

## Nomination for Robert J. Collier Trophy

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SUBJECT: Collier Nomination

January 30, 2015

Ladies and Gentlemen:

It is an honor and a privilege for the Federal Aviation Administration (FAA) Co-chair and Industry Co-chair of the General Aviation Joint Steering Committee (GAJSC) to nominate the GAJSC to receive the prestigious Robert J. Collier Trophy – 2014 “for the greatest achievement in aeronautics... in America, with respect to improving the performance, efficiency, and safety of air... vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year.” This special recognition is for the hundreds of individuals who have worked diligently since 1997 to improve general aviation (GA) safety.

The GAJSC formed in the late 1990s, along with the Commercial Aviation Safety Team (CAST), in response to a government and industry challenge by the 1997 White House Commission on Aviation Safety and Security report to reduce both GA and commercial accidents. The National Civil Aviation Review Commission also recognized the need for government-industry collaboration on a focused, consensus-based safety agenda. The program was revitalized in 2011 based on the work of Secretary LaHood's Future of Aviation Advisory Committee to place focus on GA safety.

Comprising both government and industry safety experts, the GAJSC quickly became an effective partnership, and adopted the goal of a continuous reduction in the risk of fatal GA accidents. While originally deemed virtually unattainable by many, the GAJSC has worked hard to make this goal a reality. Since its adoption of a CAST-like process in 2011, the committee has worked relentlessly to analyze data from loss-of-control (LOC) and system component failure–powerplant (SCF–PP) accidents as it works its way down the list of the largest killers in GA. From the distillation of lessons learned, the committee devised critical safety enhancements that greatly reduce accident risk and ultimately save lives. Because of this initiative, admired and emulated around the world, ***the GAJSC has developed novel solutions for reducing the risk of fatal GA LOC accidents.***

One of the first safety enhancements the GAJSC adopted was voluntary installation of angle-of-attack (AOA) indicators on GA aircraft. The Safety Analysis Team, a team chartered to guide the daily work of the GAJSC and to monitor implementation and effectiveness of the developed mitigations, found that LOC–Inflight (LOC–I) was by far the leading cause of death in GA accidents. To mitigate the risks of LOC–I accidents, the GAJSC chartered two LOC working groups: one to look at LOC–I during approach and landing and another to look at LOC–I during all other phases of flight. The combined results from the accident studies found that a properly installed and used AOA indicator would be one of the strongest mitigations against LOC–I accidents. Following the LOC–I working group studies, a commitment by GAJSC members launched the voluntary incorporation of AOA technology on GA aircraft by pilots and aircraft owners. Driven by an external vane or derived information from an avionics unit, AOA indicators help to prevent pilots from inadvertently entering into a stall and give pilots awareness of their AOA during all phases of flight. Proactive safety enhancements like this allow pilots to detect and correct problems before an accident occurs. Effective mitigations like installation of AOA indicators can fully eliminate major accident categories.

As the two LOC working groups conducted their work, they had to decide how this technology could be incorporated into existing aircraft and new type designs. In the case of new type designs and existing aircraft still in production, the General Aviation Manufacturers Association (GAMA) contacted aircraft manufacturers and communicated the results of the LOC studies, which showed the importance of integrating LOC risk mitigation technologies in aircraft. GAMA relayed the request from the GAJSC that AOA technology be strongly considered in existing and future designs where possible.

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With regard to the AOA indicator installations for the existing GA fleet, the solution was a little more complex. The regulations governing the installation of new systems on existing aircraft are designed to maintain a level of safety to protect not only the pilot and passengers on an aircraft but the general public as well. For this reason, systems deemed critical for flight go through a rigorous certification process to ensure that high level of safety. Since AOA indicators on existing aircraft would not replace the existing stall annunciation system on GA aircraft, they were described as “safety enhancing but non-flight critical.”

