

NEW YORK
CITY BAR

COMMITTEE ON AERONAUTICS NEWSLETTER

Volume 3, No. 4, December 2019

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The views and opinions expressed in these articles are those of the authors and do not necessarily reflect the views of the New York City Bar Association.

From the Committee Chair and Committee Secretary:



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Committee Chair



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Committee Secretary

Welcome to the tenth (!) issue of our Committee’s Newsletter. The prior issues are posted (by year) on the Committee’s section of the New York City Bar’s public website (click on the “News & Media” button): <http://www.nycbar.org/member-and-career-services/committees/aeronautics-committee>. We hope that our Committee Members and Alumni (and other readers accessing this Newsletter on the Bar’s website) continue to find each issue very interesting.

Our Committee focuses on a wide variety of aerospace issues, including topics covered in our 22 subcommittees (see p. 3). The Committee meets monthly from September through June and usually has guest speakers at each meeting. It is a vibrant group, and membership has grown substantially in recent years. In addition to our meetings, the Committee holds other events. Most recently, on October 24th the Committee held its second annual Hot Topics in Aviation Event, which was co-sponsored by the International Bar Association Aviation Law Committee, the Lawyer-Pilots Bar Association, and the New Jersey State Bar Association Aviation Law Committee. The Event featured presentations on aviation-related legal issues and historical events, including a panel on aircraft certification issues, speakers on space law and on the operations of the Port Authority of New York and New Jersey, and presentations on lessons of service from Naval Aviation and on the mystery of the 1927 disappearance of the L’Oiseau Blanc biplane during an attempt to make the first non-stop transatlantic flight between Paris and NYC. (<https://services.nycbar.org/EventDetail?EventKey=AVN102419&WebsiteKey=f71e12f3-524e-4f8c-a5f7-0d16ce7b3314>)

Please stay tuned for more information about activities of the Committee on Aeronautics.

¹ Before retiring in April 2018, Alan Reitzfeld was a senior partner in Holland & Knight LLP’s Litigation Practice Group, where he played a leading role for many years defending airlines in multi-district litigation arising out of numerous major domestic and foreign commercial jet airline crashes and other incidents. In addition to chairing this Committee, Alan is the Chair of the International Bar Association’s Aviation Law Committee.

² Sarah Passeri is a partner in Holland & Knight LLP’s Litigation Practice Group. Ms. Passeri’s practice focuses on aviation and complex litigation matters, as well as asset-based financing, leasing, acquisitions, sales and securitizations, with a particular emphasis on aviation and equipment finance. She has experience flying single-engine aircraft.

SUBCOMMITTEE LIST

SUBCOMMITTEE	CHAIR
Aerospace Engineering Law and Policy Subcommittee	Daniel G. Agius
Airline Business Subcommittee	Gene K. Kaskiw
Airport Travel, Safety and Funding Issues	Yuliya Khaldarova
Aviation and Government Contracting	Ian Massar
Aviation Finance Subcommittee	Michael P. Peck
Aviation Insurance Subcommittee	Sophia L. Cahill
Aviation-Related Intellectual Property Subcommittee	Jeff Tsai
Canadian Comparative Air Law Subcommittee	Jeffrey Derman
Commercial Airline Casualty Subcommittee	Erin Applebaum
Corporate/Private Jet Charter Subcommittee	Susan Sullivan Bisceglia
Cybersecurity and Aviation Subcommittee	Rebecca Tingey
Drone/UAS Regulation & Licensing Subcommittee	Michael Davies
Federal Preemption Subcommittee	Philip Weissman
Fuel Subcommittee	Patrick Ryan Morris
General Aviation Subcommittee	Albert J. Pucciarelli
International Aviation Treaties Subcommittee	Christopher B. Kende
Regulatory Subcommittee	Racquel H. Reinstein
Reports Subcommittee	Daniel G. Agius
Subcommittee on Commercial Space Flight	Austin C. Murnane
Subcommittee on ICAO Developments	Maria C. Iannini
Subcommittee on Rotary-Wing Aviation	Jonathan Callaway
Technical Advances in Aviation Subcommittee	Jenny A. Urban

COMMITTEE NEWS

Professional Awards, Honors and Recognitions

Congratulations to:

- Sarah Passeri for being named as one of only four transportation attorneys under age 40 honored by Law360 as Rising Stars. <https://www.law360.com/articles/1191150>
- Jenny Ann Urban on being included in the “2019 Airport Business Top 40 Under 40.” <https://www.aviationpros.com/airports/article/21092644/2019-airport-business-top-40-under-40>

New Positions

Jeff Tsai has joined the law firm of Covington & Burling LLP as an associate focusing on commercial transactions involving intellectual property, technology and data, particularly in the commercial aviation industry.

Presentations

Justin Green, Racquel Reinstein, Alan Reitzfeld, Jenny Ann Urban and Diane Westwood Wilson spoke at the 12th Annual McGill Conference on International Aviation Liability, Insurance & Finance, Montreal, Canada, October 18-19, 2019. <https://www.mcgill.ca/iasl/iali/iali2019>

Sarah Passeri spoke at the conference “The Aviation Lawyer’s Operating Handbook: Learning to Litigate, Navigate, and Communicate,” sponsored by the ABA Tort Trial & Insurance Practice Section, Aviation and Space Law Committee, Washington, D.C., October 24-25, 2019.

ARTICLES

The Aircraft Flew... Weird: Function Check Flights v. Diagnostic Flights

Jonathan Callaway¹

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Chair, Subcommittee on Rotary-Wing Aviation



The term “test pilot” often warrants an image of someone in a G-suit ripping apart the horizon at Mach 3 alongside Neil Armstrong or Chuck Yeager. However, the pop culture display of aviator glasses and white knuckling the controls while inverted between beach volleyball sessions isn’t how pilots spend their day. While there are those radical few who genuinely fly by the seat of their pants, most test flights involve post maintenance operational checks which are, preferably, much less eventful than any Hollywood adaptation. A simple analogy would be if brakes were changed on a car. The Hollywood version would be replacing the brakes, heading straight to Daytona and hoping for the best. In reality, prior to hitting the highway, the owner would likely perform a few brake checks in the driveway or parking lot to ensure everything works as it should in a relatively controlled environment. If there happens to be a discrepancy, the only damage would be a puddle of brake fluid or at most a small fender bender. Aircraft are no different, except that you can’t pull off the road to look under the hood if something goes awry.

There is no discrimination in FAA regulation between fixed or rotary-wing aircraft when it comes to flights following maintenance. Regulation prohibits the operation of any aircraft that has undergone maintenance unless it has been returned to service by an authorized person and the appropriate entry has been recorded in the aircraft’s logbook (14 CFR § 91.407, 2012). Federal Aviation Regulation (FAR) further demands that following any maintenance that may have appreciably changed the aircraft’s flight characteristics or substantially affected its flight operation, a pilot must perform a related operational check which is then annotated in the logbook prior to being returned to service (14 CFR § 43.7, 2004). This operational check is what many refer to as a functional check flight (FCF). Aircraft manuals will specify which maintenance items require FCFs as well as the parameters that must be observed. While FARs only require an appropriately rated pilot with at least a private certificate, the Department of Defense, as well as several commercial organizations, have programs in place to designate maintenance test pilots who are much more knowledgeable than their peers (14 CFR § 91.407, 2012).

¹ Jonathan Callaway is a student at Brooklyn Law School and a Warrant Officer in the Army National Guard, where he currently works as a drug interdiction pilot. He has approximately 12 years’ experience in aviation as a mechanic, crew chief, inspector and pilot working for organizations such as the U.S. Marine Corps, U.S.M.A. West Point, Sikorsky Aircraft and the Federal Bureau of Investigation.

Generally, FCFs are required following significant maintenance on engines, transmissions, fuel systems or flight control systems. Checklists are oftentimes very specific and state exact parameters that a pilot must evaluate during an FCF to ensure the aircraft is safe. The parameters that are evaluated are designed to not only ensure the aircraft functions normally, but that it also functions as designed when things go wrong. Pilots will have to induce failures or push an aircraft to extreme limits to ensure redundant systems operate properly and that no abnormal failures occur. For instance, a dual-engine aircraft may require rolling the non-suspect engine to idle during flight to evaluate how the engine in question performs individually under the higher workload. This may seem nonsensical because no pilot would normally fly the aircraft in that manner, but it ensures that if the good engine fails in the future, the engine being tested will perform effectively enough to operate the aircraft safely on its own.

While all FCFs include checking the function and reliability of systems, rotorcraft FCFs include several checks and adjustments to reduce vibration levels. “[A] helicopter is several thousand rotating components trying desperately to shake themselves free of one another. In my experience, this is often a true statement, but a correctable one.”² Helicopters have radically different vibration levels compared to that of their fixed-wing counterparts. These vibrations are the symptoms associated with rotating components that are not properly balanced. To understand, imagine a car that has an unbalanced tire. As the driver goes down the highway, a thumping sound will be audibly present, and the driver may experience slight turbulence in the steering wheel. This occurs because the center of rotation isn’t occurring at the center of the wheel. Balancing a tire corrects this because adding or removing weight to a rotating object can shift the center of rotation back to the actual center of the wheel. Now, imagine that same thump and turbulence proportionally to a massive unbalanced rotorhead spinning at full speed. Without corrective action, it can quickly escalate to a catastrophic failure.

While eliminating all vibrations is impossible, safe flying requires them to be as minimal as possible. To reduce vibrations, sensors are installed on the aircraft and the pilot runs through a series of flight regimes to measure the vibration severity and angular direction. A technician then reviews the data and makes an adjustment by adding or removing weight on the component vibrating which is remeasured by the pilot when the pilot repeats the series of flight regimes and tests. This process repeats until the vibrations are optimal at which point the pilot signs off the operational check, and an authorized person makes annotations in the logbook and returns the aircraft to service. The process for checking the function of other systems is very similar. The pilot will fly the aircraft, run it through specific checks, bring it back for adjustments and repeat until the aircraft is operating within limits.

This whole process seems very simple on paper, but in practice it becomes very muddled because in addition to post maintenance checks, FCFs are sometimes used to diagnose faults in an aircraft. Unfortunately, pilots don’t always know how an aircraft works beyond wiggling the sticks, and simultaneously, mechanics don’t always know how an aircraft works beyond nuts and bolts. Problems arise because two people speaking from two different, and frankly, possibly ill-informed perspectives may not be able to collectively determine what is wrong with an aircraft because the fault cannot be duplicated on the ground and neither individual has an understanding

² Robinson, M. (1999, 02 01). Helicopter Track and Balance Theory. Retrieved from AviationPros: <https://www.aviationpros.com/engines-components/article/10389059/helicopter-track-and-balance-theory>

of what really happened in the air. This prompts an FCF where a skilled pilot will run the aircraft through its paces to intentionally induce a failure to repeat and ultimately diagnose the problem. The basic concept is a skilled pilot saying “you don’t know what you’re talking about, let me have a look to see what is going on.” While this sounds absurd, it is sometimes the only way to determine if the previous pilot experienced an anomaly or if there is an underlying issue that needs to be addressed before someone gets hurt.

The legal problem with using an FCF to diagnose aircraft is that pilots and maintainers will often times delay recording a discrepancy until after the FCF in order to ensure the most accurate write-up is made. Doing this may create severe liabilities because an aircraft with a discrepancy is being accepted by another pilot and flown with no official record of the problem. When the first pilot experienced the issue in question, the proper action would be to immediately record the discrepancy as best as possible in the logbook, even if all they can say is there was an abnormal vibration or sound. The next step could possibly be an FCF, but without the proper entry in the logbook the records are technically invalid and the pilot has violated the FARs by not reporting the issue correctly. If the diagnostic FCF results in a mishap, anyone involved in the decision to fly the aircraft without recording the discrepancy will be in violation of the FARs.

Regulation is very clear when it comes to recording discrepancies following a flight (14 CFR § 121.563, 2012). The pilot shall ensure all irregularities, not just properly diagnosed failures, are entered in the logbook at the end of that flight (14 CFR § 121.563, 2012). In situations where the fault is unclear, operators sometimes lean towards not recording it in the logbook under the presumption that it is better to not record something until the exact fault is determined following an in-house investigation and FCF. This way of thinking comes from the demand to have all aircraft in a flight ready status unless there is a defined reason to down it. Unfortunately, downing an aircraft without an exact reason, or for a precautionary reason, can cause non-operators to question the validity of the discrepancy as well as the experience of those involved in writing it up. Accuracy and thoroughness are of paramount importance when it comes to recording discrepancies, but not flying a broken aircraft supersedes that standard. When a pilot doesn’t know exactly what is wrong, pretending the problem isn’t there until a senior pilot evaluates it on a risky flight is the backwards kind of thinking that may cause easily preventable mishaps. This practice leaves owners and managers vulnerable to liability when things go wrong and potentially exposes aircrews to recklessly dangerous and unpredictable situations.

