Florida's Aviation Law Journal

VECTORS

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aviation law committee of the florida bar

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To Promote Education in the Florida Aviation Community

"Read Back"

By S.V. (Steve) Dedmon

IN THIS ISSUE

Big Brother Is A Drone? 2015 Amendments to Florida "Freedom from Unwarranted Surveillance Act" 3

A Legacy That Keeps on Giving: Aviation Law Committee Awards Scholarship 6

LPBA Members Participate in a Behind-the-Scenes Tour of the Kennedy Space Center and Cape Canaveral Air Force Station 7

Yes, You Can Successfully Challenge the FAA's Denial of Your Special Issuance Medical Application 10

Rocky Mountain Flying 12

Experiencing the Good Fortune of Another: The Swearing In Ceremony of NTSB Chairman, Christopher Hart.....15

Unmanned Aircraft Systems Working Over a House Near You 17

The Effect of National Culture on Crew Resource Management 19

What You May Not Know About A NTSB Probable Cause Hearing 20

A Visit With The Chair.....22

Chapter 3: Federal Regulation of Drones 24

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If you have not noticed, this is *Vectors* 2.0. This new look is the culmination of discussions with Dixey Teel, Beth Anne Trombetta and their efforts working with the Bar's graphic design and publishing team. We, or more like I, initiated wanting to make a change at the most inopportune time for the staff, as they were preparing for the annual June meeting in Boca Raton. Despite the inconvenience, my request was met with not only a dedicated effort but also outstanding professionalism. Needless to say, but necessary to say anyway, I would like to Thank everyone involved in this process for their efforts for a job well done.

As you are probably aware the *Vectors* publication is generally done when there are enough articles to publish. Understanding writing an article can sometimes be arduous and time consuming for those contributing, and that coupled with the normal three Aviation Law committee events of which most of this year's contributors are members, one can see time is a factor regarding producing articles. With that said, and to spread the burden, (I mean wealth) I encourage others to dust off their laptops and Write!

As I mentioned above, the Aviation Law committee had its usual busy year. Outgoing chair, Brad Hassel was the driving force behind securing speakers for the mid-year and annual meetings. If you are not aware the committee also provides a one-day review course for those taking the board certification examination for aviation law and Brad secured those speakers as well-all eight of them! The topics are taken from the bibliography supplied by the Bar and they include litigation, enforcement, international law, airport land use, labor relations, air taxi operations, aircraft registration, and space law. Even if someone is not sitting for the examination, it is a thorough review of aviation law and well worth one's time. There is also the added bonus of the CLE hours associated with the review.

This year the responsibility to do all of the above falls to incoming chair Pat Phillips and his vice chairs Ahmed Faruqui and Petra Justice. We are confident Pat and his team will continue to provide quality legal topic of interest as well as continuing to educate the committee members on pertinent and relevant aviation law issues.

With all that as a prelude, let's get to it. In this issue Stewart D. Roll and Jason Lorenzon look at issues related to FAA Special Issuance Medical Certificates. Steven Hogan, Galen Bauer and Ashby Underhill give us their unique perspectives on state and federal regulations effecting Unmanned Aerial Vehicle operations. Crew Resource Management, as related to national culture, is the subject of NTSB board member Robert Sumwalt's commentary.

Pertaining to the NTSB I wrote two articles, one involving my attendance of the swearing in of the NTSB chair, Christopher Hart and my attendance at the NTSB probable cause hearing of the Scaled Composites' accident. Included in that is also some personal time I spent with Mr. Hart and the tour I was given of the NTSB laboratory facilities.

The aviation law committee's board liaison Brian Burgoon contributed an article on his Rocky Mountain High flying experience in the Colorado Rockies. Going higher, Robert Feldman gives us a tour of the Kennedy Space Center.

...and there you have an overview of what the aviation law committee and this publication bring to its members, their clients and the Florida Bar. If you are not aware, to be a part of the committee one must apply. Those applications are submitted to the Bar in December, an early January cutoff, with final appointment done by the incoming Bar President. I encourage you to apply and become a member of one of the most energetic, dynamic committees of the Florida Bar. How could it not be – we talk about aviation, aircraft and aviators!

Big Brother Is A Drone?

2015 Amendments to Florida "Freedom from Unwarranted Surveillance Act"

By Galen Bauer

New amendments to Florida's drone surveillance act, Florida Statute Section 934.50, allow drones to follow you, watch and take pictures and videos of you, your house, your spouse, and even your kids. The amendments became effective July 1, 2015, and moved us eerily closer to the world imagined by George Orwell in his publication *1984* – a world where at all times and in all places, "BIG BROTHER IS WATCHING YOU." This article explores the recent amendments to Florida's drone surveillance law and acknowledges the many beneficial uses for drones, but urges that strict limitations on drone surveillance are necessary to avoid a dangerous drift toward an Orwellian society.

Drone use versus Personal privacy

Drone use is becoming more commonplace every day. We've all heard news reports about "drone strikes" to eliminate enemy combatants in war zones. Those still happen, but they're old news. People are finding new, practical uses for drones on a daily basis. Photographers around the world are using drones to find better angles to capture their subjects. Switzerland is using drones for postal delivery. Closer to home, police are using drones to perform search and rescue in rough terrain allowing them to search more area in less time. NFL teams are using drones to make videos of practices. Amazon promises 30-minute delivery of products by drone as soon as FAA rules allow it. Whether legal or not, there are infinite uses for drones. The field is in its infancy and will grow exponentially as people discover how to use them to be more productive in less time and at a lower cost. Whether you're a drone fan or not, the drone era has arrived, is growing, and is here to stay.

As drone use has increased, so have concerns about individual privacy and property rights and the need for reasonable restrictions on their use to protect those rights. But, as freedom loving people, we enjoy the ability to pursue our careers and hobbies without restriction. As such, a natural tension has emerged between drone use and individual privacy. One expert recently advised Congress that drones present "a nightmare scenario for civil liberties."[1] So, where should the lines be drawn? Should drones be allowed to fly ten feet above your house if it's delivering a package to your neighbor? 50 feet? What if it's videotaping you while you try to enjoy an evening cocktail in your backyard hot tub? What if it's videotaping your neighbor to see whether they're doing something that might undermine their Social Security Disability claim? As Congress struggles with these questions, Florida lawmakers have been trying their own hand at the balancing of these competing interests.

In 2013, Florida adopted the "Freedom from Unwarranted Surveillance Act" (Act) and, effective July 1, 2015, amended that Act to allow for more drone activity in Florida. With these new amendments, the trend in Florida is clearly toward sacrificing individual liberties to encourage widespread drone use.

2013 – Freedom from Unwarranted Surveillance

As stated above, the first version of the Act was enacted in 2013. In both name and in substance, the Act protected Florida citizens from unwarranted governmental intrusion. Specifically, the Act said, "A law enforcement agency may not use a drone to gather evidence or other information." Fla. Stat. § 934.50(3) (2013). It provided only three limited exceptions related to the use by a law enforcement agency, being: 1) to prevent a terrorist attack; 2) to prevent imminent danger to life or serious damage to property; or 3) when the

Big Brother is a Drone?

Continued from previous page

specific use is authorized by a search warrant. Fla. Stat. § 934.50(4). As you can see, the act was short and simple. The practical ramification, related to criminal prosecution against an individual or entity, was any evidence gathered by a law enforcement agency outside of any of the three exceptions would be inadmissible as evidence because it was gathered in violation of their constitutionally protected rights to privacy. Fla. Stat. 934.50(6).

However, the 2013 Act fell short for several reasons. First, it ignored private drone use altogether. Individuals remained free to use drones for any "recreational" purpose or any specially authorized purpose, consistent with FAA regulations. Second, the 2013 Act made no mention of civil litigation or administrative proceedings. Theoretically, evidence gathered illegally by a drone could be used in civil litigation and administrative proceedings. Third, the 2013 Act provided no real penalties for violators and no meaningful way for victims to protect their privacy. The Act provided for an unspecified "civil action" but did not include any damages provisions or prevailing party attorney's fees and was only applicable against the aggrieving law enforcement agency. Fla. Stat. 934.50(5). Thus, victims had little certainty about what they might achieve other than a restraining order if they brought a civil action. Lawyers had little incentive to accept representation for those claims when faced with elusive damages and no attorney's fee provision. With these shortfalls, the 2013 act needed more work.

The 2015 Amendments

The 2015 amendments to the Act solved many of the problems from which the 2013 version suffered, but overlooked one shortcoming. First, the amendments address drone use by private actors and provide some limitations on that use. Second, the amendments help ~~to~~ provide meaningful recourse to victims of illegal drone surveillance. The amendments specifically provide for injunctive relief, prevailing party attorney's fees, and the possibility of punitive damages against the operator who conducted drone surveillance in violation of the Act. In these respects, the 2015 Amendments are major improvements to the Act.

The ~~one~~ shortcoming overlooked by the 2015 amendments is the provision regarding admissibility of evidence. That issue was addressed, with identical language in both the 2013 and 2015 versions, in subsection (6) of Section 934.50. The Act provides that evidence gathered through illegal drone surveillance is inadmissible in criminal cases. But, neither the 2013 version nor the 2015 version addresses admissibility of illegally gathered evidence in civil cases or administrative proceedings. To address this oversight, the Florida legislature needs to amend the Act further to clarify that illegally gathered evidence is inadmissible in civil cases and administrative proceedings, as well as in criminal cases.

The 2015 amendments also added more categories of drone surveillance activities that are now permissible. Where the 2013 act had only three exceptions to the general prohibition on drone surveillance, the 2015 version now has nine, with one of those exceptions having five subparts. Fla. Stat. § 934.50(4) (2015). The amendments also added a new subsection (b) that applies specifically to private drone operators. That subsection provides:

> (b) A person, state agency, or a political subdivision . . . may not use a drone equipped with an imaging device to record an image of privately owned real property or of the owner, tenant, occupant, invitee, or licensee of such property with the intent to conduct

Big Brother is a Drone?

Continued from previous page

> surveillance on the individual or property captured in the image in violation of such person's reasonable expectation of privacy without his or her written consent. For purposes of this section, a person is presumed to have a reasonable expectation of privacy on his or her privately owned real property if he or she is not observable by persons located at ground level in a place where they have a legal right to be, regardless of whether he or she is observable from the air with the use of a drone.

The phrase "in violation of such person's reasonable expectation of privacy" and the definition of that phrase, leave only a small piece of our lives presumptively private -- essentially we have to be inside our home or inside our walled-off yard. If we leave our home, drones can follow ~~us~~ and take pictures of us virtually wherever we go. If we're in our backyard and can be seen from the street or from across the retention pond, then a drone can hover over our backyard to watch us.

Even that tiny sliver of private life that the amendments do preserve can easily be taken away. Subsection (b) allows surveillance, even where there's an expectation of privacy, if we have given written consent. Hypothetically, it won't be long until our auto insurance carrier sends us a policy amendment that says by signing a coverage application or renewal, we consent to drone surveillance. How many Floridians will "consent" by virtue of getting auto insurance? How many will even notice or read the drone surveillance consent sentence in the middle of the lengthy boilerplate?

Even if we refuse to consent to drone surveillance and are in a place where we have a reasonable expectation of privacy, we can still be watched, photographed and videotaped. The 2015 amendments added six new circumstances where drone surveillance is permissible even where the subject of surveillance has a reasonable expectation of privacy. Those six new exceptions are:

- if the party doing the surveillance is engaged in a business or profession licensed by the state, subject to some limitations; Fla. Stat. § 934.50 (4)(d);
- for appraising property for the purpose of assessing property taxes; Fla. Stat. § 934.50(4)(e);
- to take images by or for an electric, water, or natural gas utility; Fla. Stat. § 934.50(4)(f);
- for aerial mapping; Fla. Stat. § 934.50(g);
- to deliver cargo; Fla. Stat. § 934.50(h); and
- to capture images necessary for safe operation or navigation of a drone; Fla. Stat. § 934.50(4)(i).

One of these new exceptions, subsection (d), could be the exception that swallows the whole rule, depending on how the courts interpret it. The entirety of that exception is:

> (d) by a person or an entity engaged in a business or profession licensed by the state, or by an agent, employee, or contractor thereof, if the drone is used only to perform reasonable tasks within the scope of practice or activities permitted under such person's entity's or license. However, this exception does not apply to a profession in which the licensee's authorized scope of practice includes obtaining information about the identity, habits, conduct, movements, whereabouts, affiliations, associations, transactions, reputation, or character of any society, person, or group of persons.

The second sentence of subsection (d) appears to prohibit licensed private investigators from using drones for surveillance. That conclusion is also supported by the legislative history of the amendment.[2] If Florida courts conclude that, indeed, private investigators cannot use drones for surveillance, then Section 934.50 should accomplish its original purpose and Floridians can worry less that drones are watching them. If however, subsection (d) is not interpreted to preclude private investigators from using drones, then drone use will grow exponentially. Drones will be watching people on behalf of investigators working for governments, law firms, insurance companies, political rivals, business rivals, jealous lovers, and so on. The erosion of personal privacy will be curbed if Florida courts interpret subsection (d) to preclude use by private investigators, as it was seemingly intended. ***Keeping "you" from becoming "me"***

Drones are here to stay. Only time will tell how pervasive they will become in our daily lives. Federal and state lawmakers will continue to hone drone laws as the abilities and practical uses of drones grow. Florida's 2015 amendments to the Freedom from Unwarranted Surveillance Act set a clear direction in favor of growing the drone industry at the cost of individual rights. As we search for a balance between drone usefulness and drone intrusion, we need to be mindful of the rights lost by those who are subject to drone surveillance. For many of us, it's not a problem if we can be the ones saying "BIG BROTHER IS WATCHING YOU" because "you" doesn't mean "me." When the tables turn and "you" suddenly becomes "me," we regret ever allowing drone surveillance at all. Surely, none of us want a world where at all times, and in all places, we have to be thinking "IF BIG BROTHER ISN'T WATCHING ME, THEN SOMEONE ELSE IS." When it comes to surveillance by drones, let's proceed with extreme caution.

Galen Bauer is a partner at Spohrer & Dodd, PL in Jacksonville, Florida. He is a Florida Board Certified Aviation Law attorney and a member of the Florida Bar Aviation Law Certification Committee. His areas of practice include aviation mishaps, trucking and auto crashes, and products liability litigation. Galen can be reached by email at gbauer@sdlitigation.com.