Through the collaborative efforts of industry and the FAA, a streamlined certification process was developed to provide a clear path to approve these non-required safety devices in the existing GA fleet as minor alterations. The new FAA policy opened the way to allow certain AOA indicators to be built to an American Society for Testing and Materials (ASTM) standard instead of each design going through the traditional certification process. If a unit is built to this standard and can be installed on the aircraft using an existing inspection port in the wing, it can greatly reduce the cost of purchase and installation for GA pilots and aircraft owners. After this policy was signed for AOA indicators, several GA equipment manufacturers brought AOA indicators to the market and they are being purchased by the community. On a related note, in 2015, the National Transportation Safety Board (NTSB) added “Prevent Loss of Control in Flight in General Aviation” to the Most Wanted List of Transportation Safety Improvements to supplement the work being done by the GAJSC and to promote awareness of these technologies to prevent loss of control.

Another issue found in the accident studies was the presence of impairing medications found post mortem in pilots involved in fatal GA accidents. In many cases, the impairing medication was available over the counter and a pilot could operate safely as a pilot in command as long as the proper amount of time passed between taking the medication and flying. As a result of the study, it was determined some pilots may not always understand the proper wait time between taking a dose and flying or in some cases that a drug is considered impairing. The GAJSC worked with the FAA Administrator and the senior leadership of the GA industry to address a joint letter to the GA community on the importance of not only understanding the medications they may be taking but understanding the underlying conditions causing their use. This outreach, conducted before the start of the 2014 summer flying season, along with other safety enhancements designed to improve a pilot’s understanding of medications and underlying conditions, will greatly help to reduce risks that stem from these issues.

The GAJSC has completed 12 of the 29 safety enhancements developed to mitigate the leading causes of GA accidents in the United States. A summary of all safety enhancements the GAJSC members have voluntarily committed to implement is attached in Appendix 1. ***These adopted safety enhancements contain novel ways that have been developed to mitigate the risk of GA fatal accidents. The way this process has led to revolutionary methodologies and the speed with which they have been implemented is an absolutely remarkable achievement.***

The GAJSC follows a disciplined, proactive, data-driven approach to develop safety enhancements. Initially it focused on the leading categories of accidents, identifying accident precursors and addressing them with an optimal resource-effective package of actions. Because the GAJSC membership represents pilots, operators, manufacturers, training and academia, as well as others, the scope of operations included in the work of the GAJSC is very broad. These operations include corporate and business aviation flights with aircraft ranging from very large jets to small reciprocating single-engine aircraft. Operations also include personal and recreational flying conducted with a vast array of aircraft spanning from reciprocating and jet-powered aircraft that can be certified to experimental or amateur-built aircraft. The diversity of the GA fleet and operations requires greater emphasis on acquiring, sharing, and analyzing aviation safety data in a collaborative environment. This becomes especially important as historical accident causes are studied and mitigated. The evolving aviation environment will likely introduce new threats that must be identified and addressed before they lead to accidents.

To accomplish this, the GAJSC also developed an incident-based risk reduction methodology that uses *precursors* to focus on risk prediction by identifying anomalies and trends. First adopted in GA by the corporate and business communities, these types of risk mitigation strategies will generate corrective actions before accidents occur. Based on almost a decade of trust and confidence, the Aviation Safety Information Analysis and Sharing (ASIAS) program allows industry and government members to share sensitive safety information in a protected environment. Digital and text-mining tools have been developed that enable a fusion of flightcrew safety reports, aircraft digital flight data recorder parameters, high definition terrain databases, weather data, and radar track data. The final product generates awareness and causal understanding of emerging safety threats never before possible.

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As the GAJSC continues to study historic accident trends and begins its proactive safety work, the committee is exploring new avenues of effectively sharing critical safety information to continue the reduction in threats that often led to past fatal accidents. Launched in 2007, ASIAS greatly expands the information sharing partnership among manufacturers, operators, and analysts. ***Using voluntarily provided aviation industry data, the GAJSC and ASIAS are identifying emerging threats before they result in accidents.***

The GAJSC includes safety experts from the FAA, Aircraft Owners and Pilots Association (AOPA), Experimental Aircraft Association (EAA), GAMA, National Business Aviation Association (NBAA), National Air Transportation Association (NATA), Society of Aviation and Flight Educators (SAFE), Light Aircraft Manufacturers Association (LAMA), National Aeronautics and Space Administration, NTSB, academia, and the insurance industry. Aircraft, component and engine manufacturers also take part in the GAJSC and its working groups. The following page contains a complete listing of GAJSC members, working group members, and observer organizations. All of these organizations share in the GAJSC's success and deserve the recognition represented by the Collier Trophy.

