HAD PWR AT IDLE. I CALLED TWR ONCE WE WERE CLR AND SAID, 'CONFIRM XX XXXX WAS CLRED FOR TKOF.' TWR CONFIRMED WE WERE CLRED, BUT WERE TOO SLOW SO HE WAS ASKING US TO EXIT THE RWY. I EXPECT TO HEAR ONLY 2 THINGS ON THE RWY: EITHER 'CLRED FOR TKOF' OR 'CANCEL TKOF CLRNC, TAXI OFF THE RWY.' 'CAN YOU TURN OFF THE RWY?' IS CONFUSING, AMBIGUOUS AND HAZARDOUS TO NORMAL DECISION-MAKING AT FULL PWR DURING TKOF ROLL. 'ABORT' WOULD HAVE MADE SENSE, BUT WITH TKOF CLRNC, I WOULDN'T EXPECT TO BE TOLD TO ABORT AND CLR THE RWY FOR A LNDG ACFT. WE RE-ENTERED THE TKOF LINE-UP AND THE EXACT SAME THING HAPPENED. WE WERE CLRED FOR TKOF, EXECUTED A ROLLING TKOF AND THE TWR SAID ONCE AGAIN, WHEN WE WERE AT FULL PWR AND ROLLING THROUGH 60 KTS, 'XX XXXX, YOU'RE TOO SLOW, CAN YOU TURN OFF OF THE RWY?' I TOLD THE FO TO NOT ANSWER THE CALL AND TO CONTINUE UNLESS WE WERE INSTRUCTED TO ABORT. THIS CLT INCIDENT -- REPEATED A SECOND TIME -- IS DANGEROUS, NONSTANDARD, AND FRUITFUL GROUND FOR A RWY EXCURSION OR WORSE. I DO NOT UNDERSTAND HOW A TWR CTLR CAN ISSUE SUCH REQUESTS AT A CRUCIAL TIME, PLUS, I QUESTION HIS BASIC OPERATING PREMISES IF ACFT IN POS AND ROLLING CAN BE EXPECTED TO EXIT THE RWY DURING TKOF ROLL IF SEPARATION WITH A LNDG ACFT BECOMES INSUFFICIENT. THAT THIS HAPPENED TWICE IS VERY DISTURBING.

### **Synopsis**

MD80 DEP FROM CLT IS REQUESTED TO 'TURN OFF THE RWY' TWICE BECAUSE OF ARR SPACING, TWR SUGGESTING FLT CREW'S TKOF ACTIONS WERE TOO SLOW.

**ACN: 617213**

**Narrative: 1**

WHEN WE WERE CLRED IN 'POS AND HOLD' THE R SEAT PLT POINTED OUT A JET WHICH APPEARED TO BE ON A BASE LEG FOR THE RWY. THE TWR TOLD US THERE WAS TFC ON DOWNWIND AND BE READY FOR AN IMMEDIATE TAKEOFF CLRNC. UPON ISSUANCE OF THE TAKEOFF CLRNC, THROTTLES WERE ADVANCED AND BRAKES RELEASED. AS WE CONTINUED, HE CALLED AIRSPEED ALIVE AND 80 KNOTS. AT THAT TIME, I TOOK THE YOKE. I CONTINUED TO LOOK OUTSIDE WAITING FOR THE V1 CALL AT 96 KNOTS. I HEARD THE CTLR SAY A CALL SIGN AND THEN THE WORDS, 'CANCEL TAKEOFF CLRNC.' I REMEMBER THINKING THERE WASN'T ENOUGH ROOM. THE CTL TWR HAD NO SOONER ISSUED THE INSTRUCTION THAN I HEARD THE R SEAT PLT SAY 'CONTINUE V1.' THIS IS NOT A NORMAL CALL FOR V1 AND THAT IS WHEN I REALIZED THE CTL TWR HAD TRIED TO CANCEL OUR TAKEOFF CLRNC. THE TAKEOFF WAS CONTINUED. IMMEDIATELY AFTER LIFTOFF, THE CTL TWR TOLD US TO TURN R 20 DEGS. AT ABOUT 200 FT AGL I COMPLIED. THE CTL TWR THEN TOLD US TO TURN R AND ENTER DOWNWIND FOR THE TFC PATTERN TO THE RWY. WE QUESTIONED THIS DIRECTIVE AS WE BEGAN A TURN TO THE R TO COMPLY. A SECOND TIME, THE CTL TWR TOLD US TO ENTER THE DOWNWIND FOR THE RWY. I CONTINUED THE TURN AS DIRECTED, BUT SOON AFTER, THE CTL TWR TOLD US TO CONTACT DEP CTL. AT THAT TIME WE WERE TURNING THROUGH A 290 HDG WHICH SENT US INTO THE ARRIVAL PATH OF ACFT AT TEB OVER-FLYING THE ARPT FOR THE L DOWNWIND ENTRY TO RWY 24. THE DEP CTLR TOLD US TO TURN BACK IMMEDIATELY TO THE NORMAL 240 DEP HDG. HE WAS UNHAPPY WITH OUR POS AND DIRECTION OF FLT. I CONTINUED THE TAKEOFF ROLL BECAUSE I THOUGHT IT WAS SAFER THAN A HIGH SPD ABORT AFTER V1. I HAD A CLR RWY AND NO VISIBLE RESTR TO A SUCCESSFUL ROTATION. THERE WERE NO OTHER CROSSING RWYS. ALL TFC WAS USING THE SAME RWY FOR ARRS AND DEPS. IN THE FUTURE, I ANTICIPATE CONTINUING A TAKEOFF UNLESS I RECEIVE EXTRAORDINARY INFO FROM THE TWR SUCH AS 'YOUR TAIL FELL OFF.' MERELY CANCELING A TAKEOFF CLRNC IS INSUFFICIENT INFO FOR A PLT TO ABORT AT THOSE HIGHER SPDS. I DON'T REMEMBER HEARING HER DIRECT A 'GO AROUND' TO THE ARRIVING ACFT, BUT I ASSUME THAT WAS THE REASON SHE ATTEMPTED TO STOP OUR TAKEOFF ROLL. I DO NOT UNDERSTAND WHY SHE DIRECTED US TO ENTER A TFC PATTERN FOR THE RWY. IT MADE NO OP SENSE FOR US TO RETURN TO LAND, BUT WE DID COMPLY WITH HER INSTRUCTIONS. PERHAPS THE CONFUSION OF THE SIT CAUSED HER TO TELL US TO ENTER A DOWNWIND (TWICE) WHEN SHE MEANT TO ADDRESS THE OTHER AIRPLANE. IT MAY HAVE BEEN PRUDENT TO REFUSE THE 'TAXI INTO POS AND HOLD' CLRNC WHEN WE SPOTTED AN AIRPLANE ON BASE, BUT THIS TYPE OF CLOSELY SPACED OP IS NORMAL AT BUSY ARPTS IN TODAY'S SYSTEM. THIS CANNOT BE THE FIRST TIME ATC HAD A 'GO AROUND,' AND HAVE IT OCCUR AS A DEPARTING ACFT IS IN THE MIDST OF A TAKEOFF ROLL AND CLB. SUPPLEMENTAL INFO FROM ACN 617530: THE TWR CTLR SAID 'FALCON XYZ TAKEOFF CLRNC CANCELED.' OUR V1 SPD WAS 96 KTS. BY THE TIME I WAS ABLE TO PROCESS HER INSTRUCTIONS WE WERE VERY CLOSE TO V1. THE FLYING PLT STARTED TO RESPOND TO THIS INSTRUCTION. FOR THIS REASON IN THE SAME BREATH I CALLED 'CONTINUE V1.' AT 112 KTS I CALL 'ROTATE.' WE WERE PERHAPS 20 TO 50 FT OFF THE RWY WHEN TWR AGAIN SAID 'FALCON XYZ,

TAKEOFF CLRNC CANCELED.' AT THIS TIME I WAS CHKING TCAS. I SAW NOTHING ON TCAS OR VISUALLY. SHORTLY AFTER THIS, THE TWR CTLR SAID, 'FALCON XYZ, CONTINUE R TURN ENTER R DOWNWIND FOR RWY 24.' THIS INSTRUCTION DIDN'T MAKE ANY SENSE TO US AT THE TIME. 'FALCON XYZ, IS DEPARTING THE ARPT.' THE TWR CTLR SAID 'CONTACT DEP.' THE DEP CTLR IMMEDIATELY ASKED US WHERE WE WERE GOING. WE TOLD HIM THAT WE WERE ON A HDG THAT WAS COMPLYING WITH THE TWR CTLR'S INSTRUCTIONS. REGARDLESS OF WHAT CAUSED HER TO ISSUE THE CANCELLATION, I WAS FORCED TO MAKE THE CLASSIC GO, NO-GO DECISION RIGHT AT OR VERY NEAR V1. IF I HAD THIS TAKEOFF TO DO OVER AGAIN, I WOULD HAVE QUESTIONED THE TWR CTLR ON THE LOCATION OF THE ACFT THAT WAS CLRED TO LAND. SHE SAID ON DOWNWIND. IT LOOKED CLOSE TO ME AND I SHOULD HAVE FOLLOWED MY GUT FEELING AND DELAYED OUR LINEUP UNTIL AFTER HIS ARRIVAL. AT NO TIME DURING THE TAKEOFF OR

### **Synopsis**

F50 DEP FROM TEB IS ISSUED ABORT APCHING V1, FLT CREW ELECTS TO CONTINUE TKOF.

**ACN: 611819**

**Narrative: 1**

CLRED FOR TKOF ATL RWY 26L (TWR FREQ 119.5). DURING THE TKOF ROLL THE TWR CANCELED THE TKOF CLRNC. THE RESULT WAS A HIGH SPD ABORT. ESTIMATED AIRSPD WHEN THE TKOF WAS DISCONTINUED WAS 130 KTS. V1 WAS 140 KTS. FLT DELAYED WHILE BRAKES AND TIRES WERE COOLED AND INSPECTED BY MAINT. WHEN WE INQUIRED FOR THE REASON FOR THE ABORT, TWR INFORMED US THAT THEIR EQUIP SHOWED A CONFLICT NEAR TXWY B2. THE TERMINOLOGY USED TO DIRECT AN ABORT BY THE TWR IS NOT PLT FRIENDLY, IE, 'ACFT X CANCEL TKOF CLRNC.'

**Synopsis**

B737 EXPERIENCED ATC DIRECTED HIGH SPD ABORT AT ATL.

**ACN: 575065**

## **Narrative: 1**

WE WERE CLRED FOR TKOF ON RWY 31 AT BNA. I (CAPT) WAS FLYING THE LEG, AND I COMMENCED THE TKOF ROLL. MY FO SET THE THRUST LEVERS AND CALLED '0 KTS.' JUST AFTER HIS CALL, TWR, IN A VERY CASUAL MANNER, STATED 'COMPANY NUMBER, CANCEL YOUR TKOF CLRNC.' HERE LIES THE REASON FOR MY RPT. THERE WAS A NOTED LACK OF URGENCY IN TWR'S VOICE. IT ACTUALLY TOOK A SECOND OR TWO TO REGISTER THAT TWR WANTED ME TO REJECT THE TKOF. I INITIATED THE PROC AT 100 KTS, AND THE REJECTED TKOF FUNCTION WORKED FLAWLESSLY. WE CAME TO AN ABRUPT STOP ON THE CTRLINE OF RWY 31 PRIOR TO THE PARALLEL TXWY FOR RWY 2L. AS WE WERE STOPPING, AN ACFT (AN RJ, I BELIEVE) ROLLED ACROSS OUR RWY ON RWY 2L. MY CONCERN IS THE PHRASEOLOGY AND THE CASUAL NATURE OF TWR'S CALL. I WOULD EXPECT TO HEAR THE PHRASE 'CANCEL YOUR TKOF CLRNC' WHEN I AM ROLLING PAST THE HOLD SHORT, OR AT THE LATEST, JUST AFTER PUSHING THE THROTTLES UP. HOWEVER, I BELIEVE THAT IT WOULD BE HELPFUL IF TWR WOULD USE 'ABORT,' 'REJECT,' OR 'STOP' WHEN ADDRESSING AN ACFT HURLING DOWN THE RWY NEAR TKOF SPD. THIS SIT MAY VERY WELL HAVE BEEN A DISASTER, HAD WE NOT REJECTED THE TKOF, AND IN MY OPINION, TWR SHOULD HAVE BEEN MORE DIRECT IN COMMUNICATING THE URGENT NEED FOR ME TO STOP MY ACFT IMMEDIATELY. I SUSPECT, AND IT IS PURELY SPECULATION, THAT TWR DID NOT WANT THERE TO BE A SENSE OF URGENCY ON THE RADIO, KNOWING THAT THERE WOULD BE AN INVESTIGATION AFTER THEY HAD MADE A POTENTIALLY DISASTROUS ERROR IN CLRING US FOR TKOF AFTER HAVING CLRED AN ACFT TO LAND ON A XING RWY. IN THIS SIT, THERE NEEDED TO BE A SENSE OF URGENCY COMMUNICATED TO US. HAD WE HESITATED MUCH LONGER, WE MAY WELL HAVE STOPPED IN THAT INTXN RATHER THAN PRIOR TO IT. NOW, AS FOR WHAT I COULD HAVE DONE BETTER. AFTER CLRING THE RWY, I WAS THINKING THAT ONLY MINIMAL BRAKE COOLING WOULD BE REQUIRED, SO I TAXIED TOWARD RWY 31 AGAIN. MY FO COULD NOT FIND THE BRAKE COOLING PAGE, SO WE WERE AT RWY 31 HOLD SHORT BEFORE WE ARRIVED AT THE OPC SOLUTION, RECOMMENDING 24 MINS OF BRAKE COOLING. I ELECTED TO JUST STAY AT THE HOLD SHORT RATHER THAN TAXI BACK TO THE GATE. IN SO DOING, I LEFT THE PARKING BRAKE SET RATHER THAN GETTING CHOCKED AND RELEASING THE PARKING BRAKE. IN HINDSIGHT, IT SEEMS SO OBVIOUS, BUT AS I SAT THERE THAT EVENING REPLAYING THE EVENT IN MY MIND, IT NEVER OCCURRED TO ME THAT I NEEDED TO RELEASE THE PARKING BRAKE. A POSSIBLE SOLUTION: MAKE THE NOTE ON THE BRAKE COOLING PAGE READ, 'WAIT XX MINS WITH THE PARKING BRAKE RELEASED (YOU KNUCKLE HEAD) PRIOR TO ATTEMPTING ANOTHER TKOF.' I WILL DO BETTER NEXT TIME.

## **Synopsis**

BNA LCL CTRLR CANCELS B737 RWY 31 TKOF CLRNC. COMING TO A STOP, THE B737 OBSERVES A CARJ LNDG RWY 2L ROLLING THROUGH THE INTXN AT RWY 31. CAPT BELIEVES AGGRESSIVE PHRASEOLOGY SHOULD HAVE BEEN USED.

## ***AOC 141-2 CANCELLATION OF TAKEOFF CLEARANCE***

### **ATPAC 141**

From Pre-Read: No mention of topic.

From ATPAC 141 Minutes:

**AOC 141-2 Cancellation of Takeoff Clearance**. Committee members had read information on AOC in pre-read and agreed the AOC had merit. The members moved and seconded, Alpha and APA, the adoption of the new AOC.

### **ATPAC 142**

From Pre-Read:

**AOC 141-2 Cancellation of Takeoff Clearance “Phraseology”** During a recent data search for information regarding “Rejected Take-off” reports identifying user confusion with the subject phraseology surfaced. 7110.65 para 3-9-10. A draft definition to be written and presented to FAA for coordination. **Status: Members to ask their membership about issue.**

From Minutes:

**AOC 141-2 Cancellation of Takeoff Clearance “Phraseology”** During a recent data search for information regarding “Rejected Take-off” reports identifying user confusion with the subject phraseology surfaced. 7110.65 para 3-9-10. A draft definition to be written and presented to FAA for coordination. Status: Members to ask their constituents about issue. Call sign “Abort, Abort, Abort “, “Safety Alert”, “Stop Immediately”. Recommendation: Needs a sense of emergency with that phraseology.

- FAA human factors should solve this issue.
- Look in 7110.65 “Abort” phraseology history and reason it was changed.
- Use ICAO Phraseology.
- Contact Wilson, ALPHA, AOPA for member thoughts?

### **ATPAC 143**

From Pre-Read:

**AOC 141-2 Cancellation of Takeoff Clearance “Phraseology”** During a recent data search for information regarding “Rejected Take-off” reports identifying user confusion with the subject phraseology surfaced. 7110.65 para 3-9-10. A draft

definition to be written and presented to FAA for coordination. Status: Members to ask their membership about issue. AOC 141-2 – Gary contacted FAA human factors, Dino Piccione. Sent 7110.65 “Abort” history never changed. Canadian usage Not in ICAO ATM Doc 44444. Phraseology. Contact Wilson, ALPHA, AOPA what their members think? Cyndi Deyoe spoke with international group. Canada forwarded theirs.

