COMMITTEE ON AERONAUTICS NEWSLETTER

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IN THIS ISSUE:

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Welcome to the fourth issue of the Committee on Aeronautics Newsletter. We hope that our Committee Members and alumni (and, of course, other readers accessing this Newsletter on the New York City Bar's website) continue to find each issue of the Newsletter very interesting.

The Committee continues to meet on a monthly basis. Our meeting this month will be held on February 21st, and, among other Committee business, it will feature a presentation on the National Transportation Safety Board ("NTSB") by former NTSB Assistant General Counsel James Rodriguez.

Our Committee continues to discuss plans to co-sponsor a transportation-oriented CLE program for the NYC Bar. At the February 21st meeting, the program planning committee will update the Committee on developments in that regard.

Please stay tuned for more information about upcoming Committee activities.

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ARTICLES

Remembering the Challenger: Engineering Failure and Legal Fallout

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January 25, 2018 was NASA's Day of Remembrance to honor astronauts who gave their lives "advancing the frontiers of exploration."[2] Among those honored and remembered are Payload Specialists Christa McAuliffe and Gregory B. Jarvis, Mission Specialists Judith A. Resnik, Ronald E. McNair, and Ellison S. Onizuka, Pilot Michael J. Smith, and Commander Francis R. Scobee: the crew of the Challenger.[3]

On January 28, 1986, the Challenger exploded a mere 73 seconds after liftoff, claiming the lives of its crew. [4] The explosion was caused by a failure of the O-ring in the right solid rocket booster.[5] The O-ring was in place to seal in the gases in the motor; it failed because it was not able to maintain the necessary seal in that day's cold temperature of 2.2 degrees Celsius.[6] Because the O-ring seal did not hold, hot propulsion gases escaped and eventually ignited, causing the external fuel tank to explode.[7]

The O-ring was manufactured by Morton Thiokol, Inc. The night before the launch, Morton Thiokol personnel warned NASA to postpone takeoff out of fear that the cold air temperature would render the O-rings ineffective.[8] NASA, anxious to make the flight which had already been delayed numerous times, launched Challenger anyway.[9]

Unsurprisingly, the Challenger Disaster led to substantial legal action. The families of Commander Scobee, Mission Specialist Onizuka, and Payload Specialists Jarvis and McAuliffe settled with NASA and Morton Thiokol for $7.7 million, split with the U.S. Government paying

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[2] Robert M. Lightfoot, Jr., *Message From NASA'S Acting Administrator*, NASA.gov, Jan. 25, 2017, https://www.nasa.gov/specials/dor2017/.
[3] *NASA – STS-51L Mission Profile*, NASA.gov, Dec. 5, 2005, https://www.nasa.gov/mission_pages/shuttle/shuttlemissions/archives/sts-51L.html.
[4] *Id.*
[5] *Id.*
[6] Michelle La Vone, *The Space Shuttle Challenger Disaster*, SPACE SAFETY MAGAZINE, http://www.spacesafetymagazine.com/space-disasters/challenger-disaster/ (last visited Feb. 13, 2018).
[7] *Id.*
[8] *Id.*
[9] *Id.*

40% of the damages and Morton Thiokol paying 60%.[10] This division of the settlement was driven by the *Feres* Doctrine, which bars military personnel from recovering from the government under the Federal Tort Claims Act (the "FTCA") when they die on duty.[11] In *Feres v. United States*, 340 U.S. 135 (1950), the Supreme Court held the government is not liable for the injuries to serviceman which "arise out of or are in the course of activity incident to service." So despite NASA's role in the Challenger Disaster, only the families of mission specialists Jarvis and McAuliffe could recover directly from the agency.[12]

The families of Pilot Smith and Mission Specialists Resnik and McNair did not participate in the initial settlement and instead sued.[13] The suit brought by the widow of Pilot Michael J. Smith was dismissed as against the U.S. Government pursuant to the *Feres* Doctrine, as he was on active military duty at the time of the disaster.[14] The Resnik, McNair, and Smith families eventually settled their claims, receiving payment solely from Morton Thiokol; the U.S. Government refused to contribute to the settlement.[15]

The *Feres* Doctrine has received a great deal of criticism over the years, though it has never been overruled. Justice Antonin Scalia, for instance, excoriated its reasoning and called the Court's decision in *Feres* "clearly wrong" and deserving of the "widespread, almost universal criticism it has received."[16] To date, neither Congress nor the Courts have intervened to allow claims of military personnel and their families under the FTCA for injuries they suffered while on duty.

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[10] Associated Press, *Challenger Settlements Disclosed: U.S. and Rocket Maker Paid $7.7 Million to 4 Families*, L.A. TIMES, Mar. 8, 1988, http://articles.latimes.com/1988-03-08/news/mn-614_1_challenger-families.
[11] *Id.*
[12] Associated Press, *supra* note 9.
[13] *Id.*; Michael Isikoff, *U.S. Refuses to Settle with 3 Shuttle Families*, WASHINGTON POST, Feb. 19, 1988, https://www.washingtonpost.com/archive/politics/1988/02/19/us-refuses-to-settle-with-3-shuttle-families/dd7da6bb-e546-4592-b0da-8cfa1dfb88b5/?utm_term=.177c23748ac7.
[14] *Smith v. Morton Thiokol, Inc.*, 712 F. Supp. 893 (M.D.Fla. 1988) (dismissing the claim against the U.S. government under the *Feres* Doctrine).
[15] Isikoff, *supra* note 12; Associated Press, *Widow of Challenger Pilot Smith Settles Suit with Morton Thiokol*, WASHINGTON POST, Aug. 23, 1988, at A3.
[16] *U.S. v. Johnson*, 481 U.S. 681, 701, 703 (1987) (Scalia, J., dissenting) (dissenting from decision to bar suits of wrongful death by active military personnel under *Feres* where the negligence was by a civilian employee of the federal government).

Unmanned Aircraft Systems – Recent Developments and News

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Congress Reinstates FAA Registration Rule for Recreational Drones

In 2015, the FAA introduced rules requiring drone hobbyists to register with the FAA all drones weighing between 0.55 and 55 pounds and to display on their unmanned aircraft identifier numbers issued by the FAA. Owners who failed to register faced civil or criminal monetary penalties and possible imprisonment. Over 800,000 hobbyists registered drones in compliance with the rules.[2]

The registration rules were soon challenged in a lawsuit filed by a drone hobbyist as violating Section 336 of the 2012 FAA Modernization and Reform Act (the "2012 Act"), which prohibits the FAA from promulgating rules regarding model aircraft. In May 2017, the U.S. Court of Appeals for the D.C. Circuit ruled unanimously and unequivocally in favor of the hobbyist.[3] "Statutory interpretation does not get much simpler. The Registration Rule is unlawful as applied to model aircraft."[4]

After the registration requirements were struck down, various efforts were made in Congress to reinstate the rules. Finally, a provision restoring the registration requirements was included in the National Defense Authorization Act of 2018, which was signed into law on December 12, 2017.[5]

The reinstated registration process costs $5.00 per applicant and may be completed online at https://www.faa.gov/uas/faqs/#reg. Just as manned civil aircraft in the United States bear an "N" number for identification purposes, the FAA provides a registration number for each registered recreational drone owner, which the owner is required to mark on the drone. (In contrast to manned aircraft, however, each recreational drone does not necessarily bear a unique number: a drone hobbyist may use one registration number for several drones operated by him or her).

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[2] http://dronecenter.bard.edu/drone-registrations/

[3] *Taylor v. Huerta*, 856 F.3d 1089 (D.C. Cir. 2017).

[4] 856 F.3d at 1092.

[5] https://www.aopa.org/news-and-media/all-news/2017/december/13/drone-registration-requirement-returns

Recreational drone owners must also have the FAA registration certificate in their possession when operating drones. Failure to register can result in civil penalties up to $27,500 and criminal fines of up to $250,000 and/or imprisonment for up to three years.[6]

Inflight Fume Events: Increasing Frequency, Few Solutions

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In recent weeks, three concerning incidents, each involving passenger and crewmember illness, have led to diversions and an emergency landing. First, on January 19, 2018, a United 767-300ER en route from Amsterdam to Newark was forced to return to Amsterdam approximately thirty (30) minutes into its transatlantic crossing. The air return was occasioned when as many as fifteen (15) passengers and flight attendants reported feeling ill, possibly due to a mysterious odor which manifest shortly into the flight.[8]

On January 28, the captain of a Spirit Airlines A320-200NEO became "nearly incapacitated" and required supplemental oxygen after an apparent fumes-related incident on a flight from Akron to Fort Lauderdale.[9] About one hour before landing, passengers and crew began to complain of an unpleasant odor in the cabin, with some flight attendants reporting dizziness, nausea and lightheadedness. The flight crew declared an emergency and initiated an early descent, depressurizing the cabin once below 10,000 feet, which seemed to improve cabin air quality. Both pilots used "quick-don" emergency oxygen masks for the last twenty minutes of the flight after detecting the odor in the cockpit. The captain stated that he felt disoriented and was unable to continue his flying duties following a safe landing in Fort Lauderdale.