The simple answer that keeps the owners and operators safe is to write the discrepancy up every single time, even if it is vague. Unfortunately, some argue that a preliminary diagnostic FCF is required because some failures can’t be duplicated on the ground for verification purposes and it doesn’t help having vague information. However, a vague record is still a legal record that may protect all parties involved and answers a lot of questions that may arise later on. Luckily, technology is rapidly changing the validity of this failing argument. Some modern aircraft now have in-flight recording systems, permanently installed test sensors and digital instruments. These tools allow an aircraft’s computer to record everything while also constantly running diagnostic tests to help ensure that, if an aircraft ever exceeds a limit, the proper information is relayed appropriately and that no pilot has to fly an aircraft that may be unsafe to diagnose what is wrong with it. Until the day when everything is recorded and automated, the FARs still require

any irregularity to be recorded in the logbook, not just the “important” ones (14 CFR § 121.563, 2012).

Task Force Urges Immediate Action to Protect Airports from Rogue Drone Threats

Michael G. Davies¹

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Chair, Subcommittee on UAS/Drone Operations and Regulation



A blue ribbon task force² made up of leading US and Canadian airport officials and former top FAA administrators recently issued sweeping recommendations to better secure US and Canadian airports from threats of malicious or careless drone operations.

The threat to airports and the havoc that can result from unauthorized drone operations is well-known and was vividly illustrated by the disruption to flight operations caused by suspected drone activity at London's Gatwick Airport in December 2018. Operations at Newark Liberty International Airport were also disrupted in January 2019.

In its report,³ the task force noted the benefits and concerns raised by Unmanned Aircraft Systems ("UAS") operations near airports:

Commercial UAS applications continue to create new opportunities and add significant value to airport operations, but, unfortunately, also continue to represent a major challenge in and around the airport environment. Airports and their tenants benefit greatly from current UAS use in perimeter security, facility surveying and inspection, equipment inspection, and emergency response support. Equally significant are the concerns unauthorized UAS operations cause at or in the vicinity of airports. Unauthorized UAS have great potential to disrupt operations and the threat of intrusions introduces substantial risk highlighting the need for solutions that can safeguard airports from rogue UAS.

However, the task force found that the federal authorities' response to the rogue drone threat has been slow and ineffective. The task force laid blame for the lack of progress in safeguarding airports from rogue drones squarely on the current UAS regulatory and legal framework. In particular, the task force pointed to the FAA's failure to implement Remote Identity ("Remote ID") capabilities, which would allow the authorities to immediately identify the operator of a

¹ Michael G. Davies, formerly a principal of the Law Offices of Michael G. Davies LLC, is now a partner in the newly-formed law firm Dunning Rievmann & Davies LLP, based in New York, New York. Mr. Davies specializes in aviation law and dispute resolution, representing aircraft owners, lessors, operators and other industry professionals in the U.S. and abroad in a range of commercial matters and disputes, including the emerging field of unmanned aerial systems. Mr. Davies also specializes in U.S. commercial litigation and international litigation and arbitration.

² The "Blue Ribbon Task Force on UAS Mitigation at Airports"

³ <https://uasmitigationatairports.org/blue-ribbon-task-force-on-uas-mitigation-at-airports-final-report/>

drone engaged in potentially threatening operations. Remote ID would assist authorities in identifying, tracking and stopping careless operators who wander inadvertently into unauthorized airspace, and to distinguish them from operators with potential criminal intent. The task force noted that the “importance of the ability to remotely identify and track [careless] operators cannot be understated, as it would significantly reduce UAS incidents caused by the largest group of violators.”

The task force also criticized the failure to establish a regulatory and funding framework empowering local authorities to respond to drone threats. Noting that the current US legal framework only allows several federal agencies the authority to engage in counter-drone actions, the task force urged that it was critical that local authorities be empowered to defend airports from drone threats. “Extending authority to engage in UAS interdiction to trained local law enforcement tasked with safeguarding airports is the critical next step for government, one that can be accomplished while protecting civil liberties and statutory limitations.”

The task force also observed that the respective roles and responsibilities of federal, state and local law enforcement agencies remain unclear, and that airport operators are constrained by law from bringing down unauthorized drones. The task force urged that airports and the federal government share responsibility for drone detection, but that the FAA be given the lead role in monitoring drone traffic around airports. It also urged that Congress extend authority to engage in UAS interdiction - - kinetic or electronic - - to trained state and local law enforcement.

Among the task force’s other recommendations:

- The FAA should urgently establish drone detection standards and provide more straightforward guidance to airports seeking to deploy detection, tracking and identification (“DTI”) technology;
- Congress should give the FAA, which is understaffed, underfunded and subject to government shutdown, sufficient resources to perform its lead role of monitoring UAS traffic in and around airports;
- It should be made clear that airports have a supporting and collaborative role in relation to the FAA rather than the lead role;
- The federal government should clearly define the roles, responsibilities and authority of local law enforcement agencies;
- Current laws prohibiting non-federal counter-UAS operations to protect airports should be reviewed; and
- The threat level at which there is likely disruption to airport operations needs to be identified and a response that considers the role of the TSA as the lead federal agency needs to be developed.

The task force urged that the increasing threats posed by rogue drones mandated immediate action, noting that “[i]t is no longer acceptable for a lack of legal framework, understanding of technology, or authority to be the reasons airports remain at risk of a serious UAS event. It is time consideration be given to balancing response capabilities with continually evolving UAS threats.”

Attacking the Unruly Passenger Problem: Round 2: The 2014 Montreal Protocol

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Chair, International Aviation Treaties Subcommittee



Long lines, cramped spaces, no legroom, bad food, surly flight attendants, add alcohol (an extra charge) and you have a recipe for belligerence, aggression and physical altercations. The problem of unruly passengers on aircraft is only increasing. The incidents range from punching another passenger to storming the cockpit door, to even threatening to open the emergency exit at 30,000 feet. A recent IATA report suggests that there is one unruly passenger incident per 1,053 flights.² This works out to an estimated number of 40,000 to 50,000 incidents in 2018 based on an estimated 45 million flights.

Both the industry and the international legal community have worked to deal with this problem, which is only getting worse. The basic legal framework is the Convention on Offences and Certain Other Acts Committed on Board Aircraft (signed at Tokyo in 1963) also known as the Tokyo Convention. The Convention makes it unlawful for passengers to commit acts which, whether or not crimes, may jeopardize the safety of the aircraft or persons or property on board or which jeopardize the “good order and discipline on board”. It authorizes the prosecution and offloading of unruly passengers, within the discretion of the pilot. If the pilot wishes the unruly passenger to be arrested, he must land in a state which is a party to the Convention and deliver the passenger to local authorities.

Unfortunately the Convention allows for a jurisdictional “gap” since the Convention requires that, for a prosecution to be successful, the state authority must prove that the passenger’s conduct constituted a crime under the law of the registration state of the aircraft (i.e. where the offending conduct occurred) rather than the law of the state where the aircraft landed and surrendered the passenger. This makes for a complex situation which often leads to the unruly passenger going scot free.

Fortunately there has been some attempt to remedy the situation with the adoption of the Montreal Protocol by IATA at the Conference held, not surprisingly, in Montreal in 2014. The Protocol extends jurisdiction under the Convention over offenses of unruly passengers to the

¹ Mr. Kende is a Member of the law firm Cozen O’Connor. He is admitted to practice in the states of New York, Massachusetts, California and the District of Columbia and numerous federal courts around the country. He is Adjunct Professor of Transportation and Maritime Law at Brooklyn Law School.

² <https://www.iata.org/policy/consumer-pax-rights/Pages/unruly-passengers.aspx>.

state of intended landing as well as the state of registration of the aircraft. Jurisdiction is also extended to third party states in the event the aircraft is re-routed.

In addition the Protocol provides greater clarity as to what constitutes “unruly behavior,” which now includes physical assault or threat of assault of another passenger or crew member as well as the refusal to follow a lawful order from a crew member for safety purposes.³

Another improvement is a provision which no longer requires that the pilot determine that the conduct constitutes a serious offence in accordance with the criminal laws of the state of registration of the aircraft, but only that he or she determine that the incident constitutes a “serious offence”.⁴ This determination will be sufficient to allow delivery of the offending passenger to local authorities. In addition, Article XIII of the Protocol actually allows for the recovery of costs from the unruly passenger (good luck with that one).

The Protocol requires ratification by 22 states to enter into force. As of the writing of this Article, 21 states, the last being Paraguay in August of this year, have ratified the Protocol. A number of states are in the process of taking appropriate steps to ratify. Thus it seems entry into force of the Protocol is imminent.

Airlines should familiarize themselves with these new provisions and ensure that their general terms and conditions of travel reflect the changes described above, including incorporating language advising passengers of the consequences flowing from unruly behavior on board their aircraft, and additionally, including advising of possible recourse for fees and costs in case of an incident. Carriers should also implement, if not already in existence, clear protocols for dealing with an unruly passenger situation on board, approved by senior management. Further, flight crews need to be trained in conflict management and avoidance so as to minimize exposure when unruly passenger situations arise. Frequently, and in my experience having dealt with a number of these cases, the crew can find itself “in between a rock and a hard place.” Do they act proactively and restrain an aggressive passenger, only to have the airline sued by that passenger (although the Protocol does purport to immunize the pilot and carrier from liability), or do they simply try to “talk the passenger down” only to find that subsequently an innocent passenger has been attacked, which will certainly entail litigation and/or substantial liability for not having acted appropriately? One such incident for a client of mine ended up costing the carrier and its insurers a very significant sum, where a decision was made to talk the unruly passenger down and simply move him to another seat, rather than restrain him.

Unfortunately we are not on Air Force One and cannot simply tell the unruly passenger “Get off my plane!” It would be nice if it were that simple. However, the situation is far more complex.

³ Montreal Protocol, Article VII.

⁴ Montreal Protocol, Article VIII.

The World's Largest Airport Is Opened!

Yuliya Khaldarova¹

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Chair, Airport Travel, Safety and Funding
Issues Subcommittee



On September 25, 2019 China opened the doors to the largest airport in the world by square footage area, Beijing Daxing International Airport (“Daxing”).

Nicknamed “starfish” by various media, the airport is meant to represent a phoenix with five concourses connected to a main hall. Designed by ADP Ingénierie and Zaha Hadid Architects, the airport consists of a 1.03-million square meter terminal building, 78 gates and six runways;² the gates are on the five “arms” of the airport, and parking and administrative offices are on a sixth “arm”.³ It cost \$63 billion dollars⁴ to build. Daxing is the world’s first airport with double-deck arrival and departure areas so the distance between the security checkpoint and the furthest gate is a mere 600 meters.⁵

Sustainable design elements include: 8 columns and 8,000 rooftop windows to allow a maximum amount of sunlight but able to absorb 60% of the solar heat,⁶ a water management system to collect rainwater and purify water from nearby lakes, and centralized heating designed to recover excess airport-generated heat.⁷ On the technology side, the airport will have 400 self-service check-in desks,⁸ facial recognition for smart check-in and secure and expedited access to the airport,⁹ paperless boarding,¹⁰ radio frequency identification devices for baggage tracking,¹¹ and

¹ Yuliya Khaldarova is a contract banking attorney currently serving as Interim Senior Counsel for USAA Federal Savings Bank. As a frequent business and leisure traveler, Yuliya enjoys learning about airports and aviation.

