EMBRY-RIDDLE Aeronautical University
SCHOLARLY COMMONS

International Journal of Aviation, Aeronautics, and Aerospace

Volume 3 | Issue 3 Article 9

8-3-2016

Position Paper: Safety Culture: Why the FAA Should Consider Adapting the WINGS Pilot Proficiency Program as a Method of Remote Pilot Recertification

Ryan J. Wallace
Polk State College, ryan.wallace@erau.edu

Scholarly Commons Citation
Wallace, R. J. (2016). Position Paper: Safety Culture: Why the FAA Should Consider Adapting the WINGS Pilot Proficiency Program as a Method of Remote Pilot Recertification. *International Journal of Aviation, Aeronautics, and Aerospace, 3*(3). https://doi.org/10.15394/ijaaa.2016.1138

On August 29, 2016, the FAA is prepared to begin certification of a whole new class of airmen to operate in the National Airspace System (NAS). Dubbed “Remote Pilots,” these individuals will be certificated to operate the vastly expanding fleet of commercial small unmanned aircraft systems. The FAA estimates that the small UAS market will grow to more than 2.7 million commercial platforms by 2020 (FAA, 2016b). Many of these new remote pilots will have no prior aviation experience operating in the NAS. In developing the recertification process for remote operators, the FAA missed a golden opportunity to engage this new group of aviators in forging the positive safety culture of the nation’s existing manned aircraft pilots.

Remote Pilot Certification & Recertification Process

UAS operators can earn the Remote Pilot certification by completing a knowledge exam at an FAA-approved testing facility, based on 12 topical areas identified by 14 CFR 107.73 (FAA, 2016c). Alternatively, UAS operators who hold an existing aeronautical certificate (other than a student pilot certificate) with a current flight review, can complete a the Part 107 small Unmanned Aircraft Systems ALC-451 training course administered on the FAA Safety Team website that addresses seven content areas identified by 14 CFR 107.74 (FAA, 2016a; FAA, 2016c). Applicants who do not hold an existing aeronautical certificate will be vetted by the Transportation Security Administration via a background check (FAA, 2016a). Upon completion of an FAA Form 8710-13 [FAA Airmen Certificate or Rating Application] in the FAA’s Integrated Airmen Certification and Rating Application (IACRA) system an FAA representative or designee will validate the applicant’s requirements are met and process issuance of the Remote Pilot Certificate with Small UAS Rating (FAA, 2016a). To continue to use small UAS flight privileges, a Remote Pilot must complete an initial aeronautical knowledge test or recurrent aeronautical knowledge test within 24 calendar months. Alternatively, certificated pilots with a current flight review may recertify their small UAS privileges via the completion of an initial or recurrent training course (FAA, 2016c).

Problem

Safety Culture

The FAA’s recertification rule follows a traditional and prescriptive, rule-based approach to Remote Pilot recertification. While this method ensures that remote pilots possess the requisite knowledge to adhere to FAA safety and operational rules, this approach potentially squanders the opportunity to engage remote pilots within the larger aviation community and foster the development of a shared positive *safety culture*.

The FAA describes a positive safety culture as "characterized by an adequate knowledge base, personnel competency, communications, training, informed decision-making, and information sharing in which lessons learned and best practices are developed and shared" (FAA, 2016d, p. 11). The FAA continues by addressing the key traits of a positive safety culture, including "shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands…there is good communication in the organization, and personnel continue to learn and develop through training and coaching" (FAA, 2016d, p. 11).

The establishment of a positive safety culture among remote pilots is significant, as many of these operators are not certificated manned aircraft pilots who have been regularly exposed to risk-based safety management training. Manned aircraft pilots receive training in hazard identification, risk assessment, and mitigation strategies at many stages throughout their training and continuing education. Part 141 flight training schools, crew resource management training, and a myriad of other training programs establish and continually reinforce the importance of safety culture. Additionally, remote pilots may not necessarily work for organizations that have well-established Safety Management Systems, such as those typically found in the aviation industry. This potentially leaves this large segment of new, professional aviators cut adrift from the safety culture shared by the vast majority of aviators. Ultimately, this segregation eliminates the potential for communication of critical safety information sharing among this National Airspace System user group.

