

How do you prepare for a flight? PAVE: Pilot, Aircraft Environment and External Pressures.

PILOT

- A pilot must continually make decisions about competency, condition of health, mental and emotional state, level of fatigue, and many other variables.

AIRCRAFT

- A pilot frequently bases decisions on evaluation of the airplane, such as performance, equipment, or airworthiness.

ENVIRONMENT

- The environment encompasses many elements that are not pilot or airplane related, including such factors as weather, air traffic control (ATC), navigational aids, terrain, takeoff and landing areas and surrounding obstacles. Weather is one element that can change drastically over time and distance.

EXTERNAL PRESSURES

- The pilot must evaluate the three previous areas to decide on the desirability of under-taking or continuing the flight as planned. It is worth asking why the flight is being made, how critical it is to maintain the schedule, and if the trip is worth the risks.

P – Pilot for the Student Pilot:

Start with I'M SAFE: Illness, medication, stress, alcohol, fatigue and emotional factors. If any of these factors apply, you should not fly. As a student pilot, you are required to carry your logbook, medical and a government ID. Your logbook and medical has the Instructor's required endorsements (90 day). As a student pilot, you are not allowed to carry passengers, fly when visibility is less than 3 miles and must have visual reference to the surface. Special requirements for the Student Pilot are: Must be a Private Pilot to take off and land within (KSFO) Class B Airspace (AIM 3-2-3) and cannot fly at night unless endorsed by the Instructor.

A – Aircraft for the Student Pilot:

Remember A R O W. Airworthiness Certificate (Has the aircraft had an Annual, 100 hour, Progressive(91.409), Pitot Static/Transponder check (24 months/91.411, 91.413), ELT check(91.207) and all AD's have been complied(91.403), Registration (Every Three Years), Operating Limits (Section 2 of POH, Pilot's Operating Handbook) and Weight and Balance (Section 6 of POH). Fuel requirements for all flights (30 minutes Day, 45 minutes Night) (91.151). The required takeoff and landing distances, runway lengths and weather forecasts (91.103). Avionics familiarity, density altitude and a current sectional.

V – Environment for the Student Pilot:

Think of the Airport and weather conditions: Crosswind (Instructor limitations), Takeoff and Landing distances, Ceiling conditions (Instructor Limitations), Visibility (Required 3 sm) and your personal minimums.

E – External Pressures for the Student Pilot:

Think about "Get there Itis." The determination to reach a destination, combined with hazardous weather, claims the lives of dozens of pilots and their passengers yearly. Also think about a no pressure solo (plan on soloing when you are ready).

Student Pilots: FAR 61.81 – 61.94

§61.83 Eligibility requirements for student pilots.

To be eligible for a student pilot certificate, an applicant must:

- (a) Be at least 16 years of age for other than the operation of a glider or balloon.
- (b) Be at least 14 years of age for the operation of a glider or balloon.
- (c) Be able to read, speak, write, and understand the English language. If the applicant is unable to meet one of these requirements due to medical reasons, then the Administrator may place such operating limitations on that applicant's pilot certificate as are necessary for the safe operation of the aircraft.

§61.89 General limitations.

- (a) A student pilot may not act as pilot in command of an aircraft:
 - (1) that is carrying a passenger;
 - (2) that is carrying property for compensation or hire;
 - (3) For compensation or hire;
 - (4) In furtherance of a business;
 - (6) With a flight or surface visibility of less than 3 statute miles during daylight hours or 5 statute miles at night;
 - (7) When the flight cannot be made with visual reference to the surface; or
 - (8) In a manner contrary to any limitations placed in the pilot's logbook by an authorized instructor.

§91.103 Preflight action.

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

- (a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be

completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein;

§91.151 Fuel requirements for flight in VFR conditions.

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

§91.207 Emergency locator transmitters.