² See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>; <https://qz.com/1715791/beijings-daxing-international-airport-is-officially-open/>; <https://www.airport-technology.com/projects/beijing-daxing-international-airport-china/>

³ See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>

⁴ See <https://www.reuters.com/article/us-china-airport/chinas-xi-declares-new-63-billion-beijing-airport-is-formally-open-idUSKBN1WA0AO>

⁵ See <https://interestingengineering.com/beijing-daxing-airport-is-now-open-and-it-has-the-worlds-largest-terminal>

⁶ See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>

⁷ See <https://www.fastcompany.com/90411014/beijings-new-mega-airport-10-years-and-11b-in-the-making-is-open>

⁸ See <https://interestingengineering.com/beijing-daxing-airport-is-now-open-and-it-has-the-worlds-largest-terminal>

⁹ See <https://www.scmp.com/news/china/society/article/3030334/beijing-daxing-airport-worlds-largest-takes-flight>

¹⁰ See <https://news.cgtn.com/news/2019-06-30/Here-are-the-futuristic-technologies-in-the-new-Beijing-airport-HW136zaeg8/index.html>

¹¹ See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>

humanoid robots ready to assist passengers.¹² It will have a robotic parking system where all one will need to do is park a car on a platform for a robot to transport it to an empty spot.¹³

Other notable design elements include an underground railway station built for the fastest trains in China¹⁴ that will connect the airport to Beijing in 19 minutes.¹⁵ To ensure the structure will withstand train ramblings and not endure shaking, engineers built 1,000 anti-seismic isolation bearings into the concrete slabs. As a result, the structure is said to be able to withstand an 8.0 magnitude earthquake.¹⁶

By 2025 Daxing targets to accommodate 72 million passengers and two million tons of cargo annually.¹⁷ The airport is also expected to replace Atlanta Hartsfield-Jackson as the world's busiest airport.¹⁸

¹² See <https://news.cgtn.com/news/2019-06-30/Here-are-the-futuristic-technologies-in-the-new-Beijing-airport-HWi36zaeg8/index.html>

¹³ *Id.*

¹⁴ See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>

¹⁵ See <https://interestingengineering.com/beijing-daxing-airport-is-now-open-and-it-has-the-worlds-largest-terminal>

¹⁶ See <https://www.engineering.com/BIM/ArticleID/19527/China-Opens-Massive-New-Daxing-International-Airport.aspx>

¹⁷ See <https://www.airport-technology.com/projects/beijing-daxing-international-airport-china/>

¹⁸ *Id.*

Senators Introduce Legislation to Address Airline Cybersecurity and Privacy

Bradford P. Meisel¹

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In recent months, Senators introduced two bills addressing airline cybersecurity and privacy.

The first bill, the Passenger Privacy Protection Act of 2019, was introduced by Senators Jeff Merkley (D-OR) and John Kennedy (R-LA) on April 11, 2019 and referred to the Senate Committee on Commerce, Science and Transportation.² The bill was introduced less than a month after Senators Merkley and Kennedy wrote a letter to executives of eight air carriers including Delta, Southwest, United and JetBlue expressing concern regarding airlines' monitoring of passengers after CNN reported that multiple airlines had cameras embedded in aircraft seats.^{3 4} The Senators' letter asked the airline executives to provide information regarding whether they use cameras to monitor passengers, the purpose of any such camera usage, and security measures used to prevent the hacking of cameras monitoring passengers or data obtained from cameras monitoring passengers.⁵

The Act, which would apply to all air carriers and foreign air carriers, would prohibit the installation of any in-flight entertainment system with an embedded camera or microphone or any camera or microphone separate from an in-flight entertainment system that is designed to observe a passenger.⁶

The Act would require that any camera already embedded in an in-flight entertainment system be removed, permanently disabled and covered, or covered to prevent it from making any

¹ Bradford P. Meisel is an Associate at McElroy, Deutsch, Mulvaney & Carpenter specializing in corporate transactions, cybersecurity, data privacy, and drone law who previously served as a Senate Judiciary Committee Law Fellow to U.S. Senator Sheldon Whitehouse of Rhode Island and Cybersecurity and Technology Law Clerk to U.S. Senator Gary Peters of Michigan.

² Passenger Privacy Protection Act of 2019, S. 1206, 116th Cong. (2019).

³ Office of Senator Jeff Merkley, "Merkley, Kennedy Raise Privacy Alarms After Revelations that Airlines May be Monitoring Passengers through In-Flight Entertainment Systems," Office of Senator Jeff Merkley (March 18, 2019) <https://www.merkley.senate.gov/news/press-releases/merkley-kennedy-raise-privacy-alarms-after-revelations-that-airlines-may-be-monitoring-passengers-through-in-flight-entertainment-systems> accessed November 21, 2019.

⁴ Francesca Street, "Can Airplane Seat Cameras Spy on Passengers?," CNN (March 3, 2019) <https://www.cnn.com/travel/article/airplane-seat-camera-intl/index.html> accessed November 21, 2019.

⁵ Office of Senator Jeff Merkley, "Merkley, Kennedy Raise Privacy Alarms After Revelations that Airlines May be Monitoring Passengers through In-Flight Entertainment Systems," Office of Senator Jeff Merkley (March 18, 2019) <https://www.merkley.senate.gov/news/press-releases/merkley-kennedy-raise-privacy-alarms-after-revelations-that-airlines-may-be-monitoring-passengers-through-in-flight-entertainment-systems> accessed November 21, 2019.

⁶ Passenger Privacy Protection Act of 2019, S. 1206, 116th Cong. (2019).

observations within two months of the Act's enactment.⁷ The Act would also require that any microphone already embedded in an in-flight entertainment system be removed or physically disconnected and covered to render it ineffective within two months of the bill's enactment. The Act further requires that any cameras or microphones separate from an in-flight entertainment system designed to observe a passenger be removed within two months of the Act's enactment.⁸

The second bill, the Cyber AIR Act, was introduced by Senators Ed Markey (D-MA) and Richard Blumenthal (D-CT) on July 18, 2019 and referred to the Senate Committee on Commerce, Science, and Transportation.⁹ Although Senators Markey and Blumenthal previously introduced a version of the Act in 2017 and Senator Markey introduced a version of the Act in 2016, the Senate Committee on Commerce, Science, and Transportation never voted or held hearings on either bill.^{10 11}

The Cyber AIR Act would direct the Secretary of Transportation to prescribe regulations requiring air carriers, foreign air carriers, and manufacturers of aircraft or electronic control, communications, maintenance, or ground support systems for aircraft to notify the Federal Aviation Administration (FAA) of any attempted or successful cyberattack on any system on board an aircraft or any maintenance or ground support system for aircraft.¹² The Act would also direct the Commercial Aviation Communications Safety and Security Leadership Group established by the January 29, 2016 memorandum of understanding between the Department of Transportation (DOT) and Federal Communications Commission (FCC) to evaluate the cybersecurity of broadband wireless communications equipment designed for consumer use on aircraft, develop effective methods for preventing foreseeable cyberattacks that exploit such equipment, and require air carriers, manufacturers, and communication service providers to implement technical and operational security measures deemed to be necessary and sufficient.¹³

⁷ *Id.*

⁸ *Id.*

⁹ Cyber AIR Act, S. 2181, 116th Cong. (2019).

¹⁰ Cyber AIR Act, S. 679, 115th Cong. (2017).

¹¹ Cyber AIR Act, S. 2764, 114th Cong. (2016).

¹² Cyber AIR Act, S. 2181, 116th Cong. (2019).

¹³ *Id.*

In Space Resource Utilization: Law, Policy, and Dispute Resolution

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This is a new column in the Newsletter that will discuss legal topics relating to commercial space flight. In this inaugural column, we will address the legal issues arising from the use of resources acquired in outer space, including Earth’s Moon and other celestial bodies. This is known in the space industry as *in situ* (Latin for “on site”) resource utilization, occasionally anglicized as “in space” resource utilization (“ISRU,” in either case).

Who is interested in ISRU?

The U.S. Government, led by NASA, has adopted a policy of pursuing ISRU,² beginning with the acquisition and use of water ice located at the South Pole of Earth’s Moon.³ These activities are currently planned to support NASA’s “Artemis” program,⁴ a successor to the Apollo program that sent nine crewed missions to the Moon, including six landings, between 1968 and 1972.⁵ The Artemis program will depend on services provided by various commercial partners, some of whom are already developing spacecraft and systems to support Artemis.⁶ Artemis will also be an international effort, in which the Australian, Canadian, and Japanese governments have all committed to participate, with others expressing interest.⁷

Beyond Artemis, other countries and commercial entities are considering lunar exploration activities including ISRU. These include the Chinese Lunar Exploration Program, an effort to

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² NASA, In-Situ Resource Utilization (accessed Nov. 18, 2019) available at <https://www.nasa.gov/isru>.

³ Steve Gorman and Mana Rabiee, NASA chief excited about prospects for exploiting water on the moon, REUTERS (Aug. 21, 2018) available at <https://www.reuters.com/article/us-nasa-bridenstine/nasa-chief-excited-about-prospects-for-exploiting-water-on-the-moon-idUSKCN1L7062>.

⁴ NASA, Artemis (accessed Nov. 18, 2019) available at <https://www.nasa.gov/specials/artemis/>.

⁵ NASA, The Apollo Missions (accessed Nov. 18, 2019) available at https://www.nasa.gov/mission_pages/apollo/missions/index.html.

⁶ Press Release, NASA, New Companies Join Growing Ranks of NASA Partners for Artemis Program (Nov. 18, 2019) available at <https://www.nasa.gov/press-release/new-companies-join-growing-ranks-of-nasa-partners-for-artemis-program>.

⁷ Press Release, NASA, NASA Gains Broad International Support for Artemis Program at IAC (Nov. 8, 2019) available at <https://www.nasa.gov/feature/nasa-gains-broad-international-support-for-artemis-program-at-iac>.

identify resources for exploitation on the Moon’s South Pole, which has already involved equipment provided by Germany, Sweden, and the Netherlands, and for which Russia, Turkey, Ethiopia, and Pakistan have signed agreements to provide support.⁸

Why does ISRU matter?

Scientists, engineers, business executives and government officials routinely speak in terms of “trillions” of dollars when discussing the future of the space industry, in large part because ISRU has extremely high *potential* value, though the timeline for feasibility remains very uncertain.⁹ As noted above, the primary near-term target of U.S. Government ISRU activity will be the deposits of water ice detected at the lunar poles. This ice could facilitate space exploration in several important ways. If prospectors can remove the ice from the lunar surface and melt it into liquid water, they could then separate it into hydrogen and oxygen via electrolysis (a century-old technique of subjecting water to an electrical current).¹⁰ Hydrogen and oxygen, cooled into liquid form, could theoretically be used to fuel space rockets.¹¹ A supply of such fuel, acquired in space, could substantially decrease the cost of space travel because it would reduce the need for fuel to be lifted from Earth’s surface using costly supplies of other fuel.¹² This would facilitate more efficient access to other ice deposits in a virtuous cycle. Oxygen gas derived from the same process could also be used as breathable air for astronauts.¹³ Of course, astronauts could also drink and wash using melted lunar ice, which would further reduce the cost of life support materials lifted into space from Earth. Additionally, blocks of water ice could be used to construct structures to house astronauts. Ice is particularly effective for such habitats because it is relatively easy to mold into a required shape and it is an excellent shield against radiation – a significant hazard to astronauts.¹⁴

Water, most of which is frozen, appears to be an abundant resource among the millions of asteroids and other celestial bodies in Earth’s solar system.¹⁵ Although most of these bodies are much farther from Earth than the Moon, the recovery of resources from some of them, including small asteroids, might be less costly than a Moon mission because these asteroids, being smaller than the Moon, have much less gravity. A visiting ship could therefore collect resources from

⁸ Chunlai et al., “China’s present and future exploration program,” *SCIENCE* (July 19, 2019) available at <https://science.sciencemag.org/content/365/6450/238> (subscription required).

⁹ Katie Kramer, NBC NEWS, “Neil deGrasse Tyson Says Space Ventures Will Spawn First Trillionaire,” (May 3, 2015) available at <https://www.nbcnews.com/science/space/neil-degrasse-tyson-says-space-ventures-will-spawn-first-trillionaire-n352271>.

¹⁰ de Groot et al., NASA TECHNICAL MEMORANDUM 113157, “Electrolysis Propulsion for Spacecraft Applications,” (Oct. 1997) available at <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19970041522.pdf>.

¹¹ *Id.*

¹² See David Shortl, THE PLANETARY SOCIETY, “Learn the rocket equation, part 1” (Apr. 28, 2017) (explaining the exponential behavior, known as the “rocket equation” in which propellant is required to lift propellant).

¹³ NASA, Breathing Easy on the Space Station (accessed Nov. 18, 2019) available at https://science.nasa.gov/science-news/science-at-nasa/2000/ast13nov_1.

¹⁴ Press Release, NASA, A New Home on Mars: NASA Langley’s Icy Concept for Living on the Red Planet (Dec. 29, 2016) available at <https://www.nasa.gov/feature/langley/a-new-home-on-mars-nasa-langley-s-icy-concept-for-living-on-the-red-planet>.