**337.1**

If circumstances require, cancel a previously issued take-off clearance and, when appropriate, inform the aircraft of the reason. (P)(N)

**337.1 Phraseology**

*If a clearance to take off is cancelled:*

- A. *before the aircraft has started to roll —  
TAKE-OFF CLEARANCE CANCELLED;*
- B. *after the aircraft has started to roll —  
ABORT TAKEOFF.*

**337.1 Note:**

*An aborted takeoff is an emergency procedure employed in situations where to continue would present a grave hazard to the aircraft. A controller-initiated abort of takeoff should be viewed as an extreme measure to be used only where there is no clear alternate course of action.*

From Minutes:

**AOC 141-2 Cancellation of Takeoff Clearance “Phraseology”** During a recent data search for information regarding “Rejected Take-off” reports identifying user confusion with the subject phraseology surfaced. 7110.65 para 3-9-10. A draft definition to be written and presented to FAA for coordination. Status: Members to ask their constituents about issue. Call sign “Abort, Abort, Abort “, “Safety Alert”, “ Stop Immediately”. Recommendation: Needs a sense of emergency with that phraseology. Look in 7110.65 “Abort” phraseology history and reason it was changed, Use ICAO Phraseology, Contact Wilson, ALPHA, AOPA for member thoughts? ATPAC #143 All research completed and provided to ATPAC members in pre-read. Decision was human factors should solve this issue if it can be addressed. Moved by ALPA and seconded by NATCA ATPAC #143 AOC CLOSED.

# ATPAC 150

## AOC 148-02 Clearances Below Published Altitudes

Presented to: ATPAC

By: AJV-8 Air Traffic Procedures

Date: February 9, 2015



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Administration



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Administration

# Suggested ATPAC actions

- Clarify when ATC may clear an aircraft below charted minimums
- Update the AIM and if needed, the 7110.65



# Stipulations

- Controllers assume responsibility for terrain clearance when assigning altitudes below published approach altitudes
- Controllers must ensure aircraft are not cleared below the MVA or MIA in any area that will be traversed during the approach



# JO 7110.65

## 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

**NOTE- 1. The altitude assigned must assure IFR obstruction clearance** from the point at which the approach clearance is issued until 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...

# Questions?





# Test Signs and Markings Update

## Preliminary Data

Presented to: ATPAC  
By: David Swanson  
Date: February 10, 2015



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# Initial Data From Test Locations

## Current Test Sites

- ORD
- CLE
- BNA – Anticipated to begin early March



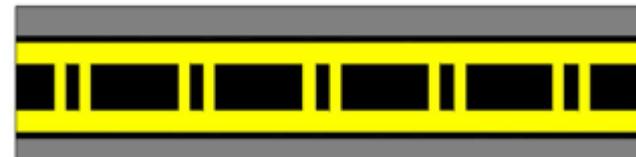
Stacking Display of Approach Hold Sign



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



# Initial Data From Test Locations

Comments from pilots and vehicle operators at ORD and CLE

## Feedback from Pilots

- Generally positive concerning the signs
- The majority think the signs improve situational awareness
- Some mention of information overload
- A more mixed reaction to the surface markings



# Initial Data From Test Locations

Comments from pilots and vehicle operators at ORD and CLE

## Feedback from ATC

- Phraseology has been the most complicated aspect for pilots and vehicle operators to understand. ATC is having to repeat instructions and add the word “sign” to clarify intent.



# Initial Data From Test Locations

Comments from pilots and vehicle operators at ORD and CLE

## Feedback from vehicle operators

- Some vehicle operators perceive a conflict between the Pattern B marking and the signs.
- The conditional nature of the Pattern B markings sometimes created a need to modify the vehicle operator SOP's.



# Initial Data From Test Locations

## Maintenance concerns

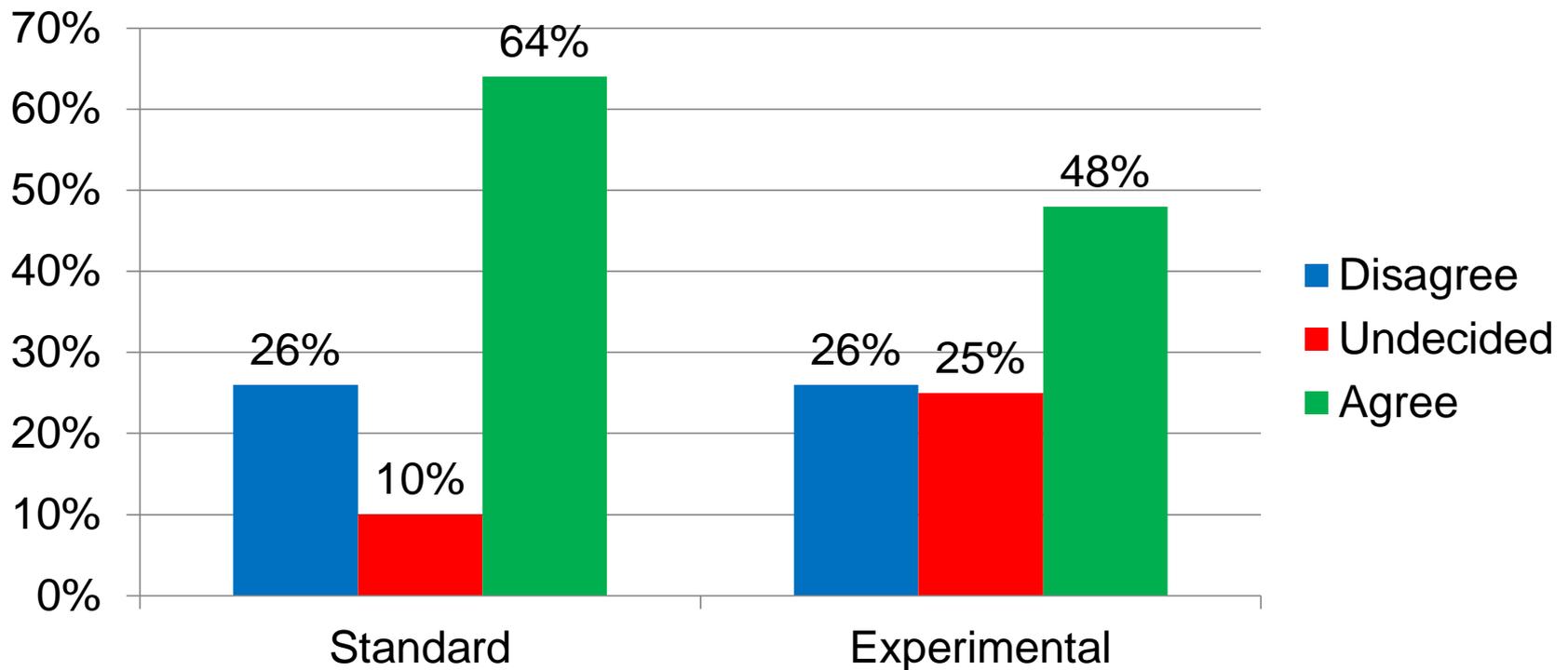
- The installation of the six-module connected signs will be difficult for most airports, since a crane or similar device is needed to install or repair them if they are knocked over.
- Some airports will require grading or earthwork which will impose significant costs.



# Initial Data From Test Locations

## Responses from pilots and vehicle operators at ORD and CLE

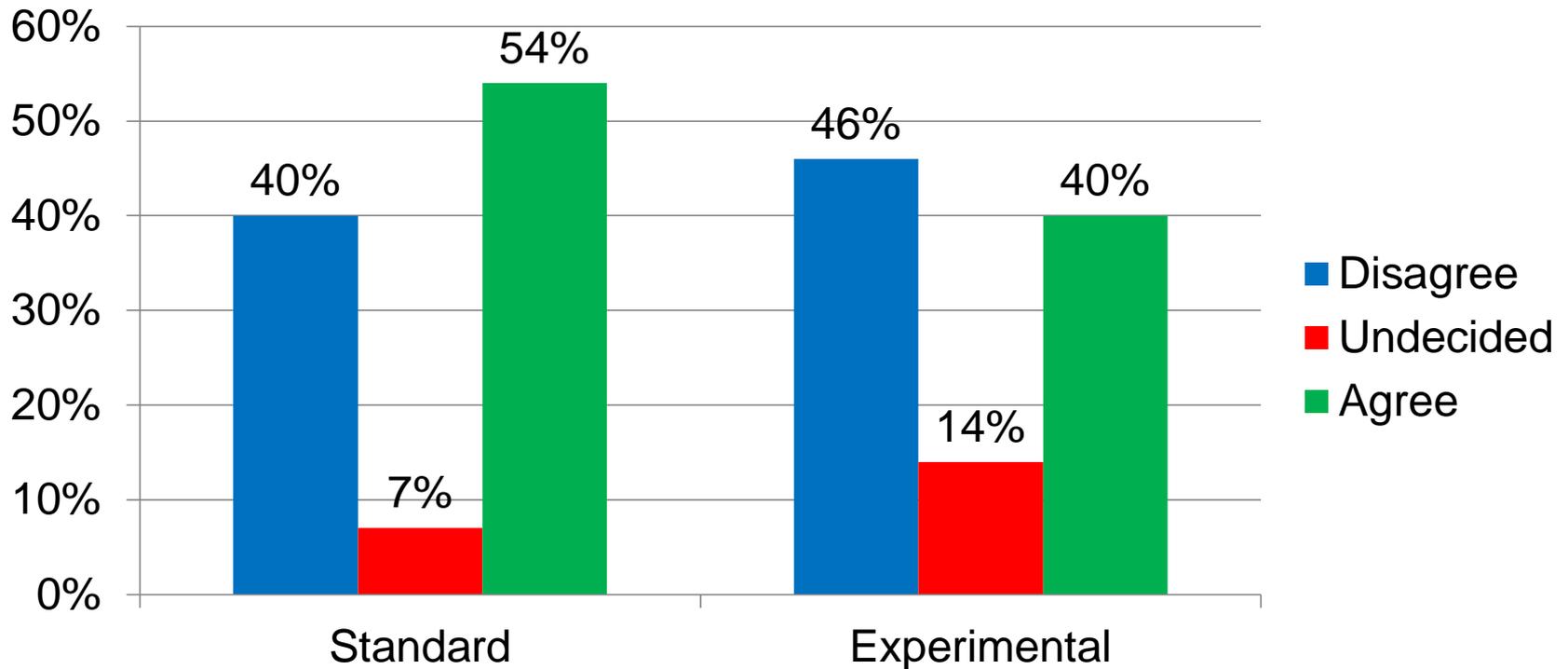
**Question:** If positioned together at a location which did not lead to a runway entrance, the meaning of the sign and surface marking would be understandable?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE

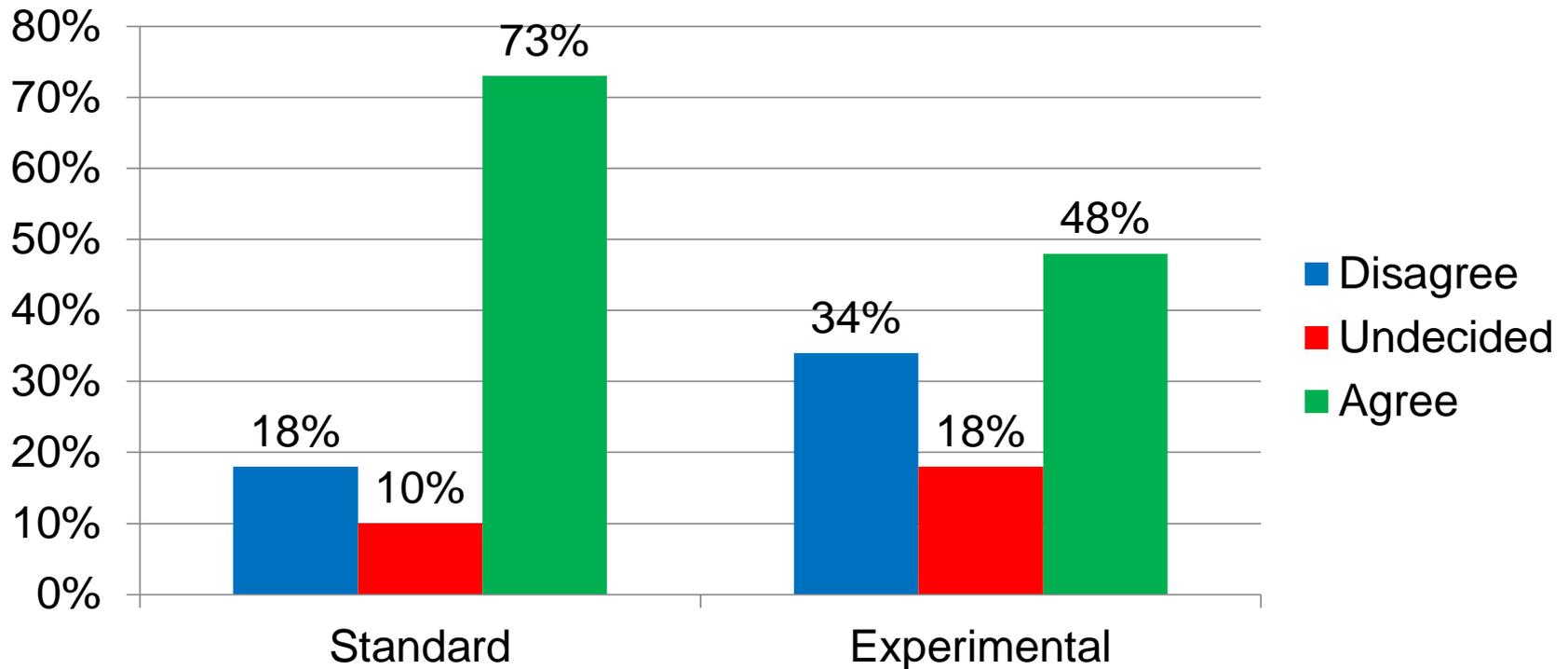
**Question:** The sign and surface marking are suitable for use on a runway?



# Initial Data From Test Locations

## Responses from pilots and vehicle operators at ORD and CLE

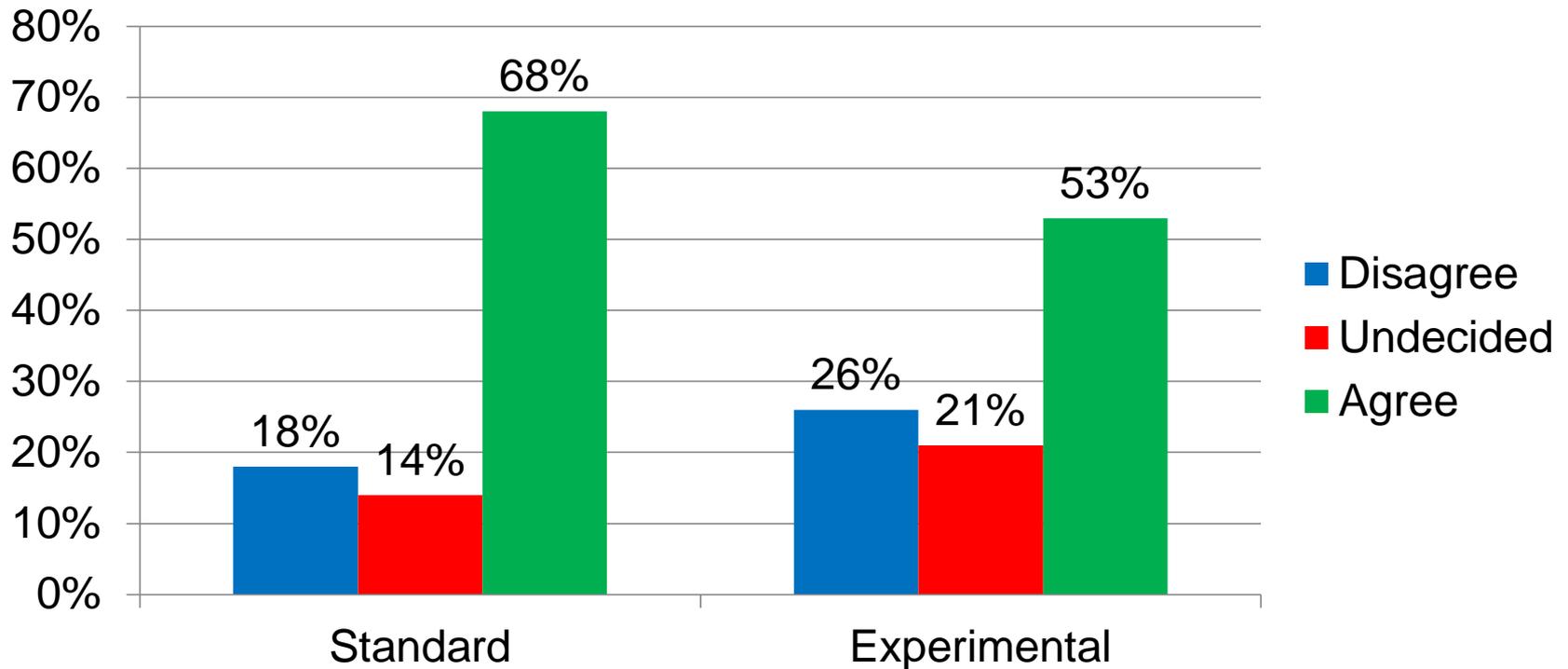
**Question:** To proceed past the sign and surface marking, explicit permission from air traffic control would be needed?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE

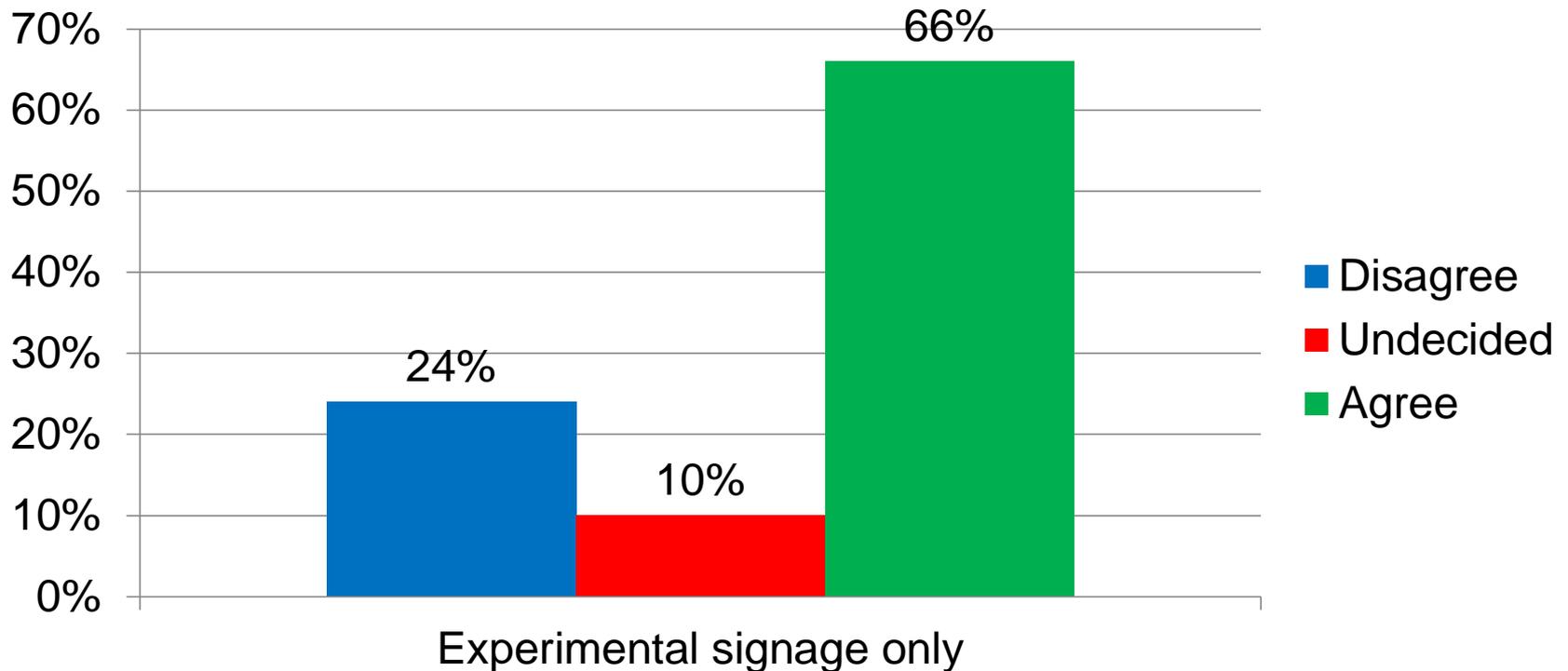
**Question:** The sign contains an appropriate quantity of information?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE  
This question specifically concerns the experimental signage only

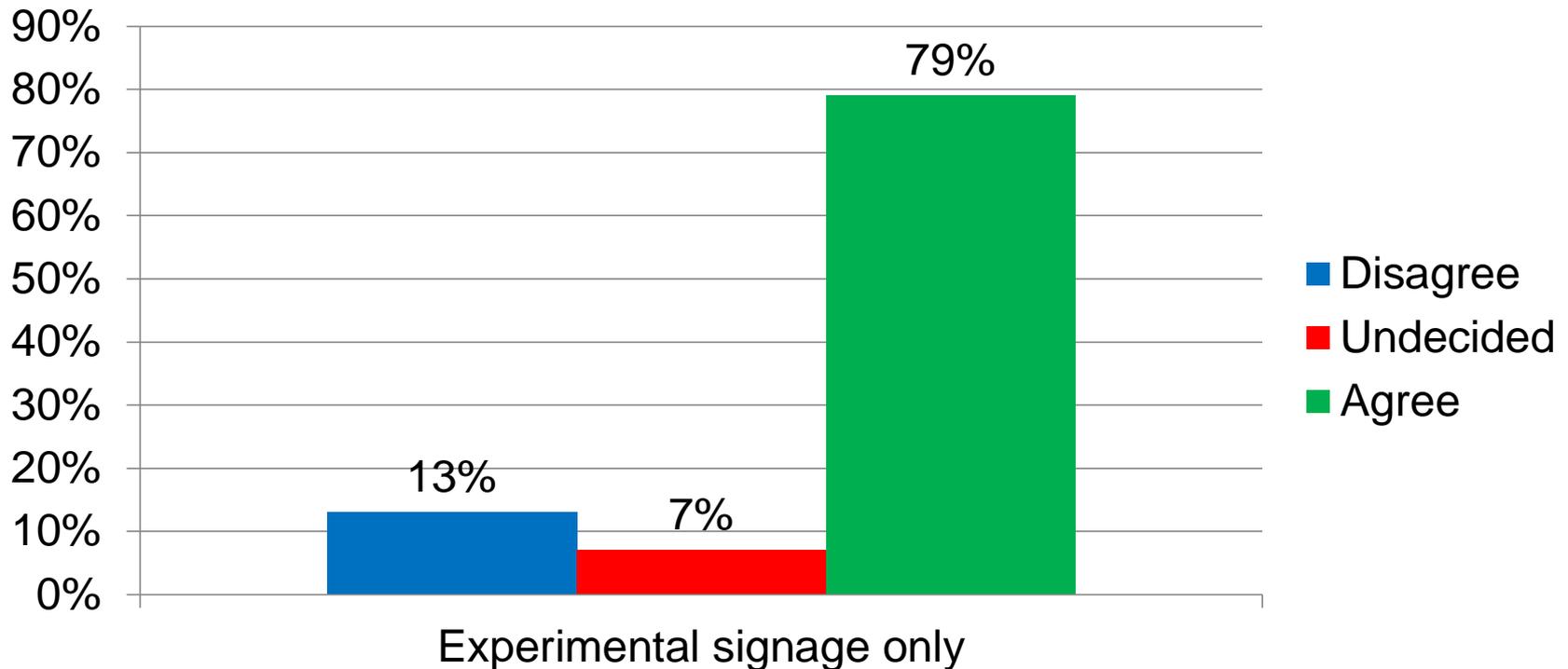
**Question:** Seeing the departure runway on the sign(s) increased your situational awareness?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE  
This question specifically concerns the experimental signage only

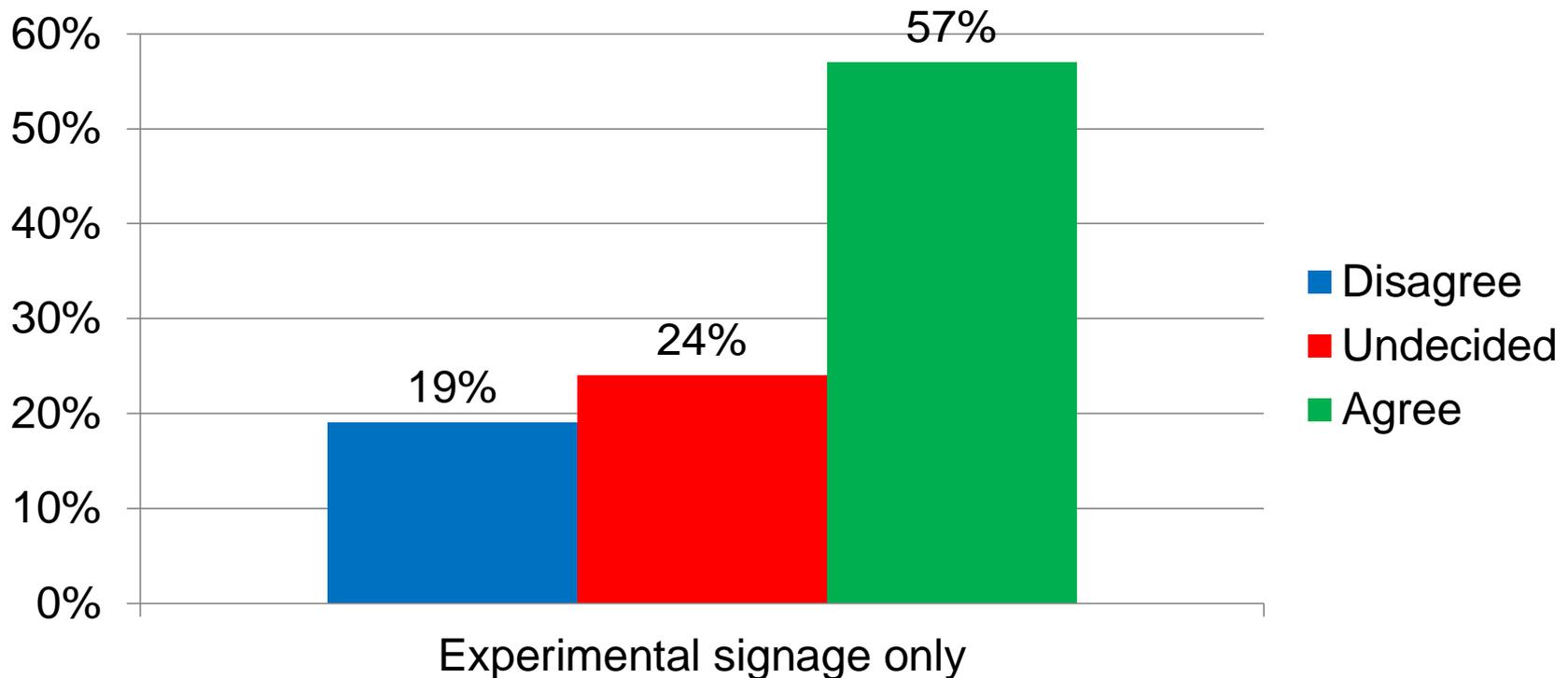
**Question:** The visual cues were understandable early enough to identify the location of the holding position?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE  
This question specifically concerns the experimental signage only

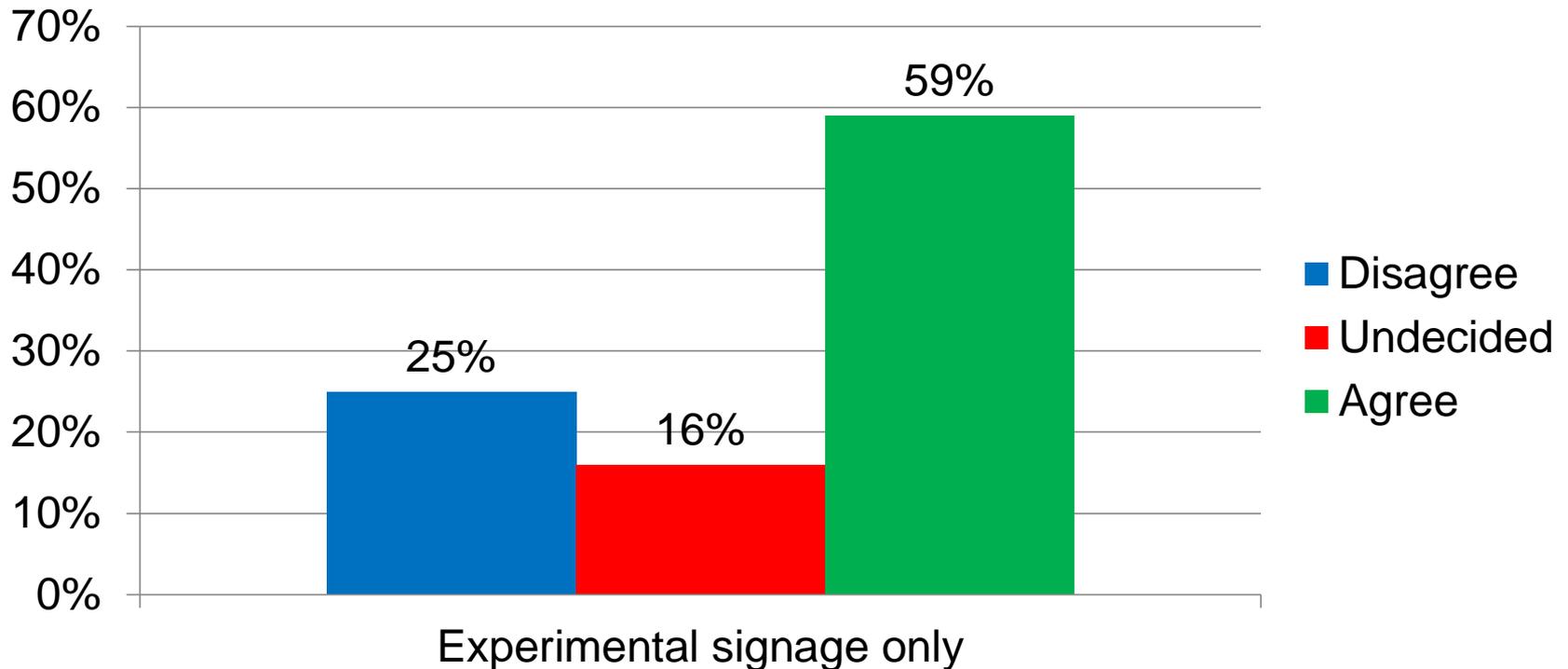
**Question:** The sign(s) and surface marking(s) were logically consistent with the instructions provided by ATC?



# Initial Data From Test Locations

Responses from pilots and vehicle operators at ORD and CLE  
This question specifically concerns the experimental signage only

**Question:** The surface marking adjacent to the sign(s) expressed the same message with the signs?



# •Questions

David Swanson

En Route Standards and  
Procedures Manager(A) AJV-83

202-267-0816

David.W.Swanson@faa.gov



# FAA Air Traffic Safety

*ALIGNING 7110.65 WITH NEXTGEN AND PBN*

## ATC Handbook Revision Project

*Presented by:*

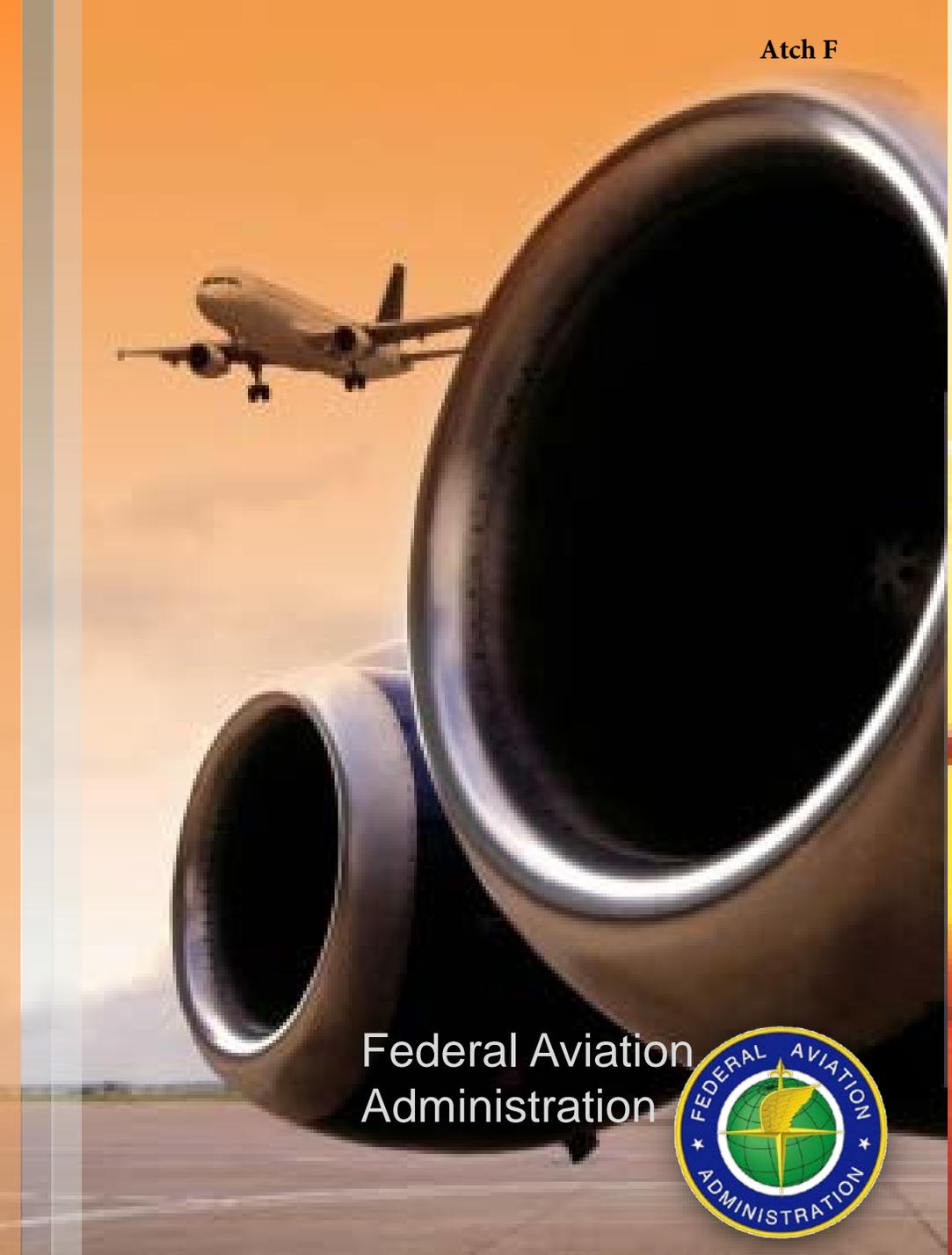
Patti Wilson ♦ Air Traffic Control Specialist, Terminal Procedures, AJV-82