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[6] https://www.faa.gov/uas/faqs/.

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[8] "Incident: United B763 over Atlantic on Jan 19th 2018, 15 people felt unwell." Hradecky, Simon. The Aviation Herald. http://avherald.com/h?article=4b3d92db&opt=6144 (Opened February 8, 2018).

[9] "Accident: Spirit A20N near Fort Lauderdale on Jan 28th 2018, fumes on board, crew feeling increasingly incapacitated." Hradecky, Simon. The Aviation Herald. http://avherald.com/h?article=4b4623d6&opt=6144 (Opened February 8, 2018).

Most recently, on February 5, a Delta 767-300ER declared an emergency over Greenland and diverted to Iqaluit, Canada when five (5) flight attendants complained of shortness of breath and dizziness, with one crewmember suffering symptoms reminiscent of a heart attack. [10] Following the diversion, one flight attendant was hospitalized and exhibited elevated levels of carbon monoxide in his blood.

Veteran observers of the commercial aviation industry will note that these incidents, though unsettling, are nothing new. In fact, the Association of Flight Attendants-CWA ("AFA"), the largest flight attendant union in the United States, estimates that one in approximately 35,000 flights are affected by a so-called "fume event."[11] Considering that in 2018, there are in excess of 105,000 scheduled airline flights per day,[12] across the world, this rate becomes even more alarming. Indeed, government agencies around the world[13] have taken notice of the rising frequency of fume events on commercial airline flights, and are coming under greater pressure from passenger groups, employees and labor unions to implement changes, including cabin air quality standards, to address their concerns.

Virtually all commercial aircraft (aside from the Boeing 787[14]) extract compressed air from the pre-combustion phase of turbine engines and auxiliary power units ("APUs"). This "bleed air" drives pneumatic systems powering essential aircraft functions, such as engine/wing anti-ice, hydraulic pressurization and environmental control systems. The compressed bleed air, initially at temperatures exceeding 300 degrees Fahrenheit, flows through air conditioning packs, mixes with filtered recirculated air, and enters the cabin environment. The recirculated air passes through HEPA (high-efficiency particulate air) filters, which are particularly effective at removing microorganisms, bacteria and other particulate matter, but generally cannot scrub volatile organic compounds ("VOCs"), the biggest culprits in aviation fume events.[15]

Bleed air can be contaminated by a number of different substances, including combustion byproducts, deicing solution,[16] synthetic lubricating oil and hydraulic fluid. While not all vapors present in bleed air are harmful, some are known to be especially toxic and comprise the majority of documented fume events wherein passengers or crewmembers reported medical

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[10] "Accident: Delta B763 over Greenland on Feb 5th 2018, 5 flight attendants becoming sick in flight." Hradecky, Simon. The Aviation Herald. http://avherald.com/h?article=4b4a1477&opt=7168 (Opened February 8, 2018).
[11] "Flight Crew Members Say Toxic Air in Plane Cabin Harmed Their Health." Kerley, David. ABC News, November 22, 2016. http://abcnews.go.com/US/flight-crew-members-toxic-air-plane-cabin-harmed/story?id=43231109 (Opened February 8, 2018).
[12] "Economic Performance of the Airline Industry." International Air Transport Association 2017 Year End Report, at 3. Available at: https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/IATA-Economic-Performance-of-the-Industry-end-year-2017-report.pdf.
[13] "Study: Fume Events – Four Safety Recommendations." Bundesstelle für Flugunfalluntersuchung (Germany), May 7, 2014. Available at: https://www.bfu-web.de/EN/Publications/Safety%20Study/Studies/140507_Fume_Events.pdf.
[14] The 787 is the only modern jetliner to use "bleedless" engines. Instead of drawing on bleed air, 787s are equipped with an onboard generator, which uses engine power to functionally replace the pneumatic system.
[15] "Aircraft Cabin Bleed Air Contaminants: A Review." Day, Gregory A. Civil Aerospace Medical Institute, Federal Aviation Administration, November 2015 at 3. Available at: https://www.faa.gov/data_research/research/med_humanfacs/oamtechreports/2010s/media/201520.pdf.
[16] The dramatically increased use in recent years of less-toxic propylene glycol (instead of ethylene glycol) in deicing fluids has reduced the risks associated with exposure to deicing fluid in bleed air.

complications. Heated or pyrolized synthetic engine oils, exhaust or hydraulic fluid can leak through imperfections in engine "wet seals," introducing hazardous substances such as tri-ortho-cresyl phosphate ("TOCP"), phosphate esters, ketones and carbon monoxide ("CO") into bleed air.[17]

Physiological symptoms attributed to VOCs in bleed air generally fall into two clinical categories: irritant effects and central nervous system ("CNS") effects. Irritant effects include: watery eyes; tearing; tightness or "scratchy" throat; swelling; altered taste; and skin rashes or hives.[18] CNS effects include: headache; memory loss; difficulty concentrating; lethargy; fatigue; disorientation; nausea; lack of awareness; numbness; paralysis; general weakness and fainting. In some documented cases, these symptoms have become permanent.[19] Clearly, there is a safety of flight issue associated with the physiological response to noxious substance exposure.

Certain VOCs are known to produce particular reactions when passengers and crewmembers are subject to increased concentrations due to bleed air contamination. For instance, acute poisoning by high concentrations of TOCP, an additive to synthetic turbine engine oil, can cause almost immediate weakness, numbness and disorientation.[20] Over time, the neurotoxic effect progresses, with pain, extremity paresthesia and even paralysis due to inhibition of certain neurotransmitters. Fatalities attributable to TOCP poisoning are unusual, but there is a high degree of permanence due to the death of nerve cells and damage to myelin sheaths. Similarly, exposure to phosphate esters, present in aerosolized hydraulic fluids, can lead to acute neurotoxic symptoms, such as irritation of mucous membranes, headaches, nausea and rashes.[21] The effects of CO poisoning are well-documented and include headaches, dizziness, nausea and disorientation. Exposure to high concentrations of CO can be fatal.[22]

There are no federal or international standards for cabin air quality, and while governing agencies readily acknowledge the seriousness of fume events, little has been done to implement any sort of regulation to this end.[23] One reason often cited is the relative rarity of fume events, and the near-impossibility of obtaining air quality samples around the time of a possible exposure. Another concern is the method of collecting samples in a scientific and statistically-significant manner. At present, there is no standardized protocol or technique for obtaining cabin air quality samples, which leads to unreliable conclusions.

A rather obvious solution appears to be the proliferation of bleedless engines, pioneered by the Vickers VC-10 in the late 1950s and now the Boeing 787 Dreamliner of the modern day. Boeing, in particular, touts significant efficiency improvement associated with bleedless

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[17] "Contamination of aircraft cabin by bleed air – a review of the evidence." Expert Panel on Aircraft Air Quality, Civil Aviation Safety Authority (Australia), September 2009 at 41. Available at: https://www.casa.gov.au/standard-page/expert-panel-aircraft-air-quality-epaaq.
[18] *Id.* at 67.
[19] *Id.*
[20] "The Airliner Cabin Environment and the Health of Passengers and Crew." National Research Council (US) Committee on Air Quality in Passenger Cabins of Commercial Aircraft, 2002 at Chapter 5. Available at: https://www.ncbi.nlm.nih.gov/books/NBK207471/.
[21] *Id.*
[22] *Id.*
[23] *Id.*

engines.[24] However, it is not clear that other airframe manufacturers are convinced of the benefits of the technology. Despite the availability of bleedless engines, Airbus retained a more traditional bleed air system for its all-new A350, and Boeing will likely do the same for its upcoming 777X series, if for no other reason than to simplify type certification.

Accordingly, it would seem for the moment that a solution to this dilemma remains elusive, making fume events an unavoidable, if rare, incident to commercial air travel.

[24] "787 No-Bleed Systems: Saving Fuel and Enhancing Operating Efficiencies." Sinnett, Mike. The Boeing Company. Available at: http://www.boeing.com/commercial/aeromagazine/articles/qtr_4_07/AERO_Q407_article2.pdf.

