Aviation Human Factors Industry News

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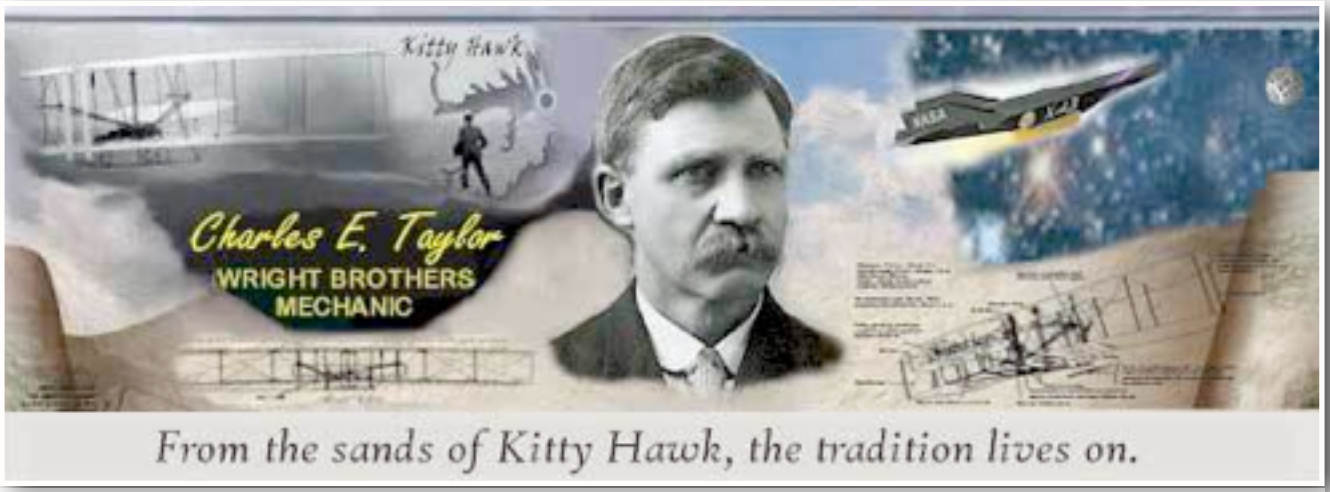


Hello all,
To subscribe send an email to: rhughes@humanfactorsedu.com
In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

Relatives visit 1985 plane crash site

Relatives of the victims of Japan's worst air disaster are making their annual visit to the crash site on a mountain north of Tokyo. This year they are marking the 33rd anniversary of the tragedy.

The relatives started climbing Osutaka Ridge in Gunma Prefecture early Sunday morning.
A Japan Airlines Boeing 747 was flying to Osaka from Tokyo on August 12th, 1985, when it crashed into the mountain. 520 people on board were killed.

The family members laid flowers and burned incense at memorial markers, and prayed at a cenotaph at the crash site.

They conducted a ceremony near the cenotaph to remember the victims. Children blew soap bubbles to pray for aviation safety.

In the evening, a memorial service will be held at the foot of the mountain. Participants will observe a moment of silence at 6:56 PM, the exact time of the crash.

Kimiko Yoshida lost her 24-year-old daughter Yumiko in the crash. She said she visits the site every anniversary because she feels her daughter returns to the site on that day.

Yoshida expressed sympathy for people who have unexpectedly lost loved ones in disasters, saying she can identify with them.

She said she will never forget the 1985 accident.

A daughter of a dentist who helped identify the victims of the accident also climbed the mountain. She said she wants to tell younger generations about the accident so it will not be forgotten.

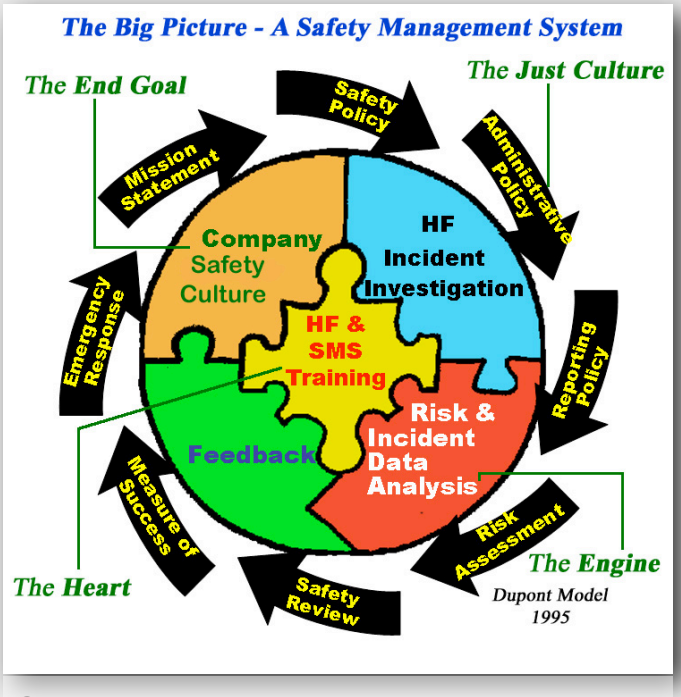
She also said she was very disappointed to learn of a helicopter crash in Gunma Prefecture on Friday, despite so many people wishing for aviation safety.