Although the GAJSC has focused primarily on the U.S. aviation system, it has increased its focus on exporting its methodology to an eager international audience. Throughout its history the GAJSC has reached out internationally to help improve aviation safety around the world. This is evidenced by the number of international organizations who have asked for updates on the work of the GAJSC, including the European Aviation Safety Agency (EASA) and Agência Nacional de Aviação Civil (ANAC).

In addition to being a leading example for GA-related safety professionals throughout the world, the GAJSC has served as a model for the helicopter community. Using the GAJSC/CAST process as a model of success, government and industry leaders chartered the United States Helicopter Safety Team (USHST) in February 2014 to reduce the worldwide military and civil helicopter accident rate 80 percent by 2016. Members include helicopter operators, airframe manufacturers, and regulators such as the FAA, Transport Canada, International Civil Aviation Organization (ICAO), and EASA.

The work and risk mitigations developed by the GAJSC, including the revolutionary method for approving AOA indicators and their installations, signifies an historic achievement in aviation absolutely deserving of the Collier Trophy. Undaunted by skeptics, the GAJSC's member organizations boldly stepped forward over 10 years ago and launched an effort that has left its mark forever on the National Aviation System. The GAJSC has developed a data-driven, consensus-based methodology that has changed the world view of GA safety and heralded a new era of proactive safety management. Throughout a period that witnessed the toughest challenges ever to face the aviation community, this government-industry team has maintained a steadfast commitment to envisioning the most effective improvements that can be made to the aviation system, and voluntarily deploying them. Without a doubt, hundreds, if not thousands, of lives will have been saved through the work of this impressive committee and the solutions they developed.

The GAJSC is clearly one of the pinnacle aviation safety organizations in the United States. The work of the GAJSC and its international outreach activities will continue the monumental task of improving global aviation safety over the next decade. The GAJSC clearly demonstrates how dedicated safety practitioners transcend organizational boundaries to improve the treasured national asset of aviation and save lives. For this sustained superior achievement, the GAJSC should receive the 2014 Robert J. Collier Trophy.

This nomination is submitted on behalf of the GAJSC, whose organizations are listed below.

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### Nominee Primary Contacts

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### GAJSC Members

#### **Member Organizations**

*Aircraft Owners and Pilots Association  
Experimental Aircraft Association  
General Aviation Manufacturers Association  
National Business Aviation Association  
National Air Transportation Association  
Society of Aviation and Flight Educators  
National Association of Flight Instructors  
Light Aircraft Manufacturers Association  
Federal Aviation Administration (Accident  
Investigation and Prevention, Aircraft  
Certification Service, Flight Standards Service,  
Office of Aerospace Medicine, Office of Airports)  
National Aeronautics and Space Administration*

#### **Working Group Members**

*Aircraft Electronics Association  
Textron Aviation  
Garmin  
Lancair Owners and Builders Organization  
Jeppesen  
Embry-Riddle Aeronautical University  
University of North Dakota  
Aviation Insurance Association  
American Bonanza Society  
Lycoming Engines  
Continental Motors  
National Agricultural Aviation Association*

#### **Observers**

*National Transportation Safety Board  
National Air Traffic Controllers Association*

### Briefers

#### **Government Briefer**

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#### **Industry Briefer**

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### Proposed Citation

THE GENERAL AVIATION JOINT STEERING COMMITTEE

“For developing and implementing novel solutions to mitigate risks contributing to fatal general aviation accidents and leading the effort to proactively improve general aviation safety.”

Appendix 1  
**Safer Skies/GAJSC**

29 Safety Enhancements developed to date  
12 completed / 17 underway  
*Updated January 23, 2015*

- \* *Completed = All GAJSC actions have been completed*
- \* *Underway = All GAJSC actions have not been completed*

**Safety Enhancement 1: Angle of Attack**

Angle of Attack Systems – New & Current Production (*underway*)

This safety enhancement designs and implements a public education campaign on the safety benefits of AOA systems supplementing existing stall warning systems in new and current production aircraft. The campaign includes both pilot and manufacturer communities.