¹⁵ NASA Jet Propulsion Laboratory, Water: Life’s Elixir in the Solar System (accessed Nov. 18, 2019) available at https://www2.jpl.nasa.gov/solar_system/water/water_index.html.

them and return to Earth (or elsewhere) without using as much fuel during the return launch as they would when launching from the Moon.¹⁶

Other resources that appear to be plentiful throughout the solar system include platinum group metals and other precious metals like gold.¹⁷ In addition to their intrinsic value, these metals have functional uses in electronic components. Other electronics staples like silicon and aluminum also appear to be plentiful throughout the solar system, as are cobalt and lithium, both of which are especially useful in solar panels and batteries. In fact, most metals, including nickel, iron, and other useful construction materials, appear frequently in analyses of asteroids. Nitrogen and ammonia, commonly used in agricultural fertilizer, have also been detected in apparently significant quantities.¹⁸

The trillion-dollar question: Is this a next-year, next-decade, or next-century thing?

The acquisition of space resources has proceeded in fits and starts over the last fifty years. The six Apollo crews that landed on the Moon brought 842 pounds (382 kilograms) of lunar rocks and dust back to Earth between 1969 and 1972.¹⁹ The Soviet Union recovered 326 grams (11.5 ounces) of lunar material between 1970 and 1976.²⁰ In 2005, a Japanese space probe collected a few grams of material from an asteroid and returned it to Earth 2010.²¹ Another Japanese probe collected two samples from another asteroid this year and will return them to Earth in 2020.²² The vast majority of these materials have remained in the possession of government agencies and are mostly used for scientific analysis, though a small amount have been privately acquired and sold commercially.²³ There is, as of yet, very little commercial activity involving materials sourced from outer space.

There have been at least two serious attempts to start businesses expressly focused upon ISRU, though both recently folded into other companies. The first was Planetary Resources (formerly ARKYD Astronautics), a company founded by former NASA and Google leaders, which announced its intention to become an “asteroid mining company” in 2012.²⁴ Shortly thereafter, several former NASA employees and other space industry entrepreneurs founded Deep Space

¹⁶ See Michael Belfiore, *How to Mine an Asteroid*, 189 POPULAR MECHS. 8, 53–55 (2012).

¹⁷ SHANE D. ROSS, NEAR-EARTH ASTEROID MINING 4 (2001), available at <http://www2.esm.vt.edu/~sdross/papers/ross-asteroid-mining-2001.pdf> (describing how chemical analysis of meteorites and spectral analysis of asteroid-reflected light indicate the presence of gold, platinum, and palladium and other metals).

¹⁸ See Brian O’Leary, Mining the Apollo and Amor Asteroids, 197 SCI. 363, 363–64 (1977)

¹⁹ NASA Johnson Space Center, Lunar Rocks and Soils from Apollo Missions (accessed Nov. 18, 2019) available at <https://curator.jsc.nasa.gov/lunar/>.

²⁰ NASA, Soviet Union Lunar Sample Return Missions, Mar. 16, 2010 available at https://www.nasa.gov/mission_pages/LRO/multimedia/lroimages/lroc-20100316-luna.html.

²¹ NASA Jet Propulsion Laboratory, Mission to Asteroid Itokawa: Hayabusa (accessed Nov. 18, 2019) available at <https://www.jpl.nasa.gov/missions/hayabusa/>.

²² Japanese Aerospace Exploration Agency, Asteroid Explorer Hayabusa 2 (accessed Nov. 18, 2019) available at <http://www.hayabusa2.jaxa.jp/en/>.

²³ Kiona N. Smith, “Soviet Lunar Samples Sell For \$855,000 At Sotheby’s, But More May Be On The Illicit Market,” (Nov. 30, 2018) available at <https://www.forbes.com/sites/kionasmith/2018/11/30/soviet-lunar-samples-sell-for-855000-at-sothebys/#1336942f7f7d>.

²⁴ Planetary Resources, Company Timeline (accessed Nov. 18, 2019) available at <https://www.planetaryresources.com/company/timeline/>.

Industries, which established a relationship with the government of Luxembourg to facilitate asteroid mining activity under that country's supervision.²⁵ Planetary Resources was acquired by Consensus, a blockchain solutions firm, in 2018.²⁶ Aerospace company Bradford Space acquired Deep Space Industries a few months later.²⁷

The most realistic near-term prospects for ISRU appear to be the acquisition and use of lunar South Pole water ice under the rubric of NASA's Artemis program, which currently enjoys priority backing of the Administration and commitments from several commercial and international partners. The Administration's stated goal is to achieve a crewed landing on the Moon by 2024, and to establish a permanently staffed lunar base on the South Pole by 2028, using lunar resources including water ice. However, there does not appear to be sufficient support in Congress for funding to meet these deadlines.²⁸

On the other hand, the possibility remains that NASA and the Artemis program could receive an indirect political boost from China. The Chinese National Space Agency ("CNSA"), which recently landed a probe on the far side of the Moon near the South Pole, plans to return samples from the Moon's South Pole by the end of next year.²⁹ After that mission, CNSA's published plans call for a series of missions to determine the feasibility of ISRU to establish a permanently staffed lunar base. If the Chinese show progress along these lines, they might provide a Sputnik-like jolt to U.S. politicians and thereby lead to more funding to enable NASA's Artemis plans.

Even if Artemis does not receive sufficient funding to accomplish its lunar exploration goals as currently planned, it remains possible that the commercial space industry will lead, rather than follow, the U.S. Government back to the Moon and beyond. SpaceX, which provides various spaceflight services under contract to NASA, the U.S. Air Force, and other commercial and government entities around the world, is currently developing a heavy-lift space transportation system called "Starship," which could transport passengers and cargo to the Moon.³⁰ SpaceX and other commercial space firms are developing newer, more capable, and less expensive space launch, transport, and landing systems, most of which are currently designed to serve NASA contracts, but which could theoretically be used for independent commercial activities if government funding falls short.

How much of this is legal?

The United States and Luxembourg have passed legislation explicitly recognizing the rights of non-governmental entities to engage in ISRU for private and commercial purposes. This position remains somewhat controversial because some scholars argue that international law,

²⁵ Emily Calendrelli, "Deep Space Industries partners with Luxembourg to test asteroid mining technologies," TECHCRUNCH.COM (May 5, 2016) available at <https://techcrunch.com/2016/05/05/deep-space-industries-partners-with-luxembourg-to-test-asteroid-mining-technologies/>.

²⁶ ConsenSys, Press Release, ConsenSys Acquires Planetary Resources (Oct. 31, 2018) available at <https://www.planetaryresources.com/2018/10/consensys-acquires-planetary-resources/>.

²⁷ Bradford Space, Press Release, Bradford Space Group Acquires Control of Deep Space Industries, Inc. (Jan. 2, 2019) available at <http://deepspaceindustries.com/>.

²⁸ Jeff Foust, "White House warns Congress about Artemis funding," SPACENEWS.COM (Nov. 7, 2019) available at <https://spacenews.com/white-house-warns-congress-about-artemis-funding/>.

²⁹ See Chunlai et al, *supra* note 9.

³⁰ SpaceX, Starship (accessed Nov. 18, 2019) available at <https://www.spacex.com/starship>.

particularly the treaty known as the “Outer Space Treaty” of 1967, prohibits ISRU by commercial entities. However, a consensus appears to be forming, at least among national governments, acknowledging that international space law does not prohibit commercial ISRU.

International law arguments surrounding commercial ISRU generally begin with Article II of the Outer Space Treaty, which states: “Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”³¹ Opponents of commercial ISRU interpret the Treaty’s prohibition against “national appropriation” of “celestial bodies” to contain an implicit additional prohibition against *private* acquisition of *resources* from celestial bodies.³² However, this implicit prohibition would read into the Treaty language that the Treaty’s drafters considered and rejected. The International Institute of Space Law (“IISL”), which drafted much of the language that was eventually adopted in the Outer Space Treaty, proposed that Article II contain prohibitions against “private appropriation” and appropriation of “areas” upon celestial bodies.³³ Neither of these prohibitions were adopted in the final version that the states parties ratified.³⁴ Twelve years after the Outer Space Treaty’s ratification, members of the UN Committee on the Peaceful Uses of Outer Space, where the Outer Space Treaty was drafted, acknowledged the Treaty’s failure to prohibit private appropriation of resources and sought to remedy this omission through a new treaty known as the “Moon Agreement,” which would have banned commercial ISRU until the international community could create an international regime to govern distribution of resources in space.³⁵ However, the Moon Agreement has only been ratified by eighteen nations, none of which are independently spacefaring.³⁶ An IISL Directorate of Studies paper published in 2016 acknowledged that the Moon Agreement is not binding on other nations as positive or customary international law.³⁷

In 2015, President Obama signed the bipartisan Commercial Space Launch Competitiveness Act (commonly known as the “2015 Space Act”) into law in the United States. This law requires federal agencies to “facilitate commercial exploration for and commercial recovery of space resources by United States citizens,” to “discourage government barriers” to such activity, and to

³¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (“Outer Space Treaty”), Jan. 27, 1967, 18 U.S.T. 2410, art. II, available at http://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf.

³² See, e.g., Carl Q. Christol, Article 2 of the 1967 Principles Treaty Revisited, 9 ANNALS OF AIR AND SPACE LAW 217-44 (Nicolas Mateesco Matte ed., 1984).

³³ See IISL, *Draft Resolution of the IISL Concerning the Legal Status of Celestial Bodies*, PROCEEDINGS, 8TH COLLOQUIUM ON THE LAW OF OUTER SPACE, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, 351 (1965).

³⁴ See Outer Space Treaty, art. II.

³⁵ Thomas Gangale, THE DEVELOPMENT OF OUTER SPACE: SOVEREIGNTY AND PROPERTY RIGHTS IN INTERNATIONAL LAW 67-88 (2009); see also See Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (“Moon Agreement”), Dec. 18, 1979, 1363 U.N.T.S. 3, art. XI, available at http://www.unoosa.org/pdf/gares/ARES_34_68E.pdf.

³⁶ United Nations Office for Outer Space Affairs, Status of International Agreements relating to Activities in Outer Space, (accessed Nov. 18, 2018) available at <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html>.

³⁷ Hobe et al., IISL Directorate of Studies Background Paper, “Does International Space Law Either Permit or Prohibit the Taking of Resources in Outer Space and on Celestial Bodies, and How is this Relevant for National Actors? What is the Context, and What are the Contours and Limits of this Permission or Prohibition?” (2016) 6, available at https://iislweb.org/docs/IISL_Space_Mining_Study.pdf.

“promote the right of United States citizens to engage” in such activity.³⁸ The same law also clarifies that.³⁹

A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.

Representative Ami Bera (Democrat from California’s 7th Congressional District), a co-sponsor of the 2015 Space Act, explained that the law will facilitate “commercial operations on the Moon” and “asteroid mining.”⁴⁰

Less than a year after the 2015 Space Act’s passage, the Federal Aviation Administration (“FAA”), which regulates the commercial launch of spacecraft from U.S. territory,⁴¹ issued its first ever “Payload Favorability Determination” for a commercial lunar lander. The proposed MX-1E lander, which has still not flown as of this date, would make a soft landing on the Moon and then conduct a series of propulsive “hops,” demonstrating an ability to transit the lunar surface.⁴² Since then, NASA has solicited and accepted bids for private companies to deliver science and technology payloads to support Artemis efforts on the Moon’s surface under “Commercial Lunar Payload Services” contracts.⁴³ Still, there are currently no contracts or solicitations that specifically contemplate private companies harvesting resources on the Moon and selling them to NASA or others. However, the NASA Administrator and other officials on the National Space Council, whose agencies would exercise regulatory and advisory roles over such activity, have frequently stated that a priority of the Artemis program is to nurture a thriving commercial economy on the Moon; one that involves the use of lunar resources, beginning with water ice.

The Grand Duchy of Luxembourg passed a law “on the Exploration and Use of Space Resources” in 2017, which contained similar provisions to those found in the 2015 Space Act described above.⁴⁴ Although Luxembourg and the United States are the only countries that have explicitly recognized commercial ISRU rights in statute, there appear to be early indications of

³⁸ U.S. Commercial Space Launch Competitiveness Act (“SPACE Act”), Pub. L. 114-90, tit. IV, 129 Stat. 721 (2015) (codified at 51 U.S.C. § 51302(a)) available at <https://www.congress.gov/bill/114th-congress/house-bill/2262/text>.

³⁹ *Id.* § 51303.

⁴⁰ 164 CONG. REC. at H3485 (daily ed. Apr. 24, 2018) available at <https://www.congress.gov/crec/2018/04/24/CREC-2018-04-24-pt1-PgH3476.pdf>.

⁴¹ 51 U.S.C. § 50905(a)(1) (2015) available at <https://www.law.cornell.edu/uscode/text/51/50905>.