http://www.sozogaku.com/fkd/en/hfen/HB1071008.pdf

Safety Management System

by Gordon Dupont

This **Safety Management System (SMS)** thing! Is it the "best thing since sliced bread" or is it just "another bureaucratic time wasting pain in the … backside?" It can be either depending on what and how you implement it.



We will be using the model on the right that was developed in 1995 and called "The Big Picture", for want of a better name at the time. The objective is to provide you with the knowledge to enable you to see that, done right, this SMS really is much better than sliced bread as it will serve to improve your Safety culture, save money, improve morale and thus, productivity. Sound good? Let's start with a little history.

In 1947 the International Civil Aviation Organization (ICAO), a branch of the United Nations, was formed. It had as its mandate to set standards and make recommended practices to enhance aviation Safety. All contracting states are expected to follow these practices or file a difference.

Instead of Chapters ICAO has Annexes instead. The origin of your AMT/AME license can be found in Annex One, while as an accident investigator, I had to understand Annex 13.

We had to know if a Chinese registered aircraft full of Japanese tourists crashed right on the border of Canada and the United States, who would investigate and where would you bury the survivors? Not everyone can answer that.

In 2006 ICAO issued a Safety Management Manual (Document 9859) to the regulatory bodies of all 150 plus contracting states. This 290 page document spelled out the basics of a Safety Management System that all member states were expected to implement or file a difference. Many member states had already mandated the requirement for a SMS to its airlines (Canada and Australia being among the first) and most also had at least parts of an SMS already functioning. Thus, a "gap analysis" could be carried out to determine what work needed to be carried out to be in full compliance.

In 2013 SMS earned its own Annex as it became Annex 19 with a much more manageable 44 page document. SMS is here to stay.

The original four SMS pillars were: 1) Safety policy and objectives, 2) Safety Risk Management, 3) Safety Assurance, and 4) Safety promotion. They are now called components or framework components. I believe that a rose by any other name is still a rose so call them what you want, but they are a must in a SMS.

There are a lot of explanations as to what an SMS is. I say that it is: **a formal, systematic, error reduction, accident prevention program that manages the Safety risks through all aspects of the company.**

What it is intending to do is to provide a framework to guide an organization toward a true Safety culture. If you aren't sure what a Safety culture is, please go back over the last two issues. There you will learn what a true Safety culture is and what your role is in it.

In its simplest terms I say that SMS is putting a program in place that "sweats the small stuff (hazards and their risks to Safety) so you never have to sweat the big stuff" (major accidents that can end in multiple fatalities and even the failure of the organization). It sounds simple enough, but how do you do it?

The model has puzzle pieces because, in my humble opinion, most companies are already doing parts of the puzzle to some degree and SMS serves to bring these parts together. So let's take a quick look at these pieces and their accompanying arrows.

The "**Human Factors and SMS Training**" module is in the center of the model and is the only piece that interconnects with all the other pieces. It is the heart of the model as it: a) trains everyone to understand why errors are made and how to avoid making them, and b) trains everyone on the importance of SMS and their role in making it succeed. This module should be one of the first to be implemented as it will assist with the other puzzle pieces fitting together.

The **Human Factors Incident Investigation** calls for looking beyond the person to determine the root causes of an incident. This will require a "Just Culture" policy to be in place. (Go back to the March 2015 article for a review of Just Culture if you don't recall what it is) This important piece ensures that when an error occurs, the "guilty party" will assist in the investigation knowing the person will be treated fairly and the end result is a "learning outcome" instead of "find the guilty party and punish them so they won't do it again" syndrome. With time and the building of trust, the investigations can take place to analyze reported near misses." These tie in with the next module.