**Safety Enhancement 2: Angle of Attack**

Angle of Attack Systems – Existing GA Fleet (*underway*)

This safety enhancement designs and implements a public education campaign on the safety benefits of AOA systems supplementing existing stall warning systems in the existing GA fleet. The campaign focuses on owners and operators.

The Aircraft Owners and Pilots Association's Air Safety Institute (AOPA) simultaneously launched an online education course, available to all pilots discussing stalls, spins and AOA. The program continues to this day and has been viewed by over 20,000 GA pilots. Additionally, several accident case study courses discussing Loss of Control-Inflight (LOC-I) have been produced and are offered free of charge to all pilots. More than 50,000 pilots have viewed these programs collectively.

**Safety Enhancement 3: Loss of Control**

Aeronautical Decision Making (ADM) (*underway*)

This safety enhancement develops and implements a public education campaign raising awareness of the need for ADM, with an emphasis on preflight planning. The initiative will focus on ADM in preflight planning, professional decision making, Flight Risk Assessment Tools (FRAT), and stabilized approaches, missed approaches, and go-arounds.

**Safety Enhancement 4: Loss of Control**

Over-Reliance on Automation (*completed*)

This safety enhancement improves certain aspects of flight training related to over-reliance on automated flight systems. The focus will be on proficiency in manual flying in the event of failure or malfunction of automated systems.

Several FAA documents relative to the Title 14, Code of Federal Regulations (14 CFR) Part 142 community were updated/produced to address manual flying proficiency: SAFO 13002, Manual Flight Operations, AC 61-93, AC 61-98, Currency Requirements and Guidance for the Flight Review and Instrument Proficiency Check, AC 61-136A, FAA Approval of Aviation Training Devices and Their Use for Training and Experience, and the instrument training handbook.

### **Safety Enhancement 5: Loss of Control**

#### **Transition Training – Tools (*underway*)**

This safety enhancement develops Web-based tools that will aid in all aspects of transition to unfamiliar aircraft across GA, to include ADM, to identify the risk of inadequate training when operating unfamiliar equipment. This safety enhancement also includes a public education campaign on the importance of transition training.

An online course that addresses transition training in a variety of aircraft is currently under development for release in 2015- co-sponsored by FAA, GAMA and AOPA.

### **Safety Enhancement 6: Loss of Control**

#### **Transition Training – Letters of Deviation Authority (*completed*)**

This safety enhancement provides for amendment of current policies to more easily allow letters of deviation authority (LODA) from 14 CFR 91.319(a) through (h) for transition training in experimental aircraft.

### **Safety Enhancement 7: Loss of Control**

#### **Utilization of Type Clubs (*completed*)**

This safety enhancement asks type clubs and operator groups to review their airplanes' existing procedures, and develop simplified procedures and checklists for missed approach, go-around, and other critical phases of flight to determine whether or where pilots are getting task-saturated/fixated in an effort to reduce the likelihood of fatal LOC accidents caused by high pilot workload.

### **Safety Enhancement 8: Loss of Control**

#### **Flight Training after Period of Flight Inactivity (*completed*)**

This safety enhancement develops and implements an awareness campaign to reduce LOC accidents resulting from returning to flying after periods of flight inactivity. To support this work, the Aircraft Owners and Pilots Association (AOPA) launched a Rusty Pilot Program in March of 2014. Several seminars and classes have been held around the country by AOPA in partnership with flight schools and flying clubs. Several more events are currently scheduled.

### **Safety Enhancement 9: Loss of Control**

#### **Part 135 Safety Culture (*completed*)**

This safety enhancement develops and implements a publication education campaign on the safety benefits of standard operating procedures for 14 CFR part 91 positioning legs, FRAT, and Safety Management Systems.

### **Safety Enhancement 10: Loss of Control**

#### **Stabilized Approach and Landing (*completed*)**

This safety enhancement promotes and emphasizes the use of the stabilized approach and landing concepts through training and guidance material changes. Adequacy of the existing guidance and advisory material on go-arounds will be reviewed. Emphasis will be placed on the effects of wind on traffic pattern operations during flight review and transition training. The FAA (AFS-800) has published these documents.

[NOTE: There is no SE 11.]

