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Subject: Recommendations from General Aviation Joint Steering Committee (GAJSC) Safety Analysis Team (SAT) about the Federal Aviation Administration's (FAA) development of the General Aviation safety metric and goal for post-FY2018 – Approved at January 2017 GAJSC Meeting

Background

The FAA's current safety metric and goal is to have no more than 1.00 fatal general aviation accidents per 100,000 hours flown in FY2018. This metric and goal was developed by the FAA in 2008-2009 with input from industry through the GAJSC General Aviation Data Improvement Team (GADIT). (The GADIT was incorporated into the SAT in the 2011 GAJSC revitalization effort.)

The FY2018 goal is based on an annual improvement (reduction in rate) of one percent per year starting with the three safest years recorded in general aviation (FY2007, 2008, and 2009). These three "baseline years" had an average fatal accident rate of 1.12 fatal accidents per 100,000 flight hours. Based on this average, the 1.00 rounded figure was selected to – among other things – simplify messaging about the agency's GA safety goal.

It should be noted that the current GA metric and goal is the second iteration of an agency safety target for general aviation operations. The FAA, as part of Safer Skies, established a goal to "remove a single year of accidents" over the decade leading up to 2007 based on expected levels of GA flying growing 1.6 percent per year during the following 10 years. The FAA also made a commitment in the late 1990s to transition to a rate-based safety metric goal for general aviation if both the accident data and exposure data (i.e., the GA and Part 135 Activity Survey) had been improved and become accepted by not only the agency but also industry stakeholders.

In 2015, the GAJSC tasked the SAT with developing recommendations for a post-FY2018 GA safety goal by spring 2017 to allow the agency to undertake the necessary coordination before the end of FY2018. The SAT met three times during 2016 to develop its input on the post-2018 metric. This memo contains the conclusions and recommendations from the SAT's evaluation, including a recommendation for further work to occur closer to the FY2018 transition.

Conclusions and Recommendations

Recommendation 1: The SAT recommends that the FAA continue to measure GA safety as a ratio between the number of fatal general aviation accidents and total hours flown.

The group discussed whether the numerator should be modified to include more accidents (e.g., the Alaska Fatal and Serious Injury measure), but concluded that the agency's focus should remain on preventing fatal accidents. The group also discussed alternatives to the denominator being based on

total hours flown, but determined that others measures of flight exposure (e.g., number of flights, landings) would introduce greater uncertainty in the data. (Hours are based on flight time, which can be found in logbooks and aircraft equipment (e.g., hobbs meter), while landings would be based on the pilot's recollection.) Alternatives to using flight hours as the denominator likely also introduce the risk of "double counting," since the same flight could be reported by multiple pilots.

The group discussed (in a manner similar to discussions in 2007-2008) whether to introduce a confidence interval or moving average around the annual safety target, but concluded that this statistical measure would likely generate significant confusion about the GA safety metric and goal, which could undermine the effectiveness of messaging around the metric and goal.

Recommendation 2: The SAT recommends that the FAA include those fatal accidents and flight time that is under the direct authority of the agency's oversight and focus on traditional general aviation flying.

The group discussed the issue of "public aircraft" (49 U.S.C. §§ 40102(a)(41), 40125) accidents and flight time and concluded that it should not be part of the FAA's safety metric, because the agency has limited authority over these operations.

The group also discussed the inclusion of Experimental Light Sport Aircraft (E-LSA) accidents and flights. The size of the E-LSA fleet was not fully considered when the current GA safety goal was developed in 2007-2008, because these aircraft only transitioned into the N-registered fleet in 2008-2010. As a result, the annual target and associated long-term goal did not consider the 4-6 annual fatal accidents that involve E-LSA aircraft. Since then, the E-LSA fleet has been fully integrated into general aviation flying and should remain part of a post-2018 GA fatal accident metric and goal.

Additionally, the group discussed whether there could be a consistent mechanism to exclude those accidents that involved reckless behavior by the pilot. Although these accidents are frustrating to the community, the SAT did not identify a consistent set of criteria through which reckless accidents could be excluded from the data set and acknowledged the challenges of reaching a definition universally acceptable to stakeholders. Additionally, if a recklessness definition was introduced by the FAA and the reckless accidents were excluded, the group expected that this would cause the FAA's accident data to diverge from the accident data published by the National Transportation Safety Board (NTSB), which could confuse internal and external stakeholders. The SAT may do future work to look at the scope of reckless accidents in the GA fatal accident dataset, but not as part of an official metric activity.

The group also concluded that it would significantly confuse and create a nonsensical metric if any UAS accidents (unrelated to manned aircraft accidents) were included in a GA metric. It was noted that work is underway in parallel through the FAA's Unmanned Aircraft Safety Team (UAST) to develop data and a safety goal for UAS.

Recommendation 3: The SAT recommends that the FAA establish a long-term, strategic goal to enhance general aviation safety.

Enhancing safety is a systematic effort that requires technical analysis and the ability to effect training, educational outreach, aircraft design and equipment, and the culture in the aviation community. As a result, establishing short-term goal would not be conducive to the development and implementation of safety enhancements by FAA or the aviation community. The group proposes that the FAA's new safety

goal be targeted at 2