⁴² Press Release, FAA, Fact Sheet – Moon Express Payload Review Determination (Aug. 3, 2016) available at https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=20595.

⁴³ Press Release, NASA, NASA Selects First Commercial Moon Landing Services for Artemis Program (May 31, 2019) available at <https://www.nasa.gov/press-release/nasa-selects-first-commercial-moon-landing-services-for-artemis-program>.

⁴⁴ Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace (Law of 20 July 2017 on the Exploration and Use of Space Resources), Official Gazette of the Grand Duchy of Luxembourg, No. 674 (July 28, 2017) available at <http://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo/en>.

an international trend toward recognition of the same rights. Luxembourg has signed a series of memoranda of understanding and joint declarations regarding ISRU projects with Belgium, the CNSA, the Czech Republic, the German Aerospace Centre, Poland, the United Arab Emirates, and the United States. As we noted above, Canada, Japan, and Australia have all committed to participate in the United States' Artemis program. Australia's participation in Artemis and Belgium's agreement with Luxembourg's space resources program send a noteworthy signal because Australia and Belgium are two of the eighteen states parties to the Moon Agreement.⁴⁵ It is not yet clear whether Australia or Belgium intend to withdraw from the Moon Agreement or interpret its provisions in such a way as to justify cooperating in commercial ISRU with Luxembourg or the United States.

The U.S. State Department is engaging with other international partners to develop consensus around commercial ISRU rights and obligations. One State Department official recently informed a NASA Advisory Council that Australia, Canada, New Zealand, and the United Kingdom are considering adopting their own national ISRU policies.⁴⁶ The same official also informed the NASA Advisory Council that China, a former opponent of ISRU, has recently acknowledged the existence of ISRU rights, perhaps because of the country's plans to engage in ISRU on the lunar South Pole.⁴⁷ Greece and Germany, on the other hand, have signaled that they may be opposed to commercial ISRU in the absence of an international regime to govern such activity.⁴⁸ Russia, similarly, has advocated the creation of an international ISRU governance regime.⁴⁹ Although these demands for a new international governance regime indicate some suspicion or even hostility toward commercial ISRU in these countries, at least one scholar has noted that the Russian Federation's call for such a regime can be interpreted as an implicit acknowledgement that the regime is necessary *because* there is not currently a prohibition against commercial ISRU in international law.⁵⁰

Although some scholars continue to express doubts as to whether and to what extent commercial ISRU is permitted under current international space law, the IISL Directorate of Studies' most recent paper analyzing the subject concluded that "the use of space resources is not explicitly prohibited as long as the other obligations in the [Outer Space Treaty] are met."⁵¹

Who Solves Disputes over ISRU?

One of the principal arguments cited by commercial ISRU opponents, or proponents of an international ISRU regime is that violent conflicts will arise among states parties and commercial

⁴⁵ See *supra* note 37.

⁴⁶ Jeff Foust, "Lunar exploration providing new impetus for space resources legal debate," SPACENEWS.COM (Sept. 7, 2019) available at <https://spacenews.com/lunar-exploration-providing-new-impetus-for-space-resources-legal-debate/>.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ Audio recording: Statement of Representative of the Russian Federation, United Nations Committee on the Peaceful Uses of Outer Space, 62nd Session (June 17, 2019) (hereinafter "62nd COPUOS Session Recording") available at <https://conferences2.unite.un.org/carbonweb/public/oosa/speakerslog/d43171b4-d380-4fda-a368-80dc19ae0042> (relevant portion begins at 81:52 of the recording).

⁵⁰ See Michael J. Listner, THE PRÉCIS, SPECIAL ISSUE (Aug. 23, 2019) available at <https://www.spacelawsolutions.com/> (subscription only).

⁵¹ Hobe et al., at 41.

entities seeking to acquire resources in the absence of such a regime.⁵² The idea, presumably, is that the regime, established under a new treaty, would have the authority to prevent ISRU prospectors from harming each other in the pursuit of resources. However, if such a treaty were enacted, its harm-prevention provisions would be largely redundant of the Outer Space Treaty, which already contains several provisions preventing “harmful interference” among explorers in outer space,⁵³ as well as provisions ensuring that all states parties maintain supervision and jurisdiction over their private space explorers, thus demanding compliance to the harm-prevention provisions.⁵⁴ There is also an existing treaty, known as the “Liability Convention,” which further elucidates states parties’ responsibility for any damage that they or their private space explorers cause, and which provides a framework for resolution of any disputes that may arise.⁵⁵ Although it is certainly conceivable that space prospectors may violate these treaties in pursuit of resources, the same could be said of any hypothetical treaty that might be enacted along with an international ISRU distribution regime.

In short, commercial and governmental ISRU prospectors would be responsible for resolving disputes amongst themselves, as many aerospace companies and governments already do through mediation and arbitration processes. Although it is possible that such processes may be insufficient to resolve all disputes, and violence is always a possibility, two significant differences between terrestrial commerce and ISRU provide some hope that forcible solutions will be few and far between. The first involves the shared hazards of spaceflight. Space resource prospectors will operate in places that are extremely more dangerous than any place where humans have sought resources on Earth. The high speeds, immense distances, hard vacuum, extreme temperatures, constant barrages of radiation, and unpredictable behavior of extraterrestrial materials make spaceflight a tremendously difficult, dangerous, and expensive undertaking even in the best of circumstances. The recent crashes of two lunar landers, the Israeli Beresheet and the Indian Vikram, illustrate how modern space agencies are struggling just to land safely on the Moon. Simulations of the potential run-away chain reaction that might result from a spacecraft collision, often known as the “Kessler Syndrome,” show that mutually assured destruction is a likely consequence of offensive activity in space. Therefore, the space environment itself provides a formidable deterrent against malign actors attempting to use force to acquire resources. Secondly, the space environment contains orders of magnitude greater quantities of resources than anything available on Earth. It seems unlikely, at least in the near term, that ISRU operations, being hampered by the hazards and costs of spaceflight, could consume enough of these resources to create the kinds of scarcity that would provoke conflict. One can of course conceive of a very long-term scenario in which resource competition might again become a potential source of conflict. Such a scenario, however, would necessarily involve extensive ISRU operations, necessitating a large and well-developed system of spacefaring entities. The operators and, eventually, residents of such spacefaring civilizations might even decide that they are better suited to develop their own methods of dispute resolution

⁵² See, e.g., 62nd COPUOS Session Recording at 81:52.

⁵³ See Outer Space Treaty, art. IX.

⁵⁴ See Outer Space Treaty, arts. VI, VIII.

⁵⁵ Convention on International Liability for Damage Caused by Space Objects (“Liability Convention”) Mar. 29, 1972, 24 U.S.T. 2389, available at <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introliability-convention.html>.

and governance – at least better suited than people who lived decades or centuries earlier on a far-away planet.

One Hand Clapping: Social Abuses and Anticompetitive Practices in EU Airline Employment

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Abstract

The deregulation of airlines in the European Union has boosted connectivity and been a boon to the traveling public. Such benefits, however, came at a cost to certain airline employees. The rise of low-cost carriers, with their hyper-sensitivity to expenses, led initially to the opportunistic use of the law of employer-friendly jurisdictions to govern labor contracts and ultimately to the use of atypical employment contracts. This practice has had adverse social and financial consequences for employees, created safety issues and had a potentially anticompetitive effect on the airline market. The European Union has, through case law and legislation, made the continued use of such employment techniques difficult, but more needs to be done with respect to enforcement.

I. Introduction

Airline deregulation in the European Union (“EU”), begun in 1987 and completed ten years later,² enhanced competition and brought to the traveling public more frequent,³ and ultimately cheaper,⁴ air service by more airlines. The European countries, led by the United Kingdom, were prompted to begin the deregulation process after observing the economic benefits of airline deregulation in the United States.⁵ In response to the decreased regulation, numerous new intra-European airlines were established. The ultimate effect of this deregulation was the creation of the European Common Aviation Area (“ECAA”) in December 2017,⁶ referred to by a leading think tank in the United Kingdom as “the world’s most liberalized aviation market”.⁷

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² There were three stages of EU airline deregulation. The European Commission (“Commission”) implemented Council Decision 87/602/EEC in 1987 (authorizing any licensed European carrier to provide scheduled service to any European market); in 1990 the European Community enacted Regulation (EEC) 2342/90 (creating a stable airline pricing structure) and Regulation (EEC) 2343/90 (removing capacity restrictions on intra-European

Liberalization and the expansion of the aviation market exacted a toll on aviation workers. Although EU legislation focused on enhancing economic freedom and opportunity, it generally left to individual Member States the task of regulating labor law and social security regimes.⁸ The low-cost carrier (“LCC”) business model, pioneered by Southwest Airlines in the United States, accounted for much of the expansion. Ryanair, easyJet and other European LCCs did not exist until the early 1990’s,⁹ but by 2015 LCC operations accounted for 41% of the airline seat capacity in the EU.¹⁰ There is no doubt that LCCs have been beneficial to business and leisure travel within the EU because of their low ticket prices.¹¹ The corollary, however, is that LCCs have been extremely cost conscious.¹² The focus on keeping expenses under tight control has resulted in the streamlining of certain operations and reductions in the creature comforts legacy airline passengers have come to expect.¹³ Unfortunately, this cost consciousness has also resulted in “forum shopping” by LCCs for jurisdictions with labor laws that are less protective of workers.¹⁴ This paper will examine examples of such procedures and how they have evolved over time in response to EU legislation and decisions by the Court of Justice of the European Union (“EUCJ”).

Community flights); and in 1992 Council Regulation (EEC) 2408/92 was enacted (requiring that by 1997, any European air carrier could offer service anywhere in Europe). In 2008, Regulation (EC) No 1008/2008 combined the regulations of the three stages into a single regulation on common rules for air transport services within the EU. See Richard Pinkham, “European Airline Deregulation: The Great Missed Opportunity” (1999) 2(1) The SAIS Europe Journal of Global Affairs (formerly The Bologna Center Journal of International Affairs), 55–69. Retrieved 24 September 2019 from <http://www.saisjournal.org/posts/european-airline-deregulation>.

³ *Id.*

⁴ Directorate-General, Mobility and Transport. (24 September 2019). “EU Aviation: 25 years of reaching new heights.” Retrieved 25 September 2019 from https://ec.europa.eu/transport/modes/air/25years-eu-aviation_en. This report gives the example of a trip from Milan to Paris for a family of four costing €1600 in 1992 and only €100 in 2017 as a result of deregulation.

⁵ Airline Deregulation Act of 1978, Pub. L. No. 95504, 92 Stat. 1705, 49 USC § 1301 (1978). For legislative history of the Deregulation Act, see 1978 U.S. Code Cong. & Admin. News 3737.

⁶ Directorate-General, Mobility and Transport. (24 September 2019). “International Aviation: ECAA.” Retrieved 25 September 2019 from https://ec.europa.eu/transport/modes/air/international_aviation/country_index/ecaa_en.

⁷ Institute for Government. (10 September 2017). “Aviation and the European Common Aviation Area (ECAA).” Retrieved 24 September 2019 from <https://www.instituteforgovernment.org.uk/explainers/european-common-aviation-area-brexit>.

⁸ European Cockpit Association. (2019). “A Social Agenda for Europe’s Aviation.” Retrieved 22 October 2019 from <https://www.eurocockpit.be/positions-publications/social-agenda-europes-aviation>. See also Article 153 of the Treaty of the Functioning of the European Union (European Union, Consolidated version of the Treaty on the Functioning of the European Union), 13 December 2007, 2008/C 115/01, retrieved on 26 October 2019 from <https://www.refworld.org/docid/4b17a07e2.html> (“TFEU”).

⁹ Although Ryanair was established in 1984, it did not expand significantly into the European market until 1990 under Michael O’Leary. See Mark Tungate, “A brief history of Ryanair,” *Management Today* (9 November 2017). Retrieved 25 September 2019 from <https://www.managementtoday.co.uk/brief-history-ryanair/any-other-business/article/1449458>.

¹⁰ International Civil Aviation Organization (“ICAO”). (2016). Low Cost Carriers (“LCCs”). Retrieved 25 September 2019 from <https://www.icao.int/sustainability/Pages/Low-Cost-Carriers.aspx>.

¹¹ Mehtap Akguc, Miroslav Beblavy & Felice Simonelli (2018). “Low-Cost Airlines Bringing the EU Closer Together,” Center for European Policy Studies (“CEPS”). Retrieved 18 October 2019 from <https://www.ceps.eu/wp-content/uploads/2018/05/LowCost%20Airlines%20Bringing%20the%20EU%20closer%20together.pdf> pp. 27-36.