The **Risk and Incident Data Analysis** module is the engine that drives the SMS. Here is where the managing of potential risks takes place. Finally we are becoming proactive and not waiting for an incident/ accident to occur before learning how to prevent a future one.

Risk and Incident Data Analysis are important enough to deserve an article of their own but it is here that hazards and potential hazards, some that the organization may have functioned with for years, are analyzed for risk. Ways to eliminate or at least mitigate the risk are considered and acted upon. Data analysis is carried out to determine the level of risk to hazards that continue to reoccur. Finally, Safety is coming to the forefront in a proactive and even predictive fashion.

Feedback is a very important module in any SMS and one that is all too often neglected. I have met people who have gone to considerable trouble to submit a Safety concern only to have it, as he put it: "disappear into the black hole." It doesn't take long before there are few, if any, reports to analyze and the system is back to where it used to be.

Management feels the system is working great with no reports until there is an accident to bring a known hazard to light. This module is one that many companies are weak at and yet it is vital for the success of any SMS.

The **Company Safety Culture** is the end goal and SMS is the mechanism to help you get there. It is hard to measure but you sure know it when you work in it. As this was covered in the past two issues, let's look at the arrows that circle this model.

A **Mission Statement** should spell out why an organization exists. It is very important for two reasons.

1. It informs the outside world about what it is your organization does and how it intends to do it. **(Important)**

2. It informs the inside world about what their organization does and how they should be doing it. **(VERY Important)** Today, ALL organizations of any size must have a **Mission Statement** and as a high consequence industry it should have the word Safety in it. This statement should be displayed everywhere and all employees should know it.

A **Safety Policy** is every bit as important to a modern organization as a Mission Statement. It is a MUST for a Safety Management System and will be the document that the SMS will evolve from. It should state everyone's responsibilities toward Safety and include a "just culture" paragraph outlining that all incidents/ accidents will be treated as learning outcomes with only agreed upon "reckless error" meriting possible discipline. This policy, like the Mission Statement, should be seen everywhere.

The **Administrative Policy** is where the "just culture" and what constitutes reckless error resides. Have a review of the March 2015 issue for more detail on this important document.

The **Reporting Policy** spells out once more that anything reported will not incur discipline except in cases of reckless error. It should state that it is everyone's duty to report what they believe to be hazards. (anything that could cause us grief) I strongly suggest that ANY hazard be reported and H&S can be separated after if necessary. This encourages reporting and results can be seen for the small stuff.

Risk Assessment is where the real work gets done and will be the subject of the next article.

A **Safety Review** is one of the 4 pillars and is a requirement to know just how well your SMS is working. One way is to ask the employees with a carefully worded survey. Outside help is also a useful tool.

A **Measure of Success** calls for Safety goals to be set and met. Zero error is not a Safety goal as it is not realistic. Keep it simple like: to reduce human errors by 25% over three years. Be sure everyone knows the goal and provide multiple progress reports.

Finally, an **Emergency Response Plan** (ERP) is required that covers any situation that will require a major response. This is a document that you hope that you will never need, but we humans are genius at finding ways to make that intentional costly error.

Implementing a Fatigue Management Program: A Human Factors Dimension to Your SMS

Chapter 11 of ISBAO centers on a Fatigue Management program. Introduced as its own chapter in 2016, the section emphasizes the need to have a Fatigue Management Plan (FMP), which is often viewed as a daunting task for operators of all sizes and complexities. In reality though, if seen as an extension of your existing SMS, the challenge is not as big as you might think. And, an FMP delivers many benefits with minimal impact to your business workflows.

Consider the basic tenets of the FMP: Policies, Education and Training, Flight and Duty limits, Deviation and Risk Management processes, Reporting, and Tracking trends. These are very similar to your existing SMS framework. Fatigue is simply another form of risk, and an FMP provides a framework to manage it—just like you are already managing all the other forms of risk in your existing SMS.

Your company's safety culture is supported in the safety policy of your SMS, and fatigue risk is a legitimate threat to safety. In fact, stating this seemingly obvious point is a key purpose of the fatigue policy in an FMP. The fatigue policy should also set forth the roles and responsibilities of relevant staff in managing fatigue risk, and affirm management support by being signed and dated by an accountable executive.

Just as an SMS relies on sound procedures, a fatigue risk management process is bookended by sound flight and duty limits. These limits are grounded in scientific principles and substantiated by industry bodies; in general aviation, they are typically defined in terms of the Flight Safety Foundation Duty Rest Guidelines of 2014.