*On behalf of*

Jack Allen ♦ Senior Technical Advisor, Mission Support, AJV-8

*February 2015*

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Federal Aviation  
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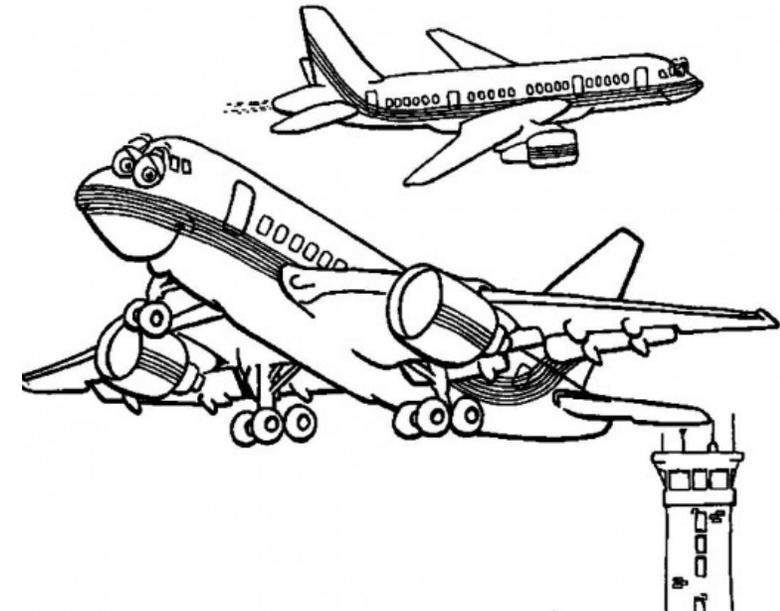
NATCA	INDUSTRY	MANAGEMENT
En Route Passing and Diverging Application	Descend Via Phraseology	Triple Independent Approaches – No High Update RADAR
Expanding the Definition of RADAR	RNAV/RNP for Adjacent Airports	Reduction of Diagonal Separation for Parallel Dependent Approaches
Pilot / Controller Glossary Class G Airspace	Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach	Treat Go-around and Missed Approach Operations as a Normal Departure:
Transitional Separation	PBN Capabilities Displayed to Controllers	Integrate ADS – B Procedural Guidance
Tower Applied and Pilot Applied Visual Separation	Shortcutting RNAV Aircraft	Reorganize Approach Clearance Differentiations, Paragraph Federal Aviation

**TOP 5 ITEM**



## En Route Passing and Diverging Application

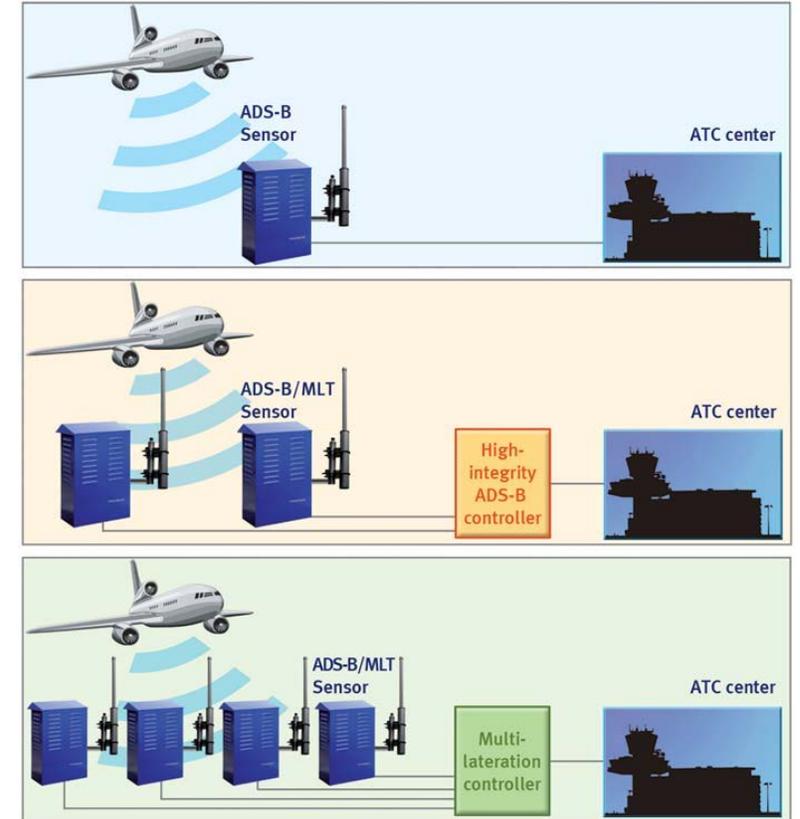
- Expanding to En Route Environment
- Single site adapted
- 20 – 45 degrees





## Definition of RADAR

- Proposing a Panel
  - Users
  - Stakeholders
- For ATC purposes only
- No phraseology change





## Pilot/Controller Glossary – Class G Airspace

- Current
  - CLASS G AIRSPACE – That airspace not designated as Class A, B, C, D or E
- Proposed
  - CLASS G AIRSPACE – Uncontrolled airspace within which ATC has neither the authority nor the responsibility for exercising control over air traffic. Safety alerts must be provided. Traffic advisories are provided, workload permitting

# ATC Handbook Top 15 - NATCA



SkyVector Aeronautical Charts

100LL Jet A Fuel Prices

ATP Jet Center FBO at DAB  
\$5.45 100LL Guaranteed \$5.90 Jet-A Guaranteed

13:57:15 Z N39°42.70' W96°25.31' Layers Link

World Hi Enroute H-5 Enroute L-10 World Lo CG-20 WAC World VFR Kansas City

Portions licensed by FlightPrep™ US Patent 7,640,098

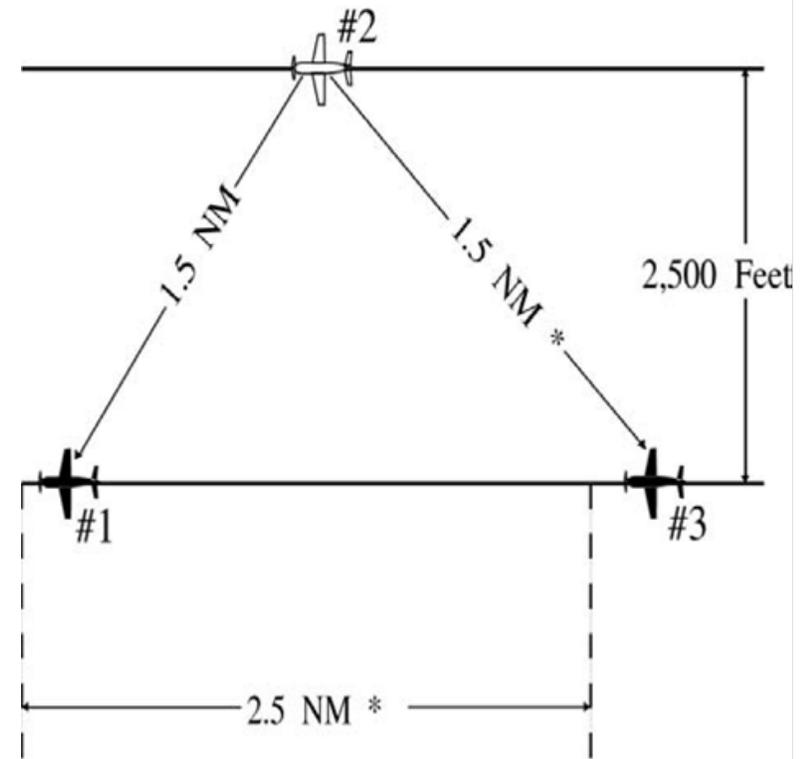
Map Data ©2013 SkyVector, ARINC





## Transitional Separation

- Internal to ATC
- Transparent to the user





## Tower Applied & Pilot Applied Visual Separation

- **TOP 5 ITEM**
- Transparent to user
- NO change to pilot applied visual separation
- Clarification for ATC

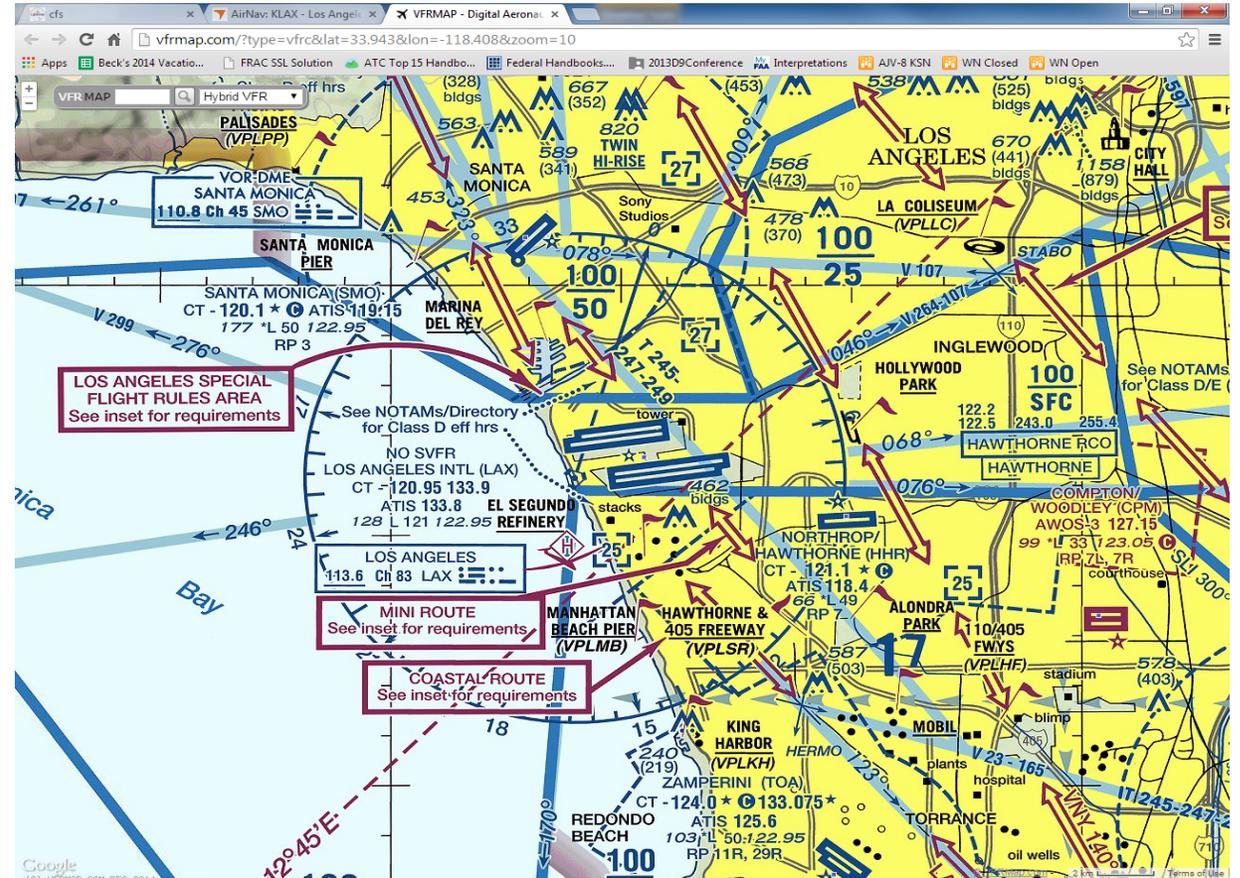






## RNAV/RNP for Adjacent Airports

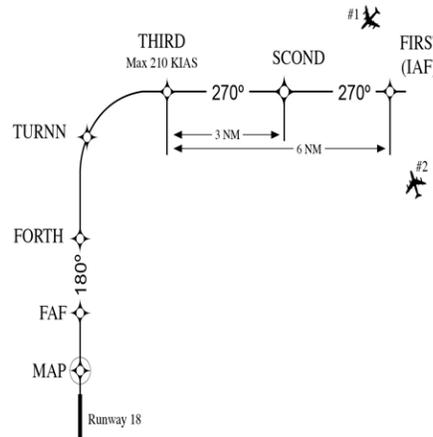
- Procedurally separate aircraft operating into airports within close proximity



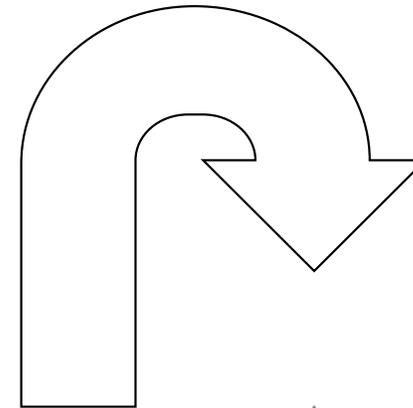


## Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach

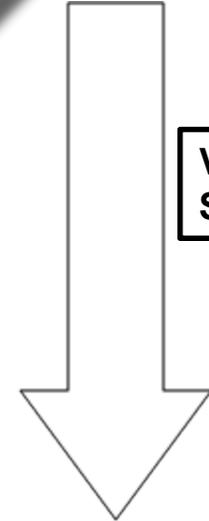
- 30 degree intercept rule
- Radius-to-Fix & RNAV paths to final meet the 30 degree requirement
- Transparent to User



RNAV Radius-to-Fix Turn



Visual Straight In





## PBN Capabilities Displayed to Controllers

- Provide equipment capabilities to controllers
- Reduce frequency congestion





## Shortcutting RNAV Aircraft

Current language in 7110.65, 5-6-1a:

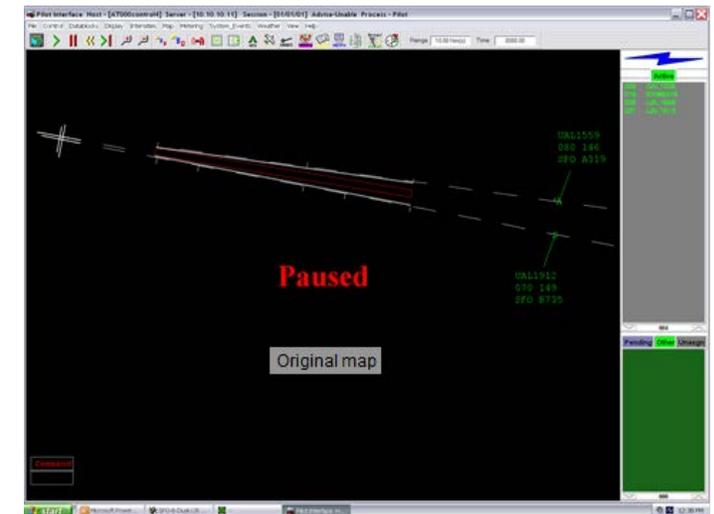
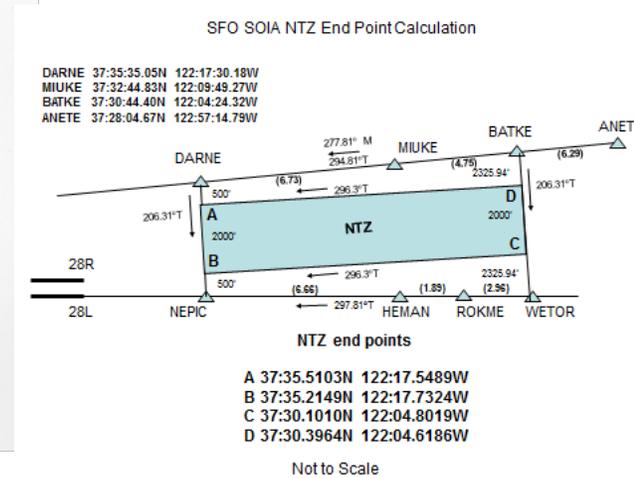
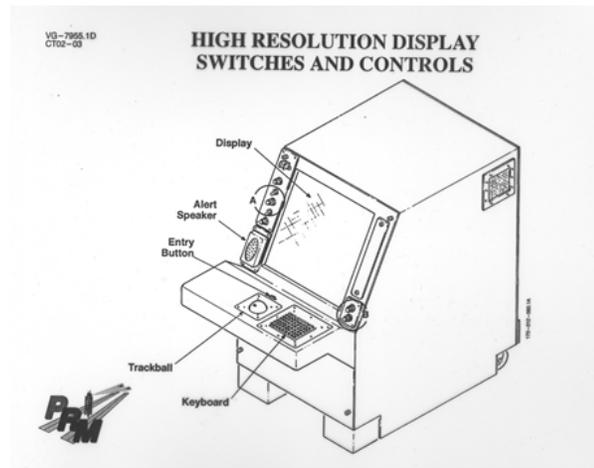
“In controlled airspace for separation, safety, noise abatement, operational advantage, confidence maneuver, or when a pilot requests. ~~Allow aircraft operating on RNAV route to remain on their own navigation to the extent possible”~~”





