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December 16, 2016

Gary Pokodner
Program Manager
Weather Technology in the Cockpit
Weather Research Branch
Federal Aviation Administration
800 Independence Ave SW
Washington, DC 20591

Re: Future Weather Technology in the Cockpit Research

Dear Mr. Pokodner,

The Aircraft Owners and Pilots Association (AOPA), the world's largest aviation membership association, appreciate the opportunity to provide input on the prioritization of future FAA Weather Technology in the Cockpit (WTIC) research. We support WTIC's efforts to improve the minimum weather service standards and to increase access to effective weather information in the cockpit. Analyzing and addressing gaps in training, communication, and display of weather is important to ensuring pilots can make informed decisions and avoid adverse conditions. AOPA respectfully submits these comments on the prioritization of future WTIC research on behalf of the hundreds of thousands of General Aviation pilots that we represent.

Increasing use of Weather Technology in the Cockpit by General Aviation

In 2016, AOPA and the FAA conducted a series of surveys to better understand how pilots utilize Flight Service and access critical flight information. We learned over 80% of General Aviation pilots routinely use an Electronic Flight Bag (EFB) in the cockpit. Most modern EFBs can display weather information and will continuously update while inflight. About 28% of pilots indicated that they routinely use SiriusXM Aviation inflight and about the same number (27%) utilizes the FAA provided FIS-B service. These services provide near real-time weather information in the cockpit and augment or, in some cases, replace Flight Service for pilots. The utilization of these services is growing as more pilots embrace technology and rely less on Flight Service. Therefore, it is important that the communication of that information is effective and usable by the pilot. It is equally valuable to acknowledge the differences between technological solutions and the services provided by Flight Service specialists and air traffic controllers.

According to the AOPA Air Safety Institute *25th Joseph T. Nall Report*, weather accidents consistently suffer the highest lethality of all accidents. In 2013, adverse weather accounted for the largest number of General Aviation fatal accidents. General Aviation pilots need effective weather information to make good decisions and to understand what impacts their flight. With the advent of affordable cockpit technology that will display near real-time weather, the question becomes whether this information is being delivered effectively and is it being properly utilized?

The WTIC program has an important mission in answering these questions and providing recommendations to resolve their underlying problems.

AOPA's Priority for Weather Research

1. Evaluate VFR Not Recommended Statement

The FAA is scheduled to award their Future Flight Service Program contract in 2017. As part of that contract, the FAA plans to modernize the service to better reflect how pilots access and utilize the service. One service change being considered by the FAA is the removal of the Flight Service specialist provided statement of "VFR Not Recommended" (VNR). The VNR statement is included in a briefing when current or forecast conditions, surface or aloft, would make flight under VFR doubtful. It is only provided if a pilot calls Flight Service via telephone or radio as only a human can currently make the determination whether that recommendation is necessary.

The 2006 FAA study titled *Analysis of Preflight Weather Briefings* looked at the effectiveness of the human briefer. The researchers analyzed the records from several Flight Service Stations and the impact of the preflight briefing on intention to fly. The results showed VFR pilots on bad weather days who received a preflight briefing delayed (46.9%), postponed or cancelled (15.6%) their flights, while others looked for alternate routes and destination points (15.6%). The researchers noted "this result shows that about 10% of the time, [Flight Service] information positively impacted the decision-making process, influenced pilot actions, and, in these cases, may have helped avoid weather-related flight incidents."

At the time the study was conducted, it is likely that nearly all General Aviation pilots used Flight Service for preflight and inflight weather information. In the decade since, most pilots have shifted to no longer calling Flight Service for this information; instead, they receive it online from various sources. The VNR statement can only be provided by a human, given there was never any consideration for including it in the online provided briefings. Due to the shift of most pilots to using self-assisted services like FIS-B and online applications, it is important the FAA understands what an effective intervention would be today and how that intervention, such as a variation of VNR, could be provided via automation.

That same 2006 study noted that for several of the briefings provided, the Flight Service specialist issued the pilot the VNR statement. Approximately 86% of these recommendations went to pilots who had filed VFR flight plans. Among this group, all but 27% changed their flight plan. For pilots who filed IFR flight plans, all but 9% decided to modify their flight plans. It is clear from these results that VNR at one time was effective at communicating to pilots that they might encounter conditions outside of VFR with many pilots modifying their plan accordingly.

Communicating the threat of VFR into IMC has become more difficult since 2006 as VNR is now viewed as ineffective, over used, too subjective, and cannot be provided to most pilots given they utilize automated resources. However, AOPA does not believe VNR should be removed. Instead, we contend that VNR and its concept should be evaluated by WTIC for improvement to become an effective intervention for those pilots who may be considering a flight that could result in VFR into IMC. It is important the recommendations of the study consider a solution for

pilots who receive their weather from automated and specialist delivered means. We believe WTIC should make it a priority to evaluate VNR given the research could influence FAA policy decisions, weather delivery applications, and pilot education.

2. Crowd Source Wind Information and Forward Looking Radar

General Aviation flies to thousands more airports than commercial aviation and to countless locations NAS wide. These pilots regularly fly in areas where there is sparse or no surface observation information available that could inform forecasts. Evaluating the use of crowd sourced information for dissemination to pilots could lead to greatly increasing the information available for decision making. AOPA believes this is an important project.

Weather cameras are used with great success in Alaska. However, they do not currently provide all the information they are capable of and are not usable at night. AOPA has advocated for expanding weather cameras to more locations where beneficial, such as areas of Colorado, and we agree that gaining more information from the cameras would benefit users. AOPA also advocates for additional research to evaluate low-light sensors or other technologies to expand the utility of this system.

3. Assess Pilot Capability to Judge Distance to Weather

Findings previously provided by WTIC show pilots misjudge how close they are to adverse weather which can lead to inadvertent IMC. This is an important issue that must be better understood so interventions, such as visual alerts, could be provided to the pilot via technology and the issue itself discussed in pilot guidance.

Conclusion

AOPA supports the WTIC program and the research that office sponsors. We propose research on VNR should be the priority given the service changes the study results could trigger. We appreciate this opportunity to provide our feedback on the priority of WTIC research projects and look forward to collaborating on General Aviation related projects in the future. Please feel free to contact me at 202-509-9515 if you have any questions.

Sincerely,

Rune Duke
Director, Airspace and Air Traffic

The Aircraft Owners and Pilots Association (AOPA) is a not-for-profit individual membership organization of General Aviation Pilots and Aircraft Owners. AOPA's mission is to effectively serve the interests of its members and establish, maintain and articulate positions of leadership to promote the economy, safety, utility, and popularity of flight in General Aviation aircraft. Representing two thirds of all pilots in the United States, AOPA is the largest civil aviation organization in the world.