(a) Except as provided in paragraphs (e) and (f) of this section, no person may operate a U.S.-registered civil airplane unless—

(c) Batteries used in the emergency locator transmitters required by paragraphs (a) and (b) of this section must be replaced (or recharged, if the batteries are rechargeable)—

(1) When the transmitter has been in use for more than 1 cumulative hour; or

(2) When 50 percent of their useful life (or, for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval.

§91.409 Inspections. Annual, 100 hour and Progressive.

(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had—

(1) An **Annual Inspection** in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by §43.7 of this chapter; or

No inspection performed under paragraph (b) of this section may be substituted for any inspection required by this paragraph unless it is performed by a person authorized to perform annual inspections and is entered as an “annual” inspection in the required maintenance records.

(b) Except as provided in paragraph (c) of this section, no person may operate an aircraft carrying any person (other than a crewmember) for hire, and no person may give flight instruction for hire in an aircraft which that person provides, unless within the preceding 100 hours of time in service the aircraft has received an annual or **100-hour inspection** and been approved for return to service in accordance with part 43 of this chapter or has received an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter. The 100-hour limitation may be exceeded by not more than 10 hours while en route to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.

(c) Paragraphs (a) and (b) of this section do not apply to—

(1) An aircraft that carries a special flight permit, a current experimental certificate, or a light-sport or provisional airworthiness certificate;

(d) **Progressive inspection**. Each registered owner or operator of an aircraft desiring to use a progressive inspection program must submit a written request to the FAA Flight Standards district office having jurisdiction over the area in which the applicant is located.

§91.411 Altimeter system and altitude reporting equipment tests and inspections.

(a) No person may operate an airplane, or helicopter, in controlled airspace under IFR unless—

(1) Within the preceding **24 calendar months**, each static pressure system, each altimeter instrument, and each automatic pressure altitude reporting system has been tested and inspected and found to comply with appendices E and F of part 43 of this chapter;

§91.413 ATC transponder tests and inspections.

(a) No persons may use an ATC transponder that is specified in 91.215(a), 121.345(c), or §135.143(c) of this chapter unless, within the preceding **24 calendar months**, the ATC transponder has been tested and inspected and found to comply with appendix F of part 43 of this chapter; and

(b) Following any installation or maintenance on an ATC transponder where data correspondence error could be introduced, the integrated system has been tested, inspected, and found to comply with paragraph (c), appendix E, of part 43 of this chapter.

(c) The tests and inspections specified in this section must be conducted by—

(1) A certificated repair station.

Private Pilot: FAR 61.102 – 61.117

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- The environment encompasses many elements that are not pilot or airplane related, including such factors as weather, air traffic control (ATC), navigational aids, terrain, takeoff and landing areas and surrounding obstacles. Weather is one element that can change drastically over time and distance.

EXTERNAL PRESSURES

- The pilot must evaluate the three previous areas to decide on the desirability of under-taking or continuing the flight as planned. It is worth asking why the flight is being made, how critical it is to maintain the schedule, and if the trip is worth the risks.

P – Pilot for the Private Pilot:

Start with I'M SAFE: Illness, medication, stress, alcohol (.04)(8 hrs-bottle to throttle), fatigue (acute and chronic) and eating factors. If any of these factors apply, you should not fly. As a private pilot, you are required to carry your pilot's certificate, medical and a government ID. As a private pilot, you are allowed to carry passengers (not for hire) – 61.113, fly when visibility is less than 3 miles (SVFR – Special VFR) and can fly without visual reference to the surface. Special requirements for the Private Pilot are: Must be a Private Pilot to take off and land within (KSFO) Class B Airspace (AIM 3-2-3) and can fly at night. Must maintain currency to carry passengers: 1.) 3 touch-n-go's during the day and 3 full stop landings at night every 90 days – 61.57. 2.) Complete a BFR (Flight Review) (minimum 1 hour of ground and 1 hour of flight – every 24 calendar months – 61.56. 3.) Have a First Class (valid for 6 months), Second Class (valid for 12 months) or Third Class (valid for 2 years if over 40 years old or 5 years if under 40 years old) medical certificate to be pilot in command.