## Triple Independent Approaches – No High Update RADAR

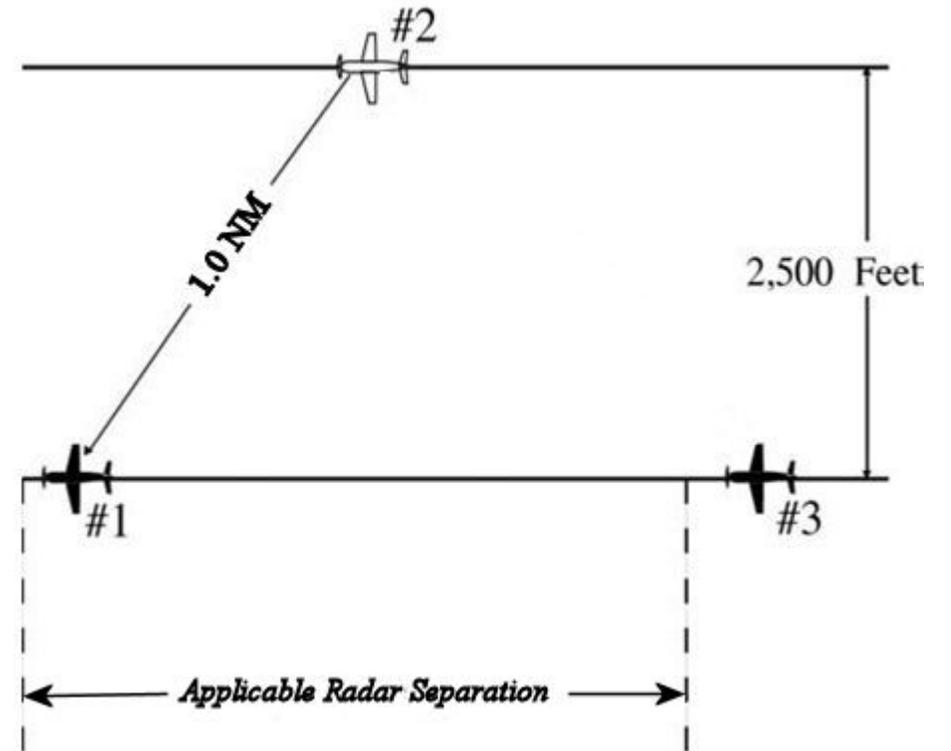
Eliminates the need for high update RADAR





## Reduction of Diagonal Separation for Parallel Dependent Approaches

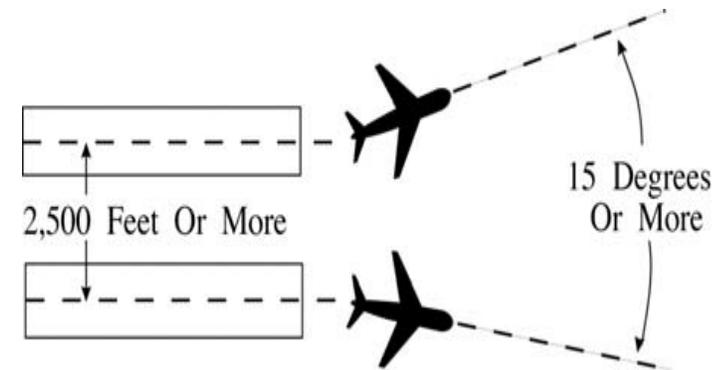
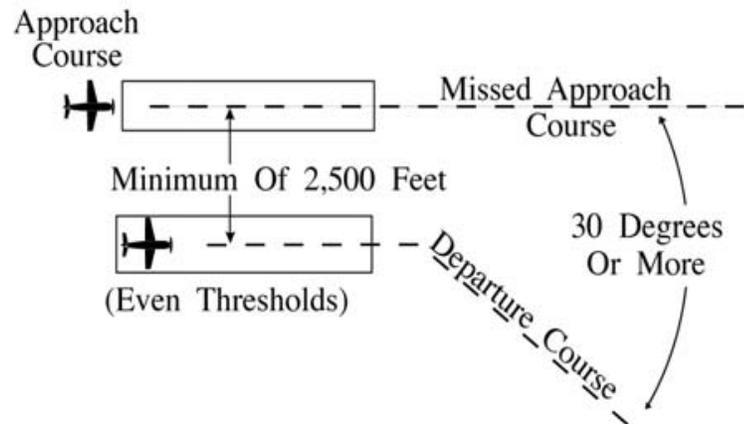
Reduces diagonal separation for simultaneous dependent approaches from 1.5 to 1.0 NM





## Treat Go-around and Missed Approach Operations as a Normal Departure

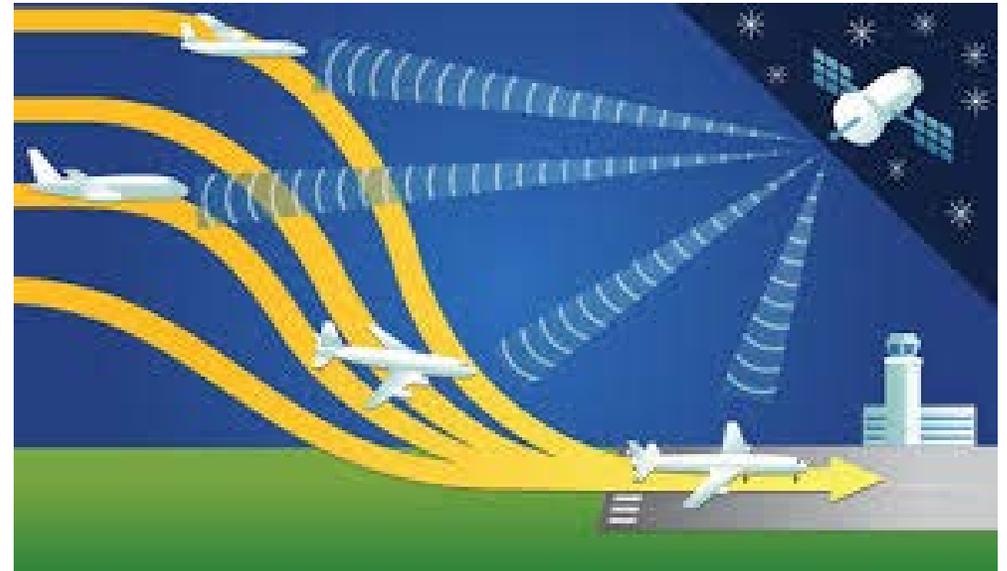
Requesting a study for 15 degrees instead of 30 degrees





## Integrate ADS-B Procedural Guidance

Within the 7110.65 change RADAR system to ATC Surveillance Source = covers future systems





## Reorganize Approach Clearance Differentiations

- Transparent to the users
- Clarifying for ATC



# Opening America's skies . . .



. . . to continued Efficiency and Safety.



*Thank you*





Atch G

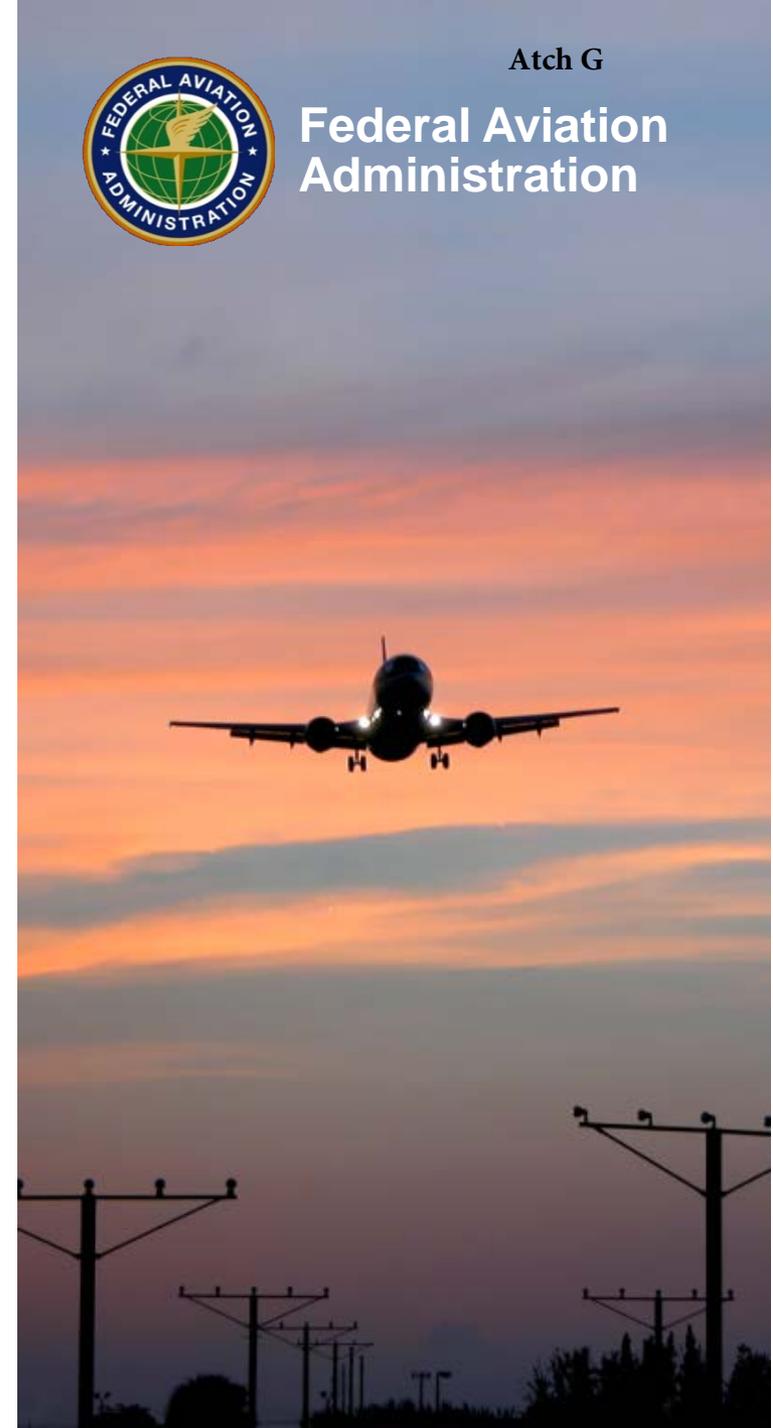
Federal Aviation  
Administration

# Runway Status Lights Informational Briefing

Presented to: ATPAC 2015

By AJM-2312/ AJW-133: Manuel Avila /Bill Leary

Date: February, 10, 2015



# Agenda

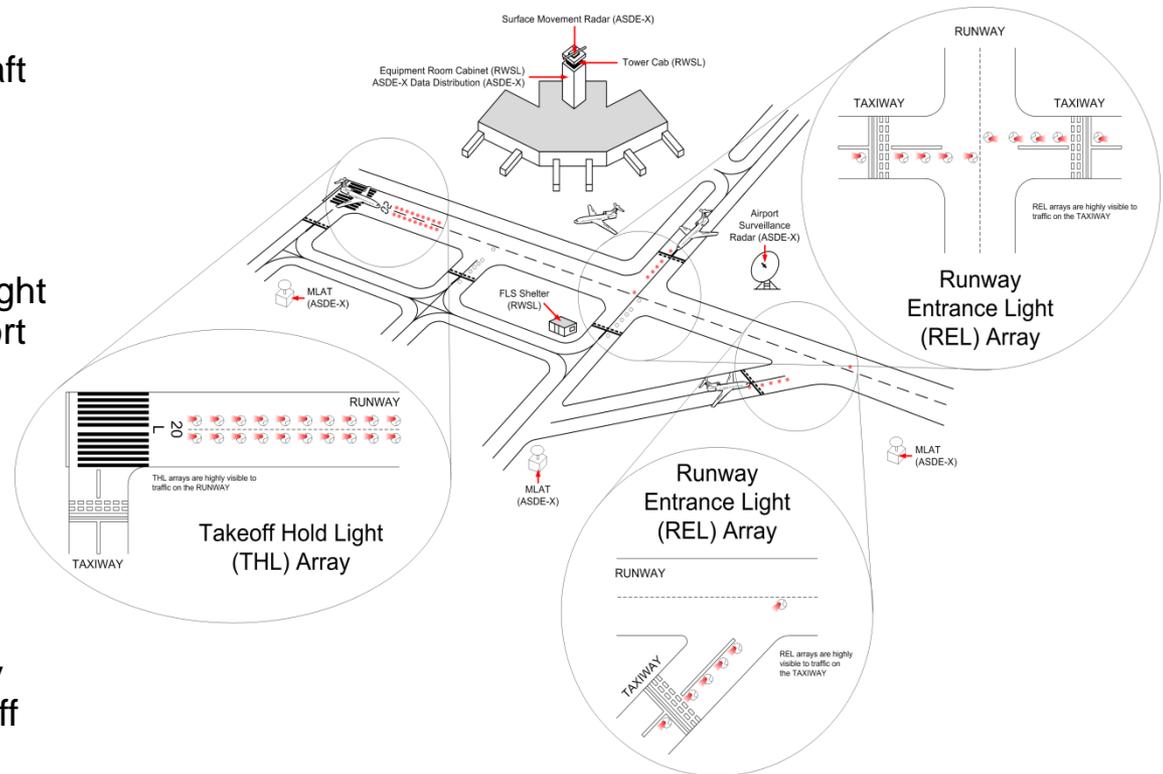
- High-Level System Overview
- Periodic Maintenance
- Maintenance locations
- Reporting
- Waterfall
- Back up slide



# RWSL Concept of Operation

RWSL integrates airport lighting equipment with approach and surface surveillance systems to provide a visual signal to pilots and vehicle operators indicating that it is unsafe to enter, cross, or begin takeoff on a runway

- The RWSL processor receives ASDE-X surveillance data of aircraft and vehicles on or near the airport surface from the ASDE-X Data Distribution
- The RWSL processor uses this surveillance data and advanced Light Logic algorithms and specific airport optimization parameters to create activation and deactivation light commands.
- These RWSL processor light commands are sent to the RWSL Field Lighting System (FLS) Light Computer to illuminate and extinguish the appropriate Runway Entrance Lights (RELs) and Takeoff Hold Lights (THLs)

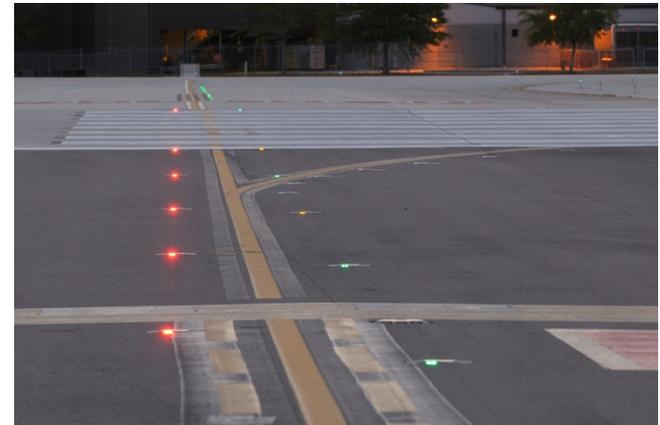


# System Description

- System consists of two subsystems:
  - RWSL Processor
  - Field Lighting System (FLS)
- Processor provides real time analysis of airport surface operations to determine runway status based on ASDE-X or ASSC surveillance data
- FLS provides physical interface to indicate runway status directly to pilots and vehicle operators
  - Airport surveillance sensor inputs are processed through light control logic that commands in-pavement lights to illuminate red when there is traffic on or approaching the runway
  - **Runway Entrance Lights (RELs)** provide a signal to aircraft crossing or entering runway from intersecting taxiway
  - **Takeoff Hold Lights (THLs)** provide a signal to aircraft in position for takeoff



Takeoff Hold Lights (THLs)



Runway Entrance Lights (RELs)

# Maintenance Locations

## Tower Equipment

- ATCT Equipment Room Cabinet
  - RWSL Processor
  - Maintenance Terminal (includes CPU and Monitor)
  - Recorder (RAID server)
  - RWSL Router
  - Time Server
  - Light Computer
- Subjunction Room – Tower Cab control Assembly (TCCA)
- ATCT Cab
  - Cab Control Panel (CCP)
  - Deactivation “Kill” Switch