James Reason (1997) codifies a positive safety culture as exhibiting five key characteristics:

Informed culture. "Those who manage and operate the system have current knowledge about the human, technical, organizational, and environmental factors that determine the safety of the system as a whole" (Reason, 1997, p. 195). Currently, UAS operators rely on regulatory guidance, FAA policies, and the guidance provided by various trade groups such as the Association for Unmanned Vehicle Systems International to produce an informed culture among remote pilots. Unfortunately, this method of information sharing is likely to only generate a one-way, top-to-bottom flow of information, removing the FAA from receiving critical safety feedback.

Reporting culture. "An organizational climate in which people are prepared to report their errors and near misses" (Reason, 1997, p. 195). The relatively limited direct interaction and cross-flow of information between the FAA and rank-and-file UAS operators is unlikely to foster this attitude among newly-certificated remote pilots. To further foster this relationship, the FAA must educate operators to use and demonstrate a commitment to honoring non-punitive reporting methods, such as the Aviation Safety Reporting System. A failure to foster use of this non-mandatory reporting method will likely result in a diminished agency capability in predicting and responding to trending safety issues in the UAS industry.

Just culture. "An atmosphere if trust in which people are encouraged, even rewarded for providing essential safety-related information-but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior" (Reason, 1997, p. 195). Generally, the FAA has set clear standards for acceptable and unacceptable UAS operations. The FAA has published significant guidance, including a robust instructional website, B4UFLY application, AC-107-2 [Small UAS], and revised AC 91-57A [Model Aircraft Operating Standards]. Moreover, the agency has partnered with community organizations, such as the Academy of Model Aeronautics, to aid in promoting safe operations of UAS. With the exception of mandatory post-accident reporting, however, UAS operators currently do not have a forum nor are they encouraged to share safety information with the agency.

Learning culture. "The willingness and competence to draw the right conclusions from its safety information system, and the will to implement major reforms when their need is indicated" (Reason, 1997, p. 196). To this point, the FAA has tread carefully prior to establishing permanent regulations, such as those contained in 14 CFR 107. The agency is acutely aware of the potential dangers posed by UAS platforms. Reports of UAS sightings and near encounters by manned aircraft operators in the National Airspace System have topped 1,346—nearly 100 per month between November 2014-January 2016, with most occurring around airports and other dense air traffic areas (FAA, 2016e; Gettinger & Michel, 2015). The agency also receives UAS encounter, incident, and accident data from the Aviation Safety Reporting System, operated by the National Aeronautics and Space Administration. A hasty search of the ASRS database for reports containing the narrative terms "UAS, drone, or unmanned" produced 229 results (NASA, 2016). While it may be premature to accurately judge the effectiveness of the *learning culture* produced by the FAA's UAS policies, it seems the agency is taking a pragmatic and conservative approach to implementing policy. The agency has access to multiple sources of UAS safety information. Whether the agency is prepared to implement major reforms, based on changing UAS safety data remains to be seen. It is important to note, however, that producing a *learning culture* requires two-way communication between the agency and operators. The FAA has not yet facilitated programs to encourage such recurring safety-related discourse and training.

Flexible culture. "Involves shifting from the conventional hierarchical mode to a flatter professional structure, where control passes to task experts on the spot, and then reverts back to the traditional bureaucratic mode once the emergency has passed" (Reason, 1997, p. 196). As previously mentioned, it is too early to make any judgements on the FAA's responsiveness to UAS safety-related information. The agency's transition from the 333 exemption process to the new 14 CFR 107 rules will likely serve as an effective gauge of the organization's flexibility to managing change.

The importance of establishing a safety culture among aviators cannot be understated. Establishing a shared mental model of safety-conscious attitudes and behaviors among aviation professionals produces a direct and measurable effect on the overall safety of the NAS. Ensuring continued aviation safety can only be achieved with all NAS elements—users, regulators, and stakeholders—working in concert to continually advance the safety benchmark.