Update: Rising Jet Aviation Fuel Costs Will Require Major Adjustments from Airlines

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In our November article, we reported that, "[c]ompanies like American Airlines Group (AAL), Southwest Airlines (LUV), Spirit Airlines (SAVE) and Allegiant Travel Company (ALGT) recently reported their third-quarter 2017 earnings. The general trend is that earnings are lower year-over-year due to higher labor and fuel costs."[2] But rising fuel costs would begin to "squeeze profitability."[3]

In an interview with Essa Sulaiman Ahmad, Vice President, Emirates Airlines,[4] he stated that "the rise in fuel prices [would] require airlines to readjust to newer costs." This trend is already making headlines in both India and Australia. According to the Bureau of Infrastructure, Transport and Regional Economics (Australia),[5] jet fuel prices are set to push airfares higher in 2018 as oil prices increase, signaling a potential end to years of cheap flights.[6]

As we also reported in November, during the period of April-through-June, the average domestic airfare in the United States dropped to $356, the lowest level for that period since 2009.[7] Since 3Q 2014, crude oil prices had declined from $100 per barrel to a 2015 – 2017 average of $38. Brent Crude Oil, which bottomed at $43.52 in June, had risen to nearly $55 in early November – an almost 25% increase. Jet aviation fuel prices also increased over the same period from $1.36-$1.62. However, since our November report, Brent Crude jumped to a high of $71.[8]

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[1] Patrick Morris has 21 years of experience in finance and investment research, energy services and exploration and production. Mr. Morris is the President of All American Oil and Gas. He holds a JD, magna cum laude, from New York Law School, an MA from Emerson College and a BA from Syracuse University. Mr. Morris is a member of the Association of Certified Fraud Examiners and a founding member of the Society for Financial Econometrics.
[2] "Airline Stock Roundup: Q3 Earnings at AAL, LUV & Others, Bullish Thanksgiving View." Zacks Equity Research, Zachs.com, Nov. 1, 2017. http://www.nasdaq.com/article/airline-stock-roundup-q3-earnings-at-aal-luv-others-bullish-thanksgiving-view-cm870015.
[3] *Id.*
[4] http://www.indiatodaygroup.com/new-site/publications/bt-about.html.
[5] Airfares Expected to Rise as Jet Fuel Costs Spike on Higher Oil Prices, Jenny Wiggins and Angela Macdonald-Smith, Jan. 15, 2018, Source: The Australian Financial Review, http://www.aviationpros.com/news/12391373/airfares-expected-to-rise-as-jet-fuel-costs-spike-on-higher-oil-prices.
[6] *Id.*
[7] Airlines cope with higher fuel prices, and that could mean higher fares, Jansen, Bart, USA Today, Oct. 26, 2017. https://www.usatoday.com/story/news/2017/10/26/airlines-cope-higher-fuel-prices-and-could-mean-higher-fares/804686001/.
[8] Airlines Warn Higher Oil Prices Will Raise Airfares, Tsvetana Paraskova, Feb. 05, 2018, 3:00 PM CST, https://oilprice.com/Energy/Energy-General/Airlines-Warn-Higher-Oil-Prices-Will-Raise-Airfares.html.

Appearing on Bloomberg TV, the CEO of the International Air Transport Association (IATA), Alexandre de Juniac, noted that the current range of oil prices—$60-$70—is an "acceptable" range.[9] The IATA forecasts that oil prices will stay within this range this year, but if they rise too much over $70, it would result in increases in ticket prices, as usual," de Juniac said.[10] Higher oil prices, "puts pressure on costs and it is more a fare inflation trigger."[11]

In our previous reporting, we indicated that prices for domestic airfares would likely increase from the 2009 lows of $356 to $400-$455 per seat.[12] Based on the updated price trends in crude oil prices, to maintain 1H, 2017 profitability, the average US domestic ticket price will have to rise to closer to $425-$475 per seat.

In its Q4 2017 quarterly report, Spirit Airlines announced that jet fuel costs are still rising rapidly, forecasting that its average fuel price will reach $2.16 per gallon this quarter, up from $1.77 per gallon a year ago—slightly higher than the range for all US domestic airlines.[13] While the increases in price are beginning to be noticed in the US domestic market, the Asia Pacific market is showing more significant signs of stress.[14]

A slew of airlines reported that the rise in crude oil prices is forecast to reduce profitability and increase ticket prices. According to a recent Reuters article,[15] "[a]irlines said the higher oil price was proving financially damaging because fare increases had so far failed to keep pace with the oil price rise."[16]

"Last year, we estimated that our fuel costs rose 20 percent compared to 2016 which had a[n] impact on our profit," said Li Zongling, the president of China's Okay Airways.[17] According to Vietnam Airlines JSC, "fuel surcharges [are] now being applied in a move that would push up fares but could gradually lead to lower demand from passengers."[18]

In the Asia Pacific market, airlines that have not hedged fuel prices are struggling to pass higher costs to passengers.[19] "Especially for passengers traveling for tourist purposes when they see [fares] past a certain level they say no," Vietnam Airlines CEO Duong Tri Thanh said.[20]

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[9] *Id.*
[10] *Id.*
[11] *Id.*
[12] Spirit Airlines Inc. Earnings: 2017 Ends on a Brighter Note, Adam Levine-Weinberg, Feb. 6, 2018 at 1:40PM, https://www.fool.com/investing/2018/02/06/spirit-airlines-inc-earnings-2017-ends-on-a-bright.aspx.
[13] *Id.*
[14] https://www.thestar.com.my/business/business-news/2018/02/06/airfares-to-jump-as-a-result-of-rising-oil-price/.
[15] Airfares to jump as a result of rising oil price: airline executives, Jamie Freed, Feb. 4, 2018, https://www.reuters.com/article/us-singapore-airshow-iata/airfares-to-jump-as-a-result-of-rising-oil-price-airline-executives-idUSKBN1FP04J.
[16] *Id.*
[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*

In Europe, Ryanair, a discount airline specializing in ultra-low cost short haul routes, expects fuel prices to impact profitability, but not before 2019.[21] The same is true for airlines that have significant hedges in place. Qantas, the Australian domestic and international carrier expects a modest rise of A$200 million ($158.82 million) this year,[22] mostly due to a significant hedge position.[23]

But hedging doesn't last forever. As hedges roll-off airlines will face the difficult decision to either hedge at higher prices or risk an unhedged fuel cost. The industry will be closely monitoring crude oil volatility. Since February 1, Brent crude has dropped from a high of $71 to a closing price on February 11, of $63.[24]

Bad News for Profitability is Good News for Renewable Jet Fuel Alternatives

While airlines begin to deal with higher aviation fuel costs globally the renewable jet fuel industry is breathing a sigh of relief. Inexpensive jet fuel has reduced the demand for renewable fuels[25] and decreased both investment and consumption. But cost is not the only factor that could drive higher renewable jet fuel consumption.

The aviation industry continues looking to biofuels to help reduce carbon emissions.[26] In January 2018, Qantas completed an 8,077 mile flight between Melbourne and Los Angeles using Honeywell's Green Jet Fuel.[27] The Honeywell fuel is derived from carinata seed, a type of mustard.[28] According to Agrisoma and AltAir, the oil from carinata is pressed into jet fuel that can replace up to 50% of the petroleum based fuels consumed in an average flight.[29]

Other airlines have experimented with alternative fuels. For example, in 2016, JetBlue announced that the airline would purchase 330 million gallons of renewable jet fuel over 10 years.[30] Singapore Airlines introduced flights on its nonstop route to San Francisco powered, in part, by biofuels derived from cooking oil. Hong Kong-based Cathay Pacific Airways also expressed support for the use of biofuels.[31] In addition, British Airways formed a partnership in 2017 with a renewable fuels company, Velocys, to develop renewable fuel options for its fleet.[32]

While the market for renewable fuels continues to grow, the cost of renewables has kept a cap on the short-term expansion of the market in aviation.[33] According to Allied Market Research, the

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[21] *Id.*
[22] *Id.*
[23] *Id.*
[24] https://www.nasdaq.com/markets/crude-oil-brent.aspx?timeframe=1m.
[25] Energy Manager Today, Qantas Completes 8,000-Mile Flight on Renewable Jet Fuel, Alyssa Danigelis. Jan. 29, 2018, https://www.energymanagertoday.com/qantas-renewable-jet-fuel-0174671/.
[26] *Id.*
[27] *Id.*
[28] *Id.*
[29] *Id.*
[30] *Id.*
[31] *Id.*
[32] *Id.*
[33] *Id.*

global renewable fuels market is set to grow approximately 80% from 2016 – 2025.[34] While the total dollar amount spent on the industry is rising, low cost petroleum derived products continue to dominate most markets, but dominate in aviation.

