



Drone Advisory Committee Public eBook

**Public eBook
June 23, 2021 DAC Meeting • Virtual**



Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual Meeting

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Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual

Virtual Meeting Logistics

- We ask that everyone remain muted during the presentations. After each briefing, there will be an opportunity for the DAC members to engage in discussion and ask questions.
- Because of the large size of the group we ask that you first raise your hand using the Zoom command on your dashboard. An FAA moderator will be monitoring the dashboard and call on you to begin speaking.
- This DAC meeting is being livestreamed and recorded. It will be made available for future viewing on the FAA's YouTube channel.
- This is a public meeting and there may be members of the media viewing the livestream. They will be instructed that all discussions are for background only.
- To access the livestream links, go to either of these websites:
<https://www.facebook.com/FAA> or <https://www.youtube.com/FAAnews>



Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual

Confirmed FAA/DOT Attendees (on camera)

Name	Title	Org.
1. Jay Merkle	Executive Director, UAS Integration Office	FAA
2. Bradley Mims	Deputy Administrator	FAA
3. Laurence Wildgoose	Assistant Administrator, Office of Policy, International Affairs and Environment	FAA
4. Ali Bahrami	Associate Administrator, Aviation Safety	FAA
5. Teri Bristol	Chief Operating Officer, Air Traffic Organization	FAA
6. Timothy Arel	Deputy Chief Operating Officer, Air Traffic Organization	FAA
7. Mark Bury	Acting Chief Counsel, Office of General Counsel	FAA
8. Shannetta Griffin	Associate Administrator, Airports	FAA
9. Claudio Manno	Associate Administrator for Security and Hazardous Materials Safety	FAA
10. Matthew Lehner	Assistant Administrator, Office of Communications	FAA
11. Bill Crozier	Deputy Executive Director, UAS Integration Office	FAA
12. Gary Kolb	UAS Stakeholder & Committee Officer, UAS Integration Office	FAA

Confirmed FAA/DOT Observers

Name	Title	Org.
1. Erik Amend	Manager, Executive Office, UAS Integration Office	FAA
2. Chris Rocheleau	Deputy Associate Administrator, Aviation Safety	FAA
3. Tonya Coultas	Deputy Associate Administrator, Security and Hazardous Materials Safety	FAA
4. Jeannie Shiffer	Deputy Assistant Administrator, Office of Communications	FAA
5. Leesa Papier	Director, Office National Security Programs and Incident Response	FAA
6. Adrienne Vanek	Director, International Division, UAS Integration Office	FAA
7. Joe Morra	Director, Safety and Integration Division, UAS Integration Office	FAA
8. Martha Christie	Deputy Director, Safety & Integration Division, UAS Integration Office	FAA
9. Emmanuel Cruz	Manager, Implementation Branch, UAS Integration Office	FAA
10. Elizabeth Forro	Special Assistant, UAS Integration Office	FAA
11. Genevieve Sapir	Security Programs Advisor, Security and Hazardous Materials Safety	FAA
12. Allison LePage	Digital Communications Manager, Office of Communications	FAA
13. Jessica Orquina	Lead Communications Specialist, UAS Integration Office	FAA



Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual

Public Meeting Agenda

Time: 12:00 pm. to 2:30 p.m. Eastern Time

Location: Virtual Video Conference

	Start	Stop	
1.	12:00 pm	12:05 pm	FAA – Greetings & Logistics
2.	12:05 pm	12:10 pm	DFO – Read Official Statement of the Designated Federal Officer
3.	12:10 pm	12:15 pm	DFO – Review of Agenda and Approval of Previous Meeting Minutes
4.	12:15 pm	12:20 pm	DFO – Opening Remarks
5.	12:20 pm	12:25 pm	Acting Chair – Opening Remarks
6.	12:25 pm	12:55 pm	Acting Chair – Task Group 9 Recommendations – Report on Situational Awareness
7.	12:55 pm	1:25 pm	DFO – UAST Presentation
8.	1:25 pm	1:35 pm	BREAK
9.	1:35 pm	2:05 pm	Acting Chair – Operations and Technology Subcommittee, Task Group 10 - Gender Neutral Language for the Drone Community Recommendations
10.	2:05 pm	2:15 pm	DFO – New Taskings
11.	2:15 pm	2:25 pm	Acting Chair – New Business/Future Agenda Topics
12.	2:25 pm	2:28 pm	DFO – Closing Remarks/Final Thoughts
13.	2:28 pm	2:30 pm	Acting Chair – Closing Remarks/Final Thoughts
14.	2:30 pm	2:30 pm	Acting Chair – Adjourn

Questions/Comments: Contact Gary Kolb, UAS Stakeholder & Committee Officer
(gary.kolb@faa.gov or 202-267-4441).



Drone Advisory Committee

DAC Membership – As of 6/7/2021

Stakeholder Group	Members
Designated Federal Officer	Jay Merkle , Executive Director, UAS Integration Office, Federal Aviation Administration
Acting Chair	Houston Mills , Vice President, Flight Operations and Safety, United Parcel Service (UPS)
Airports and Airport Communities	Seleta Reynolds , General Manager, Los Angeles Department of Transportation Dr. Paul Hsu , Founder and Chair, HSU Educational Foundation
Labor (controllers, pilots)	Trish Gilbert , Executive Vice President, National Air Traffic Controllers Association (NATCA) Joseph DePete , President, Air Line Pilots Association (ALPA)
Local, State, Tribal and/or Territorial Government or Appropriate International Entity	David Greene , Bureau of Aeronautics Director, Wisconsin Department of Transportation Bob Brock , Director of Aviation and UAS, Kansas Department of Transportation Mark Colborn , Senior Corporal, Dallas Police Department Michael Leo , Captain, New York City Fire Department
Navigation, Communication, Surveillance, and Air Traffic Management Capability Providers	Mariah Scott , President, Skyward (a Verizon company) Matt Parker , President, Precision Integrated Programs
Research, Development, and Academia	Robie Samanta Roy , Vice President, Technology, Government Affairs, Lockheed Martin Corporation
Traditional Manned Aviation Operators	Mark Baker , President and Chief Executive Officer, Aircraft Owners and Pilots Association Lorne Cass , President, Aero NowGen Solutions, LLC Molly Wilkinson , Vice President, Regulatory Affairs, American Airlines
UAS Hardware Component Manufacturers	Brad Hayden , Founder and Chief Executive Officer, Robotic Skies Christian Ramsey , President, uAvionix Corporation
UAS Manufacturers	James Burgess , Chief Executive Officer, Wing (an Alphabet company) Michael Sinnett , Vice President Product Development and Strategy, Boeing Commercial Airplanes David Carbon , Vice President, General Manager, Amazon Prime Air Adam Bry , Co-founder and Chief Executive Officer, Skydio
Corporate UAS Operators	Greg Agvent , Senior Director of National News Technology, CNN Todd Graetz , Director, Technology Services, UAS Program, BNSF Railway
Citizen UAS Operators	Kenji Sugahara , Chief Executive Officer and President, Drone Service Providers Alliance Vic Moss , Owner, Moss Photography
UAS Software Application Manufacturers	Jaz Banga , Co-Founder and Chief Executive Officer, Airspace Systems, Inc. Chris Anderson , Chief Executive Officer, 3DR



Drone Advisory Committee

Stakeholder Group	Members
Agricultural Interests	Brandon Torres Declet , Chief Executive Officer and Co-Founder, MEASURE and Chief Operating Officer & Board Director, AgEagle
Advanced Air Mobility	Dr. Jaiwon Shin , Executive Vice President, Head of Urban Air Mobility (UAM) Division and Chief Executive Officer, Genesis Air Mobility, Hyundai Motor Group Dr. Catherine Cahill , Director, Alaska Center for Unmanned Aircraft Systems Integration (ACUASI)
Industry Associations or other specific areas of interest as determined by the DAC DFO	Brian Wynne , President and Chief Executive Officer, Association for Unmanned Vehicle Systems International Thomas Karol , General Counsel, National Association of Mutual Insurance Companies David Silver , Vice President for Civil Aviation, Aerospace Industries Association Lee Moak , Founder & Chief Executive Officer, The Moak Group

OVERVIEW

DAC TASK GROUP 10 Gender-Neutral Language for the Drone Community

DAC Meeting, June 23, 2021

At the February 24, 2021, meeting of the Federal Aviation Administration's (FAA) Drone Advisory Committee (DAC), the designated federal officer established Task Group #10 (TG-10).

Subsequently, Patricia Gilbert, Executive Vice President of the National Air Traffic Controllers Association (NATCA), and Mark Baker, President of the Aircraft Owners and Pilots Association (AOPA), were asked and agreed to co-chair the task group.

Tasking:

1. The DAC to develop recommendations for gender-neutral language as an alternative to gender-specific terms currently used in the drone industry and aviation community.
2. The DAC to take the lead to facilitate the adoption of gender-neutral language throughout the drone community and provide recommendations that organizations across the industry and community can implement.

Task Group: The DAC and the Operations/Technology subcommittee members from 17 organizations — representing labor, airports, local government, providers, traditional aviation, hardware, software and drone manufacturers, and advanced air mobility — joined our tasking. The task group commenced work on March 10, 2021, via the first of many virtual meetings held by subgroups, subgroup leads, and the full task group. The diverse backgrounds, passion for the subject, expertise, experience, and strong work ethic each member brought to the work was critically important. As members tackled the research, writing, and complexity of the task, over and over again, all agreed that our recommendations and the subsequent work of the FAA and the drone community will be essential for modeling the leadership and behaviors that will build a more inclusive aviation community.

I. INTRODUCTION

As you all know, infrastructure is also jobs.

A big part of my job here at the FAA is to make sure we get the infrastructure support that we need, as well as to remove any barriers from recruiting the next generation of aerospace workers who will operate that infrastructure.

We want the best, brightest, and most diverse group of people from all walks of life, and I look forward to working with everyone here to make sure that we

recruit more women, minorities, and people from underserved communities for the aerospace workforce.

With this workforce and major investments in aviation infrastructure, our aerospace system can be greener, will continue to fuel the U.S. and world economies, and once again bring people, cultures, and ideas closer together.

— **A. Bradley Mims, Federal Aviation Administration Deputy Administrator**
"Building the Foundation for Aviation's Future"
March 31, 2021¹

As Deputy Administrator Mims indicated earlier this year, removing barriers is a key element to ensuring that top talent, from all walks of life, both individuals and organizations, is attracted to aviation as an exemplary industry with transformational leaders, determined decision makers, and diverse and highly engaged professionals.

Regardless of the perception that "progress has been made," the data shows that we continue to have a gap of women and underrepresented groups in aviation; increases in their participation over the past 15 years have been negligible.

We are uniquely positioned to do something different as the drone industry becomes a full partner in aviation. Adopting gender-neutral language is a positive step toward a more inclusive and diverse ecosystem. Diversity remains a critical building block to unleashing innovation, and a culture of equality is an essential multiplier to help maximize innovation. While diversity factors alone have a significant impact on the innovation mindset, it is much higher when combined with a culture of equality. A metastudy across multiple industries found that in companies with the most-equal and diverse cultures, an innovation mindset is 11 times greater than in the least-equal and diverse cultures.²

A robust safety culture is reliant on the participation of those expected to use it. Its success depends on three things: its scope, whether employees are knowledgeable about it, and whether they are well disposed towards it, i.e., committed to making it work.

DAC Task Group 8 - Safety Culture:

Guiding principles, or tenets, that are considered common and foundational in strong safety cultures:

- Safety ownership

¹ Mims, A. Bradley. "Building the Foundation for Aviation's Future." 31 Mar. 2021. U.S. Chamber of Commerce Aviation Summit (Virtual), Federal Aviation Administration, https://www.faa.gov/news/speeches/news_story.cfm?newsId=25981. Transcript.

² "Equality=Innovation: Getting to Equal 2019: Creating a culture that drives innovation." Accenture, 2019. <https://www.accenture.com/acnmedia/Thought-Leadership-Assets/PDF/Accenture-Equality-Equals-Innovation-Gender-Equality-Research-Report-IWD-2019.pdf>. Accessed 14 May 2021.

- Safety modeled by leadership
- Organizational values
- Learning culture
- Systemwide approach
- Trust

These are all tenets which rely on a valued, confident, and engaged community and workforce. In fact, strategies for reducing accidents and incidents in aviation due to complex human behaviors have been widely adopted in flight training with Crew Resource Management (CRM) and subsequently with air traffic services in Team Resource Management and more recently Maintenance Resource Management.