A – Aircraft for the Private Pilot:

Remember A R O W. Airworthiness Certificate (Has the aircraft had an Annual, 100 hour, Progressive - 91.409, Pitot Static/Transponder check (24 months - 91.411, 91.413), ELT check - 91.207 and all AD's have been complied - 91.403, Registration (Every Three Years) – 47.41, Operating Limits (Section 2 of POH, Pilot's Operating Handbook) – 91.9 and Weight and Balance (Section 6 of POH). Fuel requirements for all flights (30 minutes Day, 45 minutes Night) - 91.151. The required takeoff and landing distances, runway lengths and weather forecasts - 91.103. Avionics familiarity, density altitude and current sectional information.

V – Environment for the Private Pilot:

Think of the Airport and weather conditions: Crosswind, Takeoff and Landing distances, Ceiling conditions, visibility and your personal minimums. Plan on the weather for your Departure, En-route and Destination. For example: Current Metar, TAF and FA (Area Forecast), surface analysis chart, radar summary chart, winds and temperature aloft, significant weather prognostic chart, convective outlook chart, Airmets and Sigmets, PIREPs, wind shear reports, icing and freezing levels and AWOS, ASOS and ATIS reports for the route and destination. The pilot wants to make a competent "go/no-go" decision based on available weather information. Reference Weather Information – Task C in RAM Study Guide.

E – External Pressures for the Private Pilot:

Think about "Get there Itis." The determination to reach a destination, combined with hazardous weather, claims the lives of dozens of pilots and their passengers yearly. Think about the hazardous attitudes: Anti-authority, Impulsivity, Invulnerability, Macho and Resignation to see if they may apply to this flight. Allowance for delays and diversions, alternative plans and

personal equipment. After you use the PAVE checklist (step 1), use the CARE checklist (Consequences, Alternatives, Reality and External pressures) (step 2) and determine the level and severity of the risk. (Step 3) perform the TEAM checklist. Transfer Risk, Eliminate Risk, Accept Risk and Mitigate Risk.

§47.41 Duration and return of Certificate of Aircraft Registration.

(a) Each Certificate of Aircraft Registration, AC Form 8050-3, issued by the FAA under this subpart is effective, unless registration has ended by reason of having been revoked, canceled, expired, or the ownership is transferred, until the date upon which one of the following events occurs:

- (1) Subject to the Convention on the International Recognition of Rights in Aircraft when applicable, the aircraft is registered under the laws of a foreign country.
- (2) The aircraft is totally destroyed or scrapped.
- (3) The holder of the certificate loses his U.S. citizenship.
- (4) 30 days have elapsed since the death of the holder of the certificate.
- (5) The owner, if an individual who is not a citizen of the United States, loses status as a resident alien, unless that person becomes a citizen of the United States at the same time.
- (6) If the owner is a corporation other than a corporation which is a citizen of the United States.

§61.19 Duration of pilot and instructor certificates.

(a) *General.* The holder of a certificate with an expiration date may not, after that date, exercise the privileges of that certificate.

(b) *Student pilot certificate.*

- (1) For student pilots who have not reached their 40th birthday, the student pilot certificate does not expire until 60 calendar months after the month of the date of examination shown on the medical certificate.
- (2) For student pilots who have reached their 40th birthday, the student pilot certificate does not expire until 24 calendar months after the month of the date of examination shown on the medical certificate.

(c) *Other pilot certificates.* A pilot certificate (other than a student pilot certificate) issued under this part is issued without a specific expiration date.

§61.3 Requirement for certificates, ratings, and authorizations.

