

People Failure

As I begin my duty here at the U.S. Army Combat Readiness Center, I had a colleague recommend reading and reviewing mishaps over the past 60 years. I was directed to United States Army Agency for Aviation Safety (USAAVS) Flightfax library. In VOL.1 FY72-FY74, I read an article titled "People Failure." This article describes human error, a factor that does not differentiate time or experience while having no limit to the aviation professionals it affects and is still the number one contributor to aviation mishaps today.

Flightfax November 1972: From 6 May to 6 July 1972 human factors, or people failure, caused 133 mishaps in a 60-day reporting period. Now comes the important part - affecting a cure. Most people failures result from a combination of failing to follow written instructions in maintenance manuals, failing to perform proper preflight inspections and using proper techniques while flying. It seems that the "by-the-book" is still the best remedy, but the basic answer lies with the individual himself. He must take pride in himself and accomplish all tasks in a professional manner. If he does all this, he will be following by-the-book procedures and helping to eliminate these types of mishaps.

This article written 49 years ago holds true today. When we look at human factors affecting the Class A-C trends in manned Army aviation for FY21 to date. There were 60 of the 88 Class A-C manned aviation reported mishaps are attributed to human error. Human error still results from a combination of failing to follow written instructions in flight and maintenance manuals, misdiagnosing malfunctions, failing to perform proper preflight inspections, and failure to use proper techniques while flying.

Errors are a natural part of human performance. Beginners, as well as the most highly skilled experts, are vulnerable to error, and this is perhaps the most important thing to understand about error. To believe people can eliminate errors from their performance is to commit the biggest error of all. Aviation professionals should be prepared for occasional errors by learning about common kinds of errors, how errors can be minimized, how to learn from errors and how to recover from errors when they are made.



Kinds of Errors

There are two kinds of errors: slips and mistakes.

- **Slip.** A slip occurs when a person plans to do one thing, but then inadvertently does something else. Slips are errors of action. Slips can take on a variety of different forms. One of the most common forms of slips is simply to neglect to do something. Other forms of slips occur when people confuse two similar things. Accidentally using a manual that is similar to the one really needed is an example of this type of slip. Other forms of slips happen when someone is asked to perform a routine procedure in a slightly different way. For example, Beverly has been assigned runway 30 for many days in a row. This morning she approaches to land and ATC assigns runway 12 instead. As she approaches the traffic pattern, she turns to enter the pattern for runway 30 out of habit. Time

pressure is another common source of slips. Studies of people performing a variety of tasks demonstrated a phenomenon called the speed-accuracy tradeoff. The more hurried one's work becomes the more slips one is likely to make.

- **Mistake.** A mistake occurs when a person plans to do the wrong thing and is successful. Mistakes are errors of thought. Mistakes are sometimes the result of gaps or misconceptions in the learner's understanding. One type of mistake happens when a learner formulates an understanding of a phenomenon and then later encounters a situation that shows how this understanding was incorrect or incomplete. For example, an overly simplistic understanding of weather frequently leads inexperienced aviators into unexpected situations. Experts are not immune to making mistakes, which sometimes arise from the way an expert draws upon knowledge of familiar problems and responds to them using familiar solutions. Mistakes can occur when the expert categorizes a particular case incorrectly. For example, an experienced pilot may become accustomed to ignoring nuisance alerts issued by their traffic alerting system when approaching their home airport, as many aircraft on the ground turn on their transponders prior to takeoff. One night, they ignore an alert that was generated not by an aircraft on the ground, but rather by another aircraft that has turned in front of them on final approach.

Reducing Error

Although it is impossible to eliminate errors entirely, there are ways to reduce them, as described in the following paragraphs.

Learning and Practicing

The first line of defense against errors is learning and practice. Higher levels of knowledge and skill are associated with a lower frequency and magnitude of errors.

Taking Time

Errors can often be reduced by working deliberately at a comfortable pace. Hurrying does not achieve the same results as faster performance that is gained by increasing one's skill through continued practice.

Checking for Errors

Another way to help avoid errors is to look actively for evidence of them. Many tasks in aviation offer a means of checking work. Aviation Professionals should be encouraged to look for new ways of checking their work.

Using Reminders

Errors are reduced when visible reminders are present and actively used. Checklists and other published procedures are examples of reminders. Many aircraft instruments such as heading indicators offer bugs that can be used to remind the pilot about assigned headings and courses and some may also prompt altitudes and airspeeds. Mechanics and pilots alike can use notepads to jot down reminders or information that should otherwise be committed to memory.

Developing Routines

The use of standardized procedures for routine tasks is widely known to help reduce error. Even when a checklist procedure is unavailable or impractical, learners can help reduce the occurrence of error by adopting standardized procedures.

Raising Awareness

Another line of defense against errors is to raise one's awareness when operating in conditions under which errors are known to happen (e.g., changes in routine, time pressure), or in conditions under which defenses against errors have been compromised (e.g., fatigue, lack of recent practice).

Error Recovery

Given the occasional error is inevitable, it is a worthwhile exercise to practice recovering from commonly made errors or those that pose serious consequences. All aviation professionals need to learn and practice a lost procedure to ensure they can recover from the situation in which they have lost their way. It is useful to devote the same sort of preparation to other common errors.

Learning from Error

Error can be a valuable learning resource. Aviation professionals naturally make errors, which we can utilize to help pilots learn while being careful not to let the individual practice doing the wrong thing. When aviation professionals make an error, it is useful to ask them to consider why the error



happened, and what can be done differently to prevent the error from happening again in the future. In some cases, errors are slips that simply reveal the need for more practice. In other cases, errors point to aspects of learner methods or habits that might be improved. For example, beginning instrument flight learners commonly make errors when managing two communications radios, each with an active and standby frequency. When the same learners understand each radio's specific purpose (e.g., ATIS, ground, tower frequencies), error rates often drop quickly.

Aviation professionals should be aware of a natural human tendency to resist learning from errors. That is, there is a tendency to "explain away" errors, dismissing them as one-time events that will likely never happen again. The same phenomenon occurs when observing errors made by others. Reading an accident or incident report, it is easy to spot where a pilot or mechanic made an error and regard the error as something that could never happen to the reader. It is important to note that this type of bias is not necessarily the result of ego or overconfidence; rather, it is something to which we are all susceptible. Psychologist Baruch Fischhoff studied hindsight explanations given by people who were presented with descriptions of situations and their ultimate outcomes. When asked to provide explanations for events that had already

occurred and for which the outcome was known, people explained that the outcomes were "obvious" and "predictable." When the same events without the outcomes were presented to a second group, peoples' prediction of the outcome was no better than chance guessing. The study nicely illustrates the popular adage that "hindsight is 20/20."

Reducing human error in Army aviation will increase readiness, preserve Army resources, improve training output, build confidence and cohesion while reinforcing resiliency in the profession. "The basic belief of human errors is that there is some reason for all human behavior. Once this reason is identified and sufficiently defined, it can be modified/improved, thus reducing the probability of similar human errors and their consequences in the future."² You are our most valuable asset, Keep 'Em Safe! ■

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¹ *Aviation Instructor's Handbook (FAA-H-8083-9)2020*
Chapter 3: The Learning Process

² *DA PAM 385-40 18 March 2015 2-4 Human factors investigation (3) Explaining human error(s) (1) Theory*