¹² *Id.* p.15.

¹³ *Id.*

¹⁴ Yves Jorens, Dirk Gillis, Lien Valcke & Joyce De Coninck, “Atypical Forms of Employment in the Aviation Sector – Final Report, European Social Dialogue, European Commission, 2015,” p. 19. Gent, Belgium: Universiteit Gent. Retrieved 19 October 2019 from <http://hdl.handle.net/1854/LU-6852830>. (“Gent Study”).

II. The Low-Cost Carrier Model

The hallmarks of LCC operations are (i) a point to point network, (ii) single class seating, (iii) a homogeneous fleet,¹⁵ (iv) the no-frills fare,¹⁶ (v) high fleet utilization and fast turn-arounds, (vi) low labor costs, (vii) low overhead costs, (viii) low distribution costs and (ix) the use of secondary airports instead of primary airports.¹⁷ LCCs in the EU, unlike legacy carriers in that region, have found it advantageous to establish bases throughout the EU with flight crews and aircraft based at each location.¹⁸ The LCCs multi-base strategy facilitates their point-to-point service model and, as might be expected, such a strategy is less attractive to the hub-and-spoke model of the legacy carriers.¹⁹

The obvious complicating element in the operational equation for LCCs is to determine which country's labor laws apply to employees based in various countries. Since the regulations and social aspects of labor laws of Member States remain national, some LCCs have taken advantage of the differences and tried to ensure that the labor regulations applicable to its employees were those of a country with labor laws and a social security system that was favorable to employers.²⁰

III. LCC Strategies to Ensure Employer-Friendly Labor Regulation

The imposition of employer-friendly labor laws on its workforce enables an LCC to reduce certain social security costs while gaining tremendous flexibility in its operations along with the ability to swiftly adjust personnel costs.²¹ This practice gives LCCs a distinct advantage over airlines engaged in more traditional employer/employee relations.²²

¹⁵ This simplifies the licensing requirements for the personnel who fly and maintain the aircraft. See Andrija Vidović, Igor Štimac & Damir Vince. "Development of Business Models of Low-Cost Airlines" (2013) 3(1): 69 – 81,3(1) International Journal for Traffic and Transport Engineering, 69-81. Retrieved 27 September 2019 from [http://dx.doi.org/10.7708/ijtte.2013.3\(1\).07](http://dx.doi.org/10.7708/ijtte.2013.3(1).07).

¹⁶ This is also referred to as "customizable fares" and "unbundling". See Rosie Spinks, "The Battle of the Low-Cost, Long-Haul Flights is about to go Next Level" (4 December 2017), online: qz.com. Retrieved 15 October 2019, from <https://qz.com/quartz/1145905/the-low-cost-long-haul-flight-trend-is-set-to-expand-in-2018/>.

¹⁷ Judith Kloeg & Hanna Schaal, "Low-cost, long-haul -- Flight of fancy or business of the future?" (16 December 2014), online: skift.com. Retrieved 16 October 2019, from <https://www.prologis.aero/wp-content/uploads/2014/12/Low-cost-long-haul-Flight-of-fancy-or-business-of-the-future.pdf>.

¹⁸ Charlotte Brannigan, Sofia Amarai, Chris Thorpe, Samuel Levin, Hannah Figg, Rui Neiva, Samantha Morgan-Price (Ricardo) Miguel Troncoso Ferrer, Clara Garcia Fernandez, Sara Moya Izquierdo, Laura Castillo, Jesus Tallos & Clara Molina (2017). "Study on employment and working conditions of aircrews in the EU internal aviation market: Final Report" (Ricardo plc) p. 184 (pp. 1–220). Brussels, Belgium: European Commission ("Ricardo Report").

¹⁹ *Id.* p. 185.

²⁰ Airline Coordination Platform. (2019). "ECA Piloting Safety." Retrieved 27 September 2019 from <https://www.eurocockpit.be/positions-publications/social-agenda-europes-aviation>.

²¹ European Cockpit Association. (2019). "Atypical Employment in Aviation." Retrieved 22 September 2019 from <https://www.eurocockpit.be/campaign/atypical-employment-aviation> pp. 2-3.

²² Traditional employer/employee relations in the airline industry, as referred to herein, include (i) direct employment contracts with unlimited terms, (ii) fixed salaries as opposed to pay-to-fly schemes (discussed later in this article) and (iii) the granting of full social benefits to employees. See Gent Study *supra* note 14 p.85.

A. Use of Employer-Friendly Governing Law

Contracts of employment for flight crew typically specified that the employer/employee relationship would be governed by the law of the state of registration²³ of the aircraft on which the employee worked and that the employer could only be sued in courts of that Member State.²⁴ The reasoning was that since the employee worked on an airplane, there really was no Member State in which the employee “habitually carries out his work”.²⁵ So airlines, especially Ryanair,²⁶ argued that the proper place to look for governing law and jurisdiction was the state of registration of the aircraft.²⁷ Ryanair,²⁸ easyJet²⁹ and other LCCs adopted this approach even though they established bases of operations at many of their destinations and in each case required the few dozen crew members³⁰ based there to live within one hour’s travel time of the associated airport.³¹

This strategy eventually began to unravel for Ryanair and other similarly inclined LCCs when employees began job actions and took the carriers to court. The seminal case began in 2011 when six former employees of Ryanair or Crewlink, a recruiting and employment agency used by Ryanair,³² based at Charleroi Airport in Belgium filed suit in the Charleroi Labour Court located in Mons, Belgium (“Mons court”) arguing that Belgium labor laws should apply to their

²³ This thinking is based on Article 17 of the Chicago Convention. See International Civil Aviation Organization (“ICAO”), Convention on Civil Aviation (“Chicago Convention”), 7 December 1944, (1994) 15 U.N.T.S. 295. Retrieved 25 September 2019 from <https://www.refworld.org/docid/3ddca0dd4.html>.

²⁴ Sandra Nogueira, Victor Perez-Ortega, Virginie Manguit, Maria Sanchez-Odogherty and Jose Sanchez-Navarro v Crewlink Ireland Ltd (C-168/16) and Miguel Jose Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C-169/16), [2017] CJEU Joined Cases C-168/16 and C-169-16 ECLI:EU:C:2017:688 (“Joined Cases”).

²⁵ The concept of “habitually carries out his work” is defined by the CJEU in 27 February 2002, Weber, C-37/00, EU:C:2002:122, 44 & 49. It is interpreted to mean the location in which a substantial part of an employee’s duties take place, but does not preclude a portion of those duties being discharged elsewhere.

²⁶ Darragh Golden of University College Dublin stated that Ryanair’s “corporate culture . . . is synonymous with highjinks”. Darragh Golden, “Ryanair’s Secret”. *Jacobin Magazine* (10 December 2018). Retrieved 22 October 2019, from <https://jacobinmag.com/2018/10/ryanair-union-strikes-pilots-regulation>.

²⁷ In most cases this is the principle place of business of the employer.

²⁸ David M. Semanchik, Regulatory Counsel and Senior Attorney at Air Line Pilots Association International (an airline pilots union affiliated with the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO)), as a panelist at a recent aviation conference, noted that Ryanair now has 83 pilot bases outside of Ireland with no more than 2 or 3 aircraft and related crew per base. David M. Semanchik (19 October 2019), “Updates on Current and Future Issues from Key National and International Air Transport Organizations” panel discussion at the 12th Annual McGill Conference on International Aviation Liability, Insurance & Finance, Montreal, Canada 18-19 October 2019.

²⁹ “The airline base concept: European LCCs love to base aircraft and crew abroad, unlike others.” (4 October 2013). CAPA Center for Aviation (Aviation Week Network). Retrieved October 23, 2019, from <https://centreforaviation.com/analysis/reports/the-airline-base-concept-european-lccs-love-to-base-aircraft-and-crew-abroad-unlike-others-131872>.

³⁰ Since crew return to their base every evening, the airline does not incur lodging costs of crew overnighting at a distant location. *Id.*

³¹ Joined Cases *supra* note 24.

³² The use of outside employment agencies is not unusual in the aviation industry, but some European LCCs use this technique to circumvent national labor regulations and tax obligations. Justin Bachman & Carol Matlack, “The Creative Pilot Hiring Habits of Ryanair and Norwegian Air Shuttle” (12 February 2015), online: skift.com. Retrieved 25 October 2019 from <https://skift.com/2015/02/12/the-creative-pilot-hiring-habits-of-ryanair-and-norwegian-air-shuttle/>.

employment contracts and Belgian courts should have jurisdiction.³³ The employment contracts in question specified that Irish courts would have jurisdiction over disputes, Irish law would govern the working relationship and Charleroi Airport was designated as the employees' "home base".³⁴

The Mons court asked the CJEU for a preliminary ruling on the question of whether the concept of the place where an employee "habitually carries out his work"³⁵ could be equated to that of a designated "home base".³⁶ The CJEU concluded that the two terms could not be equated, but noted that the Commission had determined that for purposes of social security (and contributions to the system), the "home base" of a flight crew was determinative.³⁷ Therefore, although the social security analogy was not dispositive of the issue raised by the Mons court, the CJEU concluded in the Joined Cases that the concept of "home base" could be used in deciding the place where an employee "habitually carries out his work".³⁸

Upon receiving its decision from the CJEU, the Mons court ruled that the labor laws of Belgium can apply to Ryanair employees based in Belgium. Prior to the Mons ruling and after a series of strikes in 2018 by Ryanair employees in Belgium, Ryanair agreed with certain Belgian labor unions that Belgian laws would apply to Belgium-based crews. The Mons ruling was hailed as a major victory by Belgian labor unions, but Ryanair said the ruling really had no effect because it just restated an existing contractual arrangement with its Belgium employees.³⁹

³³ Joined Cases *supra* note 24.

³⁴ The Court in the Joined Cases relied on Council Regulation (EEC) No. 3922/91 (16 December 1991), as amended by Regulation (EC) No. 1899/2006 (12 December 2006) for the requirement of designating a "home base" for airline crew and for the definition of "home base". This regulation was repealed by Regulation (EC) No. 216/2008 (20 February 2008) but the pertinent provisions concerning definition and requirements of a "home base" (Annex III) remained in place until implementing measures could be adopted. Accordingly, the Court's understanding of "home base" remains effective today.

³⁵ The free movement of workers and services is a major tenant of the EU and the right is enshrined in Article 45 of the TFEU. The concept of "habitually carries out his work" is used to determine which laws apply to workers employed in countries other than their home country. *See* "Social Europe (2013). Practical guide on the applicable legislation in the European Union (EU), the European Economic Area (EEA) and in Switzerland." Retrieved 17 October 2019 from <https://ecas.issuelab.org/resource/practical-guide-on-the-applicable-legislation-in-the-eu-eea-and-in-switzerland.html>.

³⁶ N.B.: The Mons court did not ask the CJEU whether Irish law should apply to the employment contracts. Ricardo Report *supra* note 18 pp. 198-200.

³⁷ *Supra* note 14. The CJEU cited (i) Article III of the Rome I Treaty (European Union, Treaty Establishing the European Community (Consolidated Version), Rome Treaty, 25 March 1957, retrieved October 10, 2019 at <https://www.refworld.org/docid/3ae6b39c0.html>), (ii) EC, *Commission Regulation (EC) No. 44/2001 of 22 December 2000 (the Brussels I Regulation) on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters*, [2001] OJ, L 012, 16.1.2001, p. 8 (Article 23) and (iii) EC, *Commission Regulation (EU) No. 465/2012 of 22 May 2012 amending Regulation (EC) No 883/2004 on the coordination of social security systems and Regulation (EC) No 987/2009 laying down the procedure for implementing Regulation (EC) No 883/2004*, [2012] OJ, L 149, 8.6.2012. Previous to the promulgation of Regulation EU No. 465/2012, flight crew members paid social security at their place of residence or where their airline had its registered office. European Cockpit Association. (2012). "New EU rules on social security: how does it work." Retrieved 21 October 2019 from <https://www.eurocockpit.be/news/new-eu-rules-social-securityhow-does-it-work>.

³⁸ *Id.*

³⁹ Daphne Psadedakis, "Local labor laws apply to Ryanair employees: Belgian court," *Reuters Business News* (14 June 2019). Retrieved 27 September 2019 from <https://www.reuters.com/article/us-ryanair-workers/local-labor-laws-apply-to-ryanair-employees-belgian-court-idUSKCNITFIQY>.