On average the aviation sector consumes 10% of the total energy required in the transportation sector.[35] But the share of aviation fuel that is derived from renewables is a fraction of the total consumption. United Airlines, considered a leader in the use of biofuel,[36] only uses biofuel on short hop flights between San Francisco and Los Angeles.[37] But United is only using a 30/70 blend[38] or a total of approximately 15 million gallons over the next two years.[39] In 2016 the total fuel consumption by US airlines was 17 billion gallons.[40] So United Airlines' consumption of renewables was approximately .045% of the total US consumption.[41]

The numbers are similar at JetBlue.[42] According to the JetBlue website,[43] "JetBlue is partnering with SG Preston, a bioenergy company, to purchase renewable jet fuel made out of biomass that does not compete with food supply. Each year for ten years, [JetBlue] will be purchasing 33 million gallons of blended renewable jet fuel (made of 30% renewable and 70% traditional fuel)."[44] Put in context and based on JetBlue's own website, JetBlue's consumption of renewables accounts for only .06% of total US domestic consumption.

But hopes remain high for renewable and alternative fuel for aviation. According to various sources, biofuels can reduce CO2 emissions between 50-85%[45] depending on the feedstock and blend. But the reductions in CO2 levels remain low based on current usage. According to Agrisoma CEO Steven Fabijanski, the use of renewable blends on the Qantas Los Angeles to Melbourne flight "will reduce greenhouse gas emissions on the LA to Melbourne flight by seven per cent."[46]

But as we have reported, rapidly rising petroleum-based fuel prices are beginning to impact airline profitability, particularly in the Asia Pacific region.[47] Perhaps steadily increasing prices will increase demand for lower emission, higher priced alternatives.

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[34] https://www.prnewswire.com/news-releases/data-shows-demand-for-alternative-energy-continues-to-grow-673561643.html.
[35] Biofuels May Be The Future Of The Aviation IndustryBy Jon LeSage – Feb. 27, 2017, 3:00 PM CST. https://oilprice.com/Alternative-Energy/Biofuels/Biofuels-May-Be-The-Future-Of-The-Aviation-Industry.html.
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] *Id.*
[40] https://www.statista.com/statistics/197690/us-airline-fuel-consumption-since-2004/.
[41] *Id.*
[42] https://www.jetblue.com/green/climate-change/.
[43] *Id.*
[44] *Id.*
[45] https://ottawa.ctvnews.ca/gatineau-biofuel-company-helping-to-revolutionize-airline-industry-1.3777325.
[46] *Id.*
[47] Airfares to jump as a result of rising oil price: airline executives, Jamie Freed, Feb. 4, 2018, https://www.reuters.com/article/us-singapore-airshow-iata/airfares-to-jump-as-a-result-of-rising-oil-price-airline-executives-idUSKBN1FP04J.

Time to Reconsider the Nationality Rule in the United States

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Let's suppose you live in Duluth, Minnesota and own the largest manufacturer of single engine piston aircraft on the planet. You want to grow the business – maybe expand into the very light jet (VLJ) market – and, okay, the finances of the company are not as rock solid as one might hope. Now further suppose that an aviation company owned by the government of a rival nation – say, the People's Republic of China – is willing to provide a capital infusion in exchange for ownership and control of your company. Any problem with that under US law? Nope. This is just a foreigner making an investment in Duluth and its workers. All good. And that's how business usually works in the US. If you don't believe me, just ask Cirrus Aircraft Corporation which is now owned by China Aviation Industry General Aircraft (CAIGA).

But what would you think if you were told that this transaction could not be done because of a law stemming from the time of Calvin Coolidge which prevents you from selling more than 25% of your voting shares to a foreigner? It may sound crazy, but that is exactly the situation US certificated air carriers find themselves in due to the nationality rule.

There may have been a time when the nationality rule was necessary in order to protect fledgling US airlines, but that time has passed. The rule today is merely an impediment to the free flow of capital across borders. So perhaps it's time to permit significant foreign investment in US airlines and liberalize, or abolish entirely, the nationality rule. Many other nations have come to that conclusion concerning their own airlines and have significantly reduced or entirely eliminated the restriction.

Why does the rule persist in its current form? Various arguments have been made from time to time but the most frequent, and certainly the most emotional, is that of US national security. The thinking is that any airline operating under a US-issued certificate of public convenience and

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necessity should be owned and controlled by US citizens so as to increase the likelihood that its airplanes would be made available to augment the military's own air mobility assets in the event of a national emergency. The Civil Reserve Air Fleet (CRAF), an entirely voluntary commitment of passenger and cargo planes by US carriers, serves the augmentation function. Just not very often. Since its establishment in 1951, the CRAF has been activated only twice – during Operation Desert Shield (for 5 months in 1990/91) and Operation Iraqi Freedom (for 4 months in 2003).

At first blush the relationship between the military and the CRAF would appear to be symbiotic. Airlines commit aircraft and crews and the Department of Defense (DOD) offers participating carriers a certain amount of transport business each year. In FY 2005 $418 million in guaranteed fees were paid to air carriers together with an additional $1.5 billion in non-guaranteed fees. That's equal to the fly-away price of almost nine C-17 Globemaster IIIs. In FY 2010, the most expensive year to date for the program, DOD paid $3 billion to CRAF participants. Airlines generally like the economic benefits provided by the program and there is no reason to believe that foreign ownership would change that analysis.

The picture is not so rosy when viewed from a national security perspective. The capacity requirement shifts from troop transport to cargo when the CRAF is activated and the Air Force has expressed a preference for the purpose-built Globemaster due to design incompatibilities of civilian aircraft and the Globemaster's range, payload and ability to land on austere runways. Furthermore, in response to the threat of airline bankruptcies and the move to smaller aircraft, DOD has used foreign carriers (particularly Volga-Dnepr Airlines based in Russia) for cargo flights that the US participants were unable to handle.

In analyzing the nationality rule's contribution to national security, we should consider whether it has already been irreparably breached. If you think the airplanes committed to the CRAF are carefully maintained by loyal American mechanics in US facilities, guess again. Much of the heavy maintenance necessary to keep the airplanes in satisfactory operating condition is done overseas in locations such as El Salvador (Southwest), Mexico (Delta) and China (United) by foreign companies employing foreign mechanics. Moreover, the alliances between US and foreign carriers afford some element of control to the foreign partners. These compacts may not constitute full blown airline mergers, but the metal-neutral joint ventures (with the Delta/KAL joint venture being the latest example) seem to be mergers in everything but name. Finally, consider the control a foreign leasing company or financing bank could exert on its US airline client. So perhaps we already have significant minority or even majority effective control of US airlines by foreigners. In which case, why resist relaxing the nationality rule?

Progress on this issue will be incremental. Any liberalization, however, is likely to improve the access of US carriers to the global equity markets, allow them to realize efficiencies of scale, improve service to the consumer and result in a stronger US airline industry.

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The Perils of Icing – Atmospheric and Regulatory

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The days are getting longer and warmer and even now signs of Spring are emerging as the seasons turn again. For general aviation pilots, that means warmer weather at takeoff and a diminished need to de-ice before takeoff. See 14 CFR 91.527(a) below.

However, as in the Fall and certainly in the Winter, the onset of Spring does not eliminate concern over the perils addressed in 14 CFR 91.527(b), (c) and (d), the perils of icing aloft.

On average, unless there is a temperature inversion whereby air temperature rises as altitude increases (as when a warm, less dense air mass moves over a dense, cold air mass), generally air temperature cools at about 3 degrees Fahrenheit per 1,000 feet of altitude. Even low-flying single-engine piston aircraft taking off on a balmy 65-degree day can encounter temperatures that cause moist air, as found in all clouds, to freeze on aircraft surfaces as low as 9,000 or 10,000 feet, and even lower as the temperature of the air at the surface decreases. Icing can be deadly and there are so many accidents to confirm this. While most piston general aviation aircraft do not have anti-icing equipment, some are equipped with de-icing equipment that may help to escape icing, but that is not certified for "flight into known icing". But even those magnificently-equipped single-engine turbine powered propeller-driven aircraft that are certified for flight into known icing can be overcome by deadly ice build-up on the airframe. Airliners that are generally sufficiently powered to "thrust" their way through icy levels and have heated surfaces where ice is likely to accumulate, also can fall prey. Three accidents come to mind immediately:

- American Eagle Flight 148, an ATR 72, that crashed in Roselawn, Indiana, on October 31, 1994, killing all 68 persons on board.