As explained on SKYbrary, “CRM is concerned not so much with the technical knowledge and skills required to fly and operate an aircraft but rather with the cognitive and interpersonal skills needed to manage the flight within an organised aviation system. In this context, **cognitive skills are defined as the mental processes used for gaining and maintaining situational awareness, for solving problems and for making decisions. Interpersonal skills are regarded as communications and a range of behavioural activities associated with teamwork.** In aviation, as in other walks of life, these skill areas often overlap with each other, and they also overlap with the required technical skills. Furthermore, they are not confined to multi-crew aircraft, but also relate to single pilot operations, which invariably need to interface with other aircraft and with various ground support agencies in order to complete their missions successfully.”³

One of the most notable examples of an outcome in which these principles were applied is “the Miracle on the Hudson.” On January 15, 2009, an Airbus A320 ditched into the Hudson River after suffering double engine failure due to multiple bird strikes shortly after takeoff. All passengers and crew survived, largely thanks to exceptional resource management on the part of the flight deck, cabin crew, and first responders. In his foreword to *Crew Resource Management*, John K. Lauber writes that “the fortunate outcome of this event represents the confluence of many factors, but it is very clear that none of those would have made much of a difference had the flight crew not executed a successful ditching, and, subsequently and in close concert with the cabin crew, evacuated all 155 persons on the aircraft. This accident seems to represent the highest form of human performance — CRM at its very best.”⁴

Potentially harmful actions, terminology, and behaviors, while sometimes subtle, nevertheless undercut efforts to create a more inclusive, safe, and productive ecosystem. As suggested by the name, microaggressions seem small; but compounded over time, they can have a deleterious impact on an employee’s experience, physical health, and psychological well-being.

³ “Crew Resource Management (CRM).” SKYbrary, 21 Mar 2020.

[https://www.skybrary.aero/index.php/Crew_Resource_Management_\(CRM\)](https://www.skybrary.aero/index.php/Crew_Resource_Management_(CRM)). Last accessed 14 May 2021.

⁴ Lauber, John K. “Foreword.” *Crew Resource Management*. Kanki, Bargara G, Robert L. Helmreich, et al. (eds). Academic Press, 2010.

In fact, research suggests that subtle forms of interpersonal discrimination like microaggressions are *at least as harmful* as more-overt expressions of discrimination.⁵

A March 2021 presentation from the National Business Aviation Association (NBAA) Leadership Summit focused on diversity, equity, and inclusion (DEI) in the workplace, with a specific focus on overall safety benefits. It posited that a more inclusive and comfortable work environment is one that leads to creation of a stronger ecosystem that lends itself to removing barriers when producing operating policies and procedures. Diverse viewpoints only add to any discussion relative to risk and overall safety. On the other hand, subconscious implicit biases enable an atmosphere of “microaggressions” that are detrimental to safety in the workplace, whether in an office or on flight deck. Consultant Jim Peal, one of the presenters at the conference, noted, “When microaggressions happen – whether they are intentionally meant to hurt or not – our attention goes inside and we stop paying attention to the outside, and this can impact safety.”⁶

Diversity and inclusion are much more than a legal or moral initiative; they enhance safety and as indicated above are “a critical building block for unleashing innovation,” which gives educational institutes, government, companies, organizations, and labor unions a competitive advantage.⁷

A 2019 analysis conducted by McKinsey found that “companies in the top quartile of gender diversity on executive teams were 25 percent more likely to experience above-average profitability than peer companies in the fourth quartile. This is up from 21 percent in 2017 and 15 percent in 2014.”⁸

For all these reasons, we recommend that the Federal Aviation Administration move to adopt gender-neutral language in the drone industry. To ensure inclusion of all regardless of gender identity, and to avoid burdensome language, we recommend utilizing gender-neutral language (e.g., “person”; “they”) rather than gender-binary (e.g., “man or woman”; “he or she”).

From a practical perspective, the tasking group believes changes to adopt gender-neutral language should take on two priorities: First, all new documents, speeches, social media, and marketing and promotional material should use gender-neutral language. Second, rework of

⁵ Jones, Kristen P., et al. “Not So Subtle: A Meta-Analytic Investigation of the Correlates of Subtle and Overt Discrimination.” *Journal of Management*, vol. 42, no. 6, Sept. 2016, pp. 1588–1613, doi:10.1177/0149206313506466.

⁶Leadership Summit – DEI Benefits in the Workplace,” March 25, 2021, available at <https://nbaa.org/professional-development/on-demand-education/nbaa-go/leadership-summit/nbaa-go-leadership-summit-newsroom/leadership-summit-dei-benefits-the-workplace/>

⁷ ibid

⁸ Dixon-Fyle, S., Hunt, V., Dolan, K., and Prince, S. “Diversity wins: How inclusion matters.” McKinsey & Company, 2020. <https://www.mckinsey.com/~media/mckinsey/featured%20insights/diversity%20and%20inclusion/diversity%20wins%20how%20inclusion%20matters/diversity-wins-how-inclusion-matters-vf.pdf>. Last accessed 14 May 2021.

existing documents and materials should be prioritized by the number of individuals exposed to the material, as well as the effort required to update them.

II. Tasking & Recommendation Overview

History of Drone Naming Conventions in the U.S. and Internationally

Before turning to why we believe it is important to change the current language integrating the U.S. drone industry, it is helpful to review how some of the terminology was adopted. At the outset, it is worth noting that this nomenclature is still recent and evolving and therefore should not be viewed as sacrosanct or traditional.

The FAA's first public usage of "UAS" (unmanned aircraft systems) appeared on February 6, 2007, in the FAA's Federal Register Notice "Unmanned Aircraft Operations in the National Airspace System" (Docket No. FAA-2006-25714). This notice clarified the FAA's then-current policy concerning operations of unmanned aircraft in the National Airspace System. Further research reveals that perhaps the first notable, regulatory usage of UAS came about on August 4, 2005, in a U.S. Military Memorandum with the subject title "Unmanned Aircraft Systems (UAS) Roadmap, 2005-2030."

The first U.S. statutory reference to UAS came in the FAA Modernization and Reform Act of 2012, PUBLIC LAW 112-95 (Feb. 14, 2012). Subtitle B of this law attempted to introduce, regulate, and begin the foundation for the integration of drones. Section 313 set forth the following definitions, among others:

Small Unmanned Aircraft—The term "small unmanned aircraft" means an unmanned aircraft weighing less than 55 pounds.

Unmanned Aircraft—The term "unmanned aircraft" means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.

Unmanned Aircraft System—The term "unmanned aircraft system" means an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently.

However, the actual history of unmanned aircraft (UA), UAS, remotely piloted aircraft systems (RPAS), or drones, more than likely exceeds 50 years. The term *drone* may have been used first to describe early military targets being towed behind an aircraft for target practice. Later, military drone aircraft were flown remotely as evasive targets for military training exercises. By the early 2000s armed military drones or unmanned aircraft were used in the Middle East for intelligence, surveillance, and reconnaissance (ISR) and to conduct air-to-ground military

engagements.⁹ Over the next several years the FAA borrowed concepts of operations and terminology from Department of Defense (DOD) operational documents describing UAS or drones' interaction with air traffic control (ATC).¹⁰ Currently, the FAA and industry efforts to integrate civil UAS into the National Airspace System (NAS) include numerous terms for aircraft systems without a pilot on board. Today, the FAA regularly intermixes the terms *unmanned aircraft system* and *drone* in many of its publications and on websites, but the term *drone* is not included or defined in the Code of Federal Regulations (CFR) governing unmanned aircraft in the NAS.

Internationally, the International Civil Aviation Organization (ICAO) Air Navigation Commission, at its 175th Session on 19 April 2007, approved the establishment of the Unmanned Aircraft Systems Study Group (UASSG). The UASSG first considered introducing the term "remotely piloted" at its third meeting, 15 to 18 September 2009, after reaching the conclusion that only unmanned aircraft that are remotely piloted could be integrated alongside manned aircraft in non-segregated airspace and at aerodromes. The study group therefore decided to narrow its focus from all UAS to those that are remotely piloted. The UASSG developed the *Unmanned Aircraft Systems (UAS)* (Cir328), published in March 2011. The circular provided States with an overview of issues that would have to be addressed in the Annexes to ensure remotely piloted aircraft systems (RPAS) would be compliant with the provisions of the Chicago Convention. The UASSG then turned its attention to the development of the first edition of the Manual on Remotely Piloted Aircraft Systems (RPAS) Doc 10019, published 2015, which replaced Cir328. Both publications stated, "[T]he goal of ICAO in addressing unmanned aviation is to provide the fundamental international regulatory framework through SARPs."¹¹ Autonomous uncrewed aircraft are not within the scope of Doc 10019.

Doc 10019 defines an Remotely Piloted Aircraft (RPA) as an unmanned aircraft that is piloted from a remote pilot station. Additionally, it is important to note that RPAS is addressed by ICAO as one subset of UAS.¹² In March 2012, the first significant package of Standards and Recommended Practices (SARPS) related to RPAS was adopted for Annex 2 — *Rules of the Air* and Annex 7 — *Aircraft Nationality and Registration Marks*.

⁹ Bowden, Mark. "How the Predator Drone Changed the Character of War." *Smithsonian Magazine*, Nov 2013. <https://www.smithsonianmag.com/history/how-the-predator-drone-changed-the-character-of-war-3794671/>. Last accessed 15 May 2021.

¹⁰ Walker, J and Geiselhart, K. March 2007 RTCA Program Management Committee approved Special Committee 203 (SC-203) DO-304 Guidance material and Considerations for Unmanned Aircraft System. http://www.uasresearch.com/documents/yearbook/066-67_Contributing-Stakeholder_RTCA.pdf. Last accessed 17 May 2021.

¹¹ International Civil Aviation Organization. Manual on Remotely Piloted Aircraft Systems (RPAS), Doc 10019. ICAO, 2015. <https://skybrary.aero/bookshelf/books/4053.pdf>. Last accessed 14 May 2021.

¹² Ibid

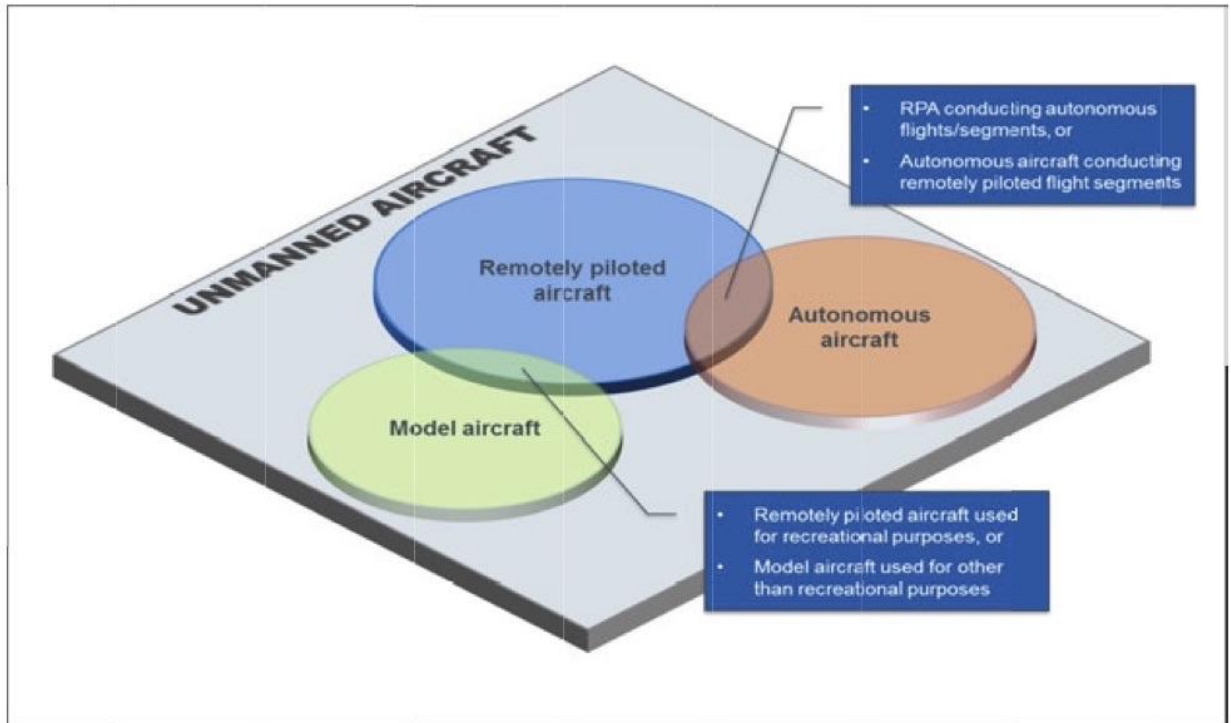


Figure 1-1. Unmanned aircraft

In 2018, Canada announced at an ICAO Conference its decision to use the term RPAS for “legal and regulatory purposes.”¹³

Even within the United States, the utilization of the term *unmanned* has not been universal. To the contrary, NASA’s History Program Office Style Guide, adopted on January 24, 2006, states: “All references referring to the space program should be non-gender specific (e.g. human, piloted, un-piloted, robotic).”¹⁴

Important Dates:

- 8/4/2005 – DOD publishes Memorandum “Unmanned Aircraft Systems (UAS) Roadmap, 2005-2030”
- 1/24/2006 – NASA establishes that all references referring to the space program should be non-gender specific (e.g. human, piloted, un-piloted, robotic). (Style Guide for NASA History Authors and Editors)

¹³ Working Paper: THIRTEENTH AIR NAVIGATION CONFERENCE Montréal, Canada, 9 to 19 October 2018. ICAO, 2018. https://www.icao.int/Meetings/anconf13/Documents/WP/wp_304_en.pdf. Last accessed 17 May 2021.