Proposed Solution

The author proposes that the FAA adopt an ongoing training framework modeled after the FAA WINGS Pilot Proficiency Program to serve as an alternative method of compliance for UAS Remote Pilot recertification. Delivery of training material could be conducted via in-person classes, or less ideally, via online computer-based training courses. To receive recertification credit, the FAA could require attendees to complete training from several topical areas, such as those addressed by the existing 14 CFR 107 Remote Pilot recertification requirements. Administration of the program could be managed via the FAA Safety Team's current WINGS and Safety Program Airmen Notification System (SPANS) programs.

What is WINGS?

The FAA WINGS Pilot Proficiency Program's purpose is "addressing the primary accident causal factors that continue to plague the general aviation community…[the program] is based on the premise that pilots who maintain currency in the basics of flight will enjoy a safer and more stress-free flying experience" (FAA, n.d., p. 1).

The WINGS Pilot Proficiency Program is a voluntary pilot education program available to all pilots (FAA, 2011). The program includes learning activities and flight training tasks identified to be common causal factors in aviation accidents (FAA, 2011). Accident causal factors are organized into three topical areas which are revised by the FAA based on changing accident and safety data (FAA, 2011). The program is divided into three phases, based on the participant's pilot certificate level:

- Basic WINGS are appropriate for Sport Pilots, Recreational Pilots, and Private Pilots, and are based on the Private Pilot Practical Test Standards
- Advanced WINGS are appropriate for Commercial pilot standards, and are based on the Commercial Pilot Practical Test Standards
- Master WINGS are appropriate for Airline Transport Pilots, Commercial Pilots with Instrument Rating, or Flight Instructors

Pilots can complete an unlimited number of phases at each level; however, completion of advanced WINGS levels requires successful completion of prior level(s). The FAA incentivizes participation in the WINGS program by allowing pilots to substitute WINGS phase completion in lieu of a flight review, in accordance with 14 CFR 61.56(e) (FAA, 2011). Furthermore, flight instructors who conduct WINGS flight training activities can receive credit to renew their Certified Flight Instructor Certificate in accordance with FAA Order 8900.1, Vol 5, Ch. 2, Sec 11 (FAA, 2011).

While there is no concrete data that proves pilot participation in the FAA's WINGS program ultimately reduces accidents, there are some compelling statistics that suggest it likely has a positive effect on aviation safety. An internal FAA report evaluated 3,654 general aviation accidents over the course of 2008-2010 (Neville, 2011). The study examined accident rates among pilots who had completed a phase of the WINGS program and those who had not. The results revealed that an extremely small, 0.14% (n = 25) of pilots who had completed a phase of WINGS in previous 12 months had been involved in an aircraft accident (Neville, 2011). To provide some perspective, nearly 8,500 pilots had completed one or more phases of the WINGS Program as of December 2010 (Neville, 2011). While this limited evaluation of WINGS does not firmly establish the program's effectiveness at improving safety, it is doubtful that the program produced anything but positive effects.

Succinctly, the FAA WINGS Pilot Proficiency Program is a voluntary program designed to actively engage pilots in enhancing their knowledge and proficiency to operate safely in the National Airspace System.

Why the WINGS Model Makes Sense

There are several reasons why adopting the WINGS model for alternative UAS Remote Pilot recertification makes sense:

Establishes a forum. Foremost, the WINGS model establishes a forum between remote operators, industry experts, and FAA representatives. This approach allows for rapid communication of regulatory, advisory, and UAS operational policy changes directly with remote pilots. Furthermore, the model creates a forum for remote pilots to access regulatory and subject matter experts to directly clarify rules and operational procedures. Such a forum creates an ideal platform for the FAA to advertise available safety resources and operational tools. Perhaps most importantly, the forum allows the FAA to establish a positive rapport among remote operators by demonstrating the agency's intent to assist operators in conducting safe operations rather than merely seek out and punish infractions. Such an approach aligns well with the agency's current national policy of educating UAS users to operate safely rather than employing enforcement mechanisms to deter unsafe behavior.

Connects operators to a Community of Practice. One of the key benefits of establishing a WINGS-style education program is the synergistic effects produced by linking remote pilots into a larger community of practice. Such an initiative is an ideal method to facilitate mentorship of remote operators at all experience levels. Moreover, this community of practice connects remote pilots with other experienced operators and subject matter experts in the field. The community of practice reinforces safety by establishing a form of "self-policing" and positive group-think among members, exemplifying James Reason's *Just Culture* traits. Finally, this community of practice creates a sounding board for the sharing of safety information and best practices among other remote pilots.