A similar case came before the Norwegian Supreme Court (for the second time) in 2017. In response to a request from a lower court, the Norwegian Supreme Court determined that a Rygge-based former Crewlink employee claiming wrongful dismissal could have her case heard by a Norwegian court even though her employment contract provided for Irish governance and jurisdiction. In response to the ruling, Crewlink agreed to settle the case and Ryanair said the case lacked future relevance because Ryanair had closed its Rygge base in 2016 (after the initial Norwegian case was filed).⁴⁰

To conclude that the issue of applicable employment law for flight crews based abroad is now settled would be a bit aspirational. The allegation has been made that some LCCs ignore the “home base” rule in the expectation that there is a lack of knowledge on the part of employees of their rights, local authorities are unfamiliar with the state of the law and disgruntled employees might give up the fight before actually receiving a judgement.⁴¹ There is, however, some movement in the direction of strengthening the rights of LCC airline employees. In late 2018 Ryanair for the first time signed a collective labor agreement governed by local (in this case Italian) law rather than Irish law.⁴² Time will tell whether this is a lasting development.

B. Use of Atypical Employment Contracts

Another employment strategy adopted relatively recently by EU LCCs is that of atypical employment contracts⁴³ based on (1) temporary work agencies, (2) self-employed workers⁴⁴ (including no-flight/no-pay regimes),⁴⁵ (3) pay-to-fly regimes⁴⁶ where the pilot pays the airline for flight time on revenue-generating flights in order to build up required flight hours and (4) individual corporations.⁴⁷

⁴⁰ “Ryanair settles landmark Norway ‘slave contract’ case with ex-stewardess,” *The Local* (3 March 2017). Retrieved 24 September 2019 from <https://www.thelocal.no/20170303/ryanair-settles-norway-slave-contract-case>.

⁴¹ Ricardo Report *supra* note 18 p. 194.

⁴² Mateusz Maszczyński, “Claims: Ryanair Still Isn’t Complying with Local Laws in New Cabin Crew Contracts” (28 May 2019), online: [paddleyourownkanoo.com](https://www.paddleyourownkanoo.com). Retrieved October 25, 2019, from <https://www.paddleyourownkanoo.com/2019/05/28/claims-ryanair-still-isnt-complying-with-local-laws-in-new-cabin-crew-contracts/>.

⁴³ Direct, long-term or no-term contracts are found almost exclusively with legacy, network carriers. See Yves Jorens, Dirk Gillis, Lien Valcke & Anneline Devolder (2015). “Atypical Forms of Aircrew Employment in the European Aviation Industry (with a focus on self-employment).” Ghent, Belgium: IRIS – Ghent University (Universiteit Gent). Retrieved 21 September 2019 from <http://www.europarl.europa.eu/cmsdata/81178/DIRK%20GILLIS%20PRESENTATION.pdf>.

⁴⁴ A trend toward self-employment is evident in almost all professions, and it is often difficult to distinguish legitimate self-employment from deliberate misclassification. Gent Study *supra* note 14 p. 265.

⁴⁵ No-flight/no-pay regimes are, as the term implies, employment contracts providing for flight crew payment only if the flight actually takes place. See Airline Coordination Platform. (2018). “A Social Agenda for European Aviation. Position paper of the Airline Coordination Platform. Brussels.” Retrieved 29 September 2019 from <https://www.eurocockpit.be/sites/default/files/2019-01/ACP%20ECA%20ETF%20Statement%20Social%20Dimension%20EU%20Aviation%2002Oct2018%20Final.pdf> p. 4.

⁴⁶ Such schemes are not common and the frequency of their use in the EU may be decreasing due to national regulations enacted to prohibit such practices. See Ricardo Report *supra* note 18 pp. 78-83.

⁴⁷ *Supra* note 21 pp. 2-3.

Temporary work agencies (“TWAs”) are defined⁴⁸ in a way that makes it difficult to readily determine whether an institution purporting to be a TWA is in fact legitimate.⁴⁹ Moreover, employment through a TWA,⁵⁰ where the worker’s employment relationship is with the TWA and not the airline, is sometimes used as part of the analysis that enables an LCC to characterize the air crew member as self-employed. Estimates are that 1 in 6 EU pilots are self-employed.⁵¹ At Ryanair, as an example, 60% of its pilots are self-employed.⁵² The Ricardo Report indicated that over 90% of pilots in their survey who were considered self-employed reported that they were not free to fly for other carriers and that they did not have flexibility in determining their flying schedule.⁵³ True self-employment, like part-time work, is recognized by the EU,⁵⁴ but one has to wonder whether many of these airline workers are truly self-employed.

The charge made by air crew trade organizations is that atypical employment, especially self-employment, is used to disguise what should otherwise be regarded as a typical direct employer/employee relationship. The atypical employment contract enables the employer to deny social benefits to the worker, circumvent earlier court decisions regarding worker protections, shift the burden of social security payments from the employer to the worker and allow maximum flexibility in the use of the workforce.⁵⁵ Although there are undoubtedly some benefits for some workers in terms of flexibility of schedule,⁵⁶ the conventional understanding of “self-employment” involves the freedom to contract with multiple employers and that does not exist in EU self-employed aviation world as regards LCCs.⁵⁷

Atypical employment arrangements may create social abuses, potential safety issues and anticompetitive practices. Furthermore, atypical employment often has a negative impact on the work/life balance of airline workers subject to those arrangements. The impact may be

⁴⁸ EC, *Commission Directive 2008/104/EC of 19 November 2008 on temporary agency work*, [2008] OJ, L 327, 5.12.2008, pp. 9-14.

⁴⁹ Ricardo Report *supra* note 18 p. 22.

⁵⁰ The Ricardo Report stated that 97% of respondents in its survey who reported having an employment contract through a TWA worked for an LCC. *See* Ricardo Report *supra* note 18 p. 34.

⁵¹ *Supra* note 21 p.1.

⁵² Ricardo Report *supra* note 18 pp. 102-105.

⁵³ *Id.* p. 106.

⁵⁴ Self-employment is recognized by EC, *Commission Directive 2010/41/EU of 7 July 2010 on the application of the principle of equal treatment between men and women engaged in an activity in a self-employed capacity and repealing Council Directive 86/613/EEC*, [2010] OJ, L 180, 5.7.2010, pp. 1-6 and part-time work is recognized by EC, *Commission Directive 97/81/EC of 15 December 1997 concerning the Framework Agreement on part-time work concluded by UNICE, CEEP and the ETUC - Annex: Framework agreement on part-time work*, [1997] OJ, L 14, 20.1.1998, pp. 9-14.

⁵⁵ *Supra* note 21 p. 7.

⁵⁶ Atypical employment, especially self-employment, is thought to potentially benefit women (especially women with children) more than men due to the expected flexibility in working hours. *See* Ricardo Report *supra* note 18 p. 137.

⁵⁷ The Ricardo Report notes that the Organization for Economic Cooperation and Development (“OECD”) defines bogus self-employment as consisting of individuals “whose conditions of employment are similar to those of employees, who have no employees themselves, and who declare themselves (or are declared) as self-employed simply to reduce tax liabilities, or employers’ responsibilities”. *See* Ricardo Report *supra* note 18 p. 100.

particularly felt by young employees and women (especially with respect to maternity leave⁵⁸ and re-entry into the aviation workforce after childbirth).⁵⁹

The various contractual arrangements between LCCs and their flight crews has attracted the attention of the European Union Aviation Safety Agency (“EASA”).⁶⁰ The EASA has encouraged airlines to be sure they are tracking performance and safety issues based on their various employment types and contractual arrangements.⁶¹ The safety issues involved in atypical employment arrangements have been highlighted in various studies.⁶² The Gent Study found that the majority of so called “self-employed” pilots had difficulty voicing safety concerns to management because of the fear such action might have on their continued employment.⁶³ In 2016, the London School of Economics joined in a study with EUROCONTROL⁶⁴ and concluded that a pilot’s perception of safety in his or her job (including management’s commitment to safety, effectiveness of maintenance and workforce fatigue) very much depended on the type of employment arrangement that person was working under. The study concluded that pilots working under atypical contracts tended to view job safety less positively.⁶⁵

The use of atypical employment contracts is not, in and of itself, necessarily detrimental to the airline or its workers.⁶⁶ But the use of such contracts by some air carriers in an attempt to reduce costs and reduce tax and social security obligations has the potential to distort the market. Although no independent study has conclusively shown that atypical employment has a significant impact on the level playing field, the lack of a common legal framework for airline employment certainly creates cost/revenue imbalances for various air carriers within the EU aviation market.⁶⁷

⁵⁸ Employees characterized as self-employed would not typically be able to avail themselves of the benefits of EC, *Commission Directive 2010/18/EU of 8 March 2010 amending Regulation (EC) No 300/2008 of the European Parliament and of the Council as far as specifications for national quality control programmes in the field of civil aviation security are concerned*, [2010] OJ, L 7, 12.1.2010, pp. 3-14.

⁵⁹ Ricardo Report *supra* note 18 pp. 137-71.

⁶⁰ The EASA is an agency of the EU composed of all 28 EU members as well as Iceland, Lichtenstein, Norway and Switzerland. European Union Aviation Safety Agency. (2019). EASA Annual Safety Conference 2019. Retrieved 18 September 2019 from <https://www.easa.europa.eu>.

⁶¹ European Aviation Safety Agency. (2017). “Practical Guide - Management of hazards related to new business models of commercial air transport operators.” Retrieved 14 September 2019 from <https://www.easa.europa.eu/document-library/general-publications/management-hazards-related-new-business-models-commercial-air>.

⁶² Ricardo Report *supra* note 18 pp. 56-58 (use of temporary work agencies), pp. 107-11 (self-employed air crew) and pp. 88-89 (pay-to-fly arrangements).

⁶³ Gent Study *supra* note 14.

⁶⁴ EUROCONTROL is a European civil/military aviation safety organization composed of 41 members. It is not part of, but works closely with, the European Union administrative organization. See EUROCONTROL. (n.d.). “About Us - EUROCONTROL.” Retrieved 28 September 2019, from <https://www.eurocontrol.int/about-us>.

⁶⁵ T. W. Reader, A. Parand & B. Kirwan (2016). “European pilots’ perceptions of safety culture in European Aviation. Report of London School of Economics and EUROCONTROL”. Retrieved 27 September 2019 from https://www.futuresky-safety.eu/wp-content/uploads/2016/12/FSS_P5_LSE_D5.4_v2.0.pdf.

⁶⁶ *Supra* note 43.

⁶⁷ Ricardo Report *supra* note 18 pp. 212-13.

IV. The Path Forward

The EU can and should do more to prevent socially abusive practices in LCC airline employment. It already has some tools in place and has evidenced an intent to tackle controversial employment issues such as those that existed in the long-distance trucking industry, where the Commission changed how truckers are paid when traveling outside their home county.⁶⁸ The same sort of initiative is appropriate to protect the social and economic well-being of flight crews.

Despite efforts by the EU to clarify the law and notwithstanding instructive decisions handed down by the CJEU, the Ricardo Report found that there was considerable confusion on the part of local labor law enforcement agencies in Member States as to what law applies to airline employees.⁶⁹ There is also a lack of awareness among airline employees of their rights.⁷⁰ Finally, although there seems at this time to be only a potential for market distortions due to the proliferation of atypical employment contracts among LCCs, if distinct negative competitive effects were to develop, traditional air carriers might also resort to atypical employment measures resulting in a race to the bottom in terms of the social well-being of airline employees and the safety record of the industry as a whole.⁷¹ There have recently been calls to action. A number of Member States have asked for a plan of action to develop a meaningful social agenda for the EU aviation industry.⁷² In addition, a consortium of legacy airlines and trade groups have outlined an agenda for Commission action to ensure conformity with appropriate standards and a level playing field for the industry in the EU.⁷³ One hopes the Commission seriously considers these proposals.

There is much work to be done but enacting clear harmonized restrictions on socially abusive airline employment contracts, enforcing the existing obligations of Member States in this regard and informing airline crews of their rights seems like the right formula for curbing unjust LCC airline employment contracts in the EU.

⁶⁸ Catherine Stupp, “Controversial EU Labor Rules Tackle Truck Drivers’ Pay and Working Conditions” (2 June 2017) online: euractiv.com. Retrieved on 22 September 2019 from <https://www.euractiv.com/section/road-safety/news/controversial-eu-labour-rules-tackle-truck-drivers-pay-and-working-conditions/>.

⁶⁹ Ricardo Report *supra* note 18 pp. 191-92.

⁷⁰ *Id.* p. 194.

⁷¹ Gent Study *supra* note 14 p. 263.