Depending on the nature of your operation, you may be continuously within those limits, or you may need a deviation from time to time. In any case, the fact remains that it is common to be operating within the guidelines and yet be experiencing high levels of fatigue risk. It is also possible to be operating under a deviation from the guidelines with a low level of fatigue risk. A central function of the risk management process of an FMP is to quickly identify to what degree fatigue risk is an issue for each flight in your operation. Knowing where the high risk zones are is an essential first step to planning appropriate countermeasures. Biomathematical tools provide the analytical engine for evaluating risk mitigation options on the fly. They also serve to objectively substantiate the prescriptive limits and/or mitigation options you've been using.

Your FMP should provide a means for everyone in your operation to report fatigue issues or fatigue statuses throughout their work shifts. A good reporting tool affords the safety personnel a view of the portions of their operation where fatigue issues appear to be the worst. Supplementing your existing Hazard Report forms with sections for fatigue considerations is an efficient approach that can also shed light on potential relationships between fatigue and specified hazards. By monitoring the feedback and data from these reports and performing root cause analyses, you can evaluate mitigation options for future consideration.

Fatigue risk is a "we" issue. Everyone works together to promote safety per your SMS, and the same holds true for managing fatigue risk. From the decisions made by the operational team scheduling duties and flights, to the personal responsibility of individuals to report to work fit for duty, everyone has a proactive role to play in keeping fatigue risks to a minimum.

Usually, fatigue countermeasures are negligible to the operation. Real-world examples include small shifts of flight departure time, power naps, extra breaks on shift, or a cup of coffee at just the right time. Simply making everyone aware that elevated fatigue levels may occur during an upcoming flight plan can galvanize the team: the sense of personal responsibility will motivate flight crew to plan ahead and get more sleep leading up to the shift/flight.

You will find that incorporating a Fatigue Management Plan in your existing SMS is not that daunting a task. And, you will quickly find it gives a significant boost to your efforts to promote a culture of safety in your air operation.

Better pilot decision-making

From Transport Canada

There's a lot to consider before you fly. How's the weather? Do you have a flight plan? Making good decisions starts before a flight and doesn't end until you're back on the ground.

With our partners Canadian Owners and Pilots Association and SmartPilot.ca, we put together these resources to help general aviation pilots make safe, informed decisions. "Take 5" minutes to read about flight safety, print a poster for your local flying club, or watch a safety video.

On this page

Check the weather before you fly

Weather is unpredictable and can change quickly. Taking time to check the weather before a flight helps ensure you'll be prepared for anything.

Take 5 for safety

- A fatal flight in bad weather: 178 seconds to live
- Pilot reports (PIREPs)

Posters

- Visual Flight Rules Flight into Adverse Weather Can Be Deadly
- It Will Pass… Wait It Out

Respect human limits

"Human factors" are physical and psychological things that can affect your performance. Whether from fatigue, distraction or poor judgment, we all have our limits. As a pilot, it's important to know and respect yours.

- Take 5 for safety: Me the hero?

Plan each flight

Planning ahead reduces the number of last-minute decisions you need to make when you fly, which also improves your focus and decision-making.

Posters

- Make your Weather Decision While You Still Have a Choice
- Snowbirds Can Fly Over Parliament Hill… You Can't
- Day Visual Flight Rules Pilots—Don't Leave Yourself in the Dark… Plan Ahead
- Be Aware of the Hazards of Night Flying

Stay aware of your surroundings

Being aware of your surroundings (what we call "situational awareness") is essential for spotting potential danger. Inform yourself about what to look out for.

Take 5 for safety

- Avoiding runway incursions

Posters

- Authorized? Be Sure! Runway Incursions Are Real!
- Everything Moves at an Airport

Videos

- Black Holes and Little Grey Cells: information and safety practices for night visual flight rules
- Danger on the Runway: how to prevent runway incursions (Transport Canada/ NAV Canada Incursion Prevention Action Team)
- Through the Overcast—See and Avoid: how to see and avoid during visual flight rules (SmartPilot.ca)
- Through the Overcast—Professional Pilot: differences between professional and recreational pilots (SmartPilot.ca)

Related links

- Maintaining pilot proficiency
- Best practices in general aviation

Feedback - Canadian Aviation Service Difficulty Reports

Hanger Noise

BOMBARDIER, CL-600-2D24
Nose Landing Gear Damaged on Push-BackSDR #20170505007

Subject:

During the aircraft push-back from the gate the tow bar shear pin sheared and the aircraft moved approximately 1 to 2 feet from its original position. The flight crew later reported the aircraft brakes were not released prior to initiating the push-back. Following the shear pin event, the tow bar was examined, the axle interface pins were bent and the tow bar head "yoke" was bent. Due to the over load caused by this event, the nose landing gear assembly and drag brace were replaced. The right nose wheel assembly was also replaced due to the damaged rim caused by the tow bar.