¹⁴ Style Guide for NASA History Editors and Authors. NASA, 2012. <https://history.nasa.gov/styleguide.html>. Last accessed 15 May 2021.

- 2/6/2007 – FAA refers to UAS in its Federal Register Notice “Unmanned Aircraft Operations in the National Airspace System”(Docket No. FAA-2006-25714).
- 2/14/2012 – Public Law 12-95 “UAS” first congressional reference.
- 10/19/2018 – Canada announces at an ICAO Conference a decision to utilize the term RPAS for “legal and regulatory purposes.”

Some have posited that the term *unmanned* is not gendered but rather meant to be universal by referring to all humans. However, as will be detailed below, studies have shown that such terms are interpreted as gendered and can lead to feelings of exclusion and gender stereotyping. Having set this stage for how drone nomenclature has evolved, we now turn to the rationale for progressing to gender-neutral language in this space. While the task group provided guidance on replacement terms, it did not undertake the development of definitions of specific recommendations for gender-neutral language because it was deemed to be out of scope for this task group.

III. Recommendations

Use gender-neutral language (rather than gender-binary language) wherever possible

Rebecca S. Bigler of the University of Texas at Austin and Campbell Leaper of the University of California, Santa Cruz, analyzed a number of studies to determine the impact of language on children’s understanding of gender. Ultimately, they found that: “The neutral terms are preferred over masculine and feminine forms because they do not impose a gender binary, make the gender of workers salient, or lead to narrow, gender exclusionary conceptions of occupations.”¹⁵

The European Parliament has embraced neutral language and discourages utilization of binary options, and airlines similarly have moved away from binary options like “ladies and gentlemen.”

Recommendation 1: The Federal Aviation Administration should adopt gender-neutral language in the drone industry. To ensure inclusion of all regardless of sex, gender expression, gender identity, and to avoid burdensome language, we recommend using gender-neutral language (e.g., “person”; “they”) rather than gender-binary (e.g., “man or woman”; “he or she”). See style guide below.

¹⁵ Rebecca S. Bigler and Campbell Leaper, “Gendered Language: Psychological Principles, Evolving Practices, and Inclusive Policies,” *Behavioral and Brain Sciences*, 2015, Vol. 2(1) 187–194, at 191.

Recommendation 2:

- A. Due to the advantage of maintaining the use of a "U" in acronyms, which minimizes renaming disruption in both FAA and other groups, "unmanned" should be replaced with "uncrewed," at least in the short term. If the FAA determines that a two-phase approach is too cumbersome, we suggest replacing *unmanned* with *drone* immediately, as the ideal long-term solution — see recommendation 2 (B) below.
- B. *Drone* is recommended as optimal for long-term use. It is a useful word that encompasses all of the various flight and control modes (from remotely piloted to highly automated) and aircraft types that currently fall under the category of "unmanned."
- C. Consider working with Congress on a revised definition of "UAS" that more accurately describes these aircraft systems.

Recommendation 3: From a practical perspective, changes to adopt gender-neutral language should take on two priorities:

- A. All new documents, speeches, social media, and marketing and promotional material should use gender-neutral language.
- B. Rework of existing documents and materials should be prioritized by the number of individuals exposed to the material, as well as the effort required to update them.

Recommendation 4: Expand beyond drones to aviation more broadly. Both the problem we are trying to solve and the benefits of making this change apply to the entire aviation industry – not just to the drone industry. Of course, language outside of the drone industry may be more entrenched given the comparative maturity of the rest of the industry, but that also means that there is a potential for even greater benefits. Furthermore, those within the drone industry naturally will need to interface with the broader aviation industry.

The Fire Department of New York City (FDNY) shared its experience in adopting gender-neutral language with the DAC TG#10.

"With the success of hiring more women into FDNY, the FDNY agreed it was important to embrace inclusive language.

The Fire Department of New York City (FDNY) created an initiative to move to gender neutral language and concluding with the adoption of City Ordinance. The FDNY gathered a task force of individuals from a variety of disciplines across the ranks of FDNY and documented a comprehensive list of gendered language found in FDNY documents. The task force then proposed gender neutral replacements for gender specific language and reviewed the proposal within the Department including the FDNY Equity Officer. A one-page document was then created for use by FDNY members as well as a template to update existing documents. Finally, the proposal was adopted by the City Council.

Thanks to constant reinforcement of the importance of adopting gender neutral language by FDNY senior officers, a shift in language is happening.

The most significant lesson we learned in making this transition is to realize this is a cultural change for people and it is normal for most everyone to resist it. Patience and perseverance were the keys to our success.”

The Federal Aviation Administration has a similar opportunity to embrace gender-neutral language and create a more inclusive environment.

FAA Gender-free Style Guide Recommendations

Prepared by the Drone Advisory Committee Task Group 10

June 2021

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Overview

The FAA Drone Advisory Committee (DAC), the agency's industry advisory board, has been tasked to develop recommendations for gender-neutral language as an alternative to gender-specific terms currently used in the drone industry and aviation community. The following reflect these recommendations, which should be seen as a starting point for a more thorough FAA internal review and policy-making process.

The primary reason for these recommended changes is to make aviation more inclusive by reducing or eliminating language that reflects intentional or unintentional bias; many of the terms are historical and stem from an earlier era of aviation. We focused mainly on gender bias, particularly on language that derived from what was once a male-dominated industry. But we also reflected a more modern

recognition that gender can be non-binary and that personal preferences should be respected whenever possible.

We hope that the FAA will incorporate these changes in its official language policies and style guides, initially in the drone sector but eventually extending throughout the FAA. That said, we primarily limited ourselves to terminology about and around drones *per se*, and did not do a systematic review of terminology in traditional commercial and general aviation.

We considered both the priority of word changes and the difficulty in making them, and roughly batched them as follows, with examples given of each category:

Difficulty in making the change (based on whether an acceptable alternative already exists in FAA language)			
		<i>Easier</i>	<i>Harder</i>
Priority of making the change (based on frequency in FAA use or explicit use of gender)	<i>Higher</i>	Repairman → Technician	Airman/men → Aviator
	<i>Lower</i>	Wife → Spouse	NOTAM → ?

The following are caveats to this section of the document:

- 1) The DAC working group did not do a comprehensive review of all FAA communications, past and present, since this was out of scope. However, the below represents some of the most common gendered terms found in modern FAA communications, based on the group's experience.

- 2) As with many style guides, the appropriate terms sometimes differ based on context. For example, some terms may be appropriate for written communications but not for spoken ones, such as air traffic control, where syllables should be minimized and homophonic similarities with other aviation terms avoided. In other cases, different terms may be used for aviation professionals versus the general lay public. With this in mind, we have broken the below recommendations into three categories: formal writing, informal writing, and spoken.
- 3) Although we did look at what some other aviation and aerospace organizations have done to reduce gendered language, we did not do a comprehensive review of all relevant government and industry groups, both in the United States and elsewhere. Even among those that we did survey, there is often no consensus on preferred terms. As is often the case, technology and society both cause language to evolve, and this evolution is still in progress around the world. So replacing “man” in aviation language is complicated by the fact that semi-autonomous technology is simultaneously replacing *humans* from many aviation roles, even challenging the fundamental concept of a “pilot in command.” We have attempted to future-proof our recommendations with this in mind, but we are aware that technology’s advance will likely lead to further changes in the language of aviation over the years to come.
- 4) Regarding the use of “drone,” we believe that this is a useful and increasingly widely used word that encompasses all of the various flight and control modes (from remotely piloted to fully autonomous) and aircraft types that currently fall under the category of “unmanned.” We are, after all, representing the FAA’s *Drone* Advisory Committee, which is certainly a nod toward acceptance of the word. As such, we have suggested it for long-term consideration as an official designation eventually replacing “uncrewed,” which has some suboptimal characteristics we discuss below. Some of the members of the TG-10 suggested the use of the term *remotely piloted aircraft systems*, recognizing that all operations will have an assigned responsible operator. However, before “drone” can be accepted as official FAA terminology, it must be fully defined and that is out of scope for this working group.
- 5) This information is not meant to broadly define how aviation terms are used or the means with which operations are conducted. It only addresses the issue of suggesting gender-neutral language for future use. These recommendations must be harmonized with other aviation terminology initiatives.

Formal FAA Written Language Recommendations¹⁶

Current FAA term	Where typically found	Proposed alternative from currently used regulatory terms	Optimal term for long-term use	Example	Reason	Reason for not selecting other terms
Airman/Airmen	Government, Manufacturers & SW Developers, Press/Media, FAA handbooks and Manuals	Aircrew	Aviator(s)	Please show your aircrew certificate to the inspector.	More inclusive of all individuals	Operator: "Crew" is acceptable, but may imply more than one person so is not optimal long-term. "Operators" can be individuals or groups, including those who might not be FAA licenced or in command. Also acceptable but not optimal
Chairman/Chairwoman	Meetings and minutes	Chair		Melissa serves as chair of the new task group.	Inclusive term for a leadership role; chairperson not used by AP*	
Cockpit	Manuals and placards found throughout airplanes.	Flightdeck		The flightdeck remains off limits to passengers.	On occasion masculine crew members have wielded the term "cockpit" to exclude or	

					undermine femme coworkers. * *Terms are used interchangeably in the regulations.	
He/She His/Hers (S)He His or Hers He or She		They, Them, Their, Theirs		Every passenger must store their belongings in the overhead compartment or under the seat in front of them.	When speaking about people-in-general, using the singular "they" avoids excluding certain individuals as well as cumbersome constructions that introduce complexity.	"His or her" : This construction is unnecessarily wordy and enforces a gender binary. ¹⁷
Manmade		Manufactured, built, fabricated, constructed, machine made		Detect-and-avoid technologies must be able to detect both naturally occurring and manufactured materials		
Manmade obstacles	Aeronautical charts	Structural obstacles		As in IFR and VFR sectional legends		
Manned aviation		Traditional aviation				
Notices to airmen (NOTAM)	Bulletins, ATIS, Dispatch releases	Some thoughts on an interim	Notice to all			

¹⁷ Although "they" as a singular pronoun traditionally has been both widely used *and* considered ungrammatical, this is changing. Not only is it common parlance, but the introduction of "they" as a non-binary gender pronoun formalizes its grammatical acceptability.

		<p>step of retaining the acronym but changing its underlying terminology: 1. <i>NOTAM</i> could be replaced with <i>notam</i> — a new noun in its own right (no longer an acronym) that means “notice to aviators.” 2. The “A” could be redefined as the missing “All” leaving the “M” available for redefinition with a word such as “Mission Commanders” or “Missions.” 3. Let the “AM” stand for American Airspace, as in “NOTice for AMerican airspace.”</p>	aviators (NOTAV)			
Pronouns		Always use an individual’s		Examples include: She/Her/Hers		

		preferred pronouns, even if they are unfamiliar to you.		Sie/Hir/Hirs They/Them/Theirs He/Him/His		
Repairman	"Repairman Certificate"	Technician				
Unmanned		Uncrewed	Drone (can be used a noun or adjective)		The U.S. General Accounting Office has suggested "uncrewed" as the preferred gender-free alternative to "unmanned."	Remotely operated, Remotely piloted: ¹⁸ Drones are increasingly highly automated and may have limited capacity for manual control (ie, piloting), relying instead on automated flight modes or pre-planned flight paths.
sUAS or Small unmanned aerial system	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Small uncrewed aerial system	Small Drone System		The U.S. General Accounting Office has suggested "uncrewed" as the preferred gender-free alternative to "unmanned." This retains the "U," which would allow acronyms to remain unchanged,	Remote Operator in Command (ROC), Remotely-Operated Aerial System (ROAS), Remotely-Piloted Aerial System (RPAS): See Unmanned above

¹⁸ The FAA now uses "operator" in its drone certification Means of Compliance (MoC) to refer to the ground crew in command.

					both within the FAA and elsewhere in aviation. However, since "uncrewed" may incorrectly imply to some that there are no humans involved at all, not even on the ground, this is not optimal. "Unoccupied" is slightly clearer but has the disadvantage of being wordier. Thus, we recommend that the word "drone" be considered for formal definition and use in the future.	
Unmanned aviation	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Uncrewed aviation ¹⁹	Drone aviation		See "Unmanned" above	RPAS, ROC, ROAS: See Unmanned above
UAS or Unmanned aerial	Manufacturers & SW Developers,	Uncrewed aerial system	Drone system		See "Unmanned" above	RPAS, ROC, ROAS: See Unmanned

¹⁹ One advantage of "uncrewed" replacing "unmanned," at least in the short term, is that it maintains the use of a "U" in acronyms, which minimizes renaming disruption in both FAA and other aviation groups. "Uncrewed" does not necessarily mean that no humans (such as a pilot in command) are involved — however, this is a nuance that may be lost on a lay audience.

system	Influencers, Government, Academia, Press/Media					above
UAV or Unmanned aerial vehicle	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Uncrewed aerial vehicle	Drone		See "Unmanned" above	RPAS, ROC, ROAS: See Unmanned above
Unmanned traffic management (UTM)		UAS Traffic Management				
NATO/ICAO Phonetic Alphabet	ATC and other radio communications	We considered, but propose no changes be made.		"Romeo, Juliett, Papa, Victor, Mike"	These are aural indicators without actual meaning, so the fact that some signifiers could have gendered connotations is less impactful. Most importantly, we are concerned about the negative safety impact of changing phonetic signifiers that are so crucial to the safety of controlled operations.	