(a) *Required pilot certificate for operating a civil aircraft of the United States.* No person may serve as a required pilot flight crewmember of a civil aircraft of the United States, unless that person:

(1) Has in the person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate or authorization—

(i) A pilot certificate issued under this part and in accordance with §61.19;

(ii) A special purpose pilot authorization issued under §61.77;

(iii) A temporary certificate issued under §61.17;

(2) Has a photo identification that is in that person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate or authorization. The photo identification must be a:

(i) Driver's license issued by a State, the District of Columbia, or territory or possession of the United States;

(ii) Government identification card issued by the Federal government, a State, the District of Columbia, or a territory or possession of the United States;

(iii) U.S. Armed Forces' identification card;

(iv) Official passport;

(A) That person's pilot certificate or document issued under §61.29(e) is in that person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate; and

(B) Has been issued in accordance with this part, or has been issued or validated by the country in which the aircraft is registered.

(3) *Medical certificate.* (1) A person may serve as a required pilot flight crewmember of an aircraft only if that person holds the appropriate medical certificate issued under part

67 of this chapter, or other documentation acceptable to the FAA, that is in that person's physical possession or readily accessible in the aircraft.

Medical Standards and Certification:

Duration: Airman medical certificates expire in 6-60 months depending on age and class, the general rule is:

First Class (ATP): Every 12 months if younger than age 40. Every 6 months over age 40.

Second Class (Commercial Pilot): 12 months.

Third Class (Private / Student Pilot): 2 years if over age 40. 5 years if under age 40.

§61.51 Pilot logbooks.

(a) *Training time and aeronautical experience.* Each person must document and record the following time in a manner acceptable to the Administrator:

(1) Training and aeronautical experience used to meet the requirements for a certificate, rating, or flight review of this part.

(2) The aeronautical experience required for meeting the recent flight experience requirements of this part.

(b) *Logbook entries.* For the purposes of meeting the requirements of paragraph (a) of this section, each person must enter the following information for each flight or lesson logged:

(1) General—

(i) Date. (ii) Total flight time or lesson time.

(iii) Location where the aircraft departed and arrived, or for lessons in a flight simulator or flight training device, the location where the lesson occurred.

§61.56 Flight review.

(a) Except as provided in paragraphs (b) and (f) of this section, a flight review consists of a **minimum of 1 hour of flight training and 1 hour of ground training**. The review must include:

(1) A review of the current general operating and flight rules of part 91 of this chapter; and

(2) A review of those maneuvers and procedures that, at the discretion of the person giving the review, are necessary for the pilot to demonstrate the safe exercise of the privileges of the pilot certificate.

(c) Except as provided in paragraphs (d), (e), and (g) of this section, no person may act as pilot in command of an aircraft unless, since the beginning of the 24th calendar month before the month in which that pilot acts as pilot in command, that person has—

(1) Accomplished a flight review given in an aircraft for which that pilot is rated by an authorized instructor and

(2) A logbook endorsed from an authorized instructor who gave the review certifying that the person has satisfactorily completed the review.

(d) A person who has, within the period specified in paragraph (c) of this section, passed any of the following need not accomplish the flight review required by this section:

(1) A pilot proficiency check or practical test conducted by an examiner, an approved pilot check airman, or a U.S. Armed Force, for a pilot certificate, rating, or operating privilege.

(2) A practical test conducted by an examiner for the issuance of a flight instructor certificate, an additional rating on a flight instructor certificate, renewal of a flight instructor certificate, or reinstatement of a flight instructor certificate.

§61.57 Recent flight experience: Pilot in command.

(a) *General experience.* (1) Except as provided in paragraph (e) of this section, no person may act as a pilot in command of an aircraft carrying passengers or of an aircraft certificated for more than one pilot flight crewmember unless that person has made at least three takeoffs and three landings within the preceding 90 days, and—

(i) The person acted as the sole manipulator of the flight controls; and

(ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required), and, if the aircraft to be flown is an airplane with a tailwheel, the takeoffs and landings must have been made to a full stop in an airplane with a tailwheel.