Endnotes

1 Statement of Harley Geiger (Senior Counsel and Advocacy Director for the Center for Democracy & Technology) before the U.S. House Committee on Oversight and Government Reform, June 17, 2015.

2 Staff Analysis of CS/SB 766, "Surveillance by a Drone", Committee on Judiciary, Florida Senate (March 26, 2015).

A Legacy That Keeps on Giving: Aviation Law Committee Awards Scholarship*

By S.V.(Steve) Dedmon

At the 2015 annual June meeting of the Florida Bar in Boca Raton, the Aviation Law Bar Committee in its meeting, was informed by associate professor Steve Dedmon that Embry-Riddle Aeronautical University (ERAU) had awarded its Eilon-Krugman-Kadi scholarship to Ms. Amber Huber. Amber is majoring in Aeronautical Science and planning to graduate in the fall of 2016. She is a private pilot with an instrument rating and currently working on acquiring her commercial pilot certificate. Academically, she will be taking a 3.36 into the fall 2015.

In her Thank You letter to the committee, Amber said her ultimate goal is to become an airline pilot. To fulfill the flight hour requirements she plans get her flight instructors' certificate, which will allow her to build time as an instructor. She acknowledged the $770.00 scholarship relieves part of her financial obligations and allows her to focus on her education. As a committee, we would like to congratulate Ms. Huber and wish her the very best as she seeks to fulfill her aviation dreams and aspirations.

The Eilon Krugman-Kadi scholarship was the result of the committee's efforts to endow a scholarship in the name of long time committee member, aviation law attorney and pilot Eilon Krugman-Kadi who died while performing an aerobatic routine in his L-39 at an airshow in Titusville, FL. As Embry-Riddle was Eilon's undergraduate alma mater, the committee felt it appropriate the scholarship originate there as a means to provide financial assistance to future generations of aviators. To endow the scholarship, committee members made the personal contributions required to meet the financial requirements as established by the university for scholarships of this nature. Since its inception in 2009, the yearly scholarship award available to qualified students has continued to rise, based in part on continued contributions by committee members.

Should anyone be interested in contributing, they can do so by sending a check to Embry-Riddle Aeronautical University, Contributions, P.O. Box 864436, Orlando, FL 32886-4436.

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Atlantis on Display at the KSC Visitors Center

LPBA Members Participate in a Behind-the-Scenes Tour of the Kennedy Space Center and Cape Canaveral Air Force Station

By Robert L. Feldman, B.C.S.

Re-published with the authorization of the authors and of the Lawyer-Pilots Bar Association (www.lpba.org), publishers of the Lawyer-Pilots Bar Association Journal

On April 17, 2015, in conjunction with the Florida Bar Aviation Law Certification Committee exam grading meeting, committee members and their families were given a tour of the Kennedy Space Center (KSC) and Cape Canaveral Air Force Station (CCAFS), organized by LPBA member Jerry Trachtman and given by Scott Thurston, Manager of Ground Systems Development and Operations, Engineering, at KSC. Other LPBA members on the tour included Ed Booth, Bruce Green, Pat Phillips, Mary Burnett and the author, Robert Feldman.

The tour included the NASA Visitors Complex and also many areas not normally seen by the public, including Launch Complex 39B, the newly reconfigured Launch Control Center (LCC) Firing Room 1, the inside of the Vehicle Assembly Building (VAB), the Shuttle Landing Facility (SLF), and the Mobile Launcher (ML). Along the shoreline road, the tour passed The Beach House, an early-1960's era house, which served as a meeting place for astronauts and their families to have some quiet time together prior to a launch. Also along the beach road, the tour visited Launch Complex 14, site of the Free World's first ICBM launch and also the site of John Glenn's historic Friendship-7 Mercury flight which, on February 20, 1962, was the first Free World orbital flight.

LPBA Members Mary Burnett, Ed Booth, Bruce Green, Jerry Trachtman, Pat Phillips & friends at the SLF

A somber part of the tour was a stop at Launch Complex 34 where, on January 27, 1967, the crew of Apollo 1, Virgil "Gus" Grissom, Edward White and Roger Chaffee perished in a spacecraft fire, which occurred during a launch rehearsal.

Another reminder that space exploration is not without risk was the plaque in the VAB marking the 16th floor storage site of the debris recovered from the orbiter Columbia. Tile damage, caused by insulating foam from shuttle's external fuel tank breaking off during launch and striking the orbiter's wing, allowed hot gasses to enter the wing during reentry, dooming the orbiter to in-flight breakup and the loss of its crew.

Since the end of the Space Shuttle program, the character of the Kennedy Space Center has drastically changed. No longer is each mission under the control of NASA or the

Kennedy Space Center Tour

Continued from previous page

United States Air Force. Now, many of its facilities are used for missions conducted by private entities. In furtherance of the changes, both NASA and the private facility lessees are reconfiguring for new space hardware, some still in its early development stages.

On July 8, 2011, the last Space Shuttle mission, STS-135, was launched from Launch Complex 39A. Since then, it has been leased to Space Exploration Technologies Corporation, also known as SpaceX, a private corporation founded by former Paypal executive and Tesla Motors CEO, Elon Musk. SpaceX plans to use it for launch of the Falcon Heavy rocket to carry heavy payloads into space, with an ultimate goal of sending payloads to, and possibly even colonizing, Mars. It will also be used for crewed launches to the International Space Station (ISS).

Meanwhile, Launch Complex 39B is being reconfigured by NASA for the Space Launch System, also planned for use to launch heavy loads into space and to carry the Orion crew capsule, ultimately on missions to Mars and deep space.

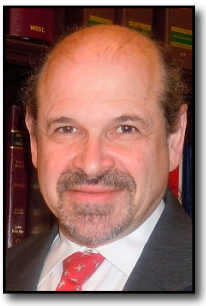
Modification of the VAB, a 525 foot tall, 716 foot long, 518 foot wide building used to vertically assemble rockets and their payloads, is now being performed to accommodate the SLS and its Orion capsule. To comprehend the size of the VAB, it is helpful to know that the flag on its side is 209 feet high and 110 feet wide. The interior is so vast, it sometimes generates its own weather. The related Mobile Launcher, parked nearby, is being modified from its configuration as the mobile launcher for the now defunct Ares-Constellation moon exploration program to its future use as the mobile launcher for the SLS-Orion missions. For launches, the ML and its attached rocket and payload stack will be mated to a modified Crawler Transporter (CT), and the assembly will travel at ultra-slow speed from the VAB to Launch Complex 39B.

Firing Room 1, at the LCC next to the VAB, has also been reequipped for use as launch control for the SLS-Orion missions.

On July 21, 2011, STS-135 orbiter Atlantis rolled to a successful stop on SLF runway 15 (which is 15,000 feet long by 300 feet wide), bringing the Space Shuttle program to an end. The location of its nosewheel stop was later permanently etched into the runway. But the conclusion of the Space Shuttle program marked a new beginning for KSC. Now, even the character of the SLF has changed in that overflights of the runway (but not landings) by general aviation aircraft are permitted.

Scott Thurston explains the layout of the International Space Station

The future is bright for the Kennedy Space Center and its publicly and privately run programs, as the process continues to make KSC ready to accommodate government and commercial launch, processing and support of new designs of launch vehicles and other hardware for the 21st century and beyond.

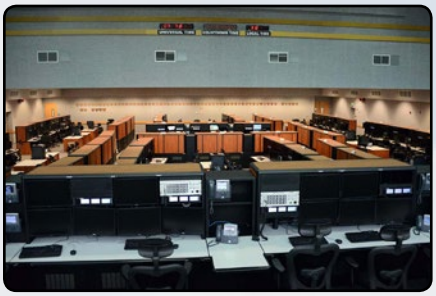


Robert Leaf Feldman is a Florida Board Certified Aviation Law attorney who has been practicing for over 37 years. Admitted to practice in Florida and Pennsylvania he has offices in Miami and Tavares, Florida, where his practice includes accident litigation (both plaintiff and defense), airline law, FAA enforcement action defense, aircraft purchase/sale/registration transactions. A single and multi-engine rated pilot and expert skydiver, he also represents clients in the parachute industry, including parachute component and system manufacturers, drop zone owners, jump pilots, and parachuting instructors and jumpmasters. He is a Panel Attorney for the AOPA Legal Services Plan program. He can be reached at (305) 598-4841 or at his e-mail address feldmans48@hotmail.com.

Photos by: Jeanine Feldman and Robert L. Feldman, B.C.S

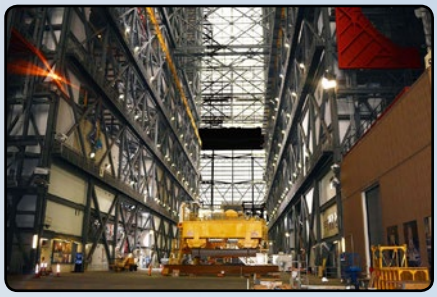
The Beach House

Launch Control Center - Firing Room 1
reconfigured for SLS-Orion missions



Plaque at Launch Complex 34
the site of Apollo 1 fire

Inside the VAB
175 Ton Crane in Transfer Aisle



Launch Control Center

Modifications to the Mobile
Launcher for the SLS-Orion
Program are in Progress

Vehicle Assembly Building

Refurbishment of Launch Complex 39B for
the SLS-Orion Program

Launch Complex 39A (Leased to SpaceX),
taken from Launch Complex 39B

Launch Complex 14 - Launch of John Glenn,
the First U.S. Man in Orbit

Orbiter Columbia's
Final Resting Place in the VAB

STS-135 - Last Shuttle mission
- Point of orbiter Atlantis
nosewheel stop on the runway at
the SLF

Yes, You Can Successfully Challenge the FAA's Denial of Your Special Issuance Medical Application

By Stewart D. Roll and Jason Lorenzon

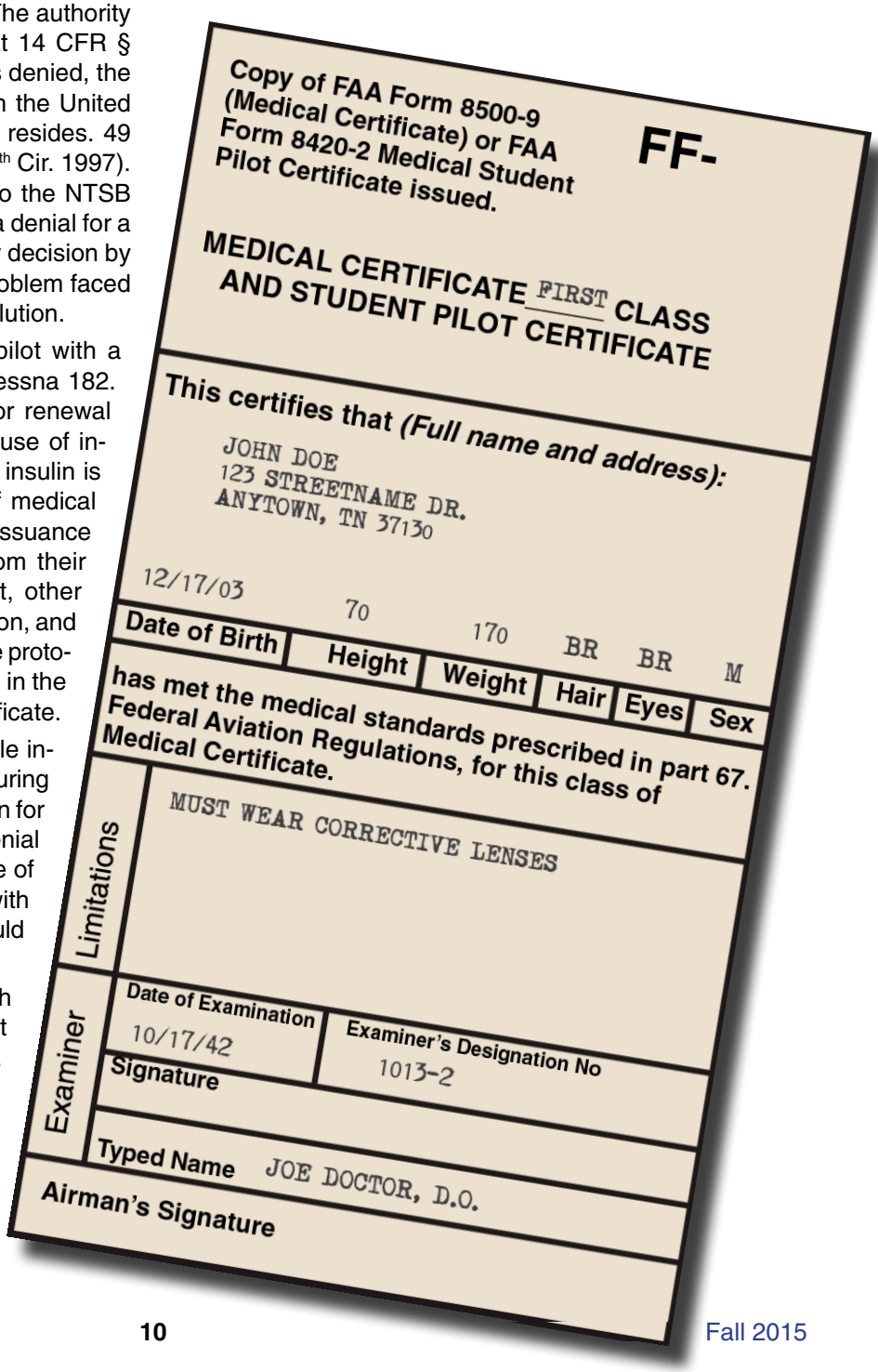
A Special Issuance Medical Application is a form of discretionary relief the FAA has at its disposal when an airman may not meet the qualifications for an unrestricted medical certification. The regulations related to appealing its denial by the FAA are different from those involving the denial of a medical certificate. The Federal Air Surgeon may grant a Special Issuance of a Medical Certificate and apply to it a specific validity period. The authority for this administrative action can be found at 14 CFR § 67.401. If the request for a special issuance is denied, the only recourse is to file a petition for review in the United States Court of Appeals where the petitioner resides. 49 USC § 46110; *Reder v. FAA*, 116 F.3d 1261 (8th Cir. 1997). In *Reder*, the applicant appealed his denial to the NTSB and the NTSB dismissed his appeal because a denial for a Special Issuance is a completely discretionary decision by the FAA. This article describes this specific problem faced by private pilot Dan Roll and the ultimate resolution.