Informal FAA Written Language

Current FAA Term	Where typically found	Proposed Term(s)	Notes
Airman/Airmen	Government, Manufacturers & SW Developers, Press/Media,	Aviator(s)	"Crew" is acceptable, but may imply more than one person so is not optimal long-term. "Operators" can be individuals or groups, including those who might not be FAA licenced or in command. Also acceptable but not optimal
Unmanned	Government, Manufacturers & SW Developers, Press/Media,	Drone (can be used a noun or adjective)	
sUAS or Small unmanned aerial system	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Small Drone System	
Unmanned aviation	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Drone aviation	
UAS or Unmanned aerial system	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Drone system	
UAV or Unmanned aerial vehicle	Manufacturers & SW Developers, Influencers, Government, Academia, Press/Media	Drone	

Air Traffic Control (Spoken) Language

Current FAA Term	Proposed Term(s)	Example	Why
Airman/Airmen	Pilot/Operator/ Aviator/Aircrew	Please show your Pilot/Operator/Aviator/Aircrew certificate to the FAA inspector.	More inclusive of all individuals
NOTAM	Retain for now, pending redefinition or change in the term (as per first tab)		
Manmade obstacles	Structural Obstacles	As in IFR and VFR sectional legends	More inclusive of all individuals
Repairman/Repairmen	Technician	To be eligible for a technician certificate each applicant is required by § 65.101 to...	More inclusive of all individuals
UAS	Retain for now, since only the acronym is typically used in spoken ATC language even as the underlying words may change as per first tab		
Cockpit	Flightdeck	The flightdeck remains off limits to passengers.	On occasion masculine crew members have wielded the term “cockpit” to exclude or undermine femme coworkers. The terms <i>flightdeck</i> and <i>cockpit</i> are used interchangeably in the regulations.

Phonetic alphabet	We considered, but propose that no changes be made.	"Romeo, Juliett, Papa, Victor, Mike"	These are aural indicators without actual meaning, so the fact that some signifiers are gendered is less impactful. Most importantly, we are concerned about the negative safety impact of changing phonetic signifiers that are so crucial to the safety of controlled operations.
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IV. Purpose

A. Audience

The Tasking team identified more than 130 individual audiences within aviation in categories of government, standards development organizations, labor groups, manufacturers-software developers, academia, influencers, press-media and the general public.

B. Why Gender-Neutral Language?

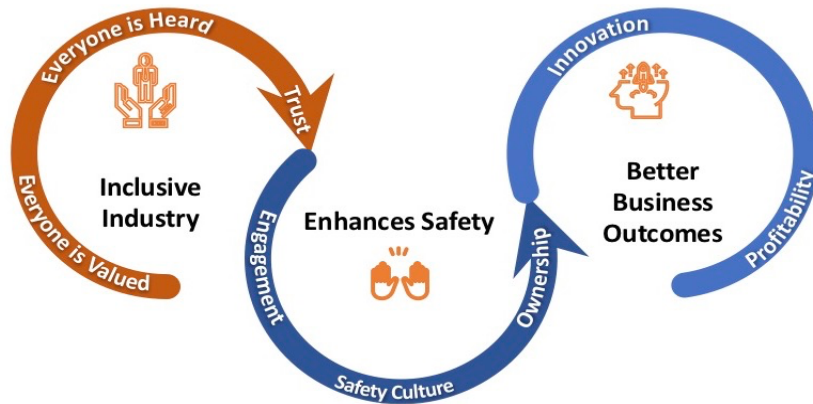
As it grows and matures, the drone industry has an opportunity to use and embrace gender-neutral language that defines it as an industry that is respectful, welcoming, and brings value to the receiver.

Today, women and other marginalized groups are significantly underrepresented in the aviation industry. This state of affairs contributes to the shortage of pilots and other aviation professionals. Aviation industry bodies accordingly have developed and adopted programs that help increase the number of women and other underrepresented groups. Avoiding imprecise and exclusionary language can help create a work environment where all workers feel safe sharing their views, thereby improving psychological and operational safety. Diversity and inclusion also lead to better business outcomes. Research shows that the utilization of gender-neutral language can lead to a more inclusive environment that draws more people to the industry and helps keep them there. Accordingly, entities ranging from international bodies to airlines have adopted gender-neutral language.

For all these reasons, we recommend that the Federal Aviation Administration move to adopt gender-neutral language in the drone industry. To ensure inclusion of all regardless of gender identity, and to avoid burdensome constructions, we recommend using gender-neutral language (e.g., “person”) rather than gender-binary language (e.g., “man or woman”).

INCLUSIVE LEADERSHIP

Sustainable talent of the best and the brightest by deepening the pool



Graphic created by Patricia Gilbert for this report.

C. Language Matters: Diversity and Inclusion in the Drone Industry Can Enhance Attraction and Retention of Professionals, Psychological Safety, and Business Outcomes

The aviation industry, like many other science, technology, engineering, and mathematics (STEM) industries, has had a long history of homogenous gender and racial participation in the United States.²⁰ Today, that engagement has not significantly changed, resulting in a continued gap of women and other underrepresented groups in aviation participation. Addressing this imbalance can help this nascent industry develop into one that attracts and retains the best and brightest professionals, creates a safe environment in which those professionals can grow and thrive, and realizes all the business advantages of inclusivity.

1. Gender-Neutral Language Helps to Create an Inclusive Culture for Attracting and Retaining Professionals

The aviation industry generally, and the drone industry specifically, lacks gender diversity.

We are aware of anecdotal stories of some in the industry expressing disbelief regarding the existence of gender disparities. When an individual is a member of the single majority group of an industry, subconscious filters occur that blind the individual of the realities of the lack of

²⁰ Ibid.

inclusion and diversity of the entire industry.²¹ An examination of the data quickly proves the existence of gender disparities in aviation.

By the end of 2019, there were more than 664,000 pilots and more than 714,000 non-pilot aviation jobs in the United States. Of those, only 52,700 pilots and 215,900 non-pilots are women. That means 7.9 percent of the pilots in the U.S. are women and 30.2 percent of non-pilot related workers are women. Furthermore, when flight attendants are subtracted from the non-pilot jobs, the number of women in non-pilot jobs in 2019 is 21,300, or 4.6 percent of the total jobs. The growth rate of these categories has been slow. From 2010 to 2019 the compounded annual growth rate of women as pilots was 1.9 percent; the number of women in total non-pilot jobs has grown 3.7 percent annually over the same period. In other words, while the number of jobs has grown, the number of women has remained far below the population ratio of women to men.²²

Furthermore, the gender disparity is greater among those in the highest ranks of commercial pilots. Although women make up 6 percent of commercial pilots, they are only 3.57 percent of captains, as shown by this data from the Air Line Pilots Association (ALPA):

Gender	Captain	%	First Officer	Second Officer	Grand Total	% of Total Population
Female	934.00	3.57	2,503.00	3.00	3,440.00	6.00
	25,503.0					
Male	0	97.57	30,486.00	6.00	55,695.00	94.00
Grand	26,137.0					
Total	0	100.00	32,989.00	9.00	59,135.00	100.00

Unfortunately, the known numbers of drone pilots are not any better. For remote pilots, records started with the creation of Part 107 in 2016. In 2019 there were 160,000 remote pilots; of those, 10,800 or 6.7 percent were women. Although the number of women as remote pilots has increased 10.5 percent per year from 2016 through 2019, the number still remains low.²³

²¹ Jolls, C. and Sunstein, C.R. "The Law of Implicit Bias." 94 Calif. L. Rev. 969, 2006.
https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=2823&context=fss_papers. Last accessed 15 May 2021.

²² "U.S. Civil Airmen Statistics," FAA annual statistics, published in 2020 (shows 2010 through 2019 data).
https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/

²³ *ibid.*

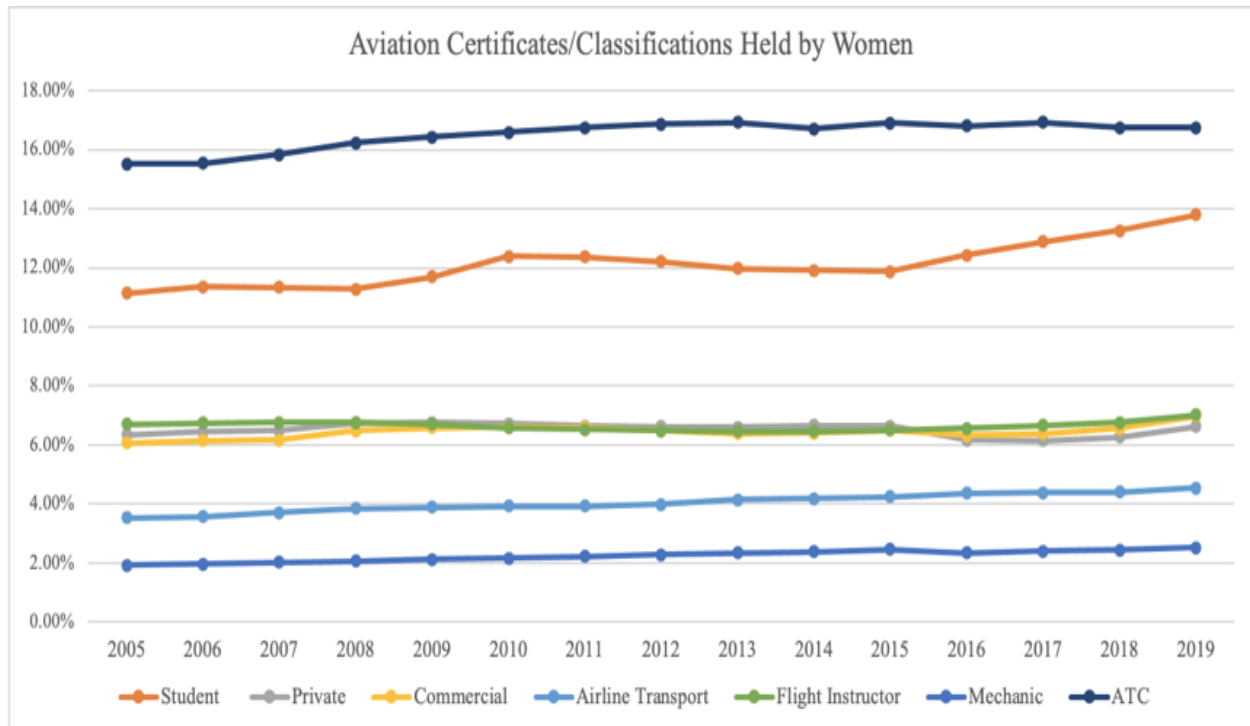


Table created from FAA/DOT data compiled by Dr. Rebecca K. Lutte²⁴

There is, however, hope for the future, with women making up 13.8 percent of student pilots.²⁵ The percentage of women in engineering, although not high, is growing as well, providing additional opportunities for women to enter the aviation sector.²⁶

It is important that we seize the opportunity to welcome and encourage those considering entering the drone industry. Although we do not have data regarding gender identity in the aviation industry generally or the drone industry specifically, we also are mindful of creating a culture where individuals feel welcome, valued, and respected regardless of race, gender, religion, national origin, sexual orientation, or other diversity traits.

Inclusion Helps Attract and Retain Professionals in the Industry

The low number of women in the aviation industry generally, and the drone industry in particular, means that there is an untapped reservoir of talented individuals who can contribute to this industry.

²⁴ Lutte, Rebecca K. "Women in Aviation: A Workforce Report." University of Nebraska at Omaha Aviation Institute, May 2019. Last accessed 15 May 2021.