## Airfield Equipment

### Shelter/Vault Equipment

- Master Light Controllers (ADB Brite III Master)
- Constant Current Regulators [ADB CRR with Advanced Control Equipment (ACE)]
- Remote Maintenance Terminal (includes CPU and Monitor)
- FLS Router

### Field Equipment

- Light Fixtures (THL & REL)
- Individual Light Controllers (ADB Brite III Remote)
- Isolation Transformer
- Light Can

# Full System Outages

In accordance with RWSL specification, design, and technical instructions including the FAA-E-3001, FAA-E-3002, SE01\_001\_SSDD, Maintenance Handbook, and TI docs

- Critical Faults
  - System designed to transition automatically to OFFLINE state
    - Full outage
    - Requires manual intervention by Tech Ops to return system to ONLINE state
  - Loss of ASDE-X or Data Distribution
  - Fault to critical Line Replaceable Unit (LRU)
  - Failures that cause all air field lights to be offline
  - Failures that cause light control latency to exceed requirements
- Manual Shutdown System engaged (“Kill Switch”)
  - System transitions to OFFLINE state
    - Full outage; manual intervention by Tech Ops to restore
    - Cuts off power to air field light circuits
  - Manual Shutdown System LRU also critical
    - Designed so MSS component failure leads to OFFLINE state

# Partial System Outages

In accordance with RWSL specification, design, and technical instructions including the FAA-E-3001, FAA-E-3002, SE01\_001\_SSDD, Maintenance Handbook, and TI docs

## Non-Critical Faults

- System stays ONLINE
  - Partial outage
  - At least one air field light circuit remains operational
- Failures that affect individual light circuits
  - Light fixtures (lamps)
  - Individual Light Controllers (ILC)
  - Isolation transformers
  - Master Light Controllers (MLC)
  - Constant Current Regulators (CCR)
  - Shelter failure (if other shelters remain online)
- Failures that affect the tower Cab Control Panel (CCP)

# Light Array Light Fixture Outage Tolerances

In accordance with Maintenance Handbook

- REL array tolerance - Allow 3 or fewer light fixtures out
- THL array tolerance
  - Allow up to 3 pairs of light fixtures out
  - Allow up to 6 light fixtures out overall
  - No consecutive pairs out allowed
- Circuit criteria
  - Same regardless of REL or THL circuit
  - Allow 29 or fewer light fixtures out overall
- Remove array or circuit from service if tolerance exceeded - via MT or RMT user interface

# Outage Reporting

It was determine that Tech Ops policy regarding issuing NOTAMs for the RWSL system is appropriate;

- If NOTAMs for full and/or partial outages are necessary and at what level of detail would be practical and appropriate; tech Ops is to follow the NOTAM order.

# Periodic Maintenance Performance Checks

In accordance with Maintenance Handbook

- Daily
  - Check ERC aural and LED indicators
  - Check Maintenance Terminal display for indicated faults
- Bi-Weekly
  - Visual checks of airfield light fixtures for operation and obstruction
  - Do for intensity step levels 2 and 5
- Monthly: Check CCR output and RMTTC/MLC aural and LED indicators
- Quarterly: Record meter readings
- Bi-Annually: Check overall circuit response rates



# Periodic Maintenance Other Tasks

In accordance with Maintenance Handbook

- Bi-Weekly: Administrator reviews access control list for anomalies
- Monthly
  - Check horizontal angular alignment of lamps
  - Administrator verifies “Firewall” account is secure
- Quarterly: Administrator exports/reviews security logs
- Annually: Comprehensive inspection and cleaning
- Every Three Years: Check insulation resistance and continuity of power cables and lighting circuits



# RWSL Logistics

- Remote access for system troubleshooting and status not available until Remote Maintenance Monitoring (RMM) is implemented sometime in 2015
- RWSL technical documentation (Technical Instruction Books and Maintenance Handbook) provided to SOC upon request
  - Troubleshooting
  - Periodic maintenance
  - Equipment identifiers
  - System certification
- 2<sup>nd</sup> level engineering (AJW-143 and AJW-148) will provide updates to the technical documentation as needed
- Maintenance training can be made available through the Area Training Coordinator
- Access to the Logistics Information System (LIS) coordinated with local SSC Manager

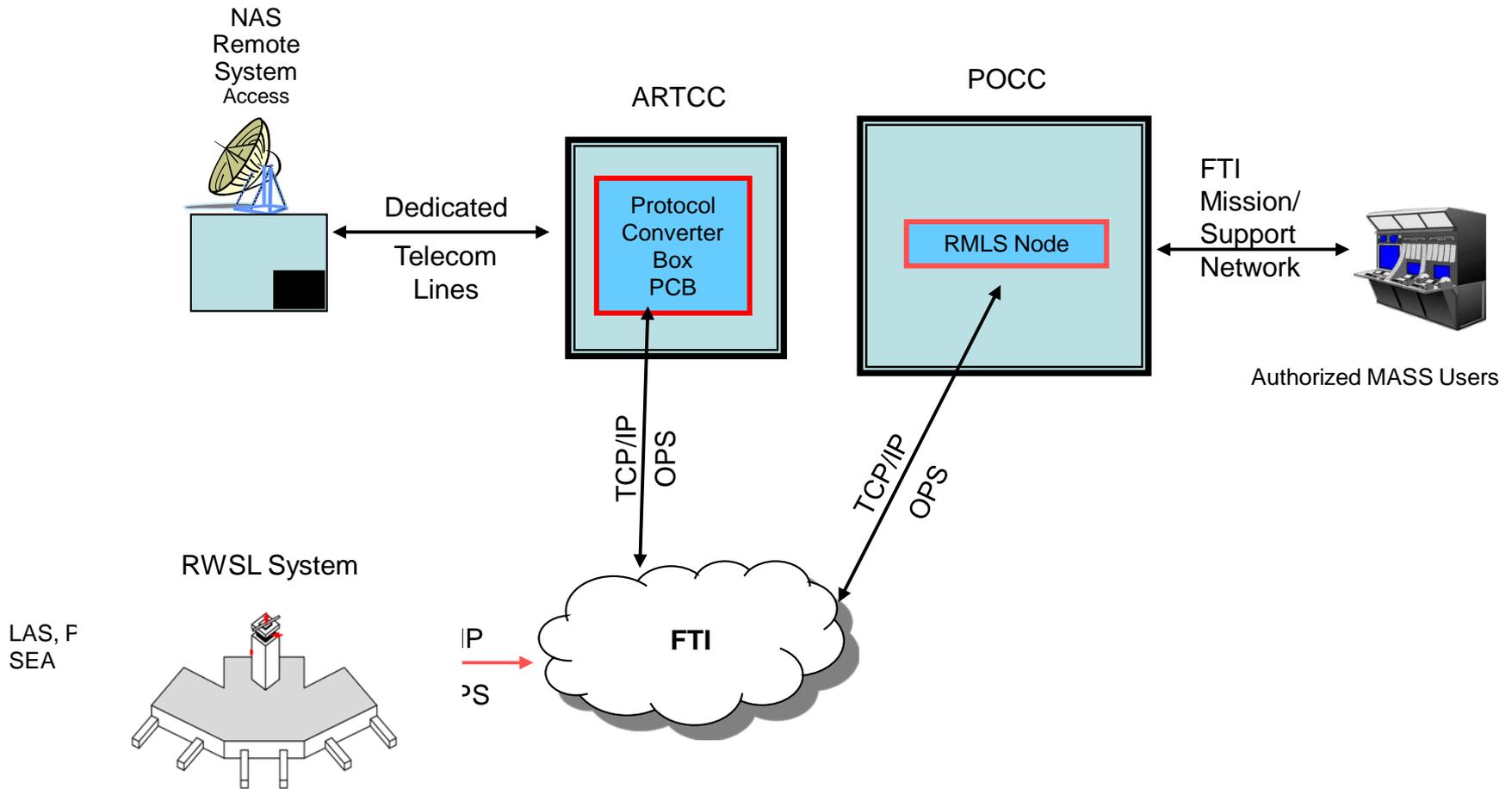
# Remote Maintenance Monitoring (RMM)

- Primary tool used by Technical Operations Service personnel to remotely monitor, control and certify NAS subsystems and facilities
- RWSL requires RMM capability
- RMM interface and capability under development
- RWSL RMM Remote Commands to include:
  - Reset RMS
  - Reboot RWSL processor
  - Reset RWSL processor
  - Reboot lighting computer
  - Reset lighting computer
- Plan to deploy sometime in 2015



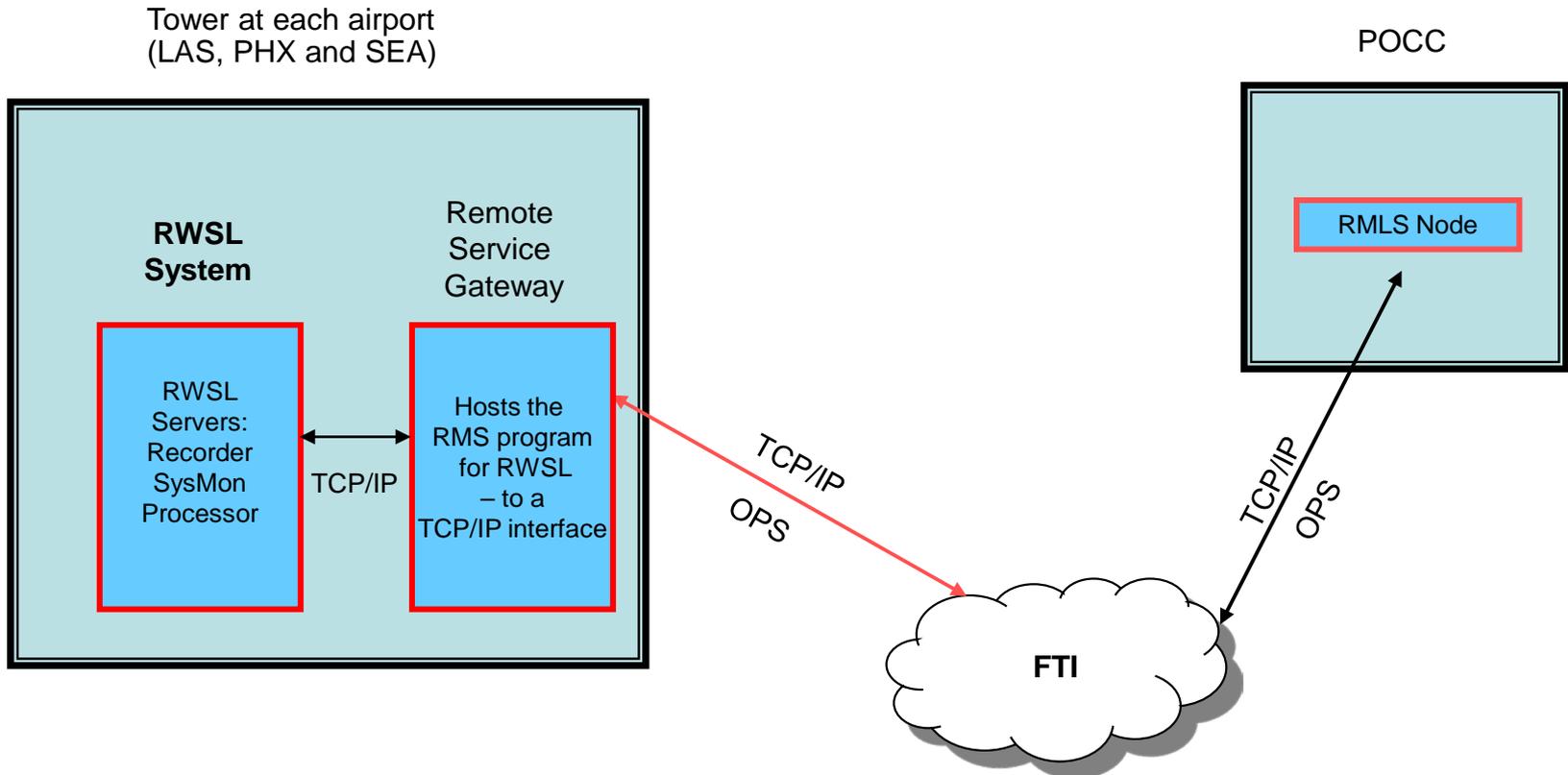
# Remote Maintenance Monitoring Overview

## Remote Maintenance Monitoring and Control (RMMC)



# Remote Maintenance Monitoring Overview (cont'd)

## RWSL Data to Remote Monitoring and Logging System (RMLS)



# Implementation Status

Site	Activity									
	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Orlando (MCO)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Dulles (IAD)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Phoenix (PHX)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Houston (IAH)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Minneapolis (MSP)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Seattle (SEA)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Charlotte (CLT)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Las Vegas (LAS)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD	Commissioned	
Fort Lauderdale (FLL)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Detroit (DTW)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
LaGuardia (LGA)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Chicago (ORD)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Los Angeles (LAX)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Newark (EWR)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
San Francisco (SFO)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
John F. Kennedy (JFK)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
Baltimore (BWI)	Construction	Installation & Checkout	SAT	CAI	NASE Perf Opt	IOC	JAI	ORD		
	Completed	In Progress			Future Activity					

# Points of Contact

<b>Role</b>	<b>Name</b>	<b>Phone Number</b>
RWSL Program Manager	Bashar Halabi (Acting)	(202) 267-8407
RWSL Project Lead	Barbara Kratz	(202) 267-8645
Technical Operations Maintenance Planning	Manuel Avila	(202) 267-6069
RWSL Implementation Site Coordination Lead	Mike Mercaldi	(202) 236-3628
RWSL Implementation Site Coordination Lead	Carl Lyons	(202) 799-8674
RWSL Implementation Site Coordination Lead	Alden Murray	(202) 556-5290
RWSL Engineering Lead	Bashar Halabi	(202) 267-8695
Maintenance Automation Program	Mark Lynch	(202) 493-1443
AJW-148 RMM Interface Development	Mike Pine	405-954-5164

# Back Up



# Tower Cab Equipment

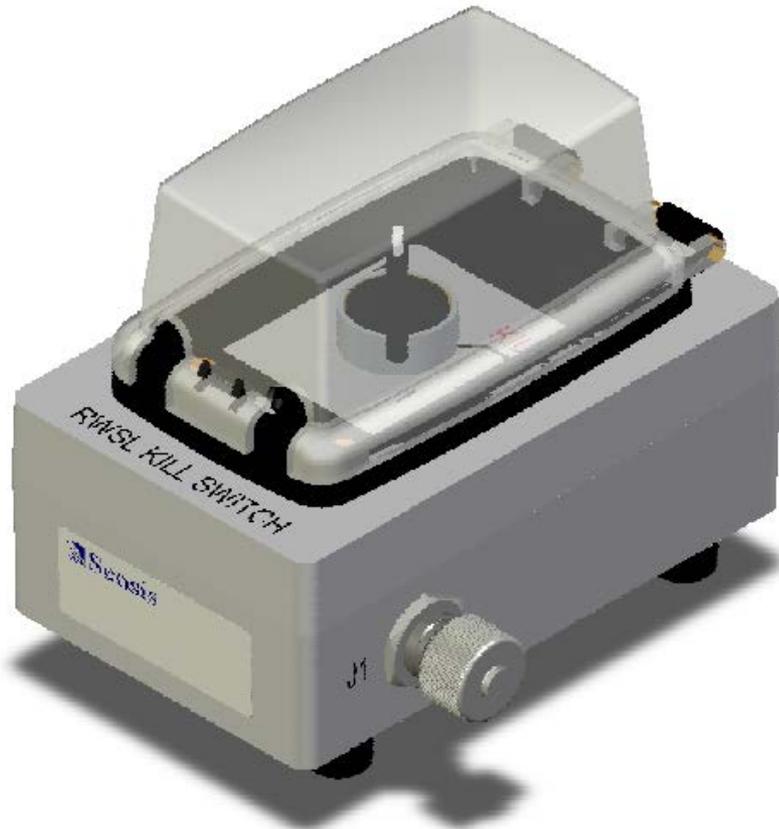
- Cab Control Panel (CCP)
  - Provides system status to Air Traffic personnel
  - Changes RELs and THLs intensity
- Deactivation “Kill Switch”
  - Shuts off all Constant Current Regulator (CCR) output power to field circuits and extinguishes all lights
  - Requires maintenance action to restore



# Image of CCP

Operational State	Screen Maintenance			
 <p data-bbox="581 344 852 436"><b>Current State:</b> <b>ONLINE</b></p>	 			
Circuit Intensities				
Runway Entrance Lights Intensity				
1	2	3	4	5
Takeoff Hold Lights Intensity				
1	2	3	4	5

# Images of Kill Switch



# RWSL Air Traffic Procedures

## 3-4-20. RUNWAY STATUS LIGHTS (RWSL)

### TERMINAL

RWSL is equipped with automatic intensity settings and must be operated on a continuous basis except under the following conditions:

- a. If a pilot or vehicle report indicates any portion of the RWSL system is on and is not able to accept an ATC clearance; then
  1. ATC must visually scan the entire runway. If the runway is observed to be clear and the lights are still illuminated, then the lights must be turned off and clearance re-issued.
  2. If a portion of the runway is not visible from the tower, ATC must visually scan the ASDE-X. If the runway is observed to be clear and the lights are still illuminated, then the lights must be turned off and clearance re-issued.
- b. When the RWSL Operational Status displays “Lost Comm with System,” consider the RWSL system out of service until checked and confirmed to be operational by technical operations personnel.
- c. Once RWSL systems are turned off, they must remain off until returned to service by technical operations personnel.
- d. Upon pilot request, adjust the light intensity.