- Socata TBM 700, N731CA, that crashed in Morristown, New Jersey, on December 20, 2011, killing all five persons on board.

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- Air France Flight 447, an Airbus A330, that crashed in the South Atlantic Ocean on June 1, 2009, killing all 228 persons on board.

For "Piper" and Cessna" pilots**,** the threat of icing and the lack of equipment that is capable of shedding ice accumulation means that flying in instrument conditions ("IMC") at altitude levels where ice build-up in the clouds, even light icing conditions, is forecast or known is illegal. And it is dangerous.

Much has been written about the exact meaning of "forecast" icing conditions, but most pilots understand that seeking a legal nuance whereby flying into icing conditions may avoid a legal infraction will not spare the pilot and passengers from the dangers of ice build-up. Being "legal" in this context is not the same as being safe. While all pilots without equipment certified for flight into icing are taught to escape icing conditions as soon as possible, ice build-up may be insidious and go undetected until escape is impossible. Carefully identifying weather conditions conducive to icing and knowing where ice has been forecast or reported are absolute prerequisites for IMC flight. Attention must be given if flight will or may take place in temperature ranges where ice may form. That can be as high as 37 degrees Fahrenheit – water tends to cool as it encounters the rapidly moving aircraft surface – a degree range that may be encountered as low as 4,000 feet above the surface on a day when the surface temperature is as high as 50 degrees.

For an excellent analysis of exactly why ice and aviation are enemies, see http://www.weather.gov/media/zhu/ZHU_Training_Page/icing_stuff/icing/Aircraft_Icing.pdf published by the Aircraft Owners and Pilots Association. In short, icing affects the aerodynamics of an aircraft, especially the wing where the flow of air over the upper surface is disrupted. That disrupted airflow and the weight of accumulated ice can increase stall speed and lower the aircraft's angle of attack. In addition, props can become unbalanced and tear up an engine and critical intakes to the engine can be blocked.

RELEVANT REGULATIONS:

Here are the relevant regulations found in 14 CFR 91.527:

91.527 Operating in icing conditions.

(a) No pilot may take off an airplane that has frost, ice, or snow adhering to any propeller, windshield, stabilizing or control surface; to a powerplant installation; or to an airspeed, altimeter, rate of climb, or flight attitude instrument system or wing, except that takeoffs may be made with frost under the wing in the area of the fuel tanks if authorized by the FAA.

(b) No pilot may fly under IFR into known or forecast light or moderate icing conditions, or under VFR into known light or moderate icing conditions, unless—

(1) The aircraft has functioning deicing or anti-icing equipment protecting each rotor blade, propeller, windshield, wing, stabilizing or control surface, and each airspeed, altimeter, rate of climb, or flight attitude instrument system;

(2) The airplane has ice protection provisions that meet section 34 of Special Federal Aviation Regulation No. 23; or

(3) The airplane meets transport category airplane type certification provisions, including the requirements for certification for flight in icing conditions.

(c) Except for an airplane that has ice protection provisions that meet the requirements in section 34 of Special Federal Aviation Regulation No. 23, or those for transport category airplane type certification, no pilot may fly an airplane into known or forecast severe icing conditions.

(d) If current weather reports and briefing information relied upon by the pilot in command indicate that the forecast icing conditions that would otherwise prohibit the flight will not be encountered during the flight because of changed weather conditions since the forecast, the restrictions in paragraphs (b) and (c) of this section based on forecast conditions do not apply.

RELEVANT DEFINITIONS:

A critical definition for pilots seeking to be compliant with the law and to be safe is the definition of "forecast icing conditions" and the various degrees of icing. They are found in the FAA Advisory Circular 91-74B:

***Forecast Icing Conditions**. Environmental conditions expected by an NWS or an FAA-approved weather provider to be conducive to the formation of in-flight icing on aircraft.*

***Light Icing**. The rate of ice accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Requires occasional cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is ¼ inch to 1 inch (0.6 to 2.5 cm) per hour on the outer wing.*

***Moderate Icing**. The rate of ice accumulation requires frequent cycling of Manual deicing systems to minimize ice accretions on the airframe. The rate of accumulation is such that anything more than a short encounter is potentially hazardous. A representative accretion rate for reference purposes is 1 to 3 inches (2.5 to 7.5 cm) per hour on the outer wing.*

***Severe Icing**. The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice and accumulation occurs in areas not normally prone to icing, such as aft of protected surfaces and other areas identified by the manufacturer. A representative accretion rate for reference purposes is more than 3 inches (7.5 cm) per hour on the outer wing. Immediate exit is required by many Airworthiness Directives (AD), flight manuals, and operations under part 91, §§ 91.13(a) and 91.527; part 121, § 121.341; part 125, § 125.221; and part 135, § 135.227.*

FAA Killed the Uber of the Skies

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A vexing topic of the aviation industry is how to attract and retain new pilots to replace the growing number of retiring commercial airline pilots. The aviation schools are simply not churning out the number of new pilots needed to fill the demand for pilots in the future, and already this has taken a toll on regional airlines, which have started to cut service.[2] Into the fore stepped the "Uber" of the skies, Flytenow and AirPooler. These services provided a digital platform for general aviation pilots to fill unused seats. Prior to the existence of these platforms, pilots would rely upon bulletin boards. The introduction of these sites made it more efficient to fill unused spaces on general aviation flights.[3]

Before delving into the topic further, it is necessary to establish that it is extraordinarily expensive to be a general aviation pilot. It is estimated that it would cost a general aviation pilot $33,750 to log in the 250 hours necessary simply to be able to carry passengers on a commercial basis.[4] On a per-hourly basis, it is estimated that it costs $225.30 per hour for a pilot to own a Cessna jet and fly 100 hours a year. Clearly, such costs make it cost prohibitive for all but the wealthy to fly general aviation flights. Flytenow and Air Pooler allowed pilots to recoup some of the extravagant costs involved in maintaining a general aviation license by sharing in the cost of operating these planes with a general public who simply logged onto the App and signed up for a cost sharing flight. This actually would have made flying safer for everyone, by enabling it to be economically feasible for pilots to become general aviation pilots, as well as to log in appropriate flight hours of practice to become seasoned pilots.

In response to the development of Flytenow and AirPooler, the FAA redefined the term "common carrier," requiring the small general aviation pilots who use those flight Apps to abide by the same regulations that commercial pilots have to abide by. Pilots would need commercial certificates, operators would need a Part 119 certificate, and flights would need to be operated according to Part 121, 125, or 135 rules (depending on the flight and plane). This would simply have been an impossible burden for these small general aviation operators to meet.

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[2] *See*: http://money.cnn.com/2017/07/27/news/companies/pilot-shortage-figures/index.html.
[3] *See*: https://reason.com/archives/2017/06/27/how-the-faa-killed-uber-for-planes.
[4] *See*: https://www.mercatus.org/system/files/mercatus-koopman-common-carriers-flight-sharing-v1.pdf.

The FAA, in its advisory circular, defined the four elements of common carriage to include "(1) a holding out of a willingness to (2) transport persons or property (3) from place to place (4) for compensation."[5]

Flytenow's attempt to avoid getting captured under this definition was twofold. First, addressing point number four, it facilitated payments only for prorated shares of flight costs, such as fuel. This is compensation that was already explicitly authorized for private pilots under the Code of Federal Regulations.[6]

The Mercatus Center noted that as far as the first part of the "common carrier" definition, Flytenow took numerous steps to avoid pilots' "holding out" to the general public in a way that implied common carriage. "The Flytenow platform itself was an exclusive, nonpublic network only available to those who had been accepted as members. Flights were not available to be indexed by search engines such as Google. To post a flight, the pilot was required to include the specific date and time, the points of operation, and a stated purpose of the flight. Members could not request itineraries directly; they could only join posted flights. Neither passengers nor Flytenow had control over flights, and pilots could accept or reject any member's request to join any planned flight, at any time, and for any (or no) reason."[7]

Regardless of what would seem a clear differentiation between sites like Flytenow and AirPooler from a "common carrier," the FAA in any case decided that pilots accepting passengers from these sites operated as a "common carrier," and had to abide by Part 135 rules.[8] Ultimately, the FAA's decision killed the "Uber of the Skies," and there remains the pilot shortage to this day. The online platforms sued the FAA, but there was a loss on the circuit court level, and certiorari was denied.[9] In the future, if there is to be an "Uber of the skies," then Congress must pass a law that narrowly defines "common carrier".

