

Thesis:

I will be pursuing a pilot's license and/or trying to become a better pilot. I will be taking flying lessons at Wiseman Aviation, where I will gain the legally required 20 hours of flight instruction, 10 hours of solo flying time, 3 hours of night flying, 3 hours of simulated instrument time, and 3 hours of cross country. The FAA requires 40 hours to be able to attain a license, however in the modern era of aviation with more complex aircraft and airspace, most pilots get their certification in 60 hours. Throughout my training I will be trying to answer the question: "What are the qualities that make for a great pilot?"

Background:

I want to become an airline pilot, and in order to achieve this goal I have to start by becoming a private rated pilot. In preparation for college I will be working toward my license. Hours have been spent poring over aviation textbooks, attending ground school sessions, and mastering essential subjects such as aviation regulations, meteorology, navigation, and aircraft systems.

I have taken the first critical steps towards becoming a licensed private pilot by embarking on flight instruction. Under the guidance of a qualified flight instructor, I have logged valuable flight hours. These initial hours have introduced me to fundamental flight maneuvers, cockpit operations, and being at the controls of an aircraft.

The achievements to date serve as a solid foundation upon which I will build, bringing me closer to the ultimate goal of earning a Private Pilot's License. When the goal of a private pilot's license is achieved, I have aspirations to get a tailwheel endorsement, a complex plane endorsement, and a high performance endorsement.

Focus and Responsibilities:

I will be working toward getting my private pilot's license and finding out what it takes to become a great pilot. Along the way for my private pilot certificate, There are many boxes to check off before I can achieve the rating. "A person applying for a private pilot certificate in airplanes, helicopters, and gyro-planes must log at least 40 hours of flight time, of which at least 20 hours are flight training from an authorized instructor and 10 hours of solo flight training in the appropriate areas of operation; three hours of cross country; three hours at night, three hours of instrument time; and other requirements specific to the category and class rating sought."(faa.gov) I also need to pass the written exam before I apply for the checkride(, which I have already passed).

Performance factors and measures of success:

Measures of success are fairly arbitrary. I think the main measure of success in learning aviation is improving upon your weak points with each lesson. Making less and less mistakes as time goes on shows that you're making progress.

Less arbitrary metrics of success would consist of:

- Landing smoothness

- Landing accuracy
- Heading accuracy
- Altitude accuracy
- Coordination of the airplane
- Clear and concise communication
- Checklist speed

Relation to Future Professional Interests:

I want to have a career as an airline pilot, and getting a private pilot's license is the first major stepping stone in becoming an airline transport pilot. By finding out what it takes to become a great pilot, I will be able to more easily achieve milestones through flight school.

Review of Literature:

In the nearly 120 years of aviation, planes have evolved from fabric, wood, and a car engine to aluminum with jet engines. As a result, the pilots have had to evolve with it. Complex systems of the aircraft require large amounts of studying from the pilots manning them.

Sometimes, the pilots can do a not so great job of identifying problems, and it can result in crashes like Air France 447. To simplify the accident, Air France 447 crashed after the pitot tube froze over and the autopilot disconnected. The pitot tube feels the pressure from the air on the plane in the forward direction. Put more simply, the pitot tube reads the speed of the aircraft relative to the air. When frozen over, the pitot tube can no longer read airspeed. The pilots monitoring failed to understand that the airspeed indicator became unreliable and the first officer attempted to counteract the descent with a backwards input on the elevator. The input placed the aircraft in a stalled condition, which is difficult to notice in large transport aircraft under instrument flight rules (IFR). IFR is a skillset and a set of rules that allows pilots to fly under conditions where they can't see (in the clouds). The Captain diagnosed the issue and put a forward input on the flight controls, failing to communicate the issue to the first officer. On an Airbus, when opposite inputs are put on the controls, they cancel each other out. Because of the lack of communication, there was no control output that cured the plane's stall. The flight unfortunately ended in disaster when the airplane stalled into the ocean. The Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civiles (BEA) determined the accident occurred as a failure of the captain to communicate his analysis to the crew clearly, and a failure of the flight crew to diagnose the failure. (BEA, 198) This accident is seen as an example of poor crew resource management.

Perhaps the most shining example of excellent crew resource management is United Airlines flight 232. On July 19, 1989 a DC-10 suffered a No. 2 engine failure that took out three of the hydraulic systems of the airplane. Captain Al Haynes employed members outside of the crew such as the check airman riding with them to gain some level of control over the aircraft. They used the thrust levers for the remaining two engines to maneuver the airplane. They used adverse thrust, which pushes one wing's leading edge more perpendicular to the relative wind

which induces a rolling motion to turn the aircraft. They used the total thrust of the aircraft to change the pitch angle. “The Safety Board views the interaction of the pilots, including the check airman, during the emergency as indicative of the value of cockpit resource management training” (NTSB, 76).

Another shining performance of a captain is one that almost everyone knows about. Captain Chelsey Sullenberger (better known as Sully) made the choice to ditch an airbus into the Hudson river of New York. Ditching is the term used for making an off airport landing in an effort to save people on board. On departure from LaGuardia airport, Cactus 1549 encountered a flock of birds that were subsequently ingested into the engines. Captain Sullenberger is celebrated for his judgment to not risk returning to an airport. “The NTSB notes that a direct return to LGA would have required crossing Manhattan, a highly populated area, and putting people on the ground at risk.”(NTSB, 89) Simulation flights did determine the turn to the airports was possible, however due to the shock factor of the dual engine failure, the turn wouldn’t have been made in time to return to land. Because of this finding, the NTSB determined that Sully’s decision making made the “highest probability that the accident would be survivable.”(NTSB, 89)

When Cathay Pacific Captain Malcom Waters encountered another unknown situation, he handled it in a way that prevented disaster. A fuel contamination from the ground caused the fuel delivery systems for the engines to fail, and unlike Sully losing power from the engines, the crew of Cathay Pacific 780 had engines stuck at higher than desirable power for landing. The crew was able to wrestle the plane onto the ground. (BEA, 26)

Perhaps the most notable feature of these successful pilots is their calm attitudes toward the high stakes situations. An example of composure under pressure is Southwest Airlines flight 1380. After suffering an engine failure, an engine blade was sent into the side of the aircraft, causing explosive depressurization of the cabin.(NTSB, 2) The captain, former US Navy pilot Tammie Jo Shults, quickly reacted in the short window necessary to put on her oxygen mask. The captain and first officer handled communications, checklists, and aviating simultaneously.

Unfortunately due to the fan blade, a person was half way sucked outside of the aircraft. Passengers worked to keep the ejected passenger in the aircraft, but the person unfortunately didn’t make it. While this was occurring, the pilots had to juggle handling the aircraft with the intercom. After landing, the first officer says “we were in the red.” The language green, yellow, red in this context are used to describe task loading. Red means you start dropping things, and there’s too much to handle. Regardless, the crew was able to keep their nerves and get the plane down on the ground.

The four successful crews I used in this review demonstrate similar qualities to one another. The ability of the crews to remain calm under pressure, the out-of-the-box thinking for their decisions, and inevitably their motor skills to just be able to fly the aircraft. Captains like Al Haynes aren’t egotistical, and are fully willing to accept help from anyone willing and able. I think each of the Captains carry the same traits, but I think each different trait is highlighted in each story. Captain Shults demonstrates the nerves it takes to deal with the pressure, Captain

Waters shows the motor skill required for flying, Captain Sullenberger has excellent judgment that was needed for survival, and Captain Al Haynes has amazing crew resource management and understanding of the aircraft. Together, these things seem to make for a great pilot.

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