Dan Roll has been an instrument rated pilot with a third class medical since 2007, and flies a Cessna 182. In November 2013, he applied to the FAA for renewal of his medical certificate, disclosing his new use of insulin to control his diabetes. While the use of insulin is disqualifying for the issuance of any class of medical certificate, the FAA has a protocol for special issuance if the applicant submits favorable reports from their endocrinologist, cardiologist, ophthalmologist, other specialists depending on one's medical condition, and your primary care physician. Complying with the protocol, Stewart included all the necessary reports in the application for the renewal of his medical certificate.

Despite providing the required and favorable information pertaining to his use of medication, during January 2014, the FAA denied Roll's application for renewal of his medical certificate. The FAA's denial letter said their action was based upon his use of insulin to control his diabetes in combination with his use of blood pressure medication, which could result in low blood sugar.

Most challenges to an FAA action, which adversely affects one's pilots certificate, must proceed through an administrative process. However, as mentioned above, denial of an application to obtain or renew a special issue medical certificate is not subject to the administrative appeal process. You can only challenge that action by petitioning the United States Court of Appeals, which serves your judicial district for review of the FAA's action.

Jason Lorenzon, who is Roll's flight instructor and friend, filed that petition in the United States Court of Appeals for the Sixth Circuit. The documents which Lorenzon and Roll filed are a matter of public record, and may be viewed at https://www.pacer.gov/, and by searching for *Roll v. Huerta,* which is identified as Case No.: 14-3228. At the time, Michael Huerta was the FAA administrator.


Copy of FAA Form 8500-9 (Medical Certificate) or FAA Form 8420-2 Medical Student Pilot Certificate issued.

FF-

MEDICAL CERTIFICATE FIRST CLASS AND STUDENT PILOT CERTIFICATE

This certifies that (Full name and address):

JOHN DOE
123 STREETNAME DR.
ANYTOWN, TN 37130

Date of Birth	Height	Weight	Hair	Eyes	Sex
12/17/03	70	170	BR	BR	M

has met the medical standards prescribed in part 67. Federal Aviation Regulations, for this class of Medical Certificate.

Limitations: MUST WEAR CORRECTIVE LENSES

Examiner
Date of Examination: 10/17/42
Examiner's Designation No: 1013-2
Signature
Typed Name: JOE DOCTOR, D.O.
Airman's Signature

Special Issuance Medical Application

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In *Roll v. Huerta*, the approach was first to litigate. However, in our case it became clearer the best approach was to pursue a settlement. With this in mind the most salient approach in this case was to go to mediation. Although most "enforcement" attorneys are trained to be adversarial, Jason was persistent in pursuing a meaningful dialogue between Mr. Roll and the FAA. Although the Sixth Circuit Mediation Program was not proactively involved, the approach was to have a conference to determine what the issues were that lead to the initial denial of Roll's special issuance medical. Once the parties had discussed their respective positions, the FAA conceded that the medical system is not user friendly and it really requires the launching of a lawsuit to resolve issues such as the one Roll was facing.

In presenting his case, Mr. Lorenzon emphasized the basis for denial of Mr. Roll's medical certificate should not be the FAA's use of 40-year-old data related to potential medication interactions that could result in low blood sugar levels. Mr. Lorenzon argued the pertinent information pertaining to Mr. Roll's fitness to qualify for a medical certificate should be the more current medical data supplied by his world-renowned endocrinologist.[1] *Based on this more current methodology, this reasoning persuaded the FAA to issue Mr. Roll a third class medical. Not withstanding this positive argument and outcome, it is still noteworthy legal precedent exists for the proposition that potential drug interaction is not a good reason for denial of the issuance of a medical certificate. See, Bullwinkel v. FAA (7th Cir. 1994), 23 F.3d 167.*

In the landmark case involving a famous aerobatic pilot, Bob Hoover, Lorenzon's approach was influenced by the fact it took many years of painful and expensive litigation to resolve Hoover's medical certification issue. Based on two FAA inspector's opinion Hoover did not look well after his aerobatic performance resulting in the FAA issuing an emergency order revoking his medical certificate. At this time, an airman affected by an emergency order was not permitted due process of law, specifically the right to appeal an emergency revocation, which is a chance to challenge the FAA's arbitrary and capricious decision.

Ultimately, Hoover's circumstances lead to the enactment of the "Hoover law" which came into effect in 2000. However, this only permitted an airman to challenge an emergency revocation. However, the Hoover law never addressed a situation like Mr. Roll's and through careful examination of the regulations, jurisdiction and case law, we were able to launch a petition for review in the Sixth Circuit Court of Appeals.

The lesson to be learned from this saga is attorneys who are familiar with the medical application regulations, laws and pertinent medical issues can successfully challenge the FAA's denial of your special medical certificate application. Patience is also another imperative quality one must have while pursuing the all-important special issuance medical certificate. Perseverance with the FAA attorneys is also a must as their workload is controlled, limited and confined compared to the private practitioner which adds additional layers an aviation attorney must navigate to a successful conclusion of medical certificate issues.

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Endnotes

1 Editor's Note: As you are probably aware, according to the medical community, Evidence Based Practice (EBP) is the conscious use of current best evidence in making decisions about patient care. (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000). In the author's opinion, this appears to be the basis of Mr. Lorenzon's effective argument to the FAA.

ROCKY MOUNTAIN FLYING

Near Salida and Buena Vista Colorado

By Brian D. Burgoon

Like most pilots, I jump at the chance to get in an airplane. Living in Atlanta, most of my flying has been in the Southeast, but I always seek out opportunities to fly in new locations, over different landscapes. This March, on a trip to Aspen, Colorado, I arranged to fly for three days with a mountain flight instructor in a Cessna 172. I was fortunate to get to fly with Gary Kraft,* the chief flight instructor with Aspen Aero, who has been flying in the Rocky Mountains for over 20 years.

Up to this point, the extent of my mountain flying experience had been in the southern Appalachian Mountains in Georgia, Tennessee and North Carolina. While flights in those mountainous areas require extra diligence and understanding of the effects the mountains have on weather conditions, flying in the Rocky Mountains is a vastly different experience where high density altitude takes on a whole new meaning. Before my trip to Aspen, I had not flown above 10,000 feet. On this trip, I would be taking off at elevations close to that.

Aspen-Pitkin County Airport (KASE), elevation 7,837 feet, is nestled in a valley surrounded on three sides by mountainous terrain with elevations ranging from 12,500 to 14,000 feet, and is well-known in the aviation world for its difficult approach. Nearly an entire page of the Airport/Facility Directory is devoted to the airport's dizzying amount of rules, regulations, procedures and prohibitions. There is a single runway, 15/33, and jets use runway 15 for landings and runway 33 for departures – even with a tailwind – because the surrounding terrain does not allow jets adequate space to safely maneuver for takeoffs and landings in the other direction. (Small single-engine piston airplanes can take off and land in either direction if traffic permits.) Due to these limitations, even when cloud ceilings are over 2,000 feet above ground, arriving planes often can be required to fly holding patterns for lengthy periods of time and eventually divert to another airport.

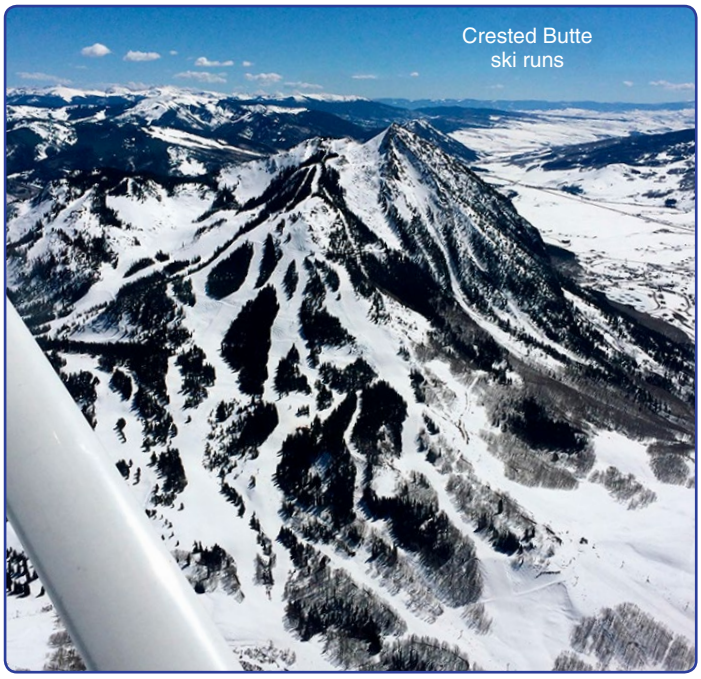
Before our preflight, Gary was great at explaining the weather issues we might expect to encounter in the mountains, and the effects the high altitude has on aircraft performance. He explained how best to position the airplane in relation to the mountain ridges, how to utilize the updrafts

Beaver Creek ski runs

Rocky Mountain Flying
Continued from previous page

coming off the mountain slopes to gain and maintain lift, and how best to avoid turbulence and downdrafts. At times, this would involve flying fairly close to the mountain ridge, just above the terrain and trees. Flying closer to the ridge would also give us more room to safely make a 180-degree turn if needed due to weather, climb conditions, terrain or mechanical issues/engine failure.

Before we even took off, I experienced the first major difference with high altitude flying. Unlike at sea level where the Cessna 172 checklist calls for setting the fuel/air mixture to full rich during engine run-up, takeoff and landing, at our high elevation, we needed to lean the mixture to achieve maximum performance. Our takeoff roll used more runway than I was accustomed to, and we climbed slowly in the thin air.


Crested Butte ski runs

Gary's experience flying in the Rocky Mountains was vital to navigating safely through the mountain passes to ensure we would clear all terrain. At one point, as we approached a mountain ahead of us, he directed me to fly to the right of the mountain. He recounted the horror stories of inexperienced pilots flying to the left of the mountain to follow the road below with the erroneous assumption that it would lead to a mountain pass. The pilots unfortunately discovered, too late, that the road continues around and behind the mountain, and terminates directly into another mountain. After flying just a few minutes, it was easy to understand how pilots who are not familiar with the mountains in the region could get confused and lost among the numerous mountain peaks and ridges, many of which look very similar to each other, and find themselves in peril.

The first day, we flew east, following the Roaring Fork River, slowly climbing to an altitude of 12,500 feet in order to safely cross the Continental Divide at Independence Pass. With mountain peaks above us on both sides and straight ahead, the view was a stark contrast to the typical scenery I was used to flying in the Southeast. After clearing the pass, Mount Elbert in the Sawatch Mountain Range – the highest peak in Colorado and second highest in the continental United States at 14,433 feet – passed by our left wing. Behind Mount Elbert was the summit of neighboring Mount Massive, just 12 feet shorter.

As we broke out into the valley, we began our descent, turned north, and landed at Lake County-Leadville Airport (KLXV). At 9,934 feet, Leadville is the highest elevation airport in North America, and pilots are given a certificate commemorating their landing. From that brief leg, it was easy to appreciate the utility of general aviation in this part of the country. What took less than 25 minutes from takeoff to landing would have been about a four hour drive.

After a brief stop at Leadville, we departed using a good portion of the 6,400 foot runway in the even thinner air. We continued north through Tennessee Pass, and could see Pikes Peak looming in the distance to the east. We flew past the back bowls of Vail ski resort, and with Eagle County Airport (KEGE) in sight, we headed southwest back to Aspen. We flew over the Beaver Creek ski resort, the Reudi Reservoir, and then into the valley to start our approach into Aspen airport.

The second day, we departed from Aspen and headed south past the Ajax and Aspen Highlands ski areas, and flew past the majestic Maroon Bells. We continued south past Crested Butte, heading toward Gunnison Airport (KGUC), situated at 7,680 feet. Gunnison Airport does not have a control tower, but it still handles commercial airline traffic serving the Crested Butte area. It was strange to hear an American Airlines regional jet announcing its position and arrival intentions over the airport's common traffic advisory

Author at Leadville Airport
Highest elevation in North America
Elevation 9,934 feet KLXV

Rocky Mountain Flying
Continued from previous page

frequency. After landing at Gunnison, we headed back north through a different set of mountain ridges back to Aspen. The terrain was rugged and remote, and certainly not a place where you would want to encounter bad weather or mechanical issues. The notation for "cabin" on the aviation chart highlighted the only manmade structure for miles. It was incredible to see untouched wilderness blanketed in snow, with just snowmobile and hiking tracks as evidence that civilization was below.

The third day, we headed back east through Independence Pass, but this time we turned to the south for landings at Buena Vista (KAEJ), elevation 7,950 feet, and Salida (KANK), elevation 7,523 feet, and then toward Monarch Pass, situated at 11,312 feet. The conditions did not allow for our initial climb to safely clear the terrain ahead, so we had to do several 360-degree climbing turns to gain lift from the updrafts coming off a peak below. Gary pointed out that this area of the Rockies was another area where inexperienced pilots have found themselves in trouble by not having sufficient familiarity with the terrain and an understanding of the weather patterns in the area. We flew through Monarch Pass, over the Monarch ski runs, and continued northwest back toward Aspen through a passage between another set of mountain ridges.

Those three days, I logged about 5½ hours of mountain flying, learned a tremendous amount, saw scenery more pristine and beautiful than I could have ever imagined, and had memories that will last a lifetime. Outside of my seaplane training, it was the most fun I ever had flying.


Mountains near Aspen

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*For those pilots interested in flying in the Rocky Mountains, Gary Kraft, Chief Flight Instructor with Aspen Aero located at Aspen-Pitkin County Airport, can be reached at (970) 274-0520 or aspencfi@gmail.com.


Near Monarch Pass

Experiencing the Good Fortune of Another: The Swearing In Ceremony of NTSB Chairman, Christopher Hart

By S.V.(Steve) Dedmon

On May 1st I received a very formal invitation to attend the swearing in ceremony of Christopher Hart to be the chairman of the National Transportation Safety Board (NTSB). My association with him began as I am on the program committee of the Embry-Riddle Aeronautical University (ERAU) Aviation Law and Insurance Symposium where he was a luncheon speaker when he was vice chair. Later, at my invitation, he spoke at one of our ERAU faculty meetings and later to two of my classes. During that visit, while eating a gourmet meal in the student center he invited me to visit the NTSB.