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[5] Fed. Aviation Admin., Advisory Circular No. 120-12A: Private Carriage Versus Common Carriage of Persons or Property (Apr. 24, 1986).
[6] 14 CFR 61.113 - Private pilot privileges and limitations: Pilot in command.
[7] *See*: https://www.mercatus.org/system/files/mercatus-koopman-common-carriers-flight-sharing-v1.pdf
[8] *See*: http://www.nationalreview.com/article/438735/faa-bans-non-commercial-aviation-wrongly-flytenow-goes-supreme-court.
[9] *Flyetenow, Inc. v. Federal Aviation Administration*, 808 F.3d 882 (D.C. Cir. 2016).

Bombardier Challenger 350

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Bombardier has now reported that it has delivered more than 200 Challenger 350 super-midsize jets since its introduction into service in mid-2014. The Challenger 350 is considered an evolutionary upgrade with more tanks-full payload with full fuel, along with more range and better fuel efficiency. It also has newer avionics for 21st century airspace operations and a better cabin.[2] The aircraft also has strong runway and climb performance. The interior is quieter, lighter and more functional because of better acoustical insulation, larger windows and incorporation of the Lufthansa Technik nice HD cabin management system.[3]

The Challenger 350 has quickly become a favorite with fleet operators. About half are concentrated in North America and 80% of those have U.S. registrations. Outside of Canada and the U.S., Challenger 350s are also in Austria, Germany, Brazil, Argentina, India, Poland, Russia, Singapore and Malta.[4]

Typically, on everyday trips, the aircraft climbs directly to FL 450, cruises at Mach 0.80 and burns about 2,000 to 2,200 lb. of fuel for the first hour and 1,800 to 1,900 lb. for the second hour. Fuel flows drop to as low as 1,600 lb. per hour on the longest trips. Most operators say the can comfortably fly 5 to 6 hrs. Several operators have reported that performance is one of its best features. Its standard-day takeoff field length (TOFL) at MTOW is 4,829 ft and departing BCAS 5,000-ft elevation, ISA +20C airport TOFL is 6,451 ft. It can climb through FL 370 in 14 min. and cruise at FL 430 to FL440.[5] The improved cabin environment often is lauded by operators. Cabin windows are 2-in. longer, providing 12% more ambient light. The length of the main seating area remains unchanged at 16.5 ft., but it's noticeably brighter because of the larger windows and upgraded wash lights. Most aircraft are configured with double-club seating.

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[2] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 58.

[3] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 58.

[4] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 59.

[5] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 59.

Many have commented favorably about the aircraft's lower interior noise levels, compared to the Challenger 300.[6]

Overall, operators say their passengers love the aircraft. The Lufthansa Technik nice HD cabin management system is easy to use. Touch-screen controls are intuitive, providing easy access to cabin lighting, temperature control and inflight entertainment systems. The aircraft's Rockwell Collins Pro Line 21 advanced avionics package includes dual IRS, dual SBAS GPS receivers and FMSes capable of LPV and RNAV approaches, Collins MultiScan weather radar, an XM satellite radio weather receiver and synthetic vision PFDs. Overall the Challenger 350 has received strong, positive compliments. The Challenger 350 has momentum. It has become the definitive transcontinental U.S. business aircraft.[7]

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[6] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 60.
[7] Fred George, "Bombardier Challenger 350" – Business & Commercial Aviation, January 2018, Pg. 61.

Exponential Growth in Autonomous Aircraft Technology Patent Filings

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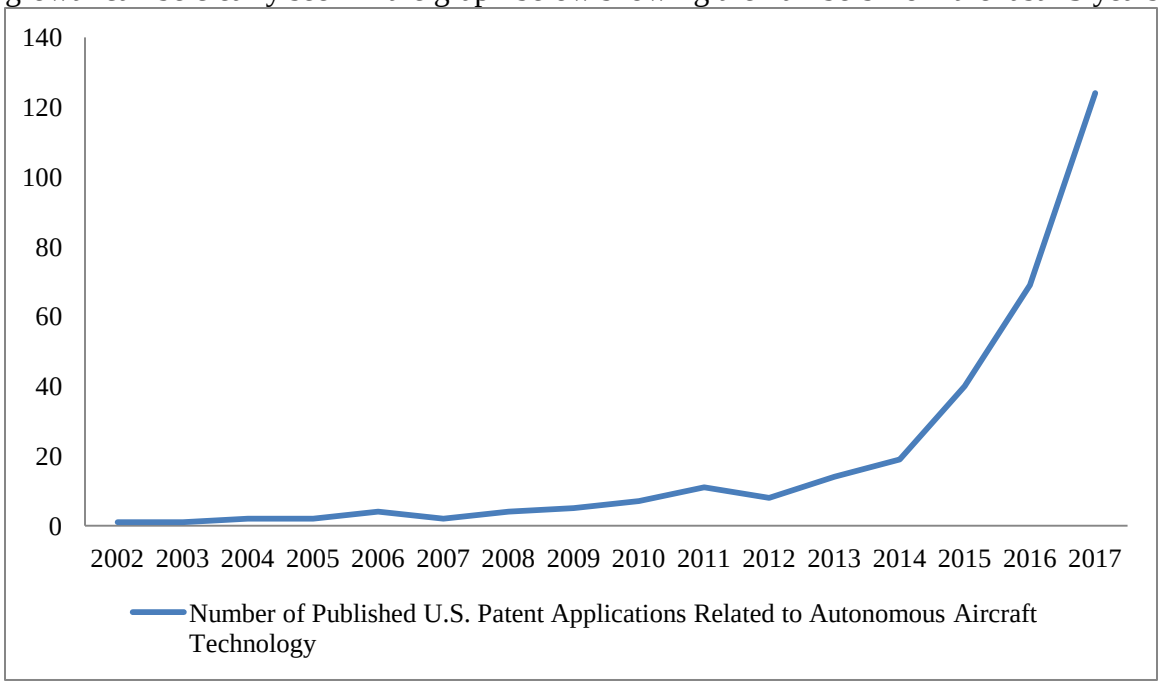
In 2017, the U.S. Patent and Trademark Office published a record 124 patent applications that mention the phrase "autonomous aircraft," "autonomous airplane," or "autonomous drones." That is nearly twice the number of such applications in 2016. In fact, from 2012 through 2017, the number has roughly doubled each year, growing exponentially from 8 to 124. This explosive growth can be clearly seen in the graph below showing the numbers from the last 15 years.



Despite this exciting trend, the record number of patent applications related to autonomous aircraft technology pales in comparison to the 1776 published patent applications that mention the phrase "autonomous vehicle" in 2017. Although dictionaries generally define "vehicle" broadly to include any means of transportation, including cars and airplanes, current research related to "autonomous vehicle" is generally directed to self-driving technology for automobiles.

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Indeed, most of the "autonomous vehicle" applications are directed to self-driving cars, not self-piloting aircraft.

While recent developments in self-driving technology have attracted much of the public's attention, the aviation industry already has several decades of head start in flight automation. For instance, most airline passengers today are probably blissfully unaware that the onboard flight computer (Flight Management System)—not their pilots—is doing most of the flying because the computer can fly the airplane more precisely, efficiently, comfortably, and safely than humans during normal operations. Human pilots, however, are better at making critical judgments, especially in an emergency, which is why pilots will probably still be required on commercial flights in the foreseeable future. But as scientists and engineers continue to make advancements in sensors, computing power, and artificial intelligence, it is only a matter of time that flights will be fully automated. As we progress toward that milestone, the growth in the number of patent filings related to autonomous aircraft technology is likely to accelerate further, eventually catching up to and surpassing those related to self-driving cars.

In the upcoming newsletters, this subcommittee plans to explore aviation technologies and related patent filings in more detail. If you have any topic of interest, suggestions, or comments, please e-mail jtsai@kramerlevin.com.

Recent State and Federal Developments in the Oversight of Drones[1]

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This article presents a brief overview of recent developments in the oversight of drones at the state and federal level. As many of these initiatives are evolving quickly, the reader should check for updates on a regular basis.

NOTABLE PROPOSED STATE LEGISLATION

Florida

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The Florida Legislature is considering H.B. 471, which would prohibit drones from being operated near critical infrastructure facilities. It also would authorize the use of drones by local and state agencies for certain purposes, such as to facilitate the search for a missing person or to aid in the collection of evidence at the scene of a crime or traffic accident.

Illinois
The Illinois General Assembly is considering H.B. 4405, which would amend the Freedom from Drone Surveillance Act to add an exemption allowing law enforcement agencies to use drones to prepare for or monitor safety at a large-scale event.

Indiana
S.B. 334 is before the Indiana General Assembly. If enacted, it would prohibit the operation of a drone while intoxicated as a class B misdemeanor offense.