# RWSL Air Traffic Procedures Cont

## 10-6-10. RUNWAY STATUS LIGHTS (RWSL)

### TERMINAL

The RWSL is a system of runway and taxiway lighting which enhances pilot situational awareness by illuminating runway entrance lights (REL) when the runway is unsafe for entry or crossing, and take-off hold lights (THL) when the runway is unsafe for departure. The RWSL system uses a configuration of in-pavement lights installed on taxiways and runways that indicate runway status only; they are not intended to indicate a clearance. The RWSL system works in conjunction with the ASDE-X system along with the Field Lighting System (FLS).

a. ATMs must ensure that when available or operating normally, the RWSL systems are operated on a continuous basis.

b. As part of the facility checklist, operation of the system must be verified once each shift.

# Maintenance Terminal Display

The screenshot displays the 'Runway Status Lights Maintenance Terminal' interface, which is divided into three main sections:

- Navigation: Menu Panel (Left):** Contains a vertical list of menu items including 'Access and About Menu', 'Administration Menu', 'Optimization Menu', and 'Maintenance Menu'. The 'Maintenance Menu' is currently selected and highlighted.
- Content Panel (Center):** Titled 'View Performance', it shows the status of various system components, all of which are in 'Health' status:
  - ASDE-X System:** ASDE-X and RWSL System Interface.
  - Remote Maintenance:** Rocky Shelter1 and Rocky Shelter2.
  - Manual Shutdown System:** Manual Shutdown System.
  - Field Lighting:** FLS Faults (0 total).
  - Equipment Room Cabinet:** RWSL Processor, Lighting Computer, SysMon, Recorder, and Power/Communications.
  - Time Server:** Time Server.
- System Status Panel (Right):** Shows the overall system state as 'OFFLINE' with a red indicator. It also displays:
  - Alerts:** 5 new message(s), with an integrity test status of 'PASSED'.
  - Diagnostics:** System Health Good.
  - Faults:** 5 new message(s), listing specific faults such as 'FLS Current for Circuit CCR2 is normal' and 'RP CCR CCR1 Intensity 4, does not match FLS Intensity 0'.

Red dashed arrows point from external labels to specific elements in the interface:

- 'Access and About Menu' points to the top of the left menu.
- 'Administration Menu' points to the 'Administration' section of the left menu.
- 'Optimization Menu' points to the 'Optimization' section of the left menu.
- 'Maintenance Menu' points to the 'Maintenance' section of the left menu.
- 'System State Window' points to the 'OFFLINE' status.
- 'Alerts Window' points to the 'Integrity Test Status: PASSED'.
- 'Diagnostics Window' points to 'System Health Good'.
- 'Faults Window' points to the list of faults.

Located in the equipment room cabinet

# Maintenance Terminal Display

## Runway Status Lights Maintenance Terminal

**Access**

- Log Off
- Modify Password

**Administration**

- Manage Users
- Test Integrity
- View Security Log

**Optimization**

- Reprocess Data
- Manage Reprocessed Data
- Analyze Data

**Maintenance**

- View Performance
- Control System
- Control Lighting
- View Airfield Display
- Playback Data
- Extract Data
- View Health Log
- View/Edit Adaptation
- About RWSL

**ASDE-X System**

ASDE-X: Health  
 Interface to RWSL System

**Cab Control**

ATC Tower East Health  
ATC Tower West Health

**Equipment Room Cabinet**

RWSL Processor Health  
 Interface to Lighting Computer

Lighting Computer Health  
 Interface to Circuits

SysMon Health

Recorder Health

Power/ Communications Health

**Remote Maintenance**

Shelter - Runways 17/35 Health  
Shelter - Runways 18/36 Health

**Manual Shutdown System**

Manual Shutdown System Health

**Field Lighting**

Faults

REL-36R 18L/E-East-6 2009-03-23 12:07:00

**System State**

ONLINE

**Alerts**

Integrity Test Status: PASSED

**Diagnostics**

**Faults**

Located in the equipment room cabinet

# Maintenance Terminal Display

## Runway Status Lights Maintenance Terminal

<b>Access</b> Log Off Modify Password <b>Administration</b> Manage Users Test Integrity View Security Log <b>Optimization</b> Reprocess Data Manage Reprocessed Data Analyze Data <b>Maintenance</b> View Performance Control System Control Lighting View Airfield Display Playback Data Extract Data View Health Log View/Edit Adaptation About RWSL	<b>ASDE-X System</b> ASDE-X:  Health Interface to RWSL System	<b>Remote Maintenance</b> Shelter - Runways 17/35  Health Shelter - Runways 18/36  Health	<b>System State</b>  <b>ONLINE</b>
	<b>Cab Control</b> ATC Tower East  Health ATC Tower West  Health	<b>Manual Shutdown System</b> Manual Shutdown System  Health	<b>Alerts</b> Integrity Test Status: <b>PASSED</b>
	<b>Equipment Room Cabinet</b> RWSL Processor  Health Interface to Lighting Computer Lighting Computer  Health Interface to Circuits SysMon  Health Recorder  Health Power/Communications  Health	<b>Field Lighting</b> Faults REL-36R 18L/E-East-6 2009-03-23 12:07:00 REL-36R 18L/E-West-3 2009-03-21 21:47:02 36R 18L THLs 2009-03-18 06:42:34 THL-35L-L16 2009-03-17 15:32:55 36L 18R THLs 2009-03-13 08:00:05 More... (7) total	<b>Diagnostics</b> 1 new message. 2009-05-19 14:50:30 • Most Probable Failed LRU- Recorder HD8
			<b>Faults</b> 2009-05-19 14:50:30 • Recorder status indicates HD8 failure

Located in the equipment room cabinet

# Surveillance and Broadcast Services ADS-B Program

Presented to:

**Air Traffic Control  
Procedures Advisory  
Committee (ATPAC)**

Date: **February 10, 2015**  
**Preston Barber**



Atch H

Federal Aviation  
Administration



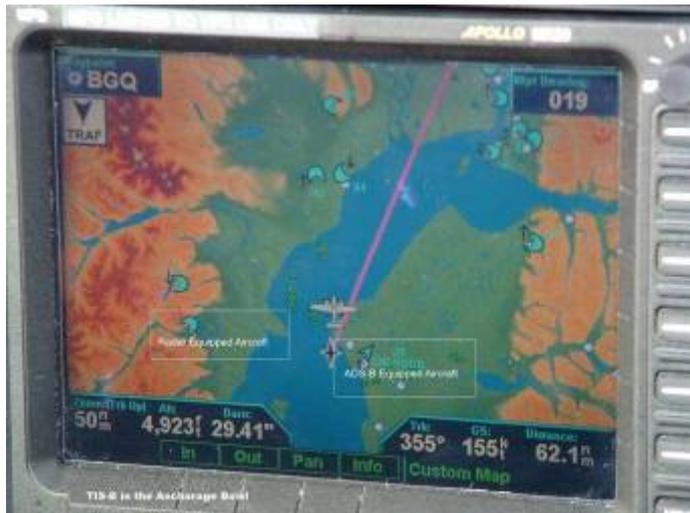
# Overview: Automatic Dependent Surveillance - Broadcast (ADS-B)

- **Automatic**
  - Periodically transmits information with no pilot or operator input required
- **Dependent**
  - Position and velocity vector are derived from the Global Positioning System (GPS)
- **Surveillance -**
  - A method of determining position of aircraft, vehicles, or other asset
- **Broadcast**
  - Transmitted information available to anyone with the appropriate receiving equipment



# Overview: Traffic Information Service - Broadcast / Flight Information Service - Broadcast

**TIS-B is a service which provides ADS-B equipped aircraft with position reports from secondary surveillance radar on non-ADS-B equipped aircraft.**

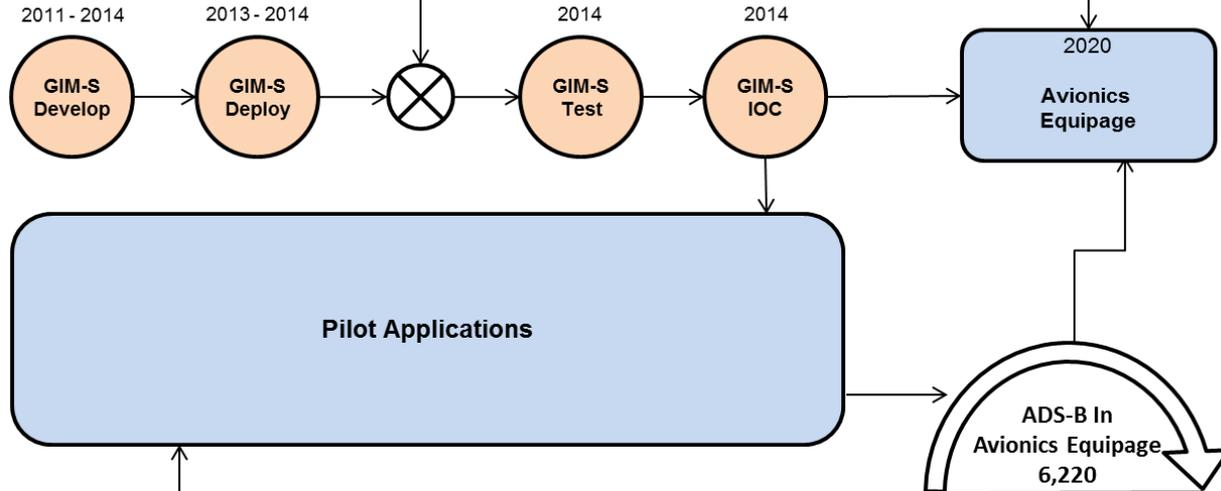


**FIS-B transmits graphical National Weather Service products, temporary flight restrictions (TFRs), and special use airspace.**



Service Delivery Points for ATC Separation Services									
	FY10 – FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	Operational
En Route	6	4	12	0 of 2	0	0	0	0	22 of 24
Terminal	19	27	16	1 of 5	13	39	28	12	63 of 159
Surface (Advisory)	16	10	9	0 of 2	3	4	0	0	35 of 44
Oceanic	0	0	0	1 of 1	1	1	0	0	1 of 3

**ATC Spacing Services**  
*Ground-Based Interval Mgmt - Spacing (GIM-S) (En Route only)*

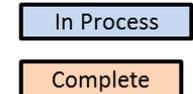


*Flight Deck Based Interval Mgmt-Spacing (FIM-S)*  
*In Trail Procedures (ITP)*  
*Traffic Situation Awareness with Alerts (TSAA)*



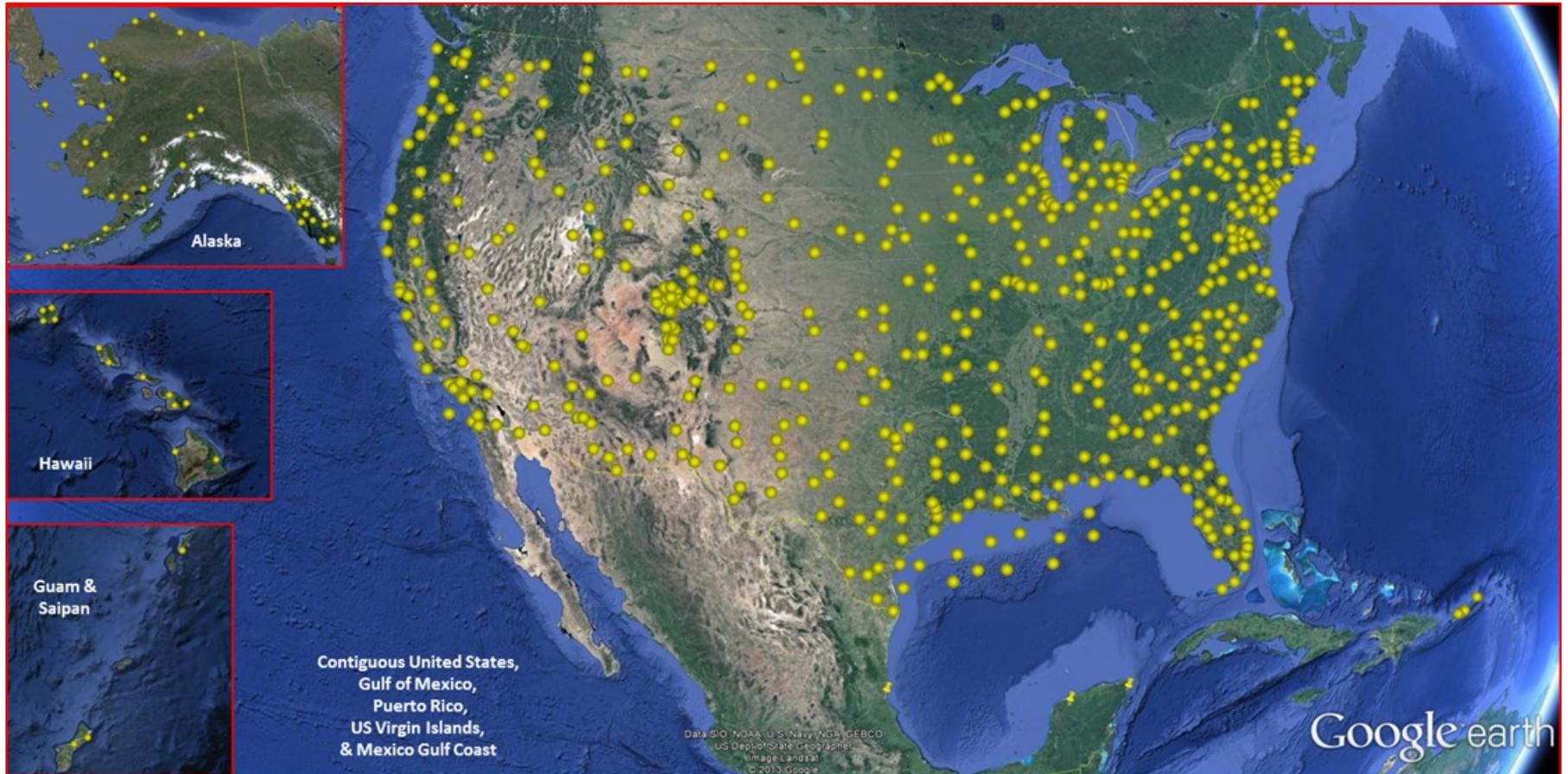
*TIS-B*  
*FIS-B*  
*ADS-R*

Pilot Advisory Services			
	FY14	FY15 – FY17	Total
Baseline Radio Station Installations (2008 – 2014)			634 of 634
Alaska Expansion Radio Station Installations	4	3 of 4	7 of 8
Service Expansion Radio Station Installations (ASSC and Gulf of Mexico) (2014 – 2017)	2	0 of 19	2 of 21
<b>Total Radio Station Installations (2008 – 2017)</b>			<b>643 of 663</b>



As of 1-1-2015 Will be updated by 2/6/2015

# ADS-B Ground Infrastructure



# FAA Air Transport Avionics Upgrades



- ADS-B Out
- Aircraft: 35 A320
- STC approved July 2012
- **All 35 modifications complete**



- ADS-B Out and In
- Aircraft: 12 747
- STC approved June 2011
- **12 ADS-B In equipped**



- ADS-B Out
- Aircraft: 110 737NG
- Boeing Service Bulletin 01 delivered May 2013
- United retrofit begins by January 2016
- Upgrades to DO-260B complete by December 2017

- ADS-B Out
- Aircraft: 164
  - 13 B747
  - 59 B767
  - 52 A300
  - 38 MD11
  - 2 B757



- STC for 767, 747/767 AML, MD11/A300 AML, and 757 approved (December 2011, January 2012, February 2013, and July 2014 respectively)
- **All 164 installs complete**



- ADS-B Out and In
- Aircraft: 20 A330-300/200
- STC for ADS-B Out approved August 2012; STC for Merging & Spacing approved January 2013
- **18 ADS-B Out and 18 ADS-B In installs complete**
- Upgrades (Out and In) complete by February 2015

*Will be updated by 2/6/2015*

# FAA General Aviation / Rotorcraft Avionics Upgrades



- ADS-B Out and In [Multi-function Display (MFD) and Portable Electronic Device (PED)]
- Aircraft: 2 Bell 206 helicopters
- STC issued January 2014
- **Upgrades completed February 2014**



- ADS-B Out
- Aircraft: 54 helicopters
- DO-282B STC for AW-139 issued June 2012
  - **7 Chevron AW-139 completed February 2013**
- **DO-260B STCs for S-76 and S-92 issued March 2014 and April 2014, respectively**
  - 47 PHI: Upgrades complete by December 2015
  - **To date, 26 upgrades complete**