Christopher Hart, NTSB Chair pictured on the left, with the author

Since his visit to ERAU we have been in touch as he became acting chair and then nominated by the President and ultimately confirmed by the Senate by a 97-0 vote to be the chair, so I was aware of his new position and had congratulated him previously. Despite his new responsibilities, in March I e-mailed him and asked if his invitation to visit was still open. He confirmed it was and we agreed I would come the last week in July and not only be able to see the workings of the NTSB, but attend the probable cause hearing related to the Scaled Composites' spacecraft accident.

The ceremony took place in the 350-seat NTSB auditorium where the various NTSB hearings take place. In nothing less than one would expect, it started with Dennis Jones, Chief Technical Adviser for the NTSB giving an airline type brief advising the guests of the location of exits should there be any type of emergency requiring evacuating the area. He then gave an overview of Mr. Hart, which included his being a pilot, a graduate of Princeton with Bachelor and Masters Degrees in aerospace engineering, a Harvard law school graduate, his first appointment to the NTSB under George Bush, Sr., and his second by President Obama as vice chair. Mr. Jones then introduced Charles Bolden, Jr., who was the Keynote Speaker.

As some of you may know, Mr. Bolden is the NASA Administrator. His background includes being a Naval Academy graduate, who became a Marine aviator and served in Vietnam, flying over a 100 combat missions while stationed in Nam Phong, Thailand. His 34-year military career included 14 with NASA's Astronaut Office. Mr. Bolden recognized Mr. Hart's great uncle, James Herman Banning, as being the first African-American to receive a pilot's license issued by the U.S. Government in 1926. He also pointed out the historical significance that Mr. Hart is the first African American to be the NTSB chairman analogizing it to his (Mr. Bolden) being the first African American NASA administrator, all under the leadership of the first African American president.

The special remarks speaker was Captain Chesley Sullenberger. He spoke of a couple of the circumstances related to the ditching of US Airways Flight 1549 in the Hudson. One was his practices was to have an actual headcount of passengers on board his airplane as opposed to the number generated by the gate agent. Another was, as he was leaving the plane, taking the aircraft maintenance squawk logbook. When asked why he took the logbook he answered, he thought someone might need it. Jokingly, he said although he did not originally note any maintenance issues, in hindsight he would have included...hit a flock of birds, engines quit, airplane very, very wet.

Photo of the Pentagon upon departure from Reagan National

He then recalled his association with the NTSB as a part of an investigation as an information gatherer. As some of you may teach this case, he was on the team related to the LAX runway incursion accident where an USAir 737 was cleared to land and hit a SkyWest Metroliner that had been cleared onto the same runway awaiting takeoff clearance. Finally, he said he had now been on the other

NTSB Swearing In
Continued from previous page

end of an NTSB investigation, as a witness in the Hudson landing.

The Honorable Ed Soliday, House Transportation Chair from Indiana, District 4 made a few remarks and administered the oath of office. Upon graduation from college Mr. Soliday was hired by United only to request military leave to fly helicopters in Vietnam. After the war he returned to United, where he ultimately became director of safety. Speaking about Mr. Hart he noted his priorities as to accident investigation were to gather the information, be inclusive and to all with integrity. Before administering the oath, he said in the name of redundancy he brought three copies. He then administered the oath, which is much, as I can personally attest, to that taken by those admitted to the United States Supreme Court Bar.

The Honorable Christopher Hart then gave his first speech as the 13th Chair of the NTSB. He recognized his family, passed board members, invited guests, political guests and thanked his staff for doing the logistics of putting the ceremony together. Noting again, his great uncle, he mentioned the movie the Great Waldo Pepper and its reference to the CAA's move to license pilots, ultimately ending in where aviation has come, since such humble beginnings. He also said his interest in accident investigation began when he read a book about the crash of the de Havilland Comet, the first production commercial jet aircraft.


Chairman Hart
Acceptance Speech

He found it fascinating the investigation found the structural failure was associated with its square windows. Recognizing the NTSB and his goals he wanted to see Increased Collaboration and Continual Improvement. Although he knew they collaborated amongst themselves and other entities and had improved its investigative and reporting capabilities, they could continue to do better. He likened this to Captain Sullenberger asking himself what he could have done better in the Hudson ditching. He ended as he began, humbled for the opportunity to serve and thankful to those who attended.


NTSB Hearing Room

As a final note: I was able to speak to Mr. Hart at the conclusion of the event and thanked him (I even have picture(s)) for inviting me. We reaffirmed my coming in July and promised to continue to stay in contact. I also saw and congratulated ERAU graduate and NTSB board member Robert Sumwalt on his recent graduation and for being the commencement speaker for the WW graduation.

John and Kathy Yodice were also there and I spoke with her as well. As you may or may not be aware, John writes a monthly legal column for AOPA. Kathy and I have chatted on a number of aviation legal issues, and as some of you may be associated with the AOPA Legal Services plan, she and her father administrate the program including the continuing education program panel attorneys attend as part of the continuing legal education process associated with being part of the program.

It was a pleasure and honor to be associated with Chairman Hart's swearing in ceremony and I wish him the very best in his new role.

S.V.(Steve) Dedmon is an Associate Professor and Associate Chair of the Aeronautical Science Department at Embry-Riddle Aeronautical University in Daytona Beach, FL. where he teaches a variety of aviation law courses. He also serves on the Florida Bar Aviation Law committee as well as being a past chair. As a pilot and aircraft owner, he holds a commercial, single/multi-engine land and sea ratings as well as an instrument rating, and glider and certificated flight instructor certificates. He can be reached at dedmo95e@erau.edu.

All photos by S.V.(Steve) Dedmon

Unmanned Aircraft Systems Working Over a House Near You

By W. Ashby Underhill

Unmanned Aircraft Systems ("UAS") also known as Unmanned Aerial Vehicles and the arguably derogatory but certainly popular catchphrase "drone", are being used more and more in the commercial markets near you as valuable tools to assist operators inspect and get the perfect photograph. As I am writing this article, and looking over the Matanzas River and inlet in St. Augustine, I can see a Phantom II vision flying over a house in Davis Shores. My Facebook feed is crowded with images taken from UAS platforms and there were two UAS platforms in operation at my friend's wedding in April. For the purpose of this article, I reference average commercial UAS photography applications as used in real-estate, home inspections, photography, and land surveys.

The FAA has deemed UAS as aircraft, even though they have let model aircraft fly for generations, the quadcopters like the Phantom, have made UAS main stream. Several mainstream media stories later the FAA became involved. If you want to use a UAS for commercial purposes, you are required to get an exemption from the FAA pursuant to Section 333. Section 333 grants the Secretary of Transportation authority to determine:

1. If a unmanned aircraft system, as a result of its size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight does not create a hazard to users of the national airspace system of the public or pose a threat to national security; and
2. Whether a certificate of waiver, certificate of authorization, or airworthiness certification under 49 USC 44704, is required for the operation of unmanned aircraft systems identified under paragraph (1)

Six months ago, the question was how do you apply and get an exception? Although that is still a question, the average commercial application is extremely simple today under the FAA's current policy regarding Section 333. The policy still requires an application; however we can now guide our clients through the process in a fraction of the time.

The FAA has streamlined the exemption process under Section 333. The FAA will grant a Certificate of Waiver or Authorization for flights at or below 200 feet to any UAS operator if the application is within the following guidelines:

1. UAS aircraft weighs less than 55 pounds,
2. Operates during daytime VFR conditions,
3. Operates within visual line of sights,
4. Does not operate within specified distances away from airports or heliports.

Unmanned Aircraft Systems
Continued from previous page

a. 5 nautical miles from an airport having an operation control tower;

b. 3 nautical miles from an airport with published instrument flight procedure,

c. 2 nautical miles from an airport without published instrument flight procedures or tower; or

d. 2 nautical miles from an heliport with published instrument flight procedure.

This policy allows flights anywhere in the country except restricted airspace such as major cities. This step is going towards the right direction and allows an attorney to spend less time preparing applications for his client. However, the policy leaves out a signification amount of areas in which UAS operators can generate revenue.

In St. Augustine, like many Florida cities, the airport is in close proximity of the beach and many neighborhoods and a 5 nautical mile barrier will prevent many useful flights. Why should an operator not be allowed to fly over homes to inspect roofs, get aerial photos of their residence, structure, or yard? The logic and reasoning behind the 200 foot ceiling should apply to allowing certificates closer to the airport. A 100 foot max ceiling with a restriction of no more than 10-20 feet above power lines arguably would satisfy these safety concerns. I can attest that a UAS is capable of taking overhead pictures of a house on a ½ acre lot without going above the tree tops. In addition, several UAS are capable of being tethered to prevent a fly-away or exceeding a safe altitude ceiling. It is imperative that we discuss these issues without clients and carefully prepare an application so that they may maximize their exemption operation area.

Although new regulations will be forthcoming from the FAA in the near future, the opportunity for operators to make money or reduce operating cost with the use of UAVs is here now. Many operators have received exemptions from the FAA but they still have additional exemptions they can and should apply for. As aviation attorneys, our clients receive value from our ability to set forth their applications effectively and efficiently. However, the real value is added from getting exceptions with more flexibility than the perimeters in which are automatically approved.

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The Effect of National Culture on Crew Resource Management*

By Robert L. Sumwalt

It was getting late in the evening as Avianca flight 052, a Boeing 707 bound from Medellin, Colombia to New York's John F. Kennedy International Airport (JFK), was issued a clearance to enter the third holding pattern of the flight. Low ceilings and visibilities were plaguing air traffic in the northeast and ATC was slowly metering traffic into JKF. When ATC extended the expect further clearance for the third time, the first officer replied, "ah, well, I think we need priority... ah, we'll only be able to hold about five minutes – that's all we can do" (NTSB, 1991, p. 2). He further advised they would now be unable to reach their alternate airport, Boston Logan International Airport (NTSB, 1991). Upon hearing that, ATC then proceeded to vector the 707 to the ILS for Runway 22R. Due to windshear and an otherwise poorly flown approach, the crew missed the approach. The captain told the first officer, "Advise him we are emergency" and a few seconds later, "Advise him we don't have fuel." While being vectored for the second approach, all four engines flamed out due to fuel exhaustion. The plane crashed into a wooded residential area on Long Island. Seventy-three of the 158 occupants lost their lives (NTSB, 1991).

The NTSB (1991) cited the crew's failure to manage fuel as part of the accident's probable cause, as well as their failure to communicate to ATC their emergency fuel situation.

Helmreich contends that the crew's behavior that night could be "dictated, in part, by norms of national culture" (Helmreich, 1994, p. 282). In building his case, Helmreich stated that "national culture may have contributed to inflexible decision making" (Helmreich, 1994, p. 282). Referring further to national cultural issues, Helmreich stated the captain's "weak leadership may have been exacerbated by a normative reluctance [by the other crewmembers] to question that leadership, and the need to maintain group harmony may have inhibited crewmembers from presenting their concerns and suggestions" (Helmreich, 1994, p. 282).

FAA (2004) stated the purpose of crew resource management (CRM) is improve aviation safety by promoting improved "situation awareness, communication skills, teamwork, task allocation, and decision-making" (FAA, 2004, p. 1). "It is clear that culture plays a significant role in determining flightcrew behavior, as well as the acceptance of CRM concepts and training" (Helmreich, Merritt, & Sherman, 1996, p. 16). This paper discusses differing national cultures and outlines how cultural issues may effect CRM.

Different Nations, Different Cultures

Hofstede says "culture is the collective programming of the mind distinguishing the members of one group or category of people from others" (Hofstede, n.d., para. 1). Strauch (2010) stated that "culture incorporates the meaning, value systems, and behavioral pattern that people with common characteristics share. When applied to those who live in a particular region, it is referred to as national culture" (Strauch, 2010, p. 247). Cultural values are handed down from one generation to the next (ICAO, 2004), are "evolutionary [and] they change over time" (Strauch, 2004, p. 247). ICAO noted that values are "held so deeply that people may be surprised, shocked, and even offended when they encounter people with values different from their own. Because they are held so deeply and emotionally, values tend to be unquestioned and resistant to change" (ICAO, 2004, p. 6).

How can the national culture of a pilot, flight attendant, mechanic, or air traffic controller effect the way they approach their jobs? Helmreich and Merritt (1998) noted that leadership styles vary with differing national cultures. "The same leader behavior which is seen as harsh and inconsistent in one culture can be interpreted as paternalistic and encouraging in another" (Helmreich & Merritt, 1998, pp. 54-55). Communication styles – a key element of CRM – also differ among cultures (Helmreich & Merritt, 1998).

> The preferred communication style in some countries is direct and specific ("say what you mean, and mean what you say"), while in others it is indirect and relies on the context to carry its full meaning (for example, when a "yes" only means "I hear you" because I do not want to argue or disagree with you). (Helmreich & Merritt, 1998, p. 55)

"The role of national culture on social interactions is persua-

Continued on page 30

What You May Not Know About A NTSB Probable Cause Hearing

S.V.(Steve) Dedmon

On Tuesday, July 28, 2015 I attended the probable cause hearing of the Scaled Composite spacecraft SpaceShip 2. Earlier in the year, then vice chair Christopher Hart had invited me to attend, knowing it was on the NTSB's calendar. Then by invitation, I was invited to his swearing in as the chair (see article on that experience herein). As many of you, I have read NTSB probable cause findings, but, at least in my case, this was the first hearing I had attended. As you are probably aware of the results of the NTSB findings regarding this specific crash, I am going to review the procedural process and possibly add to your understanding of the report generation and probable cause process.

First, the Board member take their seats, with their special assistants sitting directed behind their respective boss. The Chair then calls the meeting to order. As one would expect, a person welcomes everyone, but also points out where the closest exits are should there be an emergency requiring everyone to evacuate the area. In fact there is airport type searches before entering the auditorium. The sensors are actually set rather high as the chip in my passport set off the alarm, something it did not do at the airport on my flight up. The seating is cathedral type so everyone has a good view, accentuated by the fact there is a large image magnification screen as well. The auditorium holds approximately 300 and was about half filled.