New Hampshire
On January 3, 2018, H.B. 1759 was introduced in the New Hampshire House of Representatives. The bill limits the government's use of drones. For example, the government would be prohibited from using drones to conduct surveillance or collect evidence, with certain exceptions. The bill would also limit the public's use of drones, including prohibiting the operation of a drone that is equipped with any type of weapon.

New Jersey
The New Jersey Legislature is reviewing S.B. 797, which makes it a crime to sell or operate a drone within the state that does not contain the proper geo-fencing technology. Each drone sold or operated in New Jersey would be required to contain geo-fencing technology that prevents it from operating over 500 feet above ground level and within two miles of an airport or protected airspace. A violation of this crime would be punishable by up to 18-months imprisonment and/or a maximum fine of $10,000.

New Mexico and Vermont
Both the New Mexico Legislature and the Vermont Legislature are reviewing bills (NM S.B. 166 and VT H.B. 615) that would prohibit drone operations near correctional facilities.

Oklahoma
On January 18, 2018, H.B. 3132 was introduced in the Oklahoma State Legislature. The bill includes provisions that would prohibit the operation of a drone over the private agricultural property of another, with limited exceptions.

West Virginia
The West Virginia Legislature is considering H.B. 2627, which would prohibit the use of a drone to hunt, take, or kill a wild animal or bird.

REGULATORY

Federal Aviation Administration

FAA Drone Registry Exceeds One Million Registrations

On January 10, 2018, U.S. Department of Transportation Secretary Elaine Chao announced that more than a million drones have been registered with the FAA. Out of the million registrations, approximately 122,000 are drones operated for commercial or government purposes. Drones that weigh more than 0.55 pounds and less than 55 pounds must be registered with the FAA. Registration is effective for three years and costs five dollars. Secretary Chao stated, "[t]he tremendous growth in drone registration reflects the fact that they are more than tools for commerce and trade, but can save lives, detect hazardous situations and assist with disaster recovery."

FAA and AUVSI Co-Host UAS Symposium

The FAA and the Association for Unmanned Vehicle Systems International (AUVSI) are co-hosting the third annual UAS Symposium on March 6-8, 2018 in Baltimore, Maryland. Government officials and private stakeholders will discuss new developments, regulations, and initiatives to integrate UAS into the National Airspace System.

JUDICIAL

New Class Action Lawsuit Filed Regarding the Drone Registration Requirement

On January 5, 2018, plaintiff Robert C. Taylor filed a class action lawsuit against the FAA, on behalf of persons who registered drones on the FAA registry. The plaintiffs claim that the FAA violated the Privacy Act of 1974 and the class's privacy rights by retaining personal information and money collected through drone registrations prior to the May 2017 decision in *Taylor v. Huerta*, in which the D.C. Circuit ruled that the FAA lacked the statutory authority to impose the Registration and Marking Requirements for Small Unmanned Aircraft. On December 12, 2017, President Trump signed the National Defense Authorization Act, which restored the requirement for drones to be registered with the FAA. The class action also claims that the FAA waived its sovereign immunity when it collected the $5.00 fee in violation of a statute and that the FAA was unjustly enriched through the collection of more than $4 million in drone registration fees that it did not have the statutory authority to collect. The defendants' answer must be submitted to the U.S. District Court for the District of Columbia by March 13, 2018.

Sikkelee v. Avco Corp. and *Estate of Becker v. Avco Corp.*: Recent Decisions Contributing to the Debate over Whether Federal Law Preempts the Entire Field of Aviation Safety

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In my January article, I addressed the Middle District of Pennsylvania's finding of conflict preemption in its dismissal of certain design defect claims against an engine manufacturer in *Sikkelee v. Avco Corp.*, 2017 WL 3317545 (M.D. Pa. Aug. 3, 2017). Prior to this decision, however, the Court of Appeals for the Third Circuit, in *Sikkelee v. Precision Airmotive Corp.*, 822 F.3d 680 (3d Cir. 2016), held that federal law did not field preempt the plaintiff's product liability claims. The Third Circuit's decision as well as a subsequent decision by the Washington Supreme Court in *Estate of Becker v. Avco Corp.*, 387 P.3d 1066 (2017) highlight an ongoing split amongst courts on the issue of whether the Federal Aviation Act[2] preempts the entire field of aviation safety.[3]

The Supremacy Clause of the United States Constitution provides that federal law "shall be the supreme Law of the Land… any Thing in the Constitution or Laws of any State to the Contrary notwithstanding."[4] Thus, under the Supremacy Clause, Congress can enact statutes preempting state law, and preemption of state law is a question of Congressional intent.[5] Federal preemption may be expressed in a federal statute or it may be implied through either conflict or field preemption.[6] Field preemption occurs "when the scope of a federal statute indicates that Congress intended federal law to occupy a field exclusively."[7] Such preemption "may be found where federal regulation of a field is pervasive, or where state regulation of the field would interfere with Congressional objectives."[8]

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[2] Pub. L. No. 85-726, 72 Stat. 731 (1958).
[3] *See Sikkelee v. Precision Airmotive Corp.*, 822 F.3d 680 (3d Cir. 2016), *cert. denied sub nom. AVCO Corp. v. Sikkelee*, 137 S. Ct. 495, 196 L. Ed. 2d 433 (2016) (finding no field preemption for claim against aviation manufacturer); *Martin ex rel. Heckman v. Midwest Exp. Holdings, Inc.*, 555 F.3d 806 (9th Cir 2009)(same); *but see Goodspeed Airport LLC v. East Haddam Inland Wetlands & Watercourses Commission*, 634 F.3d 206 (2d Cir. 2011)(finding federal law to occupy entire field of air safety); *US Airways, Inc. v. O'Donnell*, 627 F.3d 1318 (10th Cir. 2010)("*O'Donnell*")(same).
[4] U.S. Const., Art. VI, cl. 2.
[5] *O'Donnell*, 627 F.3d at 1324.
[6] *Kurns v. Railroad Friction Products Corp.*, 565 U.S. 625, 630 (2012); *Sikkelee*, 822 F.3d at 687-88; *O'Donnell*, 627 F.3d at 1324.
[7] *Kurns*, 565 U.S. at 630.
[8] *Abdullah v. American Airlines, Inc.*, 181 3d 363, 367 (3d Cir. 1999)(citations omitted).

In *Abdullah v. American Airlines, Inc.*, 181 3d 363 (3d Cir. 1999), a Third Circuit decision prior to *Sikkelee*, the Third Circuit held federal law to preempt the "entire field of aviation safety."[9]

Abdullah involved negligence claims brought by passengers who sustained injuries after encountering severe turbulence on the defendant air carrier's flight.[10] Although the pilot noticed a weather system in the flight path, illuminated the fasten seatbelt sign and alerted the crew to potential turbulence, the crew never warned the passengers of the turbulence and the pilot did not change course.[11] A jury found the air carrier liable, but the trial court granted the carrier's post-trial motion finding the Federal Aviation Act impliedly preempted "state and territorial regulation of aviation safety and standards of care for pilots, flight attendants, and passengers."[12]

On appeal, the Third Circuit held that "federal law establishes the applicable standards of care in the field of air safety, generally," finding "*any* state or territorial standards of care relating to aviation safety [to be] federal preempted."[13] The court found that federal law preempted air safety generally as "it would be illogical to conclude that, while federal law preempts state and territorial regulation of matters such as pilot licensing, it does not preempt regulations relating to the exercise of the specific skill for which licensing is necessary – pilots' operation of aircraft."[14] It further noted a comprehensive standard of care governing "careless or reckless operation" of aircraft in the Federal Aviation Act regulations – 14 C.F.R. § 91.13(a) – which would apply beyond specific regulations pertaining to the operation of aircraft.[15]

While holding that federal law preempted state standards of aviation safety, the Third Circuit found that state and territorial remedies continued to exist for violation of the federal standards.[16] This finding arose from the court's reading of the Federal Aviation Act's savings clause which stated that the Act's remedies were "in addition to any other remedies provided by law."[17]

Although holding, in *Abdullah*, that federal law preempted the entire field of aviation safety, the Third Circuit, in *Sikkelee*, held that federal law did not preempt state standards of care with respect to aviation product liability claims.