(2) For the purpose of meeting the requirements of paragraph (a)(1) of this section, a person may act as a pilot in command of an aircraft under day VFR or day IFR, provided no

persons or property are carried on board the aircraft, other than those necessary for the conduct of the flight.

(3) The takeoffs and landings required by paragraph (a)(1) of this section may be accomplished in a flight simulator or flight training device that is—

(i) Approved by the Administrator for landings; and

(ii) Used in accordance with an approved course conducted by a training center certificated under part 142 of this chapter.

(b) *Night takeoff and landing experience.* (1) Except as provided in paragraph (e) of this section, no person may act as pilot in command of an aircraft carrying passengers during the period beginning 1 hour after sunset and ending 1 hour before sunrise, unless within the preceding 90 days that person has made at least three takeoffs and three landings to a full stop during the period beginning 1 hour after sunset and ending 1 hour before sunrise, and—

(i) That person acted as sole manipulator of the flight controls; and

(ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required).

§61.113 Private pilot privileges and limitations: Pilot in command.

(a) Except as provided in paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

(b) A private pilot may, for compensation or hire, act as pilot in command of an aircraft in connection with any business or employment if:

(1) The flight is only incidental to that business or employment; and

(2) The aircraft does not carry passengers or property for compensation or hire.

(c) A private pilot may not pay less than the pro rata share of the operating expenses of a flight with passengers, provided the expenses involve only fuel, oil, airport expenditures, or rental fees.

(d) A private pilot may act as pilot in command of a charitable, nonprofit, or community event flight described in §91.146, if the sponsor and pilot comply with the requirements of §91.146.

(e) A private pilot may be reimbursed for aircraft operating expenses that are directly related to search and location operations, provided the expenses involve only fuel, oil, airport expenditures, or rental fees, and the operation is sanctioned and under the direction and control of:

- (1) A local, State, or Federal agency; or
- (2) An organization that conducts search and location operations.

§91.3 Responsibility and authority of the pilot in command.

(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.

(c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.

§91.9 Civil aircraft flight manual, marking, and placard requirements.

(a) Except as provided in paragraph (d) of this section, no person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual, markings, and placards, or as otherwise prescribed by the certifying authority of the country of registry.

(b) No person may operate a U.S.-registered civil aircraft—

(1) For which an Airplane or Rotorcraft Flight Manual is required by §21.5 of this chapter unless there is available in the aircraft a current, approved Airplane or Rotorcraft Flight Manual or the manual provided for in §121.141(b); and

(2) For which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Forward vs. Aft C.G.

What are the handling Characteristics of an airplane with a Forward CG?

- Generally more stable
- Fly at a slower TAS (true airspeed) due to more drag
- Stall at a higher indicated stall speed

What are the handling Characteristics of an airplane with an AFT CG?

- Generally unstable aircraft
- Fly at a higher TAS (true airspeed), less drag, better fuel burn
- May be impossible to recover from a stall or spin

Yes, we want the CG to be within the CG Range of the aircraft, but which is better a Forward CG or an AFT CG?

To keep it simple, loading the aircraft with a forward CG within limits will increase the aircraft's stability as opposed to loading an aircraft with a more aft (rearward) CG within limits of course will decrease stability. Now, there are benefits and drawbacks to both. A forward CG with the increase in stability will make it easier to recover from a stall, however moving the CG forward will also increase drag and with drag comes a reduction in cruise speeds and fuel efficiency. When you start loading an aircraft with a more aft CG you start to lose some of that stability and it may become more difficult to recover from a stall, but this will also decrease drag resulting in higher cruise speeds and better fuel efficiency. With the types of training aircraft you are most likely flying these differences will be minimal as long as the CG stays within the designed limits set by the manufacturer.

So is it better to have a forward CG or aft CG? Well there is really no set answer to that question; it's up to you as the pilot-in-command to base your answer off the type of operations you will be conducting for that flight.