Transport Canada Comments:

This report serves as a reminder that these types of incidents can and do occur, even to highly trained and professional personnel.

It is easy to fall into the trap of examining only the events immediately leading to such an incident. Asking whether or not there was communication between the flight deck and ground crew prior to the aircraft being pushed back is natural and important, but there is also a lot of value in examining the organizational and human factors that likely contributed. Were there time pressures? Was fatigue a factor? Was this a routine push-back, or was something different? Etc.
A properly implemented Safety Management System (SMS) can help an organization learn from and avoid such incidents by helping them identify organizational and human factors during the investigation process.

An SMS can also help identify hazards that are inherent, but not always obvious, in day to day operations. With that type of knowledge organizations can build policies and procedures to defend against these types of incidents and work to strengthen their own internal safety culture.

The FAA and Sleep Apnea

by Robert Sancetta

Due to several incidents likely related to fatigue and interrupted sleep in both aviation and the trucking industry, the NTSB and DOT called on the FAA to consider screening for sleep apnea. After a thorough decision pathway analysis and beta test of the FAA's plan to comply, guidance to aviation medical examiners (AMEs) in regard to sleep apnea screening was issued early in 2015.

As one of only a handful of AMEs who participated in the beta test, I had the opportunity to work directly with FAA physicians in an attempt to make the system somewhat palatable for pilots. While safety is the primary role of the FAA, it is my goal to bring some reason into the system in my daily interface between the FAA and pilots.

If we can avoid having pilots grounded for significant periods of time, they will be a bit more honest and forthcoming from the outset. The FAA understood that point and has been collegial in that aspect in the development of the actual protocol and applicable special issuance process. Yes, pilots with sleep apnea requiring treatment will need a special issuance to keep flying, but there should be no significant period of grounding involved.

Sleep apnea comes in two forms: obstructive and central. The term “apnea” simply means “without respiration.”

Treating sleep apnea is truly one of the best things we do in medicine; it’s a condition where treatment not only lowers risk factors for many serious conditions, but the patient usually feels better right off the bat. On the contrary, prescribing a statin for cholesterol—and to reduce heart attack and stroke risks—doesn’t make a patient feel better along the way. In fact, drug side effects might be rather annoying.

In short, treating sleep apnea is a win-win situation. And while pilots likely are not pleased about yet another cumbersome FAA medical certification process, this newer protocol for sleep apnea keeps nearly 100 percent of pilots flying, even during the evaluation period. Avoiding lengthy grounding periods was something I lobbied strongly for in my interactions with the FAA during the beta test.

In obstructive sleep apnea (OSA), anatomical obstructions in the respiratory pathway cause all sorts of problems, from irregular breathing to long periods without breathing at all. These are typically followed by a loud gasp as the respiratory drive forces the body to begin breathing at all costs.

Risk factors for OSA include obesity, large tonsils, and abnormal size and shapes to the tongue, jaw, and palate, among others. Loud and irregular snoring is often, but not always, part of OSA symptoms.

While obesity is a very strong risk factor, OSA also occurs in people with a normal body habitués. In my practice, I actually have more pilots with OSA who are slim than obese.

So, what’s the big deal? Do we really need to treat sleep apnea, or is this simply more government regulation?

Untreated sleep apnea is clearly contributory in many serious medical conditions. In fact, it increases risks for cardiac disturbances (including irregular heart rhythms such as atrial fibrillation), hypertension, heart attack, stroke, diabetes, headaches, memory loss and other cognitive impairments, attention and problem-solving deficiencies, fatigue and daytime drowsiness (I know pilots who fly “all-nighters” >

are chuckling right now), and sometimes causes people to be simply irritable and unhappy. Psychiatric problems such as depression can also be exacerbated by sleep apnea. And, for men, these risks significantly exacerbate erectile dysfunction.