²⁵ https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/

²⁶ <https://www.nsf.gov/statistics/2017/nsf17310/digest/fod-women/engineering.cfm>

	Aviation Occupation	% Women
< 10%	Maintenance technicians	2.5%
	Airline executives (CEO, COO)	3.0%
	Airline transport pilots	4.6%
	Total pilots	7.9%
10% - 20%	Aerospace engineers	11.6%
	Airport managers	16.7%
	Air traffic controllers	16.8%
	Dispatchers	19.4%
20% >	Flight Attendants	79.2%
	Travel Agents	79.5%

Table created compiled by Dr. Rebecca K. Lutte²⁷

When an organization or industry does not reflect the makeup of the general population in regards to gender and other underrepresented characteristics, the ability to attract and retain talent becomes very difficult.²⁸ For example, if an individual who comes from an underrepresented gender, ethnic, or racial group is exposed to language or activity during training or at their place of employment that is non-inclusive, the individual may be more likely to leave that employer and industry due to those negative experiences.

Attracting and retaining people regardless of gender or gender identity is crucial for finding the best and the brightest so that the drone industry does not face the same labor shortages currently affecting the broader aviation industry. Boeing estimates that North America alone will need 208,000 new pilots, 192,000 new technicians, and 169,000 new cabin crew members between 2020 and 2039.²⁹ Yet the Aircraft Owners and Pilots Association (AOPA) notes that “the number of pilot certificates issued by the Federal Aviation Administration has decreased more than 60 percent since 1980.”³⁰

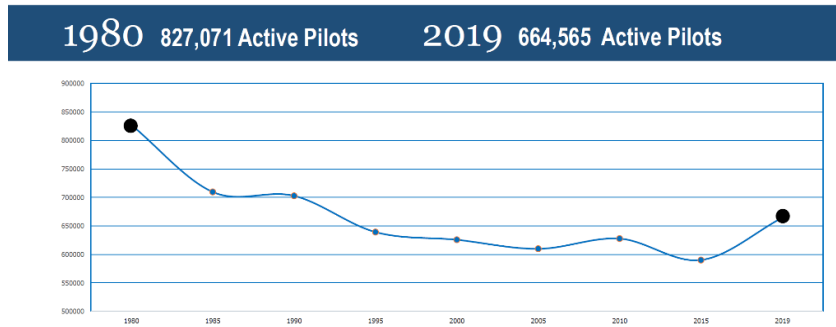
²⁷ Ibid

²⁸ Bettinger, E.P. and Long, B.T. “Do Faculty Serve as Role Models? The Impact of Instructor Gender on Female Students.” *The American Economic Review*. Vol. 95, No. 2, Papers and Proceedings of the One Hundred Seventeenth Annual Meeting of the American Economic Association, Philadelphia, PA, January 7-9, 2005. American Economic Association, 2005, pp. 152-157.

²⁹ Boeing, Pilot and Technician Outlook 2020-2039, <https://www.boeing.com/commercial/market/pilot-technician-outlook/>

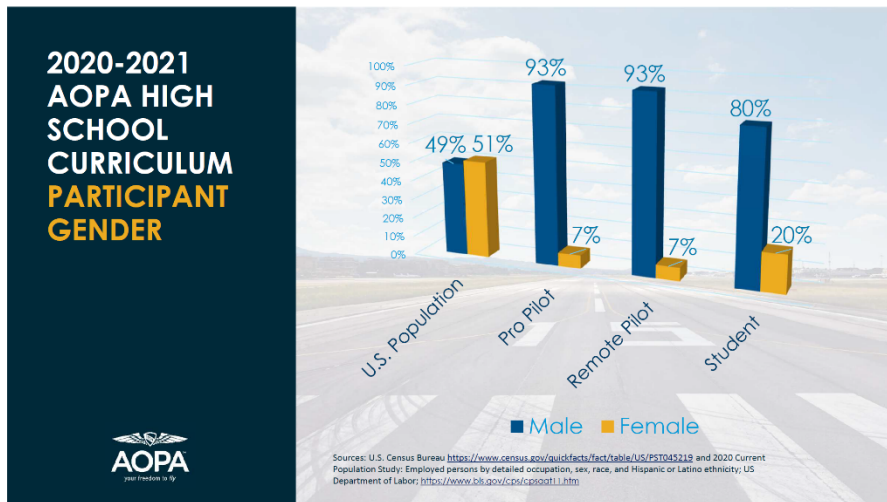
³⁰ AOPA High School Stem Curriculum, Aircraft Owners and Pilots Association, 2021
<https://youcanfly.aopa.org/high-school/high-school-curriculum>

Active Certificated Airplane Pilots, US

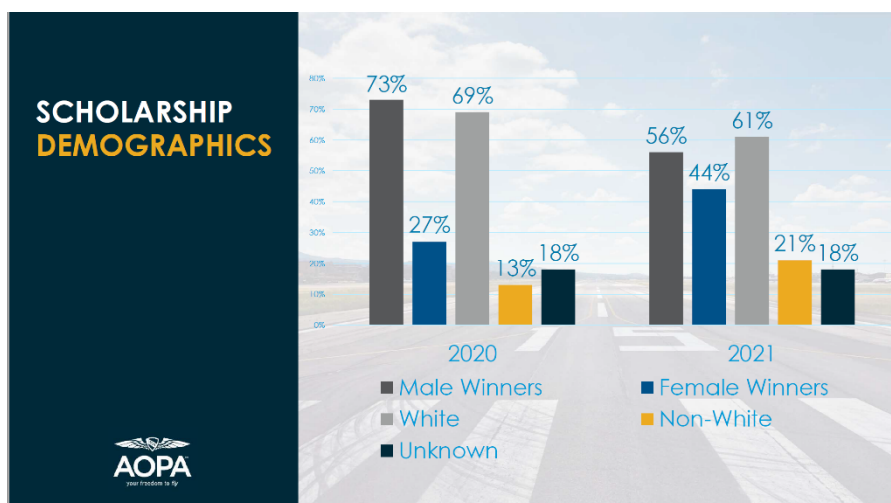


[Source: AOPA]

To expand the pilot population and the aviation community, industry groups and trade associations have developed education and outreach programs that include reaching out to groups that have been underrepresented in aviation. For example, AOPA's You Can Fly program, which includes a 4-year high school curriculum, has had success in enrolling female students at a rate (20 percent) that far outpaces the professional pilot (7 percent) and remote pilot (7 percent) rates – even if still falling well below their share of the population.



AOPA's High School Flight Training Scholarship Program offers upwards of \$1 million a year for high school students and teachers. Each scholarship recipient receives \$10,000 to pursue a primary pilot certificate. In 2021, AOPA reached out to organizations serving underrepresented groups to get the word out on the scholarships; as a result, female recipients jumped from 27 percent to 44 percent, and non-white recipients jumped from 13 percent to 21 percent — in just one year.



These results belie any assertion that low numbers of women and other underrepresented groups in aviation is attributable to lack of interest rather than other factors. In other words, it is not enough to say, “All they have to do is come join us.”

In addition to meeting labor needs, a larger number of people pursuing careers will help to amplify the industry’s voice, thereby increasing its influence in the legislative and regulatory spaces, for example. As of April 14, 2021, the 117th Congress includes 146 women Members, amounting to 26.9 percent of the total membership. With an increasingly diverse (although still gender unequal) Congress, having an industry that is more reflective of the electorate can only increase its resonance with elected officials.³¹

Gender-neutral language is one of the ways to create an inclusive and diverse organization and culture. Gender-neutral language does not isolate or identify one specific gender as an assumed identity of the organization or industry; instead it assumes an inclusive culture and diverse workplace as the default. Academia, the business community, and society have demonstrated the importance and need for adopting gender-neutral language as one method among many to foster inclusion, diversity, and safety.

The Institute for Women Of Aviation Worldwide (iWOAW) instituted a petition on Change.org calling on the Federal Aviation Administration and the International Civil Aviation Organization to “Eliminate Gender-Exclusive Words that Keep Women out of Aviation.” The petition reads, in relevant part: “Women do feel ostracized and are steering away from the aerospace careers publicly labelled as men’s careers.”³² This sentiment is consistent with research showing how gendered language can lead to stereotyping and other negative outcomes. This contributes to unintended references that aviation careers belong to men. Earlier this year, this was

³¹ Congressional Research Service, “Membership of the 117th Congress: A Profile,” April 14, 2021, available at <https://crsreports.congress.gov/product/pdf/R/R46705>.

³² Petition to Help Eliminate Gender-Exclusive Words that Keep Women out of Aviation, Change.org, 2020, <https://www.change.org/p/tell-the-faa-and-icao-to-eliminate-gender-exclusive-words-that-keep-women-out-of-aviation-from-their-publications>

demonstrated during a CNBC interview³³ on pilot shortages when the guest expert used “he” and “those guys” to refer to pilots in general.

In Bigler and Leaper’s metastudy referenced earlier, the researchers analyzed the impact of gendered language on children. This study is highly relevant to our current endeavor, given the desire to draw more people of all genders into the drone space. The authors found, “The use of gendered nouns appears to precipitate a cascading sequence of (1) gender salience, (2) gender categorization, (3) gender stereotyping and (4) gender prejudice.”³⁴ As the authors pointed out, labels that many consider innocuous create this sequence in children, which is then reinforced throughout their lives. The authors noted the utilization of gendered nouns such as “mankind” and “freshman” and pronouns like “he” and “his” to refer to people-as-such in English.³⁵ This is relevant to our examination of “unmanned” and other terminology that is used in similar ways. Despite the *intention* for such terms to be universal, “empirical studies have demonstrated that children and adults who read material using masculine generic pronouns were overwhelmingly more likely to imagine male than female characters.”³⁶ Studies also showed that gendered language affected children’s and adults’ interests,³⁷ as well as how they viewed other people’s occupational prospects in light of their gender.³⁸

Given the evidence of the impacts of gendered language — which are at best limiting and at worst actively harmful — the next question is whether moving away from such language has a positive impact on attitudes.

To improve gender equality and tolerance toward minorities, several nations have promoted the use of gender-neutral pronouns and words. Margit Tavits and Efren O. Perez studied whether these linguistic devices actually reduced biases that favor men over women. The study was executed with three large-scale experiments in Sweden, which formally incorporated in 2015 a gender-neutral pronoun into its language alongside established gendered pronouns equivalent to *he* and *she*. Swedish adults were invited to participate in online surveys that were described as focusing on the effects of visual perception, reading comprehension, and creative thinking on political judgment. This study showed that the reduced use of male pronouns relative to non-male pronouns affected mass opinion toward gender equality in politics. Speakers who used masculine pronouns were more likely to endorse traditional gender roles, as they aligned with a male-centered view. In contrast, gender-neutral pronouns effectively diminished this pro-male bias. The evidence showed that compared with masculine pronouns, use of gender-neutral pronouns decreased the mental reference to males. This shift was associated with individuals expressing less bias in favor of traditional gender roles and

³³ Fortt, Jon. “Aviation industry to face post-pandemic pilot shortage, study shows.” CNBC.com, 22 Mar 2021. <https://www.cnbc.com/video/2021/03/22/aviation-industry-to-face-post-pandemic-pilot-shortage-study-shows.html>. Web video last accessed 14 May 2021.

³⁴ Bigler and Leaper, 191.

³⁵ *Id.* at 189.

³⁶ *Id.* at 190.

³⁷ *Id.*

³⁸ *Id.* at 192.

categories, as reflected in more favorable attitudes toward women and LGBT individuals in public life. Additional analyses revealed similar patterns for feminine pronouns. The influence of both pronouns was more automatic than controlled. By prying apart language from culture, these studies helped to establish further that language effects on cognition are real and uniquely tied to structural features of communication.³⁹

Gender-neutral language is particularly important in the regulatory and legislative context. Kadija Kabba, a Legal Officer and Legislative Drafter at the Central Bank of Sierra Leone, has shown how gender-neutral language is a tool that serves precision, clarity, and unambiguity in that it aims to promote gender specificity in the pronoun used when drafting legislation. It reduces and in some cases completely omits redundancies and, in the process, produces shorter sentences that in turn produce clear and unambiguous drafts.⁴⁰ Australia, Canada, New Zealand, and the United Kingdom have long embraced gender-neutral language in legislative drafting.⁴¹ “It has been established that the use of gender-neutral language serves not only to eliminate the demeaning nature of gender-specificity in drafting legislation but also to achieve precision, clarity and unambiguity, using the best techniques of the language for the job on each occasion.”⁴²

2. An Inclusive Workplace that Uses Inclusive Language Is a Safer Workplace

As with all DAC taskings, this group views safety as paramount. We acknowledge that some may raise concerns that a change in nomenclature, for which we advocate, could lead to confusion and, therefore, diminish safety. That said, we believe that the measured, phased transition to new language outlined in this report will make for a safe transition to new language. Moreover, our research demonstrates that, far from undermining safety, an inclusive workplace that uses language inclusive of all workers is in fact a workplace with an enhanced safety profile. We are by no means intimating that the current system is unsafe; rather, we believe there is an opportunity to bring safety to an even higher level by elevating inclusion.

Furthermore, the use of inclusive language that accurately reflects the makeup of the workforce makes for a safer work environment. People naturally feel safer when they are included as a member of the crew, rather than feeling that they are an outsider if they are not part of the dominant group. And the current use of language that, in addition to being exclusive, is imprecise (e.g., using the word “unmanned” to refer to a vehicle with no woman aboard) misses out on an opportunity to achieve higher safety results.

³⁹ Tavits, M. and Perez, E.O. “Language influences mass opinion toward gender and LGBT equality,” Proceedings of the National Academy of Sciences of the United States of America, August 5, 2019, available at <https://www.pnas.org/content/116/34/16781>.

⁴⁰ Kabba, K. “Gender-neutral language: an essential language tool to serve precision, clarity and unambiguity,” Commonwealth Law Bulletin, 2011, 37:3, 427-434, DOI: 10.1080/03050718.2011.595141, available at <https://www.tandfonline.com/doi/full/10.1080/03050718.2011.595141>.

⁴¹ *Id.* at 429-30.

⁴² *Id.* at 433.

The proper use of terminology is critical to ensure that safe operations can be achieved consistently. One example of how proper terminology is critical to the safe operation of aircraft is Crew Resource Management (CRM). The Crew Resource Management communication model is now a common training aspect in commercial and corporate flight departments, and is a key operational component for personnel deemed essential to flight safety. Historical aviation training focused on the technical aspects of pilot training around the operation of an aircraft. However, as the focus of accident investigations shifted to include systemic, organizational, and cultural deficiencies, accident and incident reports began to address human factors-related errors. Accident reports have noted that “poor group decision making, ineffective communication, inadequate leadership, and poor task or resource management”⁴³ skills were contributing factors to accidents or incidents. Past training did not focus on the interactions among crewmembers that are fundamental to safe operations but rather concentrated on observing and evaluating an individual’s performance as a lone participant in the operation of the flight.

It was assumed that the individual pilot, or captain, could handle the operation of the aircraft and that others were there to provide assistance when asked. This hierarchy of duties was a stereotype of early aviation when single-pilot operations were flown. As airline aircraft became more complex, the assumption that a single pilot could handle the operation and any safety issues solely was recognized as a hazard in aviation. The “team” concept needed to be trained and implemented in flight operations to reduce the possibility of an accident because of a failure of communication or workload between crewmembers. Crew Resource Management also incorporates an introspective review component to help individuals avoid hazardous attitudes and mindsets that could lead to or contribute to an accident.

The concept of Crew Resource Management has progressed over the years and moved beyond the flight deck to recognizing that there are multiple team interactions that can negatively affect safe operations if not addressed. Today, Crew Resource Management training continues to focus on situational awareness, communication skills, teamwork task allocation, and decision making within a comprehensive framework as part of the safety and risk management strategies.

Many aspects go into the current field of human factors, that is, optimizing human performance and reducing human error by incorporating principles of the behavioral and social sciences, engineering and psychology. For purposes of this paper, and for simplification of the topic, we are going to focus on the Crew Resource Management communication aspect. That is, team communication can be negatively affected by words, either spoken or written.

⁴³ “AC 120-51E - Crew Resource Management Training,” CRM training, FAA, 8 Feb 2001, page 4. https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22879. Last accessed 17 May 2021.

Biases and attitudes have roots in culture. Culture can be influenced by nationality, religion, where people live, etc., and can be split into National, Organizational, and Professional.⁴⁴ Culture exists everywhere in the world, including locally at individual airlines or other companies. Culture is built at an airline through the priorities and ethics that are passed down from upper management to employees and is something that is built on historical actions over a long period of time.

One example of how both national culture and organizational culture can affect human factors and aviation safety is through the analysis of the crash of Asiana Airlines flight 214, a Boeing 777-200ER that struck a seawall short of the runway at San Francisco International Airport (SFO) on July 6, 2013. The accident resulted in three passenger fatalities and 40 serious injuries of the 291 passengers, and nine serious crew injuries. The accident report notes that the “flightcrew mismanaged the airplane’s descent.” Generally speaking, they were flying the aircraft too low and too slow, which resulted in the accident. There were multiple instances where the pilot monitoring and the pilot observer (relief pilot) had opportunities during the final minutes before the accident to challenge the pilot flying, but neither did. The NTSB accident report noted that the pilot flying was being observed by the pilot monitoring following their training as part of their operating experience. The report notes the pilot flying was concerned about being embarrassed if he was unable to get the flight under control.⁴⁵ The report also reflects that the pilot monitoring did not use clear and direct language to correct the pilot flying, even when he saw deviations from standard operating procedures. The NTSB report notes that the airline recommends using as much automation as possible during the flight,⁴⁶ so when the pilots inadvertently deactivated one of the automatic systems, the crew was unable to understand and respond to the loss of the technology fully.

Interactions between crew where there may have been an implied, or actual, hierarchy of power in many situations created a communication gap, as noted in accident reports — for example, the idea that the captain has sole authority and should not be questioned or challenged.

As noted earlier in this paper, some gendered language can contribute to a breakdown in team communication by reinforcing the old stereotypical hierarchical view of roles. While this barrier to communication may not be as blatant as the previous example, the subtle nuances of an implied hierarchy of power can be just as detrimental to the team aspect of safety.

3. Workplace Diversity Leads to Better Business Outcomes

Bringing more diversity to the workplace yields cultural and competitive advantages. Diversity of thought is the overriding competitive advantage, allowing for varied perspectives and skill sets that deliver faster, more innovative solutions. From a cultural perspective, diversity

⁴⁴ “Organizational Culture,” SKYbrary, 2 Oct 2020, https://www.skybrary.aero/index.php/Organisational_Culture. Last access 17 May 2021.

⁴⁵ NTSB Accident Report, NTSB/AAR-14/01, adopted June 24, 2014, page 11.

⁴⁶ NTSB report, page 62.

supports a better understanding of broader consumer and co-worker needs. The bottom line is that diversity in the workplace leads to a more engaged, satisfied workforce, attracting more new talent, which will deliver more competitive and profitable products.⁴⁷ Diversity benefits can include, among other things, solving problems more quickly,⁴⁸ higher profits,⁴⁹ and increased employee engagement.⁵⁰



V. Conclusion

Task Group #10 thanks the FAA for this tasking which allows “the DAC the opportunity to lead promoting and instituting gender-neutral language throughout the UAS/drone community”. We look forward to continuing to work closely in assisting the FAA, the drone community and the aviation industry as a whole in supporting and adopting these recommendations.

⁴⁷ Zojceska, A. “Top 10 Benefits of Diversity in the Workplace,” Talentlyft, December 19, 2018, available at <https://www.talentlyft.com/en/blog/article/244/top-10-benefits-of-diversity-in-the-workplace>.

⁴⁸ *Id.*, citing Harvard Business Review article March 31, 2017 – ‘Teams Solve Problems Faster When They’re More Cognitively Diverse.’

⁴⁹ *Id.*, citing McKinsey & Co. Research April, 2012 – ‘Is There a Payoff for Top Team Diversity.’

⁵⁰ *Id.*, citing Deloitte Research May, 2013 – ‘A New Recipe to Improve Business Performance.’

VI. Appendix

Tasking



Promoting Diversity and Inclusion in the Drone Community

- Aviation traditionally uses gender-specific terms: airman, manned, unmanned, etc.
 - There is a growing awareness of the importance of using gender neutral language that promotes inclusion and facilitates a diverse workforce.
 - Encourage the use of gender neutral language in day to day communication.
- Recent Initiatives and Trends:
- 117th Congress requires gender neutral language in official House proceedings.
 - Since 2006, NASA has shifted to use non-gender specific language.
 - Businesses and industry is shifting to non-gender specific language.

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DAC Tasking: Gender Neutral Language for the Drone Community

Opportunity:

- The DAC to lead promoting and instituting gender neutral language throughout the UAS/drone community.

Tasking:

- The DAC to develop recommendations for gender neutral language as an alternative to gender specific terms currently used in the the drone industry and aviation community.
- The DAC to take the lead to facilitate the adoption of gender neutral language throughout the drone community and provide recommendations that organizations across the industry and community can implement.

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Task Group Members

Anderson	Chris	3DR
Baker	Mark	Aircraft Owners and Pilots Association
Cahill	Cathy	Alaska Center for Unmanned Aircraft Systems Integration (ACUASI)
Cass	Lorne	Aero NowGen Solutions, LLC
Chomicki	Angelica	New York City Fire Department - Robotics
Ciriello	Verdiana	Boeing
Colborn	Mark	Dallas Police Department Aviation Unit – UAS Squad
Coon	Jim	Aircraft Owners and Pilots Association
Cooper	Chris	Aircraft Owners and Pilots Association
Gilbert	Trish	National Air Traffic Controllers Association
Hayden	Brad	Robotic Skies
Ivers	Ben	Boeing
Kolander	Candace	Airline Pilots Association
Messina	Dave	FPV Freedom Coalition
Mills	Houston	United Parcel Service
Reed	Mark	Airline Pilots Association
Schulman	Brendan	DJI
Schwartz	Michelle	Los Angeles World Airports
Scott	Mariah	Skyward
Smith	Phil	Shell
Turrieta	Camila	Airline Pilots Association
Wilson	Rebecca	Skyward

VII. References

- “AC 120-51E - Crew Resource Management Training,” CRM training, FAA, 8 Feb 2001, page 4.
https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22879.
- AOPA High School Stem Curriculum, Aircraft Owners and Pilots Association, 2021
<https://youcanfly.aopa.org/high-school/high-school-curriculum>.
- Bettinger, E.P. and Long, B.T. “Do Faculty Serve as Role Models? The Impact of Instructor Gender on Female Students.” *The American Economic Review*. Vol. 95, No. 2, Papers and Proceedings of the One Hundred Seventeenth Annual Meeting of the American Economic Association, Philadelphia, PA, January 7-9, 2005. American Economic Association, 2005.
- Bigler, R.S. and Leaper, C., “Gendered Language: Psychological Principles, Evolving Practices, and Inclusive Policies,” *Behavioral and Brain Sciences*, 2015, Vol. 2(1).
- Boeing, Pilot and Technician Outlook 2020-2039, <https://www.boeing.com/commercial/market/pilot-technician-outlook/>
- Bowden, Mark. “How the Predator Drone Changed the Character of War.” *Smithsonian Magazine*, Nov 2013. <https://www.smithsonianmag.com/history/how-the-predator-drone-changed-the-character-of-war-3794671/>.
- Congressional Research Service, “Membership of the 117th Congress: A Profile,” April 14, 2021, available at <https://crsreports.congress.gov/product/pdf/R/R46705>.
- “Crew Resource Management (CRM).” SKYbrary, 21 Mar 2020.
[https://www.skybrary.aero/index.php/Crew_Resource_Management_\(CRM\)](https://www.skybrary.aero/index.php/Crew_Resource_Management_(CRM)).
- Dixon-Fyle, S., Hunt, V., Dolan, K., and Prince, S. “Diversity wins: How inclusion matters.” McKinsey & Company, 2020.
<https://www.mckinsey.com/~media/mckinsey/featured%20insights/diversity%20and%20inclusion/diversity%20wins%20how%20inclusion%20matters/diversity-wins-how-inclusion-matters-vf.pdf>.
- “Equality=Innovation: Getting to Equal 2019: Creating a culture that drives innovation.” Accenture, 2019. https://www.accenture.com/_acnmedia/Thought-Leadership-Assets/PDF/Accenture-Equality-Equals-Innovation-Gender-Equality-Research-Report-IWD-2019.pdf.
- Fortt, Jon. “Aviation industry to face post-pandemic pilot shortage, study shows.” CNBC.com, 22 Mar 2021. <https://www.cnbc.com/video/2021/03/22/aviation-industry-to-face-post-pandemic-pilot-shortage-study-shows.html>.
- International Civil Aviation Organization. Manual on Remotely Piloted Aircraft Systems (RPAS), Doc 10019. ICAO, 2015. <https://skybrary.aero/bookshelf/books/4053.pdf>. Last accessed 14 May 2021.

“Is There a Payoff for Top Team Diversity.” McKinsey & Co. April 2012.

Jolls, C. and Sunstein, C.R. “The Law of Implicit Bias.” 94 Calif. L. Rev. 969, 2006.
https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=2823&context=fss_papers.

Jones, Kristen P., et al. “Not So Subtle: A Meta-Analytic Investigation of the Correlates of Subtle and Overt Discrimination.” *Journal of Management*, vol. 42, no. 6, Sept. 2016.

Kabba, K. “Gender-neutral language: an essential language tool to serve precision, clarity and unambiguity,” *Commonwealth Law Bulletin*, 2011, 37:3, 427-434,
DOI: 10.1080/03050718.2011.595141, available at
<https://www.tandfonline.com/doi/full/10.1080/03050718.2011.595141>.

Lauber, John K. “Foreword.” *Crew Resource Management*. Kanki, Bargara G, Robert L. Helmreich, et al. (eds). Academic Press, 2010.

“Leadership Summit – DEI Benefits in the Workplace,” March 25, 2021, available at
<https://nbaa.org/professional-development/on-demand-education/nbaa-go/leadership-summit/nbaa-go-leadership-summit-newsroom/leadership-summit-dei-benefits-the-workplace/>

Lutte, Rebecca K. “Women in Aviation: A Workforce Report.” University of Nebraska at Omaha Aviation Institute, May 2019. Last updated May 2021.

Mims, A. Bradley. “Building the Foundation for Aviation’s Future.” 31 Mar. 2021. U.S. Chamber of Commerce Aviation Summit (Virtual), Federal Aviation Administration, Transcript:
https://www.faa.gov/news/speeches/news_story.cfm?newsId=25981.

“A New Recipe to Improve Business Performance.” Deloitte Research, May 2013.

NTSB Accident Report, NTSB/AAR-14/01, adopted June 24, 2014.

“Organizational Culture,” SKYbrary, 2 Oct 2020,
https://www.skybrary.aero/index.php/Organisational_Culture. Last access 17 May 2021.

Petition to Help Eliminate Gender-Exclusive Words that Keep Women out of Aviation, Change.org, 2020, <https://www.change.org/p/tell-the-faa-and-icao-to-eliminate-gender-exclusive-words-that-keep-women-out-of-aviation-from-their-publications>

Style Guide for NASA History Editors and Authors. NASA, 2012.
<https://history.nasa.gov/styleguide.html>. Last accessed 15 May 2021.

Tavits, M. and Perez, E.O. “Language influences mass opinion toward gender and LGBT equality,” *Proceedings of the National Academy of Sciences of the United States of America*, August 5, 2019, available at <https://www.pnas.org/content/116/34/16781>.

“U.S. Civil Airmen Statistics,” FAA, 2020.
https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/. Last accessed 17 May 2021.

Walker, J. and Geiselhart, K. March 2007 RTCA Program Management Committee approved Special Committee 203 (SC-203) DO-304 Guidance material and Considerations for Unmanned Aircraft System. http://www.uasresearch.com/documents/yearbook/066-67_Contributing-Stakeholder_RTCA.pdf.

Working Paper: Thirteenth Air Navigation Conference. Montréal, Canada, 9 to 19 October 2018. ICAO, 2018. https://www.icao.int/Meetings/anconf13/Documents/WP/wp_304_en.pdf.

Zojceska, A. "Top 10 Benefits of Diversity in the Workplace," Talentlyft, December 19, 2018, available at <https://www.talentlyft.com/en/blog/article/244/top-10-benefits-of-diversity-in-the-workplace>.



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DRONE ADVISORY COMMITTEE

June 23, 2021



Housekeeping

- Meeting is being livestreamed on the FAA's YouTube, Twitter and Facebook pages.
- Meeting is also being recorded and will be made available for future viewing.
- Please remain muted during the presentations.
- After each briefing, there will be an opportunity for the members to engage in discussion and ask questions.
- Please raise your hand using the Zoom command on your dashboard and an FAA moderator will call on you to speak.
- FAA team is monitoring the livestream, if you have any problems during the meeting, please reach out in the comments.



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DRONE ADVISORY COMMITTEE

June 23, 2021

Official Statement of the DFO

PUBLIC MEETING ANNOUNCEMENT

Read by: Designated Federal Officer Jay Merkle

Drone Advisory Committee

June 23, 2021

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC. Notice of the meeting was published in the Federal Register on:

May 13, 2021

Members of the public may address the committee with PRIOR APPROVAL of the Chair. This should be arranged in advance.

Only appointed members of the Advisory Committee may vote on any matter brought to a vote by the Chair.

The public may present written material to the Advisory Committee at any time.



Federal Aviation
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DRONE ADVISORY COMMITTEE

June 23, 2021

Agenda Review

Jay Merkle

Designated Federal Officer
FAA Drone Advisory Committee



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**DRONE
ADVISORY
COMMITTEE**
June 23, 2021

Agenda

	Start	Stop	
1.	12:00 pm	12:05 pm	FAA – Greetings & Logistics
2.	12:05 pm	12:10 pm	DFO – Read Official Statement of the Designated Federal Officer
3.	12:10 pm	12:15 pm	DFO – Review of Agenda and Approval of Previous Meeting Minutes
4.	12:15 pm	12:20 pm	DFO – Opening Remarks
5.	12:20 pm	12:25 pm	Chair – Opening Remarks
6.	12:25 pm	12:55 pm	Chair – Task Group 9 Recommendations – Report on Situational Awareness
7.	12:55 pm	1:25 pm	DFO – Unmanned Aircraft Safety Team (UAST) Presentation
8.	1:25 pm	1:35 pm	BREAK
9.	1:35 pm	2:05 pm	Chair – Operations and Technology Subcommittee, Task Group 10 - Gender Neutral Language for the Drone Community Recommendations
10.	2:05 pm	2:15 pm	DFO – New Taskings to DAC
11.	2:15 pm	2:25 pm	Chair – New Business/Future Agenda Topics
12.	2:25 pm	2:28 pm	DFO – Closing Remarks/Final Thoughts
13.	2:28 pm	2:30 pm	Chair – Closing Remarks/Final Thoughts
14.	2:30 pm	2:30 pm	Chair – Adjourn



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**DRONE
ADVISORY
COMMITTEE**

June 23, 2021

Task Group 10, Gender-Neutral Language for the Drone Community

Trish Gilbert

Executive Vice President

National Air Traffic Controllers Association

Mark Baker

President & CEO

Aircraft Owners and Pilots Association



DAC Tasking: Gender-Neutral Language for the Drone Community

1. The DAC to develop recommendations for gender-neutral language as an alternative to gender specific terms currently used in the drone industry and aviation community.
2. The DAC to take the lead to facilitate the adoption of gender-neutral language throughout the drone community and provide recommendations that organizations across the industry and community can implement.



Topics

- Introduction
- Why gender-neutral language is important
- Style guide
- Final recommendation and close



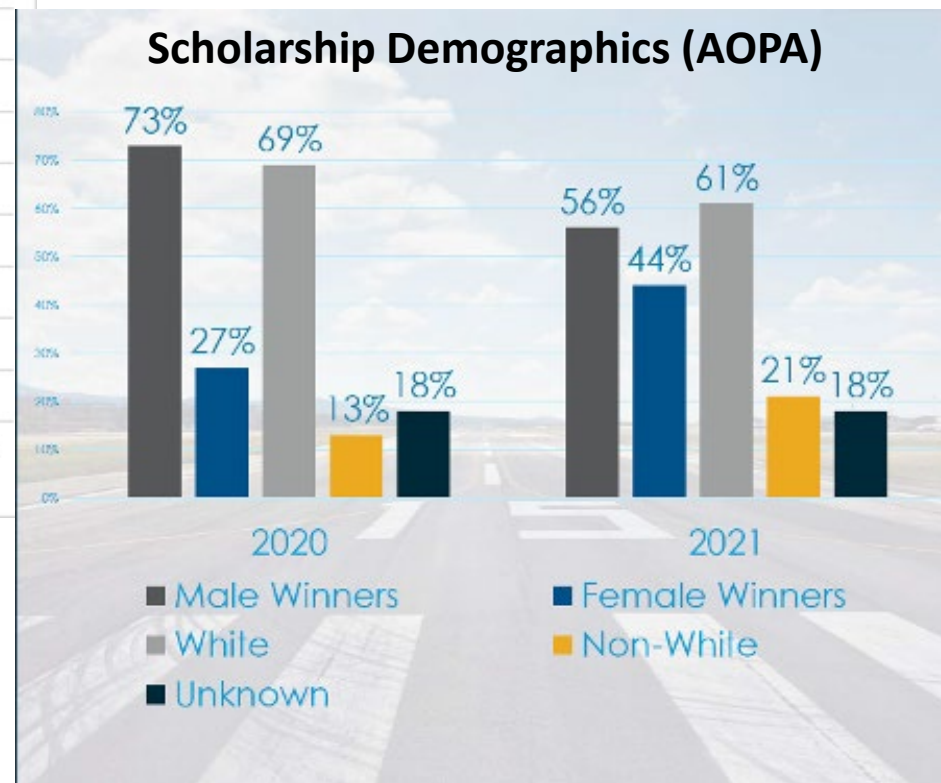
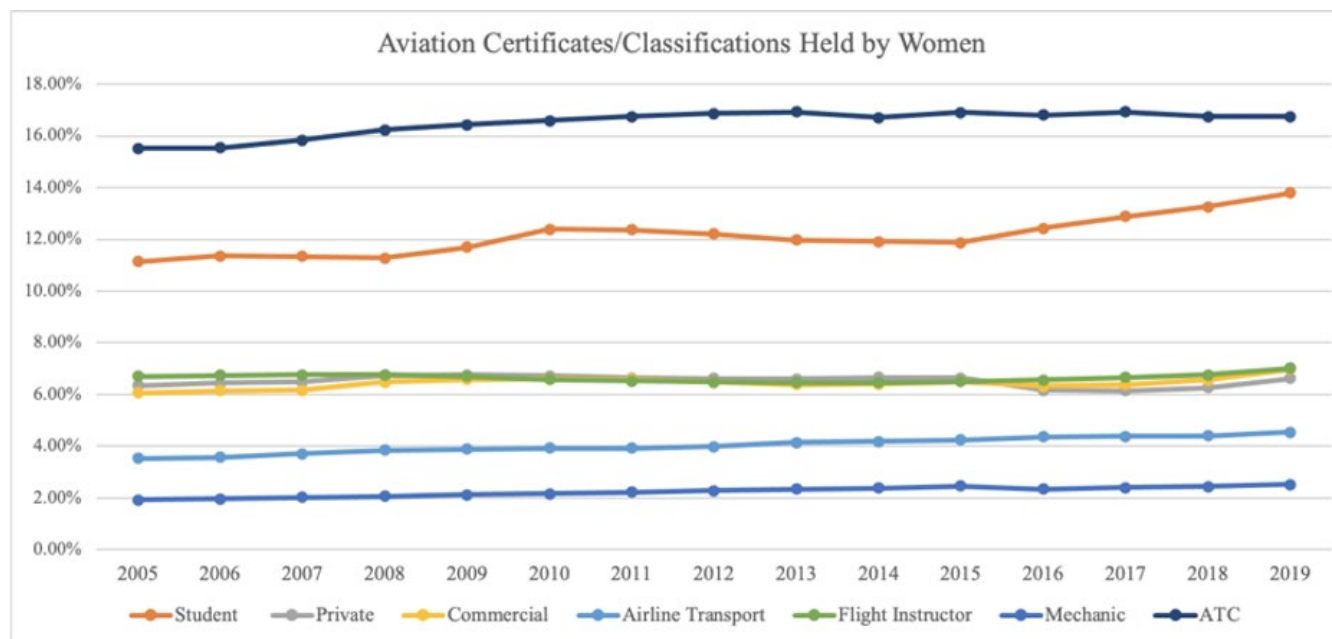
INCLUSIVE LEADERSHIP

Sustainable talent of the best and the brightest by deepening the pool





Why gender-neutral language is important





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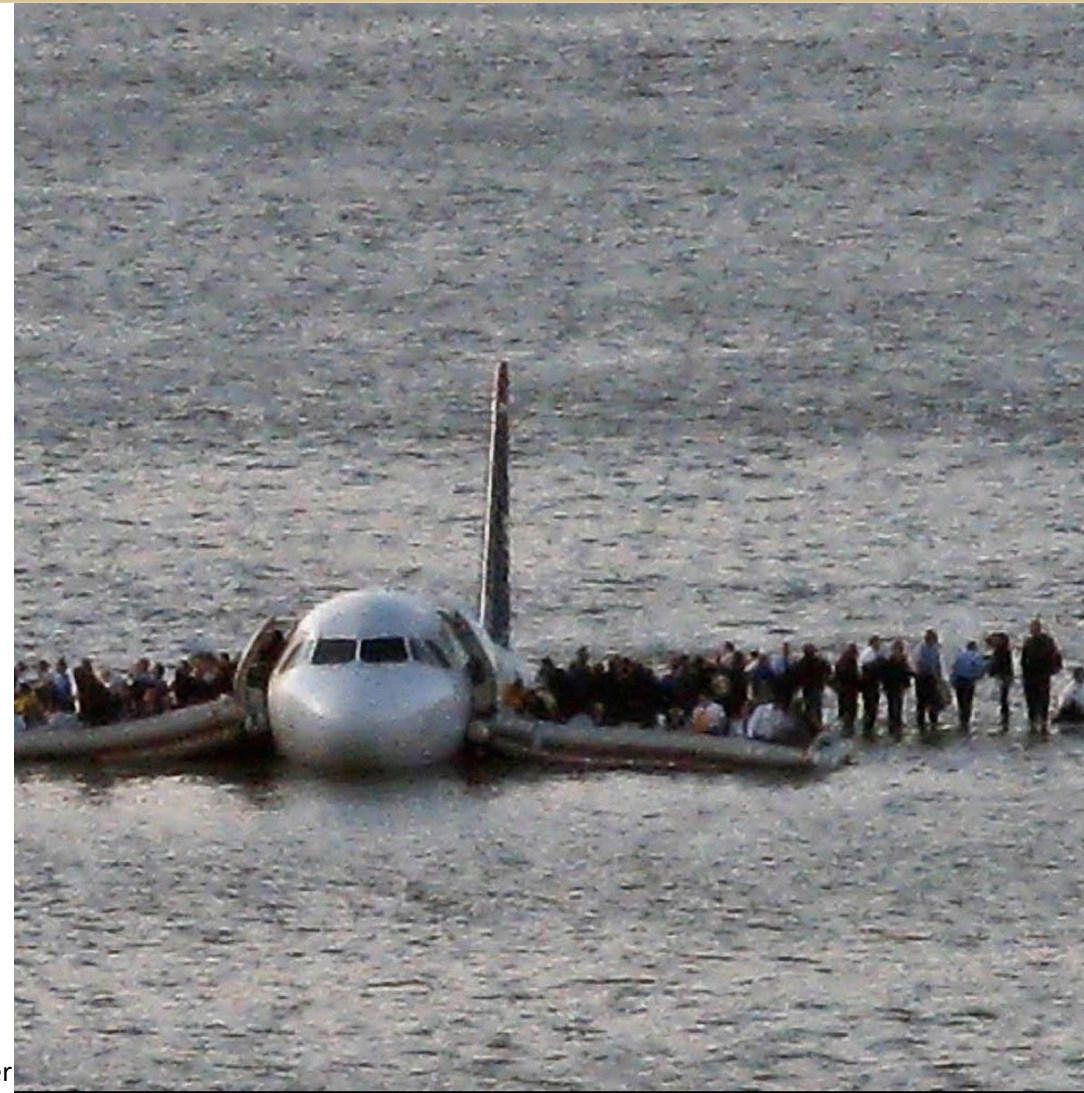
**DRONE
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COMMITTEE**

June 23, 2021

Safety Culture

DAC Tasking Group #8, Safety Culture

- Guiding principles, or tenets, that are considered common and foundational in strong safety cultures
 - Safety ownership
 - Safety modeled by leadership
 - Organizational values
 - Learning culture
 - Systemwide approach
 - Trust



Trust and Engagement enhances Safety 188

Source: Conde Nast Traveler



Top 10 benefits of workplace diversity





Recommendation #1 : Use Gender-Neutral Language whenever possible

The Federal Aviation Administration should adopt gender-neutral language in the drone industry. To ensure inclusion of all regardless of gender identity, and to avoid burdensome language, we recommend using gender-neutral language (e.g. “person”; “they”) rather than gender-binary (e.g. “man or woman”; “he or she”).





Style Guide

		Difficulty in making the change (based on whether an acceptable alternative already exists in FAA language)	
		<i>Easier</i>	<i>Harder</i>
Priority of making the change (based on frequency in FAA use or explicit use of gender)	<i>Higher</i>	Repairman → Technician	Airman/men → Aviator
	<i>Lower</i>	Wife → Spouse	NOTAM → ?



Recommendation #2: Style Guide*

- A. Retaining “**U**” in Unmanned, has advantages in retaining acronyms.
Uncrewed should replace **Unmanned; Drone** is recommended as the optimal term
- B. Replace repairman with **technician**
- C. Consider replacing **airman/airmen** with **aviator(s)**
- D. Retain **NOTAM** but as a word rather than as an acronym
- E. Consider working with Congress on a revised definition of **UAS**

*A complete list of recommended terms is contained in the report



Recommendation # 3: Where to apply

Transition to gender-neutral language should adopt these priorities:

- A. All new documents, speeches, social media and marketing promotional material should use gender-neutral language.
- B. Rework of existing documents and materials should be prioritized by the number of individuals exposed to the material, as well as the effort required to update the material.





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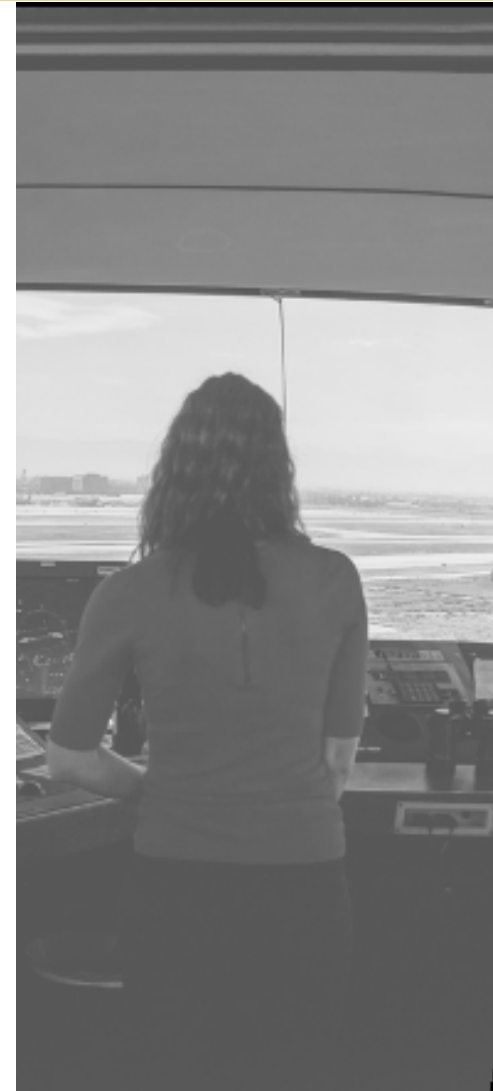


**DRONE
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June 23, 2021

Recommendation #4: Transform our communication

- Expand gender-neutral language beyond drone industry to all of aviation industry
- Encourage FAA, industry, pilots and operators to embrace the required change





Thank you to all the contributors

We had a diverse group, spanning manufacturers, associations, organizations, pilots and operators as well as gender, age and ethnicity. The team drew on the strength from other team members demonstrating the benefits of a diverse team where trust is paramount.

- 3DR
- Air Line Pilots Association
- Aircraft Owners & Pilots Association
- Alaska Center for UAS Integration
- Aero NowGen Solutions
- Boeing
- Dallas Police Department-UAS Squad
- DJI
- FPV Freedom Coalition
- Los Angeles World Airports
- National Air Traffic Controllers Association
- New York City Fire Department
- Robotic Skies
- Skyward
- Shell
- United Parcel Service



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**DRONE
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COMMITTEE**

June 23, 2021

Questions/Comments



Drone Advisory Committee

February 24, 2021 • Virtual Meeting

Captain Houston Mills presented on the DAC Operations and Technology (O & T) Subcommittee Update. Capt. Mills shared that all DAC members are automatically part of the subcommittee and that non-DAC members who would like to join the subcommittee will need to submit a resume and bio. All non-DAC members will also need to be vetted by Office of the Secretary of Transportation. Capt. Mills shared that as of the meeting, 21 non-DAC members have applied to join the subcommittee.

There was no discussion following the presentation.

View the presentation (link is timestamped for DAC (O & T) Subcommittee Update):

https://youtu.be/_2E_eWhE8hE?t=2694

New DAC Tasking – Gender Neutral Language

Presenter:

Jay Merkle, Executive Director, UAS Integration Office

Mr. Merkle, shared that the FAA is issuing a new tasking for the DAC. Mr. Merkle highlighted that the FAA is focused on promoting diversity and inclusion in the drone community. Aviation typically uses gender specific terms. There is a growing awareness of how language facilitates inclusion and creates a diverse environment. The FAA is interested in encouraging the use of gender neutral language in day-to-day language within the drone community. Mr. Merkle highlighted that there is recent trends on this topic with Congress adopting gender neutral language, businesses adopting the same measures, and international organizations also adopting this approach.

The tasking from the FAA requests that the DAC develop recommendations for gender neutral language as alternative to gender specific terms. The FAA also requests that the DAC take the lead to facilitate the adoption of gender neutral language throughout the drone community and provide recommendations that organizations across the industry and community can implement. The DAC eBook provides the official New DAC Tasking presentation slides.

Following the presentation, there was a short discussion of this new tasking.

After the conclusion of discussion, the DAC Chairman asked for a motion to approve the new tasking and assigning it to the standing subcommittee. The motion was approved; there were no objections.

View the presentation and discussion (link is timestamped for New DAC Tasking):

https://youtu.be/_2E_eWhE8hE?t=2902

New Business/Agenda Topics



Drone Advisory Committee

February 24, 2021 • Virtual Meeting

Appendix A: FAA Meeting Attendees

Name	Title	Org.
1. Jay Merkle	Executive Director, UAS Integration Office	FAA
2. Bradley Mims	Deputy Administrator	FAA
3. Angela Stubblefield	Chief of Staff	FAA
4. Laurence Wildgoose	Assistant Administrator, Office of Policy, International Affairs and Environment	FAA
5. Ali Bahrami	Associate Administrator, Aviation Safety	FAA
6. Teri Bristol	Chief Operating Officer, Air Traffic Organization	FAA
7. Timothy Arel	Deputy Chief Operating Officer, Air Traffic Organization	FAA
8. Mark Bury	Acting Chief Counsel, Office of General Counsel	FAA
9. Winsome Lenfert	Acting Associate Administrator, Airports	FAA
10. Claudio Manno	Associate Administrator for Security and Hazardous Materials Safety	FAA
11. Tonya Coultas	Deputy Associate Administrator, Security and Hazardous Materials Safety	FAA
12. Jeannie Shiffer	Acting Assistant Administrator, Office of Communications	FAA
13. Mike Romanowski	Director, Policy and Innovation Division	FAA
14. Bruce DeCleene	Director, Office of Safety Standards	FAA
15. Bill Crozier	Deputy Executive Director, UAS Integration Office	FAA
16. Gary Kolb	UAS Stakeholder & Committee Officer, UAS Integration Office	FAA

Confirmed FAA/DOT Observers		
Name	Title	Org.
1. Erik Amend	Manager, Executive Office, UAS Integration Office	FAA
2. Leesa Papier	Director, Office National Security Programs and Incident Response	FAA
3. Adrienne Vanek	Director, International Division, UAS Integration Office	FAA
4. Joe Morra	Director, Safety and Integration Division	FAA
5. Katherine Inman	Senior Attorney, Office of General Counsel	FAA
6. Elizabeth Forro	Special Assistant, UAS Integration Office	FAA
7. Marcus Cunningham	UAS Liaison, Aviation Safety Standards	FAA
8. Allison LePage	Digital Communications Manager, Office of Communications	FAA
9. Jessica Orquina	Lead Communications Specialist, UAS Integration Office	FAA
10. Khurram Abbas	Communications Specialist, UAS Integration Office	FAA
11. Jennifer Riding	Program Analyst, UAS Integration Office	FAA
12. Kristen Alsop	Digital Communications Strategist	FAA



Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual

Written Public Comments Submitted Since Last DAC Meeting



Drone Advisory Committee

June 23, 2021 DAC Meeting • Virtual

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page:

https://www.faa.gov/uas/programs_partnerships/drone_advisory_committee/

Message

To who it may concern, I learned today that the drone advisory committee is putting time and efforts into identifying language that may not be considered gender neutral or may discourage people from seeking aviation careers. Truthfully, as a drone operator and UAS business owner for the last 6 years I am disappointed to hear that there is so much effort being put into something other than safety, technological advances, and education. We are all seeing the never ending arguments over meanings of words and it is getting a bit over the top. In this case, removing the term "airman" or "unmanned" from published literature from the FAA seems pretty unproductive when these terms are derivative of the word "human," as in humankind and not "man." This isn't related to male or female and wasn't ever intended to be. I'm certain the vast majority of anyone reading FAR's doesn't believe that a specific gender is discounted. I can understand politicians bickering over such things but I know there are far more pressing regulatory items where efforts can be placed. Members of this committee have been chosen to represent multiple facets of the industry and I am truly surprised that this is even an issue. I can honestly say all of the other operators I know and have spoken to agree that this is a waste of time and feel like a fruitless attempt at political correctness. I do thank the advisory committee for their hard work on drone rules and regulations and I hope that effort continues. Thank you for your time.