### **Safety Enhancement 12: Loss of Control**

#### **Weather Technology (*underway*)**

This safety enhancement investigates and deploys cost-effective technologies that can provide real-time weather information (including actual conditions as viewed through a remote camera) at airports, similar to what is being done in other parts of the United States, such as Alaska.

### **Safety Enhancement 13: Loss of Control**

#### **Weather Technology (*completed*)**

This safety enhancement educates the GA community on and promotes the use of available weather information technologies, such as the National Oceanic and Atmospheric Administration (NOAA) Aviation Digital Data Service (ADDS) icing tool.

### **Safety Enhancement 14: Loss of Control**

#### **Engine Monitoring Technology (*completed*)**

This safety enhancement develops a public education campaign based on the current available technological capabilities on the use of engine monitoring, engine analysis, and fuel-monitoring/indicator systems. As part of this work, GAMA conducted a review of the capabilities of existing engine monitoring technologies.

### **Safety Enhancement 15: Loss of Control**

#### **Flight after Use of Medications with Sedating Effects (*underway*)**

This safety enhancement includes a public/education/outreach campaign to promote the understanding of the effects of medications and the need to use current FAA recommendations and guidance on flying while under the influence of medications to ensure medications do not decrease a pilot's alertness and increase the risk of impairment of the airman's flight capabilities. The FAA, Jeppesen, and other flight training instruction content organizations will include medication awareness training for all pilots in their training curriculums. They will incorporate the "I'M SAFE" personal checklist from the Aeronautical Information Manual into the training curriculum, as well as all preflight risk assessment tools for use before each flight. Medical organizations will be encouraged to provide guidance to physicians to emphasize the importance of learning if patients are pilots and to recognize the importance of educating pilot patients about the possible hazards to flight associated with medications prescribed to or used by them. The FAA's Office of Aerospace Medicine (AAM) will evaluate the feasibility of the development, deployment, and upkeep of an online "medication wait time tool."

### **Safety Enhancement 16: Loss of Control**

#### **Flight with Impairing or Incapacitating Medical Conditions (*underway*)**

This safety enhancement recommends the FAA Medical Certification Division improve electronic medical records to assist the applicant in accurately reporting previously reported historical medical events/records so that Aviation Medical Examiners have a complete and accurate history when providing medical examinations.

### **Safety Enhancement 17: Approach and Landing**

#### **Flight with Impairing or Incapacitating Medical Conditions (*completed*)**

This safety enhancement asks AOPA and Experimental Aircraft Association to work with the pilot community to determine additional methods to overcome barriers to open and honest communications on potentially hazardous medical issues and improve pilot professionalism and the ability to conduct accurate pilot medical self-assessment before each flight. This work included an AOPA developed a survey that was included in AOPA and EAA electronic newsletters. The groups received 2,297 responses and the results were used in the development of the online medical self-assessment course.

[NOTE: There is no SE 18, 19, or 20.]

### **Safety Enhancement 21: Loss of Control**

#### **Risk Based Flight Review (*completed*)**

This safety enhancement requires the FAA to compile and disseminate risk-based concerns to flight instructors and flight schools to highlight regional and national risks in training and flight reviews. National risk-based concerns identified by the GAJSC in studies for that year should also be shared.

### **Safety Enhancement 22: Approach and Landing**

#### **Flight Data Monitoring (*underway*)**

This safety enhancement aims to increase GA participation in Flight Data Monitoring (FDM) programs by creating a public education campaign on the safety benefits of FDM programs; assessing the GA community's current sentiment, perception of, and understanding of FDM before and after the public education campaign; determining the incentives, if any, required to generate a meaningful level of GA participation in a national FDM program; and creating a non-punitive policy to promote the use of voluntary GA FDM programs similar to that used with FOQA. Hold an Aviation Safety InfoShare-like conference to communicate best practices and encourage other fleet operators and individual owners/operators to participate in a national FDM program.

### **Safety Enhancement 23: Loss of Control**

#### **Experimental-Amateur Built/Flight Test (*underway*)**

This safety enhancement calls on the FAA and industry to develop a public education campaign based on best practices to guide experimental-amateur built (E-AB) aircraft builders on when to reenter a structured flight test phase following a modification to an aircraft. The FAA and industry will review and revise the adequacy of the existing guidance and advisory material on the issue of center of gravity limits, including lateral, for amateur-built experimental aircraft.