Treating OSA usually consists of a continuous positive airway pressure device (CPAP), the nasal mask used during sleep. While earlier versions of these devices were uncomfortable and loud, over time they continue to become more portable, quieter, and less annoying to the patient—and less annoying to the patient's spouse. In addition, surgery can be curative in some cases. A small subset of pilots is well treated with a simple, although not inexpensive, oral appliance.

Speaking of the spouse, the majority of patients being treated for sleep apnea report that their spouse is not only less concerned about the patient's health and long-term prognosis, but the near resolution of snoring (along with the quietness of the newer CPAP machines) means that he/she might actually sleep in the same room as the patient once again. Yet another win for sleep apnea treatment.

Central sleep apnea (CSA) is a bit different. The results are similar, with disrupted breathing and potential long-term health risks, but the apneic episodes in this case aren't caused by anatomical variants.

In CSA, the brain itself is the culprit. This makes it a more difficult "fix," with a more challenging prognosis. However, over time the FAA has found that pilots with CSA tend to do pretty well with treatment, and so certification is also possible for these pilots.

Sometimes there is a mix of OSA and CSA in the same person. These folks might use CPAP and often simultaneously a small flow of regular oxygen. There are various means to achieve stability, and fortunately most of these pilots return to the cockpit in spite of their slightly increased risks over garden-variety OSA.

There has been concern among pilots that a marginally high body mass index (BMI) would prompt the FAA to mandate formal sleep apnea screening. Fortunately, that is not the case. Typically, the FAA allows the AME to weigh the BMI (and consider if the pilot is very muscular, for example) along with any other risk factors being considered and then recommend whether or not the pilot undergo formal screening.

There are several methods for formal screening, including the “gold standard” of the observed sleep study (you know, in the sterile, cold, noise, and lack of privacy in a formal medical setting). I’m a lousy sleeper at best, and I can promise any medical provider that my chances of getting any sleep in such a setting would be virtually zero. Fortunately, there are now more convenient methodologies to screen for sleep apnea, including user-friendly home testing.

As for BMI, there is no hiding from the fact that those with a very high BMI have a greatly increased risk for sleep apnea. In fact, the morbidly obese person has a 75 percent to 90 percent chance that they have clinically significant sleep apnea. There is, therefore, a verifiable reason to include BMI as part of this protocol.

What happens if the person (obese or not) is diagnosed with sleep apnea? First and foremost, get it treated. As I state in all of my talks to pilot groups, it’s easier to keep you flying if you are still alive.

Once treated, the patient will state, almost without exception, “Wow, this might be a pain, but I feel better than I have in many years!” They usually don’t mind if their spouse lets them sleep in the same room once again, too.

What about the FAA and career implications for the pilot? In my next blog, I’ll discuss the workings of how the AME screens for sleep apnea and assists in the special issuance process. Again, barring some dramatic co-morbid medical condition discovered during the evaluation (that would be grounding in and of itself), most pilots treated for sleep apnea continue to fly without interruption. In most cases, the special issuance is routinely granted. There will be annual follow-up requirements, but these are reasonably simple to comply with.

Dr. Sancetta is a former DC-10 captain with 11,000 flight hours. He has worked as a Senior AME since 1993 and is appointed as AME Consultant to the Federal Air Surgeon.

Flight instructor without valid certificate won't face jail time for fatal crash

After the deadly plane crash that killed six people nearly two years ago, there will be no jail time for the flight instructor accused of failing to properly train Mid-South dentist Dr. Jason Farese before that crash.

Charles Phillips, the flight instructor, admitted to illegally conducting flights for hire and providing flight instruction without a valid airman's certificate.

Thursday, a federal judge sentenced him to three years' probation, and he must serve the first six months on house arrest, along with 100 hours of community service.

National Transportation Safety Board's (NTSB) final report released in May blamed pilot error and improper training for the August 2016 plane crash in Tuscaloosa County, Alabama.

On board the plane were doctors Jason and Lea Farese, Dr. Austin Poole and his wife Angie, and Dr. Michael Perry and his wife Kim. The six were returning to Oxford from a Florida dental convention.

Court documents show the Federal Aviation Administration (FAA) suspended Charles Phillips' airman's certificate in 2009, citing medical reasons. The FAA also barred him from operating any aircraft.

Despite that, the investigation found between March 2013 and July 2016 Phillips was paid to pilot more than 50 flights, according to the indictment.

Federal investigators found Phillips continued to teach people to fly between March and May of 2016, though his certificate to teach had expired.