Reinforces building a positive Safety Culture. Establishing a forum for training and sharing safety information is a key step in creating a positive safety culture. The initiative directly ties in with the goals articulated by the Safety Management System construct and establishes a clear methodology for conducting Safety Promotion-related activities. Perhaps most importantly, this initiative allows the agency to forge a positive safety culture among a unique group of aviators that would likely not be served by other programs or safety initiatives, such as those designed for manned aircraft operators.

Provides for more effective learning. A WINGS-based program transitions remote pilot recertification from merely a rule-based, knowledge assessment into a holistic *learning culture*. This method makes learning a regular, recurring process, keeping important operational and safety information at the forefront of operator's attention. Conversely, the existing recertification system, tends to encourage rote memorization to pass the biennial knowledge exam. Finally, a WINGS-based process eases the financial burden for remote operators to pay for re-testing or re-certification at an FAA-approved testing center.

Conclusion

Establishing a positive safety culture is a critical step in ensuring continued safety among all NAS users. The FAA's approach to regulating UAS safety solely through knowledge assessment and compliance enforcement simply does not create an environment that reinforces the five key elements of safety culture. To properly facilitate the creation of an *informed*, *reporting, just, learning*, and *flexible* culture among UAS operators, the FAA must establish an appropriate forum to actively engage this new group of aviators to generate personal and individual commitment to safety.

The author recommends the FAA consider adopting the proposed FAA WINGS Pilot Proficiency Program model as the basis for an alternative method of compliance for sUAS Remote Pilot recertification to achieve these ends.

References

Federal Aviation Administration. (n.d.). *WINGS pilot proficiency program.* Retrieved from https://www.faasafety.gov/WINGS/pub/learn_more.aspx

Federal Aviation Administration. (2011). *WINGS pilot proficiency program* [Advisory Circular, AC 61-91J]. Retrieved from http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/9e3e97f6e4d841d98625783f004f1159/$FILE/AC%2061-91J.pdf

Federal Aviation Administration. (2016a). *Becoming a pilot.* Retrieved from https://www.faa.gov/uas/getting_started/fly_for_work_business/becoming_a_pilot/

Federal Aviation Administration (2016b). *FAA aerospace forecast fiscal years 2016-2036.* Retrieved from http://www.faa.gov/data_research/aviation/aerospace_forecasts/media/FY2016-36_FAA_Aerospace_Forecast.pdf

Federal Aviation Administration (2016c). *Operation and certification of small unmanned aircraft systems* [Docket No. FAA-2015-0150]. Retrieved from https://www.federalregister.gov/articles/2016/06/28/2016-15079/operation-and-certification-of-small-unmanned-aircraft-systems#sec-107-53%20

Federal Aviation Administration. (2016d). *Safety management system* [National Policy Order 8000.369B]. Retrieved from http://www.faa.gov/documentLibrary/media/Order/FAA_Order_8000.369B.pdf (7)

Federal Aviation Administration. (2016e). *UAS sightings report* [database]. Retrieved from http://www.faa.gov/uas/resources/uas_sightings_report/

Gettinger, D. & Michel, A.H. (2015). *Drone sightings and close encounters: An analysis.* Retrieved from http://dronecenter.bard.edu/files/2015/12/12-11-Drone-Sightings-and-Close-Encounters.pdf

National Aeronautics & Space Administration. (2016). *Aviation safety reporting system database* [database]. Retrieved from http://asrs.arc.nasa.gov/search/database.html

Neville, B. (2011). *Report on the effectiveness of the WINGS pilot proficiency program* [Internal FAA Report]. Retrieved from https://www.faasafety.gov/files/gslac/library/documents/2011/Sep/57618/WINGS%20Accident%20Report-Edited.pdf

Reason, J. (1997). *Managing the risks of organizational accidents.* Aldershot, UK: Ashgate Publishing.

Wright, R. (2013). The WINGS program: The evidence says the FAA's pilot proficiency program is successful but few pilots use it. *Aviation Safety, 33*(1), 4.