Next, all the staff who had anything to do with generating the report are present as they may be queried by the Board for explanations of what is ultimately presented to the Board. In this case there were a total of 18 staff members present. Each were introduced along with what department they represented. Then a select few, 6 in this case, including the senior investigator gave an overview of the findings. Most, but not all used PowerPoint as an aid to those in attendance, but essentially read their testimony/findings.

After the conclusion of the presentations, the Board members were allowed to ask questions. If any of you have attended an appellate or Supreme Court case, and I suspect most if not all of you have, you are familiar with the speakers timers with their green, yellow and red lights. The NTSB uses these as well and each member has 5 minutes to ask their questions or in some cases, make statements, to be fielded by specific individuals or anyone in the group who can address the issue. When the red light comes on, the Board member pretty much finishes up. As the Board is one member short, there was twenty minutes of questions. This process is then repeated so there are a total of 2 rounds of questions. Up until the hearing, the Board has only been in possession of the report for approximately three weeks and has not discussed it with the staff until the hearing.

When this portion is concluded, there is then a motion to accept the report, a second, any additional discussion amongst the Board, then a vote. In this case, there was an amendment to the report as the condition of the aircraft was misstated, then amended, so there was a motion to accept the amendment, then a vote, then the motion process described above to accept the report. The vote to accept the vote was 4 in favor with none opposed.

As concluded by the staff, the probable cause of the accident is then read to the Board. In this particular instance the Chair wanted to amend the probable cause findings. His amendment was then discussed with the staff and the Board. Ultimately, part of the change was incorporated into the original statement, it was then reread, a motion to accept it, a second, additional discussion, then a

NTSB Probable Cause Hearing
Continued from previous page

vote by the Board, which was again 4-0 in favor of accepting the probable cause findings. With that, the Chair read a final statement, a motion to adjourn was made, seconded, vote taken—then done. The Board members then were taken to a media center off the main entrance to be interviewed by various media representatives (there were 6 cameras filming the proceedings).

The hearing in its entirety lasted about three hours. During the presentation of the results, the questions by the Board, the answers by staff, and the procedural aspects, I found the experience enlightening and educational. It had never occurred to me the totality of the involvement of the staff and the lack thereof, relatively speaking, of the Board. I was aware the Board is essentially the public face of the face of the NTSB when they are on site at an accident, but thought they had a larger role in the findings. Live and Learn would be the moral of that story. Anyway, should you have the opportunity, I highly recommend attending a hearing. Besides the National Air and Space Museum is only two blocks away.

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A Visit With The Chair

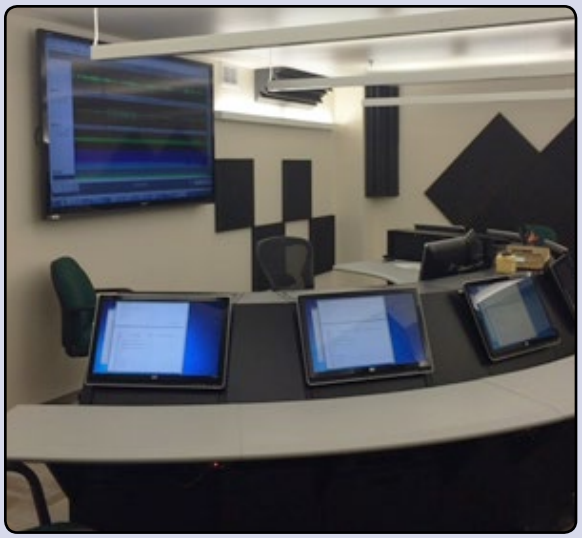
Wednesday morning I met with Chairman Christopher Hart and his special assistant Vishal Amin (an ERAU graduate), a meeting we had scheduled in March. As discussed in a previous trip report, I was invited and attended his swearing in ceremony in May so this was the second time I had traveled to DC in two months. I began by reviewing my observation of the previous day's hearing. We discussed the procedural aspects as well as some of the Board members' technical questions to the staff.

In the hearing, Mr. Hart had queried the staff regarding Scaled's use/non use of simulation to prepare the pilots for the flight and how and if they attempting to simulate the horizontal and vertical G forces, and what that simulation entailed. His question addressed such issues, as were there motion simulators, were they dressed as they would be in the actual flight, were there challenge and response commands, and written checklists, obviously human factor issues. He had also asked if there had been specific and active discussions as to unlocking the feathering mechanism while in the transonic bobble (which the copilot did at 0.82 Mach and was not supposed to be done until 1.4 Mach) and the possible consequences.

We also discussed Robert Sumwalt's questions and concerns regarding the co-pilot being the single point failure part in the process and its potential catastrophic consequences. I asked also how many man-hours were involved in this investigation or one of this nature, to which he responded they were still gathering that information. This was a 9-month investigation, which, in part was lessened by the information given to them by Scaled, one of the most important items being the in-cockpit video footage of the actions of the crew where they were able to observe the co-pilot unlocking the feathering handle.

I then asked questions regarding his congressional statements regarding 3rd class medicals. He is opposed to eliminating them; I am in favor so we had a spirited conversation. Incidentally, it is in the Pilot Bill of Rights II and as an amendment to a current highway bill being addressed by the Senate. If you are not aware, the Air Line Pilots Association (ALPA) opposes eliminating the medicals. We then discussed UAV operations and concerns they raise.

We then finished by examining the process by which the Board issues opinions on pilot certificate actions. The actual opinions are written by the 11 member NTSB legal staff, or combination thereof. It then goes through the same process as a crash investigation and ultimately the Board votes, which becomes their decision. (Actually, during a break in the probable cause hearing I introduced myself to David Tochen, their general counsel who was one of the 18 staff members present. I did so, as he may be a speaker at the ERAU Aviation and Law Symposium of which I am a program committee member). Having taken more time of chairman Hart's time than maybe I should have, I thanked him for his time and hospitality.



A Tour of the NTSB Laboratory Facilities

At this point I was introduced to James Ritter, Deputy Director of the Office of Research and Engineering for my tour of the lab facilities. At this facility they retrieve and analyze the data obtained from flight data recorders (FDR), cockpit voice recorders (CVR), iPhones, iPads and a variety of electronic storage devices. When a device is received there is a committee, headed by a chair that begins the investigative process from which the final report comes. As you are probably aware, when an airplane crashes in the water they keep the FDR and CPR in water until it is receive at the lab where it is then put in an oven to dry out the contents as uniformly and quickly as possible. Otherwise, if they are transported without being in water the contents begin to dry, which can destroy the integrity of the information.

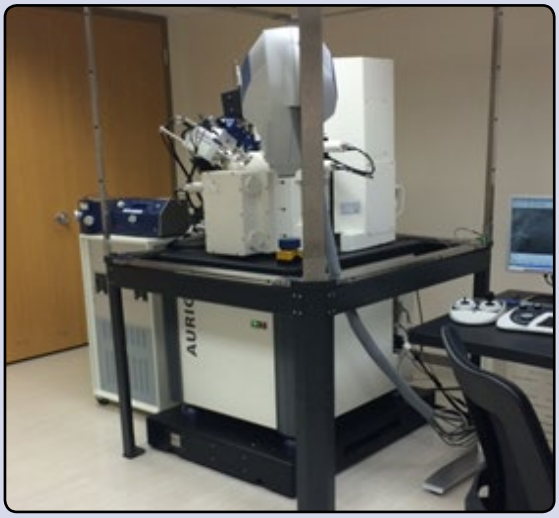
Pertaining to information stored in iPhones (as they were retrieving some information from one) and iPads this got my immediate attention as I asked if they had subpoena power-which they do not. However, if it is part of the wreckage, it is evidence so it is theirs, if there is a criminal context they can get it and they can ask an individual to give it up, which is what happened in a rail accident. They can obtain information from carrier servers. So beware...there is a lesson here. There was a technician retrieving data from some circuitry from an A36 and Jim and the technician were taken aback when I said it was from a Bonanza!

There are 3 rooms dedicated to

A Visit With The Chair

Continued from previous page

retrieving FDR and CVR information and then 3 where the CVR information audio replications can be heard via headsets and simultaneously seen on computer screens. There are six stations in a semicircle type arrangement where parties such as the airlines, manufactures and other stakeholders can hear the recordings, all of which is overseen by the chair of the CVR committee. To protect the sound quality there is soundproofing inside each room and an in-use sign outside the room as to not disturb those inside while listening to the recordings.



We then went into the materials testing lab where I saw a 125K-dollar electron microscope as well as laser testing equipment used for non-destructive stress and integrity testing. They also have an 80K 3D printer used for replicating parts that have failed by showing how it may have been defectively made. One example they had replicated showed a hollow spot, thus being the epicenter from which a crack originated. The printer can also reproduce the material that should have originally been there and thus produce a piece that would be a perfect fit in the voided area.

The last part of the tour was the video replication facility. Here, a video of a flight can be reproduced showing various aspects of a flight. As you can imagine, a pilot view, flight profile, pilot flight control inputs, instrumentation readouts and a host of other visual references can be reproduced. Admittedly, they only use what they need to support their report and probable cause conclusions. Should anyone is interested, you can Google NTSB videos and see where examples of their work are posted on YouTube.

Aware of my visit, they had already queued up their reproduction of the Asiana crash. The view included the aircraft's actual decent profile, the pilots view and a view of the flight control inputs. They then animated the actual crash, which was based on video recordings obtained from a spectator that recorded the crash. Most of this animated view included the aircraft skidding first on its belly, then up on its nose at an approximate 40-degree angle (my estimation) before rebounding back onto the runway.

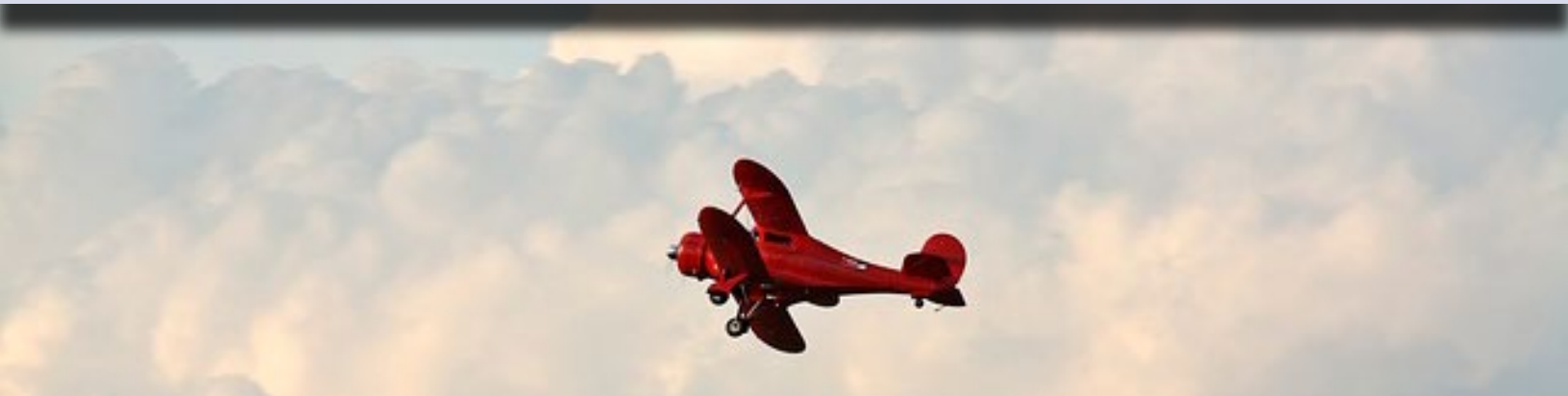
When I related my experience with forensic aviation videos pertaining to aircraft accidents they showed me another they produced a few years ago showing the mechanical linkages between the yoke and elevator of a Beechcraft 1900 and loss of pitch authority, resulting in a crash. As I was acquainted with the Asiana and the Beechcraft accident (in Charlotte) we were able to discuss other accidents we were familiar with, one being the Mel Carnahan accident.

Not to be one dimensional, on either of our parts, we also looked at and discussed a reenactment of a school bus accident looking at specifics related to seat configuration, seat height and the use/non-use of seat belts and the issues they pose in an attempt to protect children in case of an accident. At this point, with nothing more to see, the tour was concluded and I was on my way to Ronald Reagan Washington National Airport.

As was the hearing, my time with Mr. Hart and Mr. Ritter was time well spent and quite the enjoyable experience. I was given a standing invitation to come back and tour the hangar at Dulles where the fully built fuselage of TWA 800 is stored, which hopefully I will be able to do earlier in the spring of next year.

As a side note: the takeoff of my original flight to Washington was delayed due to a battery that was installed on a wheel chair that was to be loaded in the cargo hold. Appears airlines, or at least JetBlue in this instance, really does take the transportation of hazardous materials seriously.

Aviation Law is just Cool! ✈



Chapter 3: Federal Regulation of Drones

By Steven M. Hogan

Getting Clear on Terms

Though the "d-word" doesn't scare me, we have to get clear on our technical terminology. The word "drone" has no fixed meaning. It's a pop-culture term. It means whatever the speaker wants it to mean. "Drone" is less than helpful as a descriptive word.

The term "Unmanned Aircraft System" is more precise. This is a defined term under the FMRA that means "an unmanned aircraft and [its] associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system." *FMRA*, § 331(9). An Unmanned Aircraft System (or "UAS") is more than just the airborne device. A UAS includes all components that make the device work. This means the airframe, its mechanical components (engines, rotors, whatever), the controller used by the Pilot in Command (or "PIC"), the communications system that allows the airframe to be controlled by the PIC, and so on. Every piece that makes the device "work" is part of the unmanned system.

The UAS category is subdivided into two general sections. The first refers to the small devices that are easily accessible by consumers. These are "Small" Unmanned Aircraft Systems. This term is also defined by the FMRA as "an unmanned aircraft weighing less than 55 pounds." *FMRA*, § 331(6). This term is abbreviated as "sUAS."

To qualify as an sUAS, the airframe must weigh fifty-five pounds or less, fully loaded on takeoff. The weight includes all components and the payload. So if your camera is super-heavy, you could "tip the scales" and no longer have an sUAS on your hands.

There is no special term for a UAS that is not an sUAS due to weighing over 55 pounds. Anything over that weight is still a "UAS" for regulatory purposes.