Phillips also was charged with lying to the FAA and NTSB during the Farese plane crash investigation. That charge was dropped as part of a plea agreement.

From the 60-count indictment, Phillips pleaded guilty to two counts of training pilots without a license and conducting flights for hire.

NTSB officials determined the plane crash was caused by an engine failure due to improper fuel consumption from the plane's four tanks during flight.

FAA Safety Team | Safer Skies Through Education

Topic of the Month: Get It Right in Maneuvering Flight
Notice Number: NOTC7961

More than 25% of general aviation fatal accidents occur during the maneuvering phase of flight — turning, climbing, or descending close to the ground. The vast majority of these accidents involve buzzing attempts and stall/spin scenarios (half of which are while in the traffic pattern). #FlySafe and read our fact sheet!

Download Fact Sheet: http://bit.ly/2M8lf1H

Ten of the world's biggest aviation mysteries

Here are 10 of the greatest mysteries in aviation, from the early history of flight to modern day.

1. Amelia Earhart

The pioneering aviator vanished over the Pacific Ocean in 1937 while attempting to circumnavigate the globe. Various reasons have been given for her disappearance. The theory that she was captured by Japanese forces has been suggested before; others believe she faked her own death; a few oddballs even claim she was abducted by aliens. The photo, found in a former "top secret" file at the US National Archives, and thought to have been taken in 1937, has been subjected to facial-recognition and other forensic testing - and could put the mystery to bed.

A documentary, Amelia Earhart: The Lost Evidence, aired on the History channel, argued that the photograph proves Earhart and her navigator Fred Noonan were picked up by the Japanese military, who believed they were spies, and taken prisoner. It states that the pair crash-landed in the Japanese-held Marshall Islands and proposed that the US government knew of Earhart's whereabouts and did nothing to rescue her. The theory was somewhat disproved, however, after the new image was said to have appeared in a Japanese travel brochure published years before Earhart disappeared.

2. The Bermuda Triangle

The roughly triangular area bounded by Miami, Bermuda and Puerto Rico is where dozens of aircraft and ships are said to have vanished in unusual circumstances, with the disappearances attributed to paranormal or extraterrestrial activity.

Notable incidents include the disappearance of Flight 19, a US Navy bomber, on December 5, 1945, as well as the aircraft sent to search for it; that of a Douglas DC-3 aircraft with 32 people on board in 1948; and a mid-air collision between two US Air Force planes in 1963.

3. "D B Cooper"

In 1971, an unidentified man traveling under the name of "Dan Cooper" managed to hijack a Boeing 727, extort a $200,000 ransom, and leap from the rear exit on the aircraft (with a parachute), never to be seen again. No conclusive evidence has emerged confirming his true identity or subsequent whereabouts, but FBI investigators claimed he would not have survived the jump.

A year after the incident "Cooper vanes" were installed to disable aircraft doors while the landing gear is up.

4. TWA Flight 800

Trans World Airlines Flight 800, a Boeing 747, exploded and crashed into the Atlantic Ocean near East Moriches, New York, on July 17, 1996, resulting in the deaths of all 230 people on board.

While many speculated that terrorists were to blame, no evidence of a criminal act was discovered by the FBI following a 16-month investigation. Others suggested that a US Navy vessel blew up the plane with a missile strike, and that the US Government has since instigated a cover-up.

A report published on August 23, 2000, however, concluded that a short circuit was the most likely cause of the explosion.

5. Uruguayan Air Force Flight 571

On October 13, 1972, a Uruguayan air force plane carrying 40 passengers and five crew members disappeared while crossing the Andes. Seventy-two days later, after everyone on board was presumed dead, 16 survivors emerged. The story of how starvation drove them to eat some of the dead passengers was made into the 1993 film "Alive".

6. Air France Flight 447

In the early hours of June 1, 2009, Air France Flight 447 from Rio de Janeiro to Paris went missing, along with 216 passengers and 12 crew. The Airbus A330-200 disappeared in the middle of the ocean, beyond radar coverage and in darkness. It took a shocked and bewildered Air France six hours to concede its loss and for several days no trace of it was found. Even when wreckage was discovered, the tragedy was no less perplexing. The aircraft had flown through a thunderstorm, but there was no distress signal, and the jet was state-of-the-art, a type that had never before been involved in a fatal accident. The aircraft's black boxes were recovered nearly two years later, at the bottom of the ocean. A final report, published in July 2012, said the accident occurred due to obstruction of the "pitot tubes" due to ice crystals, which caused the auto-pilot to disengage, as well as human error. It later emerged that the pilot had only slept one hour the previous night after a romantic jaunt in Brazil with his girlfriend.