⁷² Joint declaration on a social agenda in aviation by Belgium, Denmark, France, Germany, Luxembourg and The Netherlands, 2 February 2018, cited in European Commission. (2019). Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Aviation Strategy for Europe: Maintaining and promoting high social standards (Report No. Com/2019/120 final). Retrieved 27 October 2019 from <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52019DC0120>.

⁷³ *Supra* note 45 pp. 3-4.

Certiorari Denied in *Love Terminal Partners, L.P. v. United States*

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On June 24, 2019, certiorari was denied by the U.S. Supreme Court in the matter of *Love Terminal Partners, L.P. v. United States*, 889 F. 3d 1331 (Fed. Cir. 2018).² This article briefly analyzes the history behind the case and the arguments that were presented.

Background:

Love Terminal Partners involved the Federal overturning of the “Wright Amendment”³ that limited air service at Love Field in Dallas to the four states that were contiguous to Texas. The Wright Amendment was passed in order to support development of Dallas/Fort Worth International Airport. In 1999, Love Terminal Partners, L.P. (“LTP”), one of the plaintiffs to this case, was assigned an existing sublease for a 9.3-acre portion of Love Field and constructed the six-gate Lemmon Avenue Terminal and a parking garage on this parcel.⁴ After construction was completed, passenger service existed for eight months but was not profitable and was shut down. Throughout this period, Southwest Airlines (“Southwest”) and other airlines offered Wright Amendment-compliant service out of the main terminal (Love Field is in fact the main hub of Southwest). In July 2006, a five-party agreement was entered into between Southwest, American Airlines, Dallas-Fort Worth Airport Authority, City of Dallas, and City of Fort Worth, which called for full ticketing at Love Field, repeal of the Wright Amendment, and limiting Love Field to 20 gates (eliminating 12 gates, including those at the Lemmon Avenue Terminal). This resulted in Congress enacting WARA⁵ in October of that year, essentially codifying the terms of the five-party agreement. Determining that this Congressional enactment rendered their leasehold valueless, the plaintiffs ceased paying rent and were evicted in 2008, when the plaintiffs sued arguing that there was a regulatory taking.⁶

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² *Cert. Denied* at 139 S. Ct. 2744 (2019).

³ PL 96–192, Feb. 15, 1980, 94 Stat 35.

⁴ *Love Terminal Partners, L.P. v. United States*, 889 F. 3d 1331, 1337 (Fed. Cir. 2018).

⁵ Wright Amendment Reform Act of 2006, Pub. L. No. 109-352, 120 Stat. 2011 (2006).

⁶ *Id.* at 1337-39.

Court Analysis:

The lower court held that indeed WARA was a regulatory taking by the Federal government and ordered the payment of \$133 million; the key finding was that the Claims Court held this was a taking because WARA required the City of Dallas to acquire and demolish the gates of the Lemmon Avenue Terminal. The United States appealed this decision and the Federal Circuit reversed the lower court decision and held this was not a taking. The Court cited to *Wyatt v. United States*, 271 F.3d 1090, 1097 (Fed. Cir. 2001) and noted that “As a threshold matter, ‘the existence of a valid property interest is necessary in all takings claims.’”⁷ The Court held that there was no regulatory taking when no passenger service was operating out of the Lemmon Avenue Terminal, and in fact the plaintiff had been operating at a loss since taking over the leasehold in 1999. The Court assumed that WARA essentially banned the plaintiffs from operating, but noted that in reality, what WARA had accomplished was government action that helped some parties and not others, and Congress had the authority to favor some parties above others. Nonetheless, because the plaintiff was operating at a yearly loss at the Lemmon Avenue Terminal, the Court held that no taking had taken place. The plaintiff further argued that, regardless of whether or not there was a net loss under the years, Love Field was subjected to the Wright Amendment and the plaintiffs were entitled to the *increase* in value to their parcel that was part and parcel with WARA. The Court rejected that argument and noted “owners are not entitled, if [their lands] were ultimately taken, to an increment of value calculated on the theory that if they had not been taken they would have been more valuable.”⁸ The Court finally noted that WARA did not specify that the Lemmon Avenue Terminal should be taken at no compensation, but rather that there should be negotiations with the landlord or eminent domain. However, since the landlord ceased paying rent and was evicted, no money was due to the plaintiff.⁹

Counter arguments presented to the *Love Terminal* decision:

Professor Ilya Somin of George Mason University Law School noted that the above-noted five-party agreement was really a form of cartel that locked the plaintiffs out of the benefits of WARA. He further noted that in valuing a parcel, likely changes in a regulatory regime are routinely taken into account, just as are perceived market changes that have not yet occurred. Just because a property was not deemed valuable at one point in time does not mean it would forever be value-free, and the fact that the plaintiff’s parcel was even acquired at all shows there was some inherent value to it.¹⁰ Professor Richard Epstein of New York University Law School also noted that the Federal government enabled the above-mentioned five-party agreement to take place by blocking an antitrust lawsuit and blessing the agreement under WARA. Thus, the Federal government was an active participant in the taking. Additionally, Professor Epstein noted the test of value of a property is not whether it turns a profit but what the value is on the fair market.¹¹ The Cato Institute, and others, filed an amicus brief. The brief’s two main arguments

⁷ *Id.* at 1339.

⁸ *Id.* at 1347, citing *United States v. Miller*, 317 U.S. 369, 379 (1943).

⁹ *Id.* at 1349.

¹⁰ See “The Supreme Court Should Take the Love Terminal Takings Case” located at <https://reason.com/2019/05/31/the-supreme-court-should-take-the-love-terminal-takings-case/>

¹¹ See “Plunder at Love Field” located at <https://www.hoover.org/research/plunder-love-field>

were that the Federal Circuit's approach would defeat any takings claim for a property that is not yet turning a profit and review is appropriate to resolve a conflict in the lower courts as to whether prospective economic value should be considered in assessing the merits of a regulatory takings claim.¹²

Nonetheless, despite presenting these arguments before the Court, ultimately the Supreme Court failed to take up certiorari and the Federal Circuit decision holds.

¹² See Brief *Amici Curiae* of the NFIB Small Business Legal Center, National Association of Home Builders, Real Estate Roundtable, Cato Institute, Southeastern Legal Foundation, and Owners' Counsel of America in Support of Petitioners located at <https://www.cato.org/sites/cato.org/files/pubs/pdf/love-terminal-partners-cert-stage.pdf>

The Application and Limitation of 91.13

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The Regulation:

§91.13 Careless or reckless operation.

(a) Aircraft operations for the purpose of air navigation. No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another.

Pilots may not understand why some aviation regulations are written deliberately vague, erroneously believing that the FAA could use these regulations to snag airmen and operators for minor errors or lapses in judgement. No regulation better illustrates this than 14 CFR 91.13, which prohibits the operation of an aircraft in a careless or reckless manner. The vague and nonspecific wording is not to ensnare the most minor indiscretions, but to limit the application to the most egregious of offenses.

Pilots will often make the claim that the FAA can charge an airman with a violation under CFR 91.13 if the airman operates contrary to the guidance in the Aeronautical Information Manual. The FAA will not bring such a case, as NTSB case rulings have limited the FAA's application of 91.13 in enforcement cases to having to meet either of these two general criteria:

- (1) A deliberate and high risk action that led to an accident or a significant incident. For example, the FAA would not bring a case against an airman should s/he approach a runway with significant extra speed, but was able to stop the airplane by the end of the runway. However if the airman did overrun, and sustained significant damage to the airplane or persons or property, an FAA enforcement case (EIR) would have merit.
- (2) A violation of another regulation. In this case the addition of 91.13 is logical – if an airman violated another regulation, it would be an indication that the airman may have been careless or reckless. The FAA will generally add 91.13 to any EIR against a pilot.

If an airman is charged with 91.13, it is critical that this be a negotiating point in the FAA informal conference. The FAA is typically willing to reduce the sanction by up to 20%, and drop 91.13 in exchange for a settlement. Insurance companies often view the finding of 91.13 in the

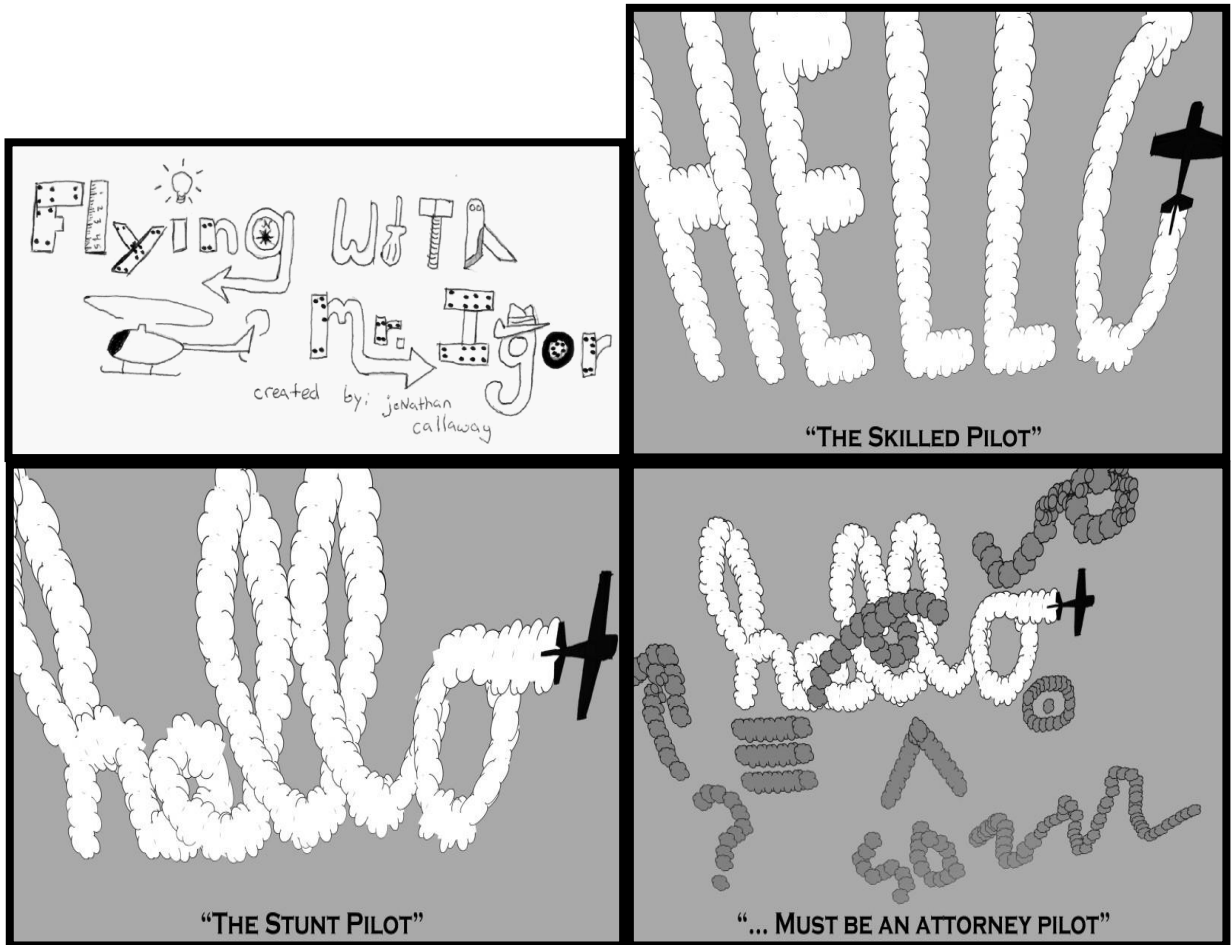
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same way they would a DUI conviction for a motor vehicle, and a 91.13 on an airman's record could result in a de facto civil penalty. Therefore an airman or the airman's lawyer should request that 91.13 be dropped in the informal conference.

FUN PAGES¹

Comics

By Jonathan Callaway, Chair of the Subcommittee on Rotary-Wing Aviation



¹ Please submit original aviation-related drawings, puzzles, pix, etc. for the Fun Pages to areitzfeld@gmail.com.

Committee Photos

October 24, 2019 “Hot Topics in Aviation” Event¹

Panel 1



Panel 2



¹ Many thanks to Philip Weissman, Chair of the Federal Preemption Subcommittee, for serving as the photographer for the event and taking many of these photos.

Panel 3



Audience



Audience



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**12th Annual McGill Conference on International Aviation Liability,
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Justin Green and Diane Westwood Wilson among the panel on “Update on Products Liability Cases and A Case Study on Major Accident Litigation: Plaintiff and Defendant Strategies”



Racquel Reinstein, Alan Reitzfeld and Jenny Ann Urban among the panel on “Liability of Airports, ANSPs, and Maintenance Providers”