*Will be updated by 2/6/2015*



- ADS-B Out
- Aircraft: 1 Cessna 150
- AML STC for Cessna 150/172/182 issued December 2012
- **Upgrade completed December 2012**

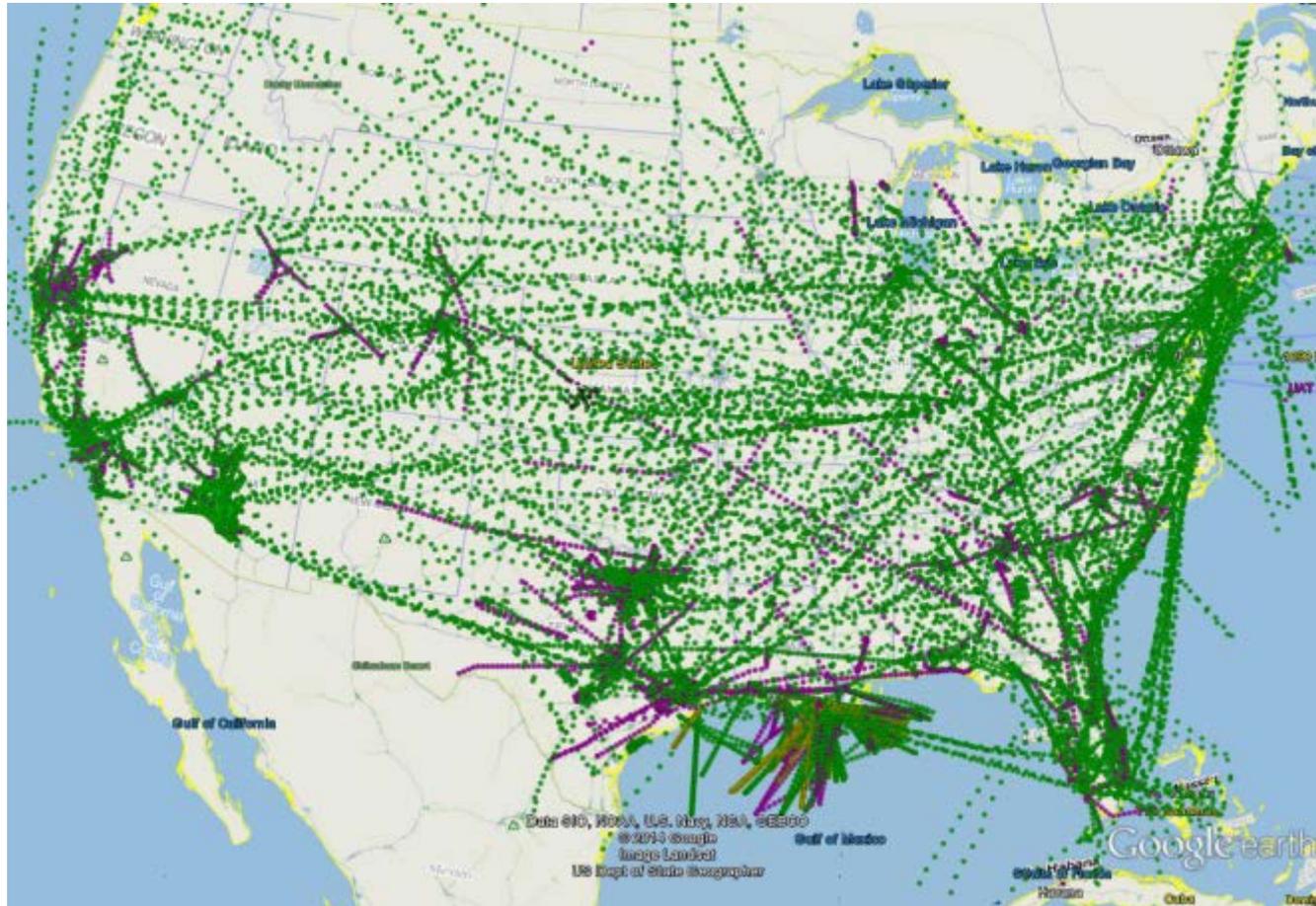


- ADS-B Out
- Aircraft: 400 legacy Capstone aircraft
- Contract awarded to FreeFlight Systems on April 30, 2013
- **AML STC for fixed wing issued March 2014**; AML STC to include AS-350 is expected in September 2015; working field approval for Bell 412
- Upgrades complete by 2016
  - **To date, 122 upgrades complete**

# ADS-B V2 + V1 Approved GoMex Helicopters: 24 Hour Snapshot (Tues Jan 6<sup>th</sup>, 2015) Good enough for automation

Coverage extends ≈250nm over Atlantic and Pacific.

<https://vimeo.com/116455843>



Will be updated 2/5/15

Count	Link
747	260B
208	282B
13	Dual Out
21	260A Helos
3	Anonymous Ops (Included in 282B count)
989	LV1+LV2

**Note: Some aircraft with multiple flights**

Green = DO-260B

Purple = DO-282B

Yellow = 260A GoMex approved helicopters

# San Juan ADS-B V2 24 Hour Snapshot (Tues Jan 6<sup>th</sup>, 2015) Good enough for automation

<https://vimeo.com/116379028>

Will be updated 2/5/15

Green = DO-260B

Count	Operator or Type
14	JetBlue
1	US Airways
3	UPS
7	Business Jets
25	260Bs

Note: Some aircraft with multiple flights



# ADS-B Compliance Monitor Overview

## Purpose:

Provide Compliance Monitoring Services for ADS-B equipped aircraft and vehicles

## Objectives:

- Identify aircraft operating below ADS-B Out Final Rule requirements and vehicles operating below Vehicle Transmitter requirements
- Monitor equipage growth
- Support AIR certification flight process

Op Id	Start Time	Dur	ICAO	Version	Out	In	Tail Num	Flight Id	ME	Int / Acc	Km	Other
21735	11/12/2013 12:43:22 PM	0:12:21	A50A34	2	UAT		N4238					
18920	11/11/2013 6:42:53 PM	0:32:21	A50A34	2	UAT		N4238					
10854	11/10/2013 11:52:10 PM	0:26:56	A50A34	2	UAT		N4238					
9746	11/10/2013 9:31:26 PM	1:35:53	A50A34	2	UAT		N4238					
8325	11/10/2013 6:55:11 PM	0:41:14	A50A34	2	UAT		N4238					
6946	11/10/2013 4:01:40 PM	1:01:43	A50A34	2	UAT		N4238					
6037	11/10/2013 1:37:49 PM	0:20:33	A50A34	2	UAT		N4238					

■ Complete   
 ■ In Progress   
 ■ Not Yet Started



# Service Availability Prediction Tool (SAPT)

## Purpose

- Satisfy ARC recommendation 21 to provide a preflight prediction system that assesses the ability of positioning services to meet the position accuracy and integrity requirements necessary to operate in the ADS-B designated airspace.
  - Predict NIC and NACp along a proposed route of flight for ADS-B users.
  - Provide Backup if ADS-B performance is not met
  - Provide RAIM status for TSO-129 per AC90-100A

## Issue Report

- Enhancement Release mostly completed but delayed
- Some requirements, e.g. performance, can't be met in Enhancement Release
- Google Earth Discontinued
- Linux & virtualization now required by EDC
- Algorithm changes presented to SC-159 produce significantly more conservative results than previous

## Current Status (As of Jan 2015)

<u>Constraint</u>	<u>Condition</u>	<u>Trend</u>	
- Cost	●	▼	● Meeting expectation
- Schedule	●	▼	● At risk
- Technical	●	▼	● Not meeting expectation
- Risk	●	■	▲ Better
			■ No change
			▼ Worse

## Need For Assistance and Approval

- New schedule and approach
- Change Control Account to reflect new schedule
- Google Earth issue resolution
- Algorithm issue resolution
- Tech Refresh Plan

■ Complete  
■ In Progress  
■ Not Yet Started

Initial Test Release  
Sept 2011

Baseline Release  
May 2013

RAIM Integration  
FY13-Aug 2014

Enhancement Release  
FY13-FY15

Second-Level Transition  
FY14-FY15

Tech Refresh  
FY15-FY16



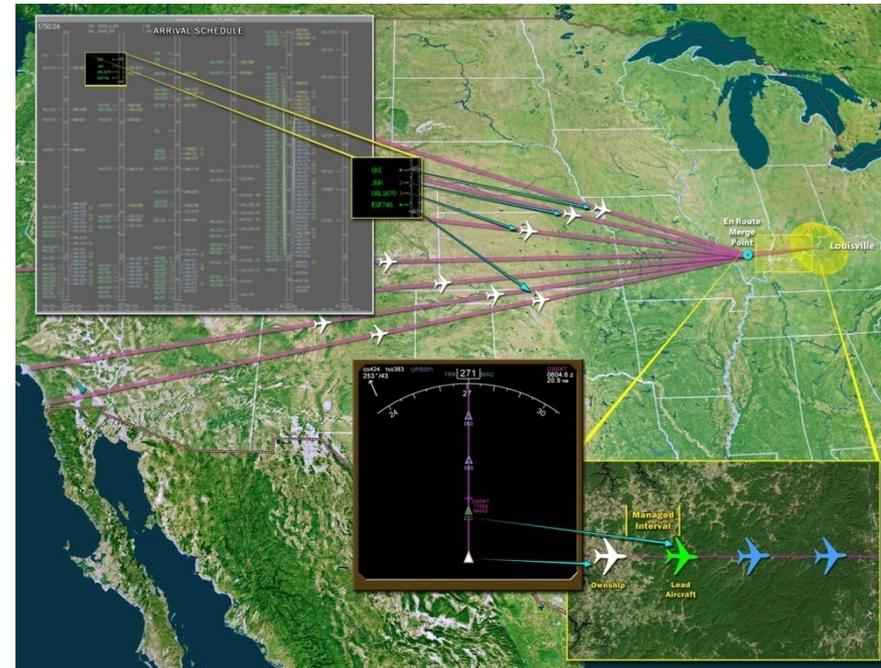
# Interval Management

**Description:** Produce operational benefits through precise management of intervals between aircraft whose trajectories are common or merging

**Goal:** Create an operational environment that maximizes airspace throughput while enabling aircraft to minimize fuel burn and environmental impacts.

**Objectives:**

- Deploy GIM-S functionality NAS-wide to begin benefits accrual
- Develop a FIM-S MOPS
- Pursue an Investment Decision for AA&C Applications
- Mature A-IM Concepts and prepare message sets for DataComm inclusion



## Key Project Milestones

■ Complete; ■ In Progress; ■ Not Yet Started;



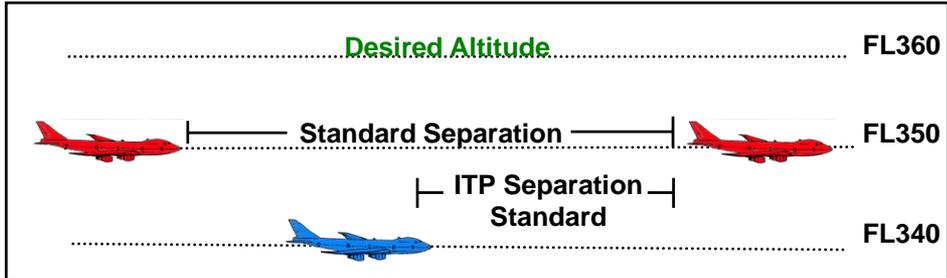
# ITP Application Overview

**Purpose:** Provide operational benefits in non-surveillance airspace by enabling “in-trail” climbs/descents at reduced separation distances

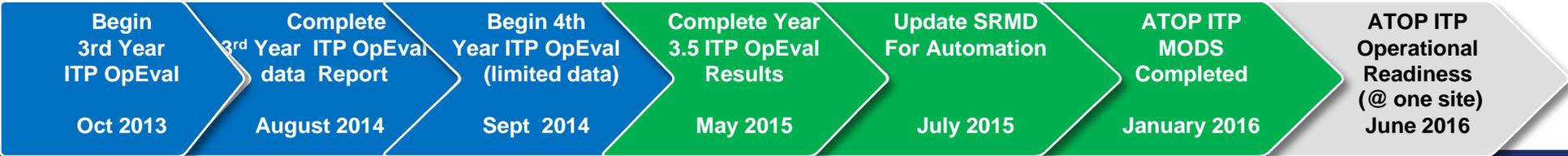
**Goal:** Employ ITP in oceanic air carrier operations (revenue service)

**Objectives:** Validate operational performance and economic benefits of ITP  
Develop and validate ADS-B ITP MOPS material

**Partners:** United Airlines,  
Honeywell, Goodrich,  
Airports Fiji Limited,  
Airways Corp NZ



■ Complete; ■ In Progress; ■ Not Yet Started;



# Next Steps / FY15 Planned Activities

- **Complete validation of multi-center metering for GIM-S by March 2015**
- **Complete first radio construction in support of the Gulf of Mexico expansion by June 2015**
- **Continue rollout of Air Traffic Control Separation Services**
  - Achieve IOC at last en route site by September 2015
  - Achieve IOC at four additional terminal sites by September 2015
- **Monitor avionics compliance and work with industry on the *Equip 2020* initiative**
- **Prepare for JRC requests**
  - Investment Analysis Readiness Decision (IARD) for ADS-B In Applications

# *Questions?*





Surveillance & Broadcast  
Services – Implementation Lead

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**Federal Aviation  
Administration**

# **TBFM Update**

## **Briefing for ATPAC**

Presented by: AJV-85

Date: February 10, 2015



# Background

- **AJV-8, Air Traffic Procedures** - focal point for TBFM oversight, TBFM National Operations Team, defining priorities and coordinating implementation of the Vision across Service Units.
  - **AJV-85, Future Standards and Procedures**
    - TBFM Action Plan
    - Coordination with Metroplex and SBS for oversight of TBFM related activities



# Policies and Procedures

- **Policy and Procedures have been updated are in process for publication. Changes include:**
  - Definitions
  - Roles and Responsibilities
  - Use policy
  - Facility direction for support and maintenance to ensure the system provides optimum performance.



# Communication

**Working with the ATCSCC on a method to communicate status of TBFM to customers.**



# TBFM Tool Umbrella (To Support Metering)

Function	Availability	Description
TBFM – Time-Based Flow Management	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	IOC 9/22/2014/ ZAB/PHX	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 9/22/2014 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	IOC ZLA 11/3/2014	Automation of the coordination and management of departures to meet the en route slots
TSS – Terminal Sequencing and Spacing	2018 <b>FID 3/2015</b>	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.





# Additional Information



# Training

- **Required for all operational and traffic management personal at TBFM equipped facilities via web based training.**
  - FAA and NATCA leadership video
- **TMC/STMC training development in progress.**
  - Expect to train all TMC's by 2017
- **Conceptual briefing for facility management and staff under development.**
- **Customer information packages are under development.**



# GIM-S Extended Metering Capability

## Description of Capability

- **Allows meter points to be created in en route airspace over extended distances with speed advisories provided to controllers to meet STAs at a meter point**
- **Increases opportunities for Optimized Profile Descents (OPDs) by pre-conditioning the spacing and sequencing of the arrival stream**
  - Key site – ZAB for PHX arrivals – IOC 9/22/14 on EAGUL Arr.
- **Initial Deployment: ZAB-PHX, ZDV-DEN, ZLC-SLC, ZLA-LAX**



# Integrated Departure Arrival Capability (IDAC)

## Description of Capability

- **IDAC provides displays in towers/terminals to allow TMCs or controllers to schedule departures**
  - Reduces need for APREQ phone calls to Center TMCs
  - Tower schedules directly, but Center TMU display allows TMCs to review schedule and coordinate changes if needed
  - IDAC display shows tower's available departure slots
- **Additional IDAC site deployment – 68 additional terminals in the next 4 years..**



# Information Sharing

## Description of Enhancement

- **Provides additional information on metering operations to NAS users**
- **SWIM-compliant approach to TBFM data sharing for AOCs, other external users**
- **Includes current TBFM and TBFM enhancements data**
- **Currently testing with Delta, expecting a SW update spring 2015 to correct issues.**
  - Requires an interface to view data



# Additional ACM Sites

## Description of Enhancement

**Completed 11/2015**

- **Provides additional ACM capabilities to enhance the use of TBFM. Added:**
  - ZSE, ZLA, and ZLC for aircraft landing SFO
  - ZDC and ZHU for aircraft landing ATL
  - ZAB for aircraft landing LAX
  - ZME and ZFW for aircraft landing IAH
  - ZOA and ZAB for aircraft landing SAN



# Terminal Sequencing and Spacing

- **Scheduled deployment late 2018 for 5 sites. Notional sites are PHX, IAH,**
  - Extension of TBFM automation and schedule into the terminal:
  - Create a time-based schedule for all arrival aircraft to merge points and the runway
  - Communicate this schedule to TRACON controllers via a set of display tools including slot markers, speed advisories, timelines, RNP indicators, etc.
- **Operational Integration Assessment of the NASA product – May 2015**



# Questions & Discussion