7. Helios Airways Flight 522

On August 14, 2005, air traffic controllers in Greece lost contact with Helios Airways Flight 522, but the plane remained in the holding pattern for Athens Airport for more than an hour. At one point, a Greek fighter jet was scrambled, and spotted the pilot slumped over the controls. Around half an hour later the plane started to descend, crashing into the hills near Grammatiko, killing all 121 passengers and crew (the deadliest air disaster in Greek history). An investigation revealed that a gradual loss of cabin pressure had left the crew incapacitated.

8. Flying Tiger Line Flight 739

On March 16, 1962, a Lockheed L-1049 Super Constellation propliner carrying 93 US soldiers and 3 South Vietnamese, disappeared in clear weather on its way to Clark Air Base in the Philippines, prompting an eight-day search of more than 200,000 square miles. Eye witnesses on a civilian tanker reported seeing an explosion, but no remains were ever found.

9. Egyptair Flight 990

In 1999, Egyptair Flight 990 from New York to Cairo plummeted into the Atlantic Ocean around 60 miles off the US coast. All 217 people died in the crash, but mystery still surrounds its cause. The Egyptian Flight Officer controlling the plane was recorded repeatedly saying "I rely on God" moments before the disaster, and a colleague claimed he crashed the jet as an act of revenge after being reprimanded by the airline for sexual misconduct, but an investigation concluded he did not deliberately cause the accident.

10. BSAA Avro Lancastrian Star Dust

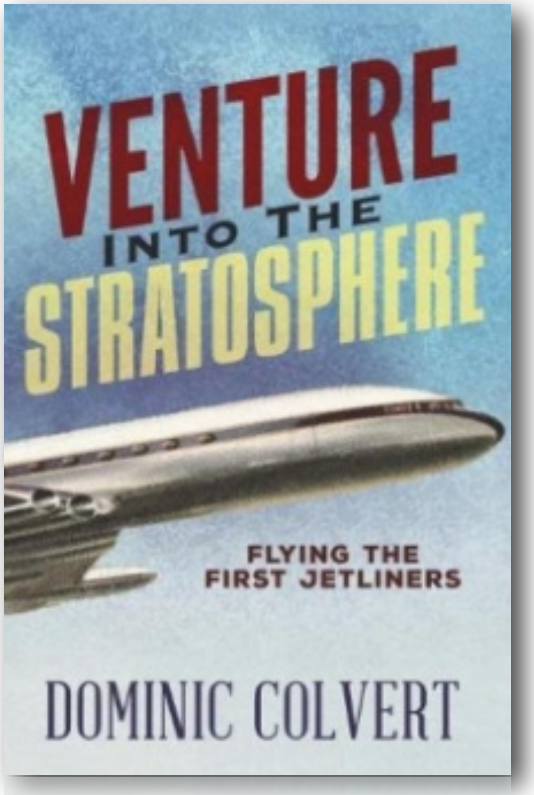
In August 1947, Star Dust, a British South American Airways airliner vanished as it flew between Buenos Aires, Argentina, and Santiago, Chile, via Mendoza. No wreckage was discovered for over 50 years, provoking conspiracy theories about sabotage and abduction by aliens. A Rolls Royce engine and the remains of nine of the eleven victims were eventually found at the foot of a glacier in the Andes.

New Aviation Book, "Venture Into the Stratosphere" Takes Readers Back to the First Days of Jetliners

Morgan James' new transportation book release, *Venture Into the Stratosphere: Flying the First Jetliners* by Dominic Colvert of Palo Alto, contains true memoirs from the golden days of commercial aviation. It is for anyone that is interested in aviation —the secrets of the flight deck and how the monumental growth in flight safety came about.

Venture Into the Stratosphere takes place during the 1950s, when the world was first introduced to jetliners. After the second World War that left almost no family untouched, the jet age marked a time of positive social change in the world.

The memoirs recount the origins of the jet age from personal, social, and engineering perspectives.Dominic Colvert worked as a flight engineer during the rise of jetliners, therefore, he uses his personal experiences to bring this era to life for all generations. He gives readers a detailed, inside look at the flight routines, explains technical matters in simple terms, and wraps it all up in a gripping personal love story. *Venture Into the Stratosphere* will evoke nostalgia in some while making the future flights of all readers more fascinating and exciting.



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