In *Sikkelee*, the plaintiff asserted, *inter alia*, a defective design claim against an aircraft engine manufacturer arising from an aircraft accident that killed her husband, the pilot of the aircraft.[18] Specifically, the plaintiff alleged that the accident resulting in her husband's death was the result of a design defect in the carburetor of the aircraft's engine.[19] The plaintiff initially asserted breaches of state law standards of care, but, the district court granted a motion to dismiss on the

[9] *Id.* at 365 & 371.
[10] *Id.* at 365.
[11] *Id.*
[12] *Id.* at 366.
[13] *Id.* at 367 & 371.
[14] *Id.* at 371.
[15] *Id.*
[16] *Id.* at 374-75.
[17] *Id.*
[18] *Sikkelee*, 822 F.3d at 685.
[19] *Id.*

pleadings holding that the claims, based on state law standards of care, fell within the preempted field of aviation safety.[20] The plaintiff then filed an amended complaint again asserting state law claims, but substituting federal for state standards of care.[21] However, the district court granted the manufacturer's motion for summary judgment with respect to plaintiff's design defect claim finding that the Federal Aviation Administration's issuance of a type certificate for the engine meant that the manufacturer satisfied the federal standard of care. On appeal, the Third Circuit found that the district court erred in its determination that field preemption applied to the plaintiff's claims and, thus, should not have granted summary judgment on that ground.

In its *Sikkelee* decision, the Third Circuit first addressed its holding in *Abdullah* and found that *Abdullah* was not controlling.[22] Specifically, the court found its holding in *Abdullah* to be limited to "in-air operations" despite the *Abdullah* court stating "in broad terms" that the Federal Aviation Act preempted the field of aviation safety.[23] The court further noted that the catch-all standard of care in the federal regulations, 14 C.F.R. § 91.13(a), applied to operating – not designing or manufacturing – an aircraft.[24]

After finding that *Abdullah* was not controlling, the Third Circuit analyzed whether Congress intended the Federal Aviation Act to preempt aircraft liability claims, concluding that it did not. In reaching this conclusion, the Third Circuit applied a presumption against preemption, rejecting the argument that such a presumption should not apply with respect to aviation product liability claims because of the history of federal involvement in the field of aviation safety.[25] After finding the presumption against preemption to apply, the Third Circuit did not find a clear and manifest congressional intent to overcome the presumption.

The Third Circuit found that the Federal Aviation Act itself did not signal a congressional intent to preempt aviation product liability claims.[26] Although the Federal Aviation Act authorized the Federal Aviation Administration to promulgate regulations "promot[ing] safety of flight of civil aircraft in air commerce by prescribing… minimum standards governing the design, material, workmanship, construction, and performance of aircraft, aircraft engines, and propellers as may be required in the interest of safety," the provision did not evince such a congressional intent because the statutory language had been taken from the Civil Aeronautics Act, which, according to the court, clearly did not preempt product liability claims.[27] Moreover, the Third Circuit found support for its findings from the Act only establishing "minimum standards" for aviation safety and containing a savings clause that, while not inconsistent with requiring application of federal standards of care, does not support a finding of a clear and manifest intent to preempt state product liability claims.[28]

[20] *Id.*
[21] *Id.*
[22] *Id.* at 688-90.
[23] *Id.*at 689.
[24] *Id.*
[25] *Id.* at 690.
[26] *Id.* at 692.
[27] *Id.* at 693.
[28] *Id.* at 692-93.

The Third Circuit further found, contrary to the amicus opinion submitted by the Federal Aviation Administration, that the Federal Aviation Act regulations lacked evidence of a congressional intent to preempt aviation product liability claims.[29] The court found certain "fundamental differences" between the regulations governing "in-flight operations" in *Abdullah* and regulations governing aircraft design. The court noted, among other things, that the aircraft design regulations prescribe procedural requirements for manufacturers, not specific rules governing the manufacture and design of aircraft, and did not include "a comprehensive standard of care" to evaluate conduct not specifically prescribed by the regulations, such as 14 C.F.R. § 91.13(a) for the operation of aircraft.[30]

After *Sikkelee,* the Supreme Court of Washington in *Estate of Becker v. Avco Corp.,* 387 P.3d 1066 (2017), also concluded that federal law did not preempt state product liability claims relating to aviation safety.[31] *Becker* involved a similar product liability claim for a defective carburetor that was alleged to have caused an aircraft accident resulting in the death of the plaintiffs' decedent.[32] Applying the presumption against preemption and expressing support for the Third Circuit's *Sikkelee* decision as well as the Ninth Circuit decision in *Martin v. Midwest Express Holdings, Inc.,* 555 F.3d 806 (9th Cir. 2009), the Washington court found that the federal aircraft manufacture and design regulations were not established to supplant state law standards of care and were "not comprehensive or pervasive enough to show Congress' intent to preempt state law."[33]

In contrast with the recent *Sikkelee* and *Becker* decisions, the Second and Tenth Circuits have held federal law to preempt the entire field of aviation safety.[34] Notably, the Tenth Circuit in *US Airways, Inc. v. O'Donnell,* 627 F.3d 1318, 1325 (10th Cir. 2010) found the presumption against preemption to not apply because the field of aviation safety has "long been dominated by federal interests."[35]

The recent *Sikkelee* and *Becker* decisions highlight a divide amongst courts as to whether federal law preempts the entire field of aviation safety, including state law product liability claims pertaining to the manufacture and design of aircraft. This issue will likely continue to be the subject of contentious debate and litigation and may, in a future case, be eventually resolved by the United States Supreme Court.

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[29] *Id.* at 693-94.
[30] *Id.* at 694-95.
[31] *Estate of Becker v. Avco Corp.,* 387 P.3d 1066, 1072 (2017).
[32] *Id.* at 1067.
[33] *Id.* at 1071.
[34] *See Goodspeed Airport LLC v. East Haddam Inland Wetlands & Watercourses Commission,* 634 F.3d 206 (2d Cir. 2011)("In *Air Transport Ass'n of America, Inc. v. Cuomo (ATA),* 520 F.3d 218, 225 (2d Cir. 2008), this Court observed that several of our sister circuits, and several district courts within our own circuit, have concluded that Congress intended to occupy the entire field of air safety and thereby preempt state regulation of that field… Today we join our sister circuits."); *US Airways, Inc. v. O'Donnell,* 627 F.3d 1318, 1327 (10th Cir. 2010)("We conclude that the comprehensive regulatory scheme promulgated pursuant to the FAA evidences the intent for federal law to occupy the field of aviation safety exclusively.").
[35] *US Airways, Inc.,* 627 F.3d at 1325.

FUN PAGES

Readers are encouraged to please submit (via email to alan.reitzfeld@hklaw.com) aviation-related original cartoons, other works of art (especially airplane doodles), poems, photographs, crossword puzzles, etc. for the Newsletter Fun Pages.

Photos

Thanks go to: (1) International Aviation Treaties Subcommittee Chair Christopher B. Kende for submitting the "emotional support Peacock" photos from The Jet Set, https://www.facebook.com/thejetsettv/videos/1777925285573434/; and (2) Fuel Subcommittee Chair Patrick Morris for submitting the photo of Helsinki in February.

Did you know?

Aviation History

Regulation of the airways began one hundred years ago this month as President Woodrow Wilson issued an order requiring licenses for civilian pilots and owners. https://en.wikipedia.org/wiki/Portal:Aviation/Anniversaries/February_28

Aviation Vocabulary Builder: Selected Federal Aviation Regulations

Part 91—General Operating And Flight Rules, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=4d3af1f0dd1276732ed7cf0d8daf6195&mc=true&node=pt14.2.91&rgn=div5#se14.2.91_11

Part 119—Certification: Air Carriers And Commercial Operators, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=9311698c59f46da00be65d97bce9170e&mc=true&node=pt14.3.119&rgn=div5

Part 121—Operating Requirements: Domestic, Flag, And Supplemental Operations, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=9311698c59f46da00be65d97bce9170e&mc=true&tpl=/ecfrbrowse/Title14/14cfr121_main_02.tpl

Part 125—Certification And Operations: Airplanes Having A Seating Capacity Of 20 Or More Passengers Or A Maximum Payload Capacity Of 6,000 Pounds Or More; And Rules Governing Persons On Board Such Aircraft, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=9311698c59f46da00be65d97bce9170e&mc=true&node=pt14.3.125&rgn=div5

Part 133—Rotorcraft External-Load Operations, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=9d03eb9274538bc22d7c1665a683f2dd&mc=true&tpl=/ecfrbrowse/Title14/14cfr133_main_02.tpl

Part 135—Operating Requirements: Commuter And On Demand Operations And Rules Governing Persons On Board Such Aircraft, available at https://www.ecfr.gov/cgi-bin/text-idx?SID=9311698c59f46da00be65d97bce9170e&mc=true&tpl=/ecfrbrowse/Title14/14cfr135_main_02.tpl