### **Safety Enhancement 24: Loss of Control**

#### **Single-Pilot CRM (*completed*)**

This safety enhancement identifies best practices regarding single-pilot CRM. The identified best practices should be communicated to the GA community through a public education campaign. This outreach was completed February 2014.

### **Safety Enhancement 25: Loss of Control**

#### **Reduce Regulatory Roadblocks (*underway*)**

This safety enhancement is for the FAA to institute streamlined processes in its Office of Aviation Safety (AVS) for certifying and installing novel technology that has a high probability of safety benefits with an accompanying low safety risk.

### **Safety Enhancement 26: Loss of Control**

#### **Reduce Regulatory Roadblocks (*underway*)**

This safety enhancement involves the 14 CFR Part 23 Reorganization Aviation Rulemaking committee (ARC) developing the top-level industry standard, as well as a lower tier standard for the existing fleet of small airplanes. The objective of this Part 23 tier is to provide standards appropriate for alterations and modifications of older Part 23, Civil Air Regulations (CAR) 3, CAR 4a, and Aeronautics Bulletin No. 7 airplanes. The criteria should include standards for safety-enhancing, non-required equipment as well as for general alterations. The burden of proof for low-risk safety-enhancing modifications would be that the equipment does not interfere with existing certified hardware. By providing current standards, FAA approval of safety-enhancing updates should be more efficient and less costly.

### **Safety Enhancement 27: Loss of Control**

#### **Reduce Regulatory Roadblocks (*completed*)**

This safety enhancement calls for a review of 14 CFR 21.8 and 21.9, to make sure these rules are not unintentionally producing roadblocks to the installation of non-required, safety-enhancing equipment. If these rules are creating an unintended roadblock, create paths that are most cost effective up to and including the exemption process.

### **Safety Enhancement 28: Loss of Control**

#### **Pilot Response to Unexpected Events (*underway*)**

This safety enhancement will be used to educate flight instructors and pilots on the need for preparing for unexpected events in the cockpit, focusing on the importance of briefing for emergencies, positive transfer of controls, and the recognition and management of the “startle response.” This safety enhancement will also better prepare pilots for engine failure after takeoff. Work will include developing best practices, refining the takeoff pre-brief to emphasize what action will be taken dependent on the current situation, and recommend training/practicing the developed best practices on a regular basis.

[NOTE: There is no SE 29.]

### **Safety Enhancement 30: Loss of Control**

#### **Medication List for Pilots (*underway*)**

This safety enhancement is to develop a medication list, easily available to all pilots and available online, of approved or acceptable medications along with disqualifying medications. The online tool should provide accurate aerospace medical guidance about the most common acceptable and unacceptable medications with recommended return-to-duty times following the use of these medications and provide information about drug interactions. The underlying conditions the medication treats should be highlighted.

**Safety Enhancement 31: Loss of Control**

Test Pilot Utilization and E-AB Pilot Proficiency (*underway*)

This safety enhancement will improve amateur-built flight testing safety through greater understanding of test pilot qualifications and a listing of test pilots willing to work with homebuilders.

**Safety Enhancement 32: Loss of Control**

Airman Certification Standards (*underway*)

This safety enhancement establishes standards for pilot testing and training, to include introducing risk-based decision making at the earliest point practical in airman training.

**Safety Enhancement 33: Loss of Control**

Safety Culture (*underway*)

This safety enhancement improves the safety culture of general aviation, to include industry promotion of local flying clubs and pilot associations to help foster an environment of education and mentoring for pilots.

**Safety Enhancement 34: Loss of Control**

Outreach (*underway*)

This safety enhancement calls for new, improved, and effective communication to the pilot community on the following topics:

- Importance of abiding by limitations and knowledge of aircraft performance
- Primary duty of a pilot being to fly the aircraft – Aviate/Navigate/Communicate
- Scenario-based training for handling spatial disorientation
- Need for training and currency when flying in mountainous areas
- Importance of certified flight instructors and airmen establishing, maintaining, and adhering to personal minimums