When the FAA finalizes its rules for operation of sUAS in the National Airspace System (or "NAS") (get used to acronyms – they are part of the lingo!), they may include special rules for "micro" – or super-small – sUAS. That may entail a new term for micro UAS as that set of rules evolves. As of now, all UAS that are 55 pounds or less are properly referred to as sUAS.

sUAS: Where the Commercial Action Is

sUAS platforms offer the largest economic opportunity that has ever existed for robotic technology. This is a bold claim and I believe it completely.

Here's why: with sUAS platforms and small, light, inexpensive sensor components, collection of data for a whole host of industries is now within reach. Some examples:

- Precision Agriculture: showing farmers what plants are stressed, are in need of water, where pests are, etc. so that they can act accordingly in real-time to increase yields.
- Wildlife surveys.
- As-built inspections (in 3-D!) for buildings.
- Public Safety: finding lost children and adults.
- Emergency Management: quick, safe reconnaissance of a disaster area to identify survivors and allocate live-saving resources accordingly.
- Bridge inspections – up-close images of bridge components conducted quickly, cheaply, and reliably to check the maintenance needs of each span.
- Power line surveys: use of specialized cameras to identify "flares" where electricity is leaking out of components that need to be replaced or repaired.
- Surveys of mining operations to generate immediate topographical maps of what the terrain looks like after an excavation or blast.
- Shoreline surveys of sea turtle nesting sites to provide an accurate count of where they are without disturbing the wildlife.
- Fire department use of sUAS with thermal imaging cameras that will show where the "hot spots" are within a building before firefighters enter the structure. Identification of survivors in need of rescue can be accomplished in this manner as well.
- Awesome video of any event you can think of (weddings, surfing competitions, 5K and 10K races, marathons, etc.).
- Promotional video and still imagery for real estate sales.
- Monitoring of large tracts of land for environmental studies and research purposes.
- Identification of vulnerable populations of endangered

wildlife without the use of human monitors in manned aircraft.

- *Let your imagination run wild.*

This technology is truly game changing in ways we cannot predict. "Big data" can now influence any industry you can think of. These kinds of operations can all be done with sUAS weighing far less than 55 pounds.

Waivers and Waiting

As I type these words, there is only one way to operate commercially according to the FAA. You must receive a waiver specific to your proposed commercial activity.

There are two general ways to get these waivers. The first is the "old and difficult" way. This is applying for Special Airworthiness Certificates in the Experimental or Restricted Category (SAC-EC and SAC-RC, respectively). This used to be the only way one could fly a UAS of any size for commercial purposes. This is how oil companies were approved to fly in the Arctic in 2013.[1] The "easier" way to get flying is through the "Section 333 Exemption" process. This process is an example of the constant change in this industry.

The Section 333 process only "opened up" in September 25, 2014, when the FAA granted six exemptions for use of sUAS on closed motion picture sets.[2] That is barely seven months from where I sit today.[3]

The Section 333 process is only open for sUAS platforms. The legal authority for the FAA to grant these exemptions is found in Section 333 of the FMRA. This section reads as follows:

> **SEC. 333. SPECIAL RULES FOR CERTAIN UNMANNED AIRCRAFT SYSTEMS.**
>
> (a) IN GENERAL.—Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.
>
> (b) ASSESSMENT OF UNMANNED AIRCRAFT SYSTEMS.— In making the determination under subsection (a), the Secretary shall determine, at a minimum—
>
> (1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and
>
> (2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).
>
> (c) REQUIREMENTS FOR SAFE OPERATION.— If the Secretary [of the Department of Transportation] determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system. *FMRA*, § 333.

That language has been in place since February, 2012. So why the wait? Who knows – your guess is as good as mine.

The best answer I have is that the FAA has a very complicated job in front of it. Creating a system that works everywhere in the country for a brand new technology is a tall order. It's a task made even harder because the technology is constantly morphing with breathtaking speed.

The upshot is that we now have a process for the FAA to determine whether "certain unmanned aircraft systems may operate safely in the national airspace system" in a given commercial context.

So what does this process look like? The application itself takes the form of a letter to the FAA. The letter is a "legal and technical" document explaining how a commercial operator will operate safely despite non-compliance with some (or all) of the Federal Aviation Regulations.[4]

The application should list the technical specifications of the sUAS at issue and the procedures to follow in case something goes wrong. This could mean systems failure, loss of communication link, and anything else that could hurt the platform's ability to fly. The application should also state the general parameters of the proposed operations and the credentials and training of the Pilot in Command. At least, that's the process today. It could change tomorrow. For example, the process changed while I was writing this book.

The FAA initially required each recipient of an exemption to apply for separate "Certificates of Waiver or Authorization" (referred to as "COAs") before actually flying. This means that an applicant had to: (1) file for an exemption; (2) receive the exemption; and (3) then apply for a COA for each commercial operation.

While not ideal, this was certainly a better process than trying to apply for SAC-EC or SAC-RC approvals for each commercial flight.

As this writing, there are over 700 exemption requests pending. The FAA has granted just over 100 of them. You see the problem: the FAA could anticipate each exemption holder filing hundreds of COA applications while the rules are under consideration. That means the FAA would have to individually examine each one. This could have gridlocked the process and fatally over-stretched the agency's resources.

This may be why the FAA loosened things up on March 20, 2015. The FAA announced a new process for granting "blanket" COAs to applicants that receive exemptions. In the memorandum announcing this new policy. The FAA would grant a "blanket" COA to successful applicants that allowed commercial operations in more restricted parameters than

applicants normally ask for. However, the blanket COA would allow plenty of room to operate commercially.

The terms of the blanket COA that the FAA announced are:

- Operations are confined to 200 feet AGL maximum;
- Operations must take place during daylight Visual Flight Rule conditions;
- Operations must be within Visual Line of Sight (VLOS) of the operator;
- The operator must issue a Notice to Airmen (NOTAM) at least 24 hours prior to the proposed operation; and
    - The operations must remain at least:
    - 5 Nautical Miles (NM) from an airport with an operational control tower;
    - 3 NM from an airport having a published instrument flight procedure but not an operational control tower; and
    - 2 NM from an airport, heliport, or seaport that has neither a published instrument flight procedure nor an operational control tower.[5]

If an exemption holder needs to operate *differently* than the blanket COA provides for, the operator can still file for a COA detailing the specifications for a particular flight. Given that the FAA will be processing fewer COA applications than they would otherwise be without the blanket COA process, these applications should even out at a 60-day approval window or less.

The fluidity of this process revealed itself again on April 9, as the FAA announced that it would institute a "summary grant" procedure for Section 333 applications, and that private pilot licenses (as opposed to recreational or sport pilot licenses) are no longer required.[6]

The NPRM: A Valentine's Day Gift

The Section 333 process will not last forever. It will be the "way things are" for the next two to three years, though. That's plenty long enough to justify the investment in applying for an exemption.

The next "phase" of things will be different, though. The FAA released its long-awaited proposed sUAS rule on February 15. Right after Valentine's Day. The fifteenth was a Sunday. How in the world did that happen?

It all started with Steve Zeets logging on to regulations.gov to check on the status of his Section 333 Exemption application. An unexpected document popped up in response to his search. This document looked like a statement of the FAA's policy in regard to sUAS regulation. He quickly downloaded it to his computer and shared it with some friends, none of whom could find the document on the website. Apparently, the document was taken down as quickly as it was posted.

As Professor Gregory S. McNeal of the Pepperdine University School of Law writes, "what Zeets didn't know was that he may have been the only person in the world to have been in the right place at the right time, able to download the inadvertently uploaded document before it was taken down by an unknown government official."[7]

Up until that day, the drone community was nearly unanimous in expecting very restrictive regulations from the FAA. Few, if any, members of the commercial drone industry expected the NPRM to come out any way but awful.

You can forgive the pessimism. There was (and still is) plenty of frustration in the community with how "slow" the regulators have moved. This is the result of conflicting incentives and lived realities. There is no "good guy" or "bad guy" in this story.

On one hand, you have a flood of entrepreneurial energy moving into the sUAS market. This has been fueled by the widespread availability of relatively low-cost platforms delivering high-performance results. Of course, you get what you pay for. A $15,000 system is much more capable of handling high-end data collection and analysis than a $500 consumer-grade model. The more expensive you go, the more resilient the system will be to software malfunctions and the like.

On the other hand, you have the FAA – an agency with a mandate to keep the national airspace system ("NAS") *safe at all costs*. The FMRA handed the FAA the job of finding a way to integrate autonomous, pilotless devices into the NAS in a way that guaranteed the safety of manned flight. This is a tall order – especially when the Congressional mandate did not come with a whole lot of "extra money" to allow the FAA to staff the matter up.

The FAA's reaction was to be methodical and deliberate in implementing each part of the FMRA mandate. This led to wild frustration in the sUAS community as the FAA missed the FMRA deadlines.

For example, the final sUAS rule was supposed to be released by July, 2013, according to section 332(b) of the FMRA.[8] That did not happen. The NPRM did not come out until February, 2015, after Mr. Zeets found the document in question.

What happened next was thrilling, at least for me. I remember checking Twitter before bed on Friday, February 13 (wild life, right?). One of the "drone news" feeds that I subscribe to posted the document that Mr. Zeets found. I paged through the document on my phone. I could not tell whether it was legitimate or a fake. I went to bed without retweeting in case the document ended up being a fraud.

On Saturday morning, I took my daughters to gymnastics class. My kids are at the age where the oldest can go out on the "gymnastics floor" for her class. This means I can sit with the younger one after her class is over and read silly things on my phone.

When I fired up Twitter to see what was up, nearly everyone I followed in the drone industry was talking about Mr. Zeets' discovery. Bloomberg News was the first to verify its authenticity. Professor McNeal wrote series of rapid-fire articles on Forbes analyzing the document and confirming

it was real.[9]

The noise built to a crescendo that Saturday. Each hour provided a growing certainty that the document was real, and the FAA was taking an extremely progressive view toward regulating sUAS operations. This was a watershed moment. No one expected the rule to look this good.

The FAA put out a statement later that day informing the public of an "announcement" to come via conference call at 10:00 a.m. on Sunday. That Sunday was February 15th.

So you know what the drone community did on Valentine's Day? Rampantly speculated online about what this all might mean.

On Sunday at 10:00 a.m., the call-in line quickly broke down with hundreds of people dialing through. There was no guidance on the FAA website about what to do or whether another line would open up.

In the chaos, Twitter blew up again with the drone community sharing information in real-time about who was on and what might happen. It was then that Brendan Schulman, the grand master of U.S. drone lawyers, coined the term "dronerati" for the Twitter accounts focused on the drone industry.

Finally, one of the "dronerati" tweeted out the new call-in number. I quickly called in. This was between 10:00 and 10:30 that Sunday morning. I remember it clearly. I gave my kids some food and instructions to "go play" while Daddy was on the phone.

Not everyone who called in made it through. By some miracle I got on the call. There were over two hundred people on the line. The FAA announced that the NPRM was indeed coming out and that it would look as good as we all thought. The same day, the White House issued an Executive Order on drones outlining the federal policy on data collection by autonomous devices.[10]

This was a huge turning point in the discussion. The commercial drone industry finally had some hope that the regulators were going to get this *right*.

That was a great Valentine's gift. A great big smooch from the FAA.

Better than chocolate or roses.

The Biggest Opportunity of Our Generation

On that Fateful Sunday Morning call, a question was asked to the FAA spokesperson: "how long will it take for the NPRM to be finalized into a rule?" The answer came back: *two to three years*.

That's a long time. It's also the blink of an eye.

If you've read this far, you know I've been in this game since 2012. That's three years of struggling alongside industry pioneers trying to make a go of it with commercial drones.

That seems like a long time, but it's not. The days may be long but the years are short. The NPRM will be finalized before we know it.

In the meantime, commercial operators have a clear path to legal operation through applying for Section 333 Exemptions. This process is getting faster and clearer every day. You absolutely can start a drone business, right now, and get flying. The door is open wider than it's ever been.

Companies that get their exemptions now have a head start on the rest of the industry. The exemption process means that the entire industry is a "gated community" you have to get permission to join. There is nothing that an individual company can do to change this.

Complaining about it doesn't help. It can make you feel better for a moment, but that's fool's gold. The better option is to think about how you can take advantage of the situation.

Apply now. Get your exemption. Start making your mistakes. Figure out your business model. Make money *now* while the FAA grinds toward a final rule.

The opportunity is here for the taking. Drone companies will *never* have this advantage again. Once the NPRM is finalized, the doors will be open to a huge competitive environment.

This will lead to more drone manufacturers entering the industry. The price for high-end platforms will drop. They may drop *really fast*. This means that if you get good at providing drone services (DaaS, or "Drones As A Service"), you will have your pick of hardware platforms to experiment with.

Think about the opportunity. There is a two to three year window where your competitors will largely be "frozen out" of the market. If you get an exemption, you can show customers that *you* have the "special ticket" to operate legally under the FAA's regulations, all while your competitors *don't*.

How many customers will want to purchase services from an "illegal" operator? Would you feel comfortable with a "pirate" drone operation flying over your daughter's wedding? How about an expensive piece of real estate?

This is a huge competitive advantage. Now is the time to act. Every day that you don't apply for an exemption is time that you are not building your business ahead of intense competition. This opportunity will never, ever, come around again.

What You Need For An Exemption

When you file an exemption application, what does that look like? What do you need? This is another issue full of constant change. Right now, here are some general guidelines:

1. Are you a Pilot?

Or do you at least *know* a pilot? This is a necessary first step in gaining an exemption to fly your drone for profit. The FAA is requiring every exemption applicant to pledge that the Pilot in Command (the "PIC") of the drone in question will have *at least* a recreational or "sport" pilot's license. Thankfully, the FAA no longer requires a medical clearance.

Now, is a pilot's license *really necessary* in order to fly an sUAS? Of course not. I know that, you know that, and anyone who's watched their buddy with a pilot's license crash a quad-rotor knows that.

This is what the FAA requires, though. They have not

budged on this point for any granted exemption as of this book's publication date.

Practically, if you do not already hold a pilot's license, it's probably not worth your time to get one just for your drone business. The window of opportunity for Section 333 Exemptions will only be open for three years, maximum. Spending the time and treasure it will take to get your license will add unnecessary overhead to your business.

Of course, if you want to get a pilot's license because flying is awesome, go right ahead! You can deduct that as a business expense on your taxes, so the cost will effectively be discounted. Talk to your accountant or tax professional![11]

The better way forward, in my view, is to state in your exemption application that you will ensure that the PIC for each commercial flight has at least a recreational or sport pilot's license. You can find these people, hire them to fly for you, and off you go.

You do not need to worry about hiring them as "employees" with benefits, etcetera. The cleanest way forward may be to strike a deal where the PIC gets a percentage of the money made from each flight. If all they are doing is flying the device and you are putting together the data product for the customer, then a 25% cut to the PIC is probably sufficient.

It all depends on what you negotiate, but I think you can do that deal. That would be $62.50 on a $250.00 photography job. Maybe round up to $100 for the PIC and charge $350 to the customer. Experiment with different options and see what works best.[12]

The main thing is to find a PIC you can trust that can handle your sUAS. Family may or may not be the best choice. This will be a good experiment in your ability to read people. If you do the work in finding customers and putting the data together on the back-end, your business model is set.

Of course, if you already have a pilot's license then you're ready for takeoff!

2. Flight Parameters?

Though the space is still in flux and the FAA could change its mind, generally flights are allowed up to 400 feet above ground level (or "AGL") and within visual line of sight ("VLOS") of the Pilot in Command ("PIC").

The "blanket COA" referenced earlier comes into play here. The FAA has started granting blanket approval for flights that meet the parameters set out earlier in this book.

This is important, as now an exemption holder is not required to file a separate COA application for each flight. That means that your only "wait time" is the period between when you file for your exemption and when you get it. You won't have an additional wait time for the FAA to approve your COA *after* it has blessed your flight plan in the exemption process.

The terms of the blanket COA are more restrictive than the flight parameters the FAA is approving for most Section 333 exemptions. The practical result is that if you have a business reason to fly at 400 feet (as opposed to 200 feet, for example), you will need to file a separate COA application for that operation.

3. What About Public Entities?

Everything I've just said about the Section 333 process pertains *only* to private entities. Public entities, like State Universities, Police Departments and Sheriff Offices, and government-run Environmental Protection agencies, do not need a commercial approval in order to operate.

Instead, public entities can skip straight to the COA process. This is a shorter path to get up and flying.[13]

The requirements for the COA are the same, mechanically. However, the public entity will have to have some evidence that it is truly "public" under the federal aviation regulations, thus rendering the sUAS a "public aircraft" under the pertinent rules.

I like to use a letter from the general counsel of the entity in question certifying that the aircraft is a "public aircraft" under 49 U.S.C. § 40102. This is normally sufficient.

If for some reason your entity is oddly structured, you may need different kinds of proof. That is a "nitty-gritty" question you should raise with a professional assisting you in the process. *(This book is not legal advice, contact your legal professional, etcetera.)*.

The World After the NPRM

The window of opportunity to take advantage of the Section 333 process will close when the sUAS rule is finalized. Once the sUAS rule is "on the books," then the regulatory landscape will look quite different. You can expect the following changes if the final rule looks like the NPRM[14]:

1. No Special Approvals Needed

Commercial operators will not need to seek special exemptions from the FAA before flying. This will lower the industry's barrier to entry for anyone who meets the operator and aircraft certification requirements.

2. Easier Operator Certification

The NPRM states that "operators" of sUAS systems will not need to hold any sort of pilot's license. Instead, the operators will need to pass an aeronautical knowledge test at an FAA-approved knowledge testing center. No one knows exactly what this test will look like at the moment. Suffice to say it will likely require knowledge of how airspace classes work and similar information.

There may be a "vetting" process for operators conducted by the Transportation Safety Administration. Again, what this will look like is unclear.

Operators that pass the knowledge test and vetting process will receive an "unmanned aircraft operator certificate" with an sUAS rating. This certificate will never expire, but operators will be required to pass a recurring aeronautical test every two years.

The minimum age for operators may be as low as 17 years. Expect younger competition!

Federal Regulation of Drones

Continued from previous page

The sUAS used in operations must be available for inspection by the FAA. Accidents must be reported to the FAA within 10 days of any incident that causes personal injury or property damage.

Operators will have to perform pre-flight inspections of the sUAS in question.

3. Aircraft Requirements

The sUAS that an operator uses will have to be registered with the FAA. This is a simple process at the moment. It costs $5.00 and requires a form to be sent in to the FAA. As of the date of this writing, you can find instructions on how to register your sUAS here (.pdf link).

The aircraft registration will result in an "N-Number" that you must display on your sUAS. This "aircraft marking" will have to be displayed in the largest "practicable manner." The exact size will differ based on the size of your platform.

An FAA "airworthiness" certificate will not be required. This is a plus! It means that you will not have to prove to the FAA that your particular sUAS platform is ready and able to fly. This will help operators that purchase "out of the box" systems ready to fly. You will not have to be a technical expert to get up and going.

The sUAS will have to be maintained in a "condition for safe operation." The meaning of this phrase will change based on the requirements of the system. As the rules get finalized, we may see more specific requirements for various system classes.

4. Operational Limitations

The NPRM as currently written requires operators to stay within "visual line of sight," or "VLOS." This requirement has sparked a great deal of controversy in the sUAS community. VLOS means what it says – operations must take place within "visual" line of sight without enhancement. This means within sight of the naked eye.

The technology is quickly outstripping the VLOS requirement. First-Person View ("FPV") flying is rapidly becoming one of the most engaging ways to fly an sUAS. FPV is a term that encompasses any technology that allows the pilot to see as the sUAS sees – a real-time video view of the flight. When this works, it's like the PIC is "on board" the sUAS and can react quickly to any obstacles in its way. The technology is not advanced enough, however, for the FAA to feel comfortable in FPV-only controlled operations.

This does not mean that FPV cannot be used. To the contrary, FPV technology is specifically addressed in the NPRM and will likely be "okay" to use as a supplement to naked-eye control under VLOS conditions.

There have been a number of comments submitted to the FAA that address the proposed VLOS requirement. These comments may change the VLOS criteria for sUAS platforms. We cannot be sure at this time how the VLOS rule, if any, will turn out.

Closely tied to the VLOS requirement is the FAA's stance on daylight-only operations. The NPRM as written will not allow any "night flights." Daylight, in this context, means sunrise to sunset as measured by the local time applicable to the operation.

The VLOS requirement also folds into the FAA's requirement of a 3-mile visibility minimum as calculated from the control station. Practically, this means that you can't operate in rainy or foggy conditions (not that you'd get very good data if you did, anyway).

The maximum altitude for flights will be 500 feet. This is higher than the "blanket COA" currently issued to Section 333 exemption holders, and the 400 foot operational ceiling that most applicants are seeking.

Airspace limitations will apply as well. These issues can get complicated. Your best bet for a detailed explanation of airspace classes is to review the FAA's handbook on the topic (.pdf link).

For our purposes, it's sufficient to say that the NPRM states the following with regard to different airspace classes:

- Class A (18,000 feet and above): Operations prohibited.
- Class B, C, D, and E (regulated airspace): Operations allowed with permission of Air Traffic Control.
- Class G (unregulated airspace): Operations allowed without permission of Air Traffic Control.

Airspace classifications change based on where you are. Some airspace is "special use" and some is "restricted." You should call your local FAA Flight Standards District Office for information specific to your location.

Your sUAS may also be restricted from operating over persons "not directly involved in" the operation. This may pose a problem for event photography using sUAS. A way around this could be to define persons "involved in" the operation as those who consent to the photography operation. This issue will be an emerging one as the rules are finalized.

A potential solution to this problem is contained in the NPRM's "microUAS" option. This may allow greater freedom to operate "very" small sUAS in Class G airspace and over persons not "directly involved" in the operation. The NPRM proposes that this category include sUAS that are no heavier than 4.4 pounds (or two kilograms). This is similar to Canadian regulations.

Finally, the sUAS will need to be inspected pre-flight by the operator. The operator must not conduct an operation if the operator knows of a physical or mental condition that would interfere with safe operation of the sUAS. [15]

The Big Heavies

The NPRM we just reviewed only applies to the sUAS world! The "big boys" of robotic planes (think: the ones that can cross an ocean…) are an entirely different story. It will be a much longer time horizon before "robo pilots" are conducting flight operations in the NAS, whether autonomously or not.

These kinds of operations are certainly coming in the future. That's a subject for another day.

* The following is an excerpt from the author's recent

Federal Regulation of Drones
Continued from previous page

book, *The Drone Revolution: How Robotic Aviation Will Change the World*. The book was published on April 28, 2015. It is available on Amazon in hard copy and Kindle. The author has made a full copy of the book available for free at his personal blog, www.robotic-aviation.com. If you enjoyed this excerpt, the author invites you to download the entire book, for free, at www.robotic-aviation.com.

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Endnotes

1 *See* "One Giant Leap for Unmanned Kind" FAA Press Release, July 26, 2013 (noting the "Restricted Category" approval for Arctic operation of two sUAS platforms).

2 All six of these exemption applications were filed by the law firm of Cooley, LLP, in Washington, D.C. The industry owes a debt of gratitude to their pioneering work!

3 April, 2015, to be precise.

4 These regulations are largely codified in chapter 14 of the Code of Federal Regulations.

5 *See* "FAA Streamlines UAS COAs for Section 333," FAA Press Release March 24, 2015.

6 *See* "FAA Summary Grants Speed UAS Exemptions" FAA Press Release, April 9, 2015.

7 Gregory S. McNeal, *Leaked FAA Document Provides Glimpse Into Drone Regulations*, Forbes.com (Feb. 14, 2015).

8 Section 332(b) directed the FAA to publish the "final rule" within 18 months of the FMRA (18 months following February, 2012, is July, 2013). The NPRM was supposed to be released two months following the FMRA, with the final rule to be completed 16 months later. *See FMRA* § 332(b)(1)-(2).

9 My favorite of the series is the article referenced above in Note 7.

10 *Presidential Memorandum: Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems*, White House Press Release (Feb. 15, 2015).

11 I'm a tax litigator too, so of course I had to mention this!

12 Talk to an accountant or other tax professional about the paperwork necessary to formalize this arrangement. You may need to issue a Form 1099 for IRS purposes, depending on your arrangement.

13 An exception to this rule is when a public entity is engaged in commercial activity. The most common example is when a public university is offering training to students in return for tuition payments. The "commercial" nature of this transaction is undoubtedly tenuous, but it pays to be safe rather than sorry. No reason to risk the FAA shutting down your operation.

14 You can read the entire NPRM on the FAA's website if you are inclined to. Your best bet to find the NPRM is to go to www.faaa.gov and search for the "UAS" page. I say this because the FAA has regularly switched its "drone" URLs around to reorganize the information. As of the date of this writing, you can find the NPRM here: https://www.faa.gov/uas/nprm/.

15 The NPRM is a 195-page document. This summary is necessarily brief and incomplete. I encourage

you to skim through the full NPRM to get a sense of how things may work out. Please refer to Note 14, above, for instructions on accessing the full NPRM.

Crew Resource Management
Continued from page 19

sive, yet it is often unseen by members within that culture, and is seen as unpredictable and 'nonsensical' from the outsider's perspective" (Helmreich & Merritt, 1998, p. 56). ICAO (2004) stated that, like fish being unaware of the water in which they are swimming, people tend to be unaware of their specific culture.

The work of Professor Geert Hofstede provided a framework to better describe and understand characteristics of different national cultures. As reported by Hutchins, Holder & Perez (2002), Helmreich and Merritt consider Hofstede's work to be the "gold standard" of cultural studies. "His substantial study is one of the largest cross-cultural research programs ever undertaken. It offers a number of significant cross-cultural insights relevant to CRM" (Johnston, 1993, p. 374).

In the early 1970s, Hofstede studied IBM's database of employee attitudes, based on surveys of over 116,000 employees in 72 countries (Hofstede & Bond, 1988). Unlike other surveys performed by organizations to determine job satisfaction, Hofstede found many of the 150 questions on the IMB survey to be ideally suited for measuring culture (Hofstede & Bond, 1988).

> They included such questions as "How important are each of the following to you in an ideal job?" followed by a list of 14 job characteristics such as earnings, job security, challenge, freedom, cooperation, and so forth. In addition, questions were included to the preferred style for one's ideal manager (from very directive to laissez-faire). Finally, judgments were asked about general issues at work, such as "competition among employees usually does more harm than good." Employees were asked to rate their responses from "strongly agree" to "strongly disagree." (Hofstede & Bond, 1988, pp. 9-10)

Hofstede noted that because the IBM employees represented a group that differed only in nationality – that is, they shared similar educational backgrounds and were performing similar jobs for the same organization - "the national culture issues found inside IBM should be a conservative estimate of those existing for the country at large" (Hofstede & Bond, 1988, p. 10).

Hofstede initially identified four dimensions of national culture: power distance, individualism/collectivism, masculinity/feminity, and uncertainty avoidance (Hofstede & Bond, 1988). The applicability of Hofstede's research to CRM was born-out by Helmreich and Merritt (1998) when they conducted research of pilot's attitudes. They used a Flight Management Attitudes Questionnaire that pertained to CRM-related topics such as leadership, communications, procedures, stress, automation, and organizational climate (Helmreich & Merritt, 1998). After four years of data collection, they had received over 15,000 completed pilot questionnaires from 36 airlines in 23 countries (Helmreich & Merritt, 1998). They found strong correlation between

Hofstede's cultural dimensions and their research findings of pilot attitudes (Helmreich & Merritt, 1998).

Power Distance

Power distance (PD) is the degree to which subordinate members of a culture, society, organization, institution, team, family, etc. "accept and expect that power is distributed unequally" (Hofstede & Bond, 1988, p. 10). It is a measure of the "inequality that is defined from below, not from above; it suggests that a society's level of inequality is endorsed by its followers as much as by its leaders" (Hofstede & Bond, 1988, p. 10).

In high power distance cultures, subordinates defer heavily to their superiors, and subordinates are not likely to challenge or question superiors (Helmreich & Merritt, 1998). "Subordinates in high power-distance cultures tend to accept and expect autocratic leadership and are generally unwilling to question the acts or decisions of leaders" (FAA, 1996, p. 117). High PD countries "seem likely to provide the most potent source of CRM problems, since it is closely associated with social stratification, perceptions of social status, and the value system of both leaders and followers" (Johnston, 1993, pp. 377-378). Johnston further stated that "junior crewmembers are more likely to fear the consequences of disagreeing with leaders" (p. 378) and that leaders are more likely to be the initiators of conversation.

Helmreich (1994) noted that the culture of Colombia, the nationality of the crew of Avianca flight 052, is associated with high PD.

> The high PD of Colombians could have created frustration on the part of the first officer because the captain failed to show the kind of clear (if not autocratic) decision making expected in high PD clusters. The first and second officers may have been waiting for the captain to make decisions, but still may have been unwilling to pose alternatives. (Helmreich, 1994, p. 282)

Conversely, in low PD countries, members of a team are likely to call each other by first names, and questioning - perhaps even contradicting - superiors (Helmreich & Merritt, 1998).

Asian and Latin American cultures rank high in PD, United States ranks in the middle range, and Austria having lowest ranking (Helmreich & Foushee, 2010).

Individualism/Collectivism

This dimension pertains to societal views regarding whether people are more comfortable being associated with groups or more comfortable being associated with individual actions and decisions. Strauch (2010) described this dimension as "the degree to which individuals in a culture accept and pursue goals that are in their own best interests, as compared with those of the group to which they belong" (Strauch, 2010, p. 247). Quite simply, it is a measure of how members of a culture are willing to be influenced by others (FAA, 1996).

On one end of the continuum is individualism, where "individual decision-making is normal and preferred to group decisions. Individual initiative and leadership are highly valued" (Johnston, 1993, p. 378). Countries with lineage to England (U.S., Australia, Great Britain, ranked highest in individualism (Johnston, 1993).

"On the collectivist side, we find societies in which people from birth onward are integrated into strong, cohesive in-groups; often their extended families (uncles, aunts, and grandparents) continue protecting them in exchange for unquestioning loyalty" (Hofstede & Bond, 1988, p. 11). Group decisions are preferred to individual decisions (Johnston, 1993). "Social identify and position are determined by membership in various in-groups. Here the implications for cockpit communications and CRM should be obvious" (Johnston, 1993, p. 378).

Johnston (1993) illustrated that Asian and Latin American cultures ranked highly in collectivism, meaning they are low in individualism.

With Colombia being weighted heavily toward the collectivism end of the continuum, Helmreich hypothesized that the junior officers of Avianca 052 may have been uncomfortable challenging the captain. "Coming from a culture in which group harmony is valued above individual needs, there was probably a tendency for the crew to remain silent while hoping that the captain would 'save the day'" (Helmreich, 1994, p. 282).

Uncertainty Avoidance

In cultures with high degrees of uncertainty avoidance (UAV), people are uncomfortable with unstructured situations and those where there are no clearly established rules and procedures (Hofstede and Bond, 1988). They believe in "rigidity and strong adherence to the formality of rules and regulations" (Johnston, 1993, p. 378). Hofstede and Bond (1988) stated cultures with high UAV dimensions try to avoid uncertainty associated with ambiguous, novel, and different from usual situations by strict adherence to rules. "High UAV is associated with a tendency to be inflexible once a decision is made as a means of avoiding the discomfort associated with uncertainty" (Helmreich, 1994, p. 282).

On the other hand, countries with low UAV dimensions "are more tolerant of behaviors and opinions that differ from their own; they try to have as few rules as possible" (Hofstede & Bond, 1988, p. 11).

Helmreich (1994) stated that high UAV may have played a role in the Avianca crash, saying the crew may have wished to avoid the uncertainty of diverting to an airport that was different than their planned destination.

Masculinity/Feminity

Cultures with high degrees of masculinity (MAS) are very assertive and competitive (Hofstede & Bond, 1988; Strauch, 2010) and ambitious (Strauch, 2010). "Decisiveness, interpersonal directness, and machismo are common in high MAS societies" (Johnston, 1993, p. 378). Men in these cultures tend to be "assertive, tough and focused on extrinsic achievement (high earnings, promotions, material success)" (Helmreich & Merritt, 1998, p. 60).

On the other end of this dimension is feminity, where cultures are nurturing and caring (Hofstede & Bond, 1988). "Women are supposed to be modest, tender and concerned with quality of life" (Helmreich & Merritt, 1998, p. 60).

Hofstede found that Japan ranked highest in MAS, while Sweden was on the complete opposite end of this dimension (feminity) (Johnston, 1993).

Because of the tough, autocratic attitude, and possibly an intimidating style of communications associated with high dimensions of masculinity, Johnston noted "there are high implications for CRM" (Johnston, 1993, p. 378).

Tying Together Cultural Dimensions

The cultural dimensions "do not exist independently; they interact with each other" (Johnston, 1993, p. 378). Providing evidence of the interactions among dimensions, Helmreich stated that in high collectiveness, high power distance cultures, there have been instances where "crews have chosen to die in a crash rather than disrupt the group harmony and authority and bring accompanying shame upon their family and in-group" (Helmreich, 1994, p. 282).

In 1996, a Korean Airlines Boeing 747 crashed while on approach to Guam. Two-hundred, twenty-eight lives were lost. The NTSB determined that the captain failed to properly brief and execute the approach, and the first officer and flight engineer failed to monitor and challenge his errors (NTSB, 2000). Although the NTSB did not specifically attribute these errors to the influence of national culture, a review of that accident indicates the junior crewmembers were not assertive. For example, the first officer failed to callout the captain's premature descent from two different step-down altitudes during the instrument approach (NTSB, 2000). And while the first officer later properly called for a missed approach, his statement was less than assertive, simply stating, "Let's make a missed approach" (NTSB, 2000, p. 5). Considering they were only seconds from impacting ground, this statement should have been more assertive. While not referring specifically to this accident, Helmreich and Merritt (1998) noted that Korean pilots feel shame when making a mistake in the presence of others.

Different Attitudes toward Automation

FAA (1996) stated that PD and individualism/collectivism can affect how willing flightcrews are to accept and utilize flight-deck automation. Using attitudinal surveys across pilot groups in twelve countries, Helmreich, Merritt, and Sherman (1996) conducted research to determine pilots' attitudes toward automation. They found large differences between cultures (Helmreich et al., 1996). Referring to the work of Helmreich et al. (1996), Strauch stated: "In particular, pilots from cultures scoring high on Hofstede's power distance dimension tended to prefer and use automation more than did pilots from cultures scoring lower on the dimension" (Strauch, 2010, p. 254).

To illustrate, pilots were asked whether or not they agree with the statement, "In order to maintain safety, pilots should avoid disengaging automated systems" (Helmreich et al., 1996, p. 15). Responses varied widely; on one end of the spectrum, 36% of pilots in one country agreed with the statement, but on the other end of spectrum, 86% of responding pilots in another country agreed. Another statement was, "My company expects me to always use automation." Responses from one airline showed 91% agreement, compared to only one-third from another national culture.

Captain Bud Musser flew for an Asian carrier for four years after retiring early from a major U.S.- based airline. He stated that pilots in that airline were uncomfortable when he elected to manually fly to cruise altitude, and those pilots had a heavy dependence on automation (personal communication with Captain B. Musser, September 23, 2013).

Helmreich et al. (1996) expressed concern about the widespread variance in attitudes toward automation use. Attitudes that promote over-reliance on automation can degrade safety, and conversely, under-reliance on automation can also negatively affect safety (Helmreich et al., 1996).

Cross-Cultural Cockpits

The above discussion outlines differences in national cultures, as defined by Hofstede. The Avianca 052 crash illustrates how national culture can have implications for CRM. The Avianca crew was all of the same nationality, but how does national culture affect CRM when crewmembers

in the same cockpit are from different national cultures? This section discusses these aspects.

Although U.S. air carriers employ mostly, if not all, American citizens, airlines across the world make widespread use of employing expatriate pilots. "In civil aviation today, cross-cultural contacts is the norm rather than the exception" (ICAO, 2004, p. 2). The workforce of Emirates, for example, consists of pilots from 120 nationalities, 140 cabin crew nationalities, and they speak over 100 different languages (Captain Simon Lawrence, personal communication, September 24, 2013). "Cross cultural interactions are a daily occurrence in international civil aviation, but their real significance to aviation safety is only marginally understood" (ICAO, 2004, p. 1).

With multicultural flightcrews "the environment becomes less predictable, more uncertain, and requires more cognitive effort" (ICAO, 2004, p. 2). While language differences are one of the biggest challenges, "other issues that can create tension among multicultural groups include religion, politics, economics, humor, history, and yes, racism" (Helmreich & Merritt, 1998, p. 208). The differences "may inhibit the open communication and team fellowship needed for safe flying" (Helmreich & Merritt, 1998, p. 209).

> Cultural differences, variations in aviation experience and background, and linguistic difficulties can create uncertainty and hesitation in the cockpit, which can be hazardous in the cockpit. If not managed appropriately, initial uncertainty can escalate into frustration, resentment and even paranoia, thereby creating an even more serious safety threat. (Helmreich & Merritt, 1998, pp. 209-210)

An example illustrating a clash of cultures is the 1977 crash involving a Japan Airlines DC-8 freighter in Anchorage, AK. The NTSB (1978) determined that the performance of the captain was severely impaired due to his having a blood alcohol concentration (BAC) of nearly 0.30% . (To put this into perspective, this is 3 ½ times today's legal BAC for driving an automobile and over seven times greater than allowed by FAA for pilots when flying.) The taxi driver who took the crew to the airport called his dispatcher to express concern that the captain was drunk, as evidenced by his incoherent speech and inability to get out of the cab without steading himself on the car door (NTSB, 1978). While taxiing out the captain initially lined-up on the wrong runway for departure, only to be corrected by ATC. On takeoff, the captain over-rotated the aircraft and stalled.

In spite of the 52 year-old American captain's obvious intoxication, neither the 31 year-old Japanese first officer nor the 35 year-old flight engineer attempted to intervene in allowing the captain to attempt the flight in the first place, to initially taxi onto the wrong runway, and finally, to over-rotate the aircraft and allow it to stall (NTSB, 1978).

The reluctance of the two junior crewmembers to

> confront the captain, and their inaction in the face of his control of the aircraft, can be attributed to their reluctance to humiliate the captain. This is because an affront to the captain's "face" would have resulted by their suggesting to the captain, their superior, that he delegate the takeoff to the first officer, a junior crewmember. (Strauch, 2010, p. 255)

Strauch (2010) said this crash illustrates how in some cultures, crewmembers are more willing to die than to challenge a superior.

In studying multicultural flightcrews, Helmreich et al. (1996) reported seeing a "shift toward greater informality in command relationships (an attempt to relax the social barriers), and as the same time, a heightened formality with greater regard to standard operating procedures (greater adherence to rules) (Helmreich et al., p. 16). "CRM becomes the linchpin that holds all this together" (Ratwatte, as cited in Helmreich & Merritt, 1998, p. 211).

Developing CRM Programs for Differing National Cultures

Given that CRM is such a powerful element in mitigating cultural differences, what measures should be considered when implementing CRM programs in operations where differing national cultures are present?

The FAA (2004) emphasized the criticality of addressing national culture in CRM programs. "If not recognized and addressed, factors related to culture may degrade crew performance. Hence, effective CRM training must address culture issues, as appropriate in each training population" (FAA, 2004, p. 16).

Johnston (1993) and Helmreich et al. (1996) emphasized that a "one size fits all" approach will not work and that "CRM training requirements vary from culture to culture" (Johnston, 1993, p. 381). "CRM training that work wells in one culture may not be positively received in others" (Helmreich et al., 1996, p. 15).

CRM was first invented by researchers and practitioners in the U.S. (Helmreich & Foushee, 2010) and thus, had tended to be based on U.S. cultural values and beliefs. To this point, Helmreich et al. (1996) made an interesting observation:

> CRM programmes have been shown to produce positive changes in flightcrew behaviour and attitudes in the United States and are now mandated for flightcrews worldwide. Theoretically and empirically, none of the cultures we have studied has values fully congruent with the underlying premises of CRM. For example, pilots in high Uncertainty Avoidance cultures may be precise in adherence to Standard Operating Procedures (SOP), including use of checklists, but may be more stressed by ambiguous and unexpected situations leading to hasty, and perhaps less evaluated, decisions. On the other hand, pilots from low [uncertainty avoidance] cultures may be more flexible in their approach to abnormal or unexpected situations, but may be more lax and complacent in addressing Standard Operating Procedures and hence, more likely to lose

situation awareness and to allow dangerous situations to develop. (Helmreich et al., 1996, p. 15)

"To be effective, the organization of work and management practices must reflect the social mores of the relevant cultures" (Johnston, 1993, p. 380). Triandis (as cited in Johnston), stated "it has become clear that one cannot take a psychological method and use it in another culture without drastic modification" (Johnston, 1993, p. 380). "The desired form and substance of CRM straining may be as much of a variable as the culture itself" (Johnston, 1993, p. 381).

Summary

Research has shown that the values, norms, beliefs, and practices of one culture can vary widely between countries. Although there is no right or wrong culture, some cultures are more accepting of junior crewmembers voicing safety concerns to their superiors. Some prefer a flatter gradient between captain and junior flight officers, while some cultures embrace flightdeck automation more than others. CRM programs that are tailored for a specific culture have better acceptance, thus better effectiveness, than an off-the-shelf program that was developed for a totally different culture.

It is hoped that by having a better understanding of cultural differences, CRM developers can fully appreciate and capitalize on those differences. Through that approach, the true intent of CRM – improving safety – can be more fully realized.

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Robert L. Sumwalt was sworn in as the 37th Member of the National Transportation Safety Board in August 2006, whereupon President George W. Bush designated him as Vice Chairman of the Board for a two-year term. In November 2011, President Barack Obama reappointed Member Sumwalt to an additional five year term. Prior to coming to the Board, Mr. Sumwalt was a pilot for 32 years, including 24 years as an airline pilot with Piedmont Airlines and US Airways. After his airline career he joined SCANA, a Fortune 500 energy company, where he managed their corporate aviation department. He logged over 14,000 flight hours and earned type ratings in five aircraft. He holds a Bachelor of Science degree from the University of South Carolina and a Master of Aeronautical Science (with Distinction) from Embry-Riddle Aeronautical University, specializing in Aviation/Aerospace Safety Systems and Human Factors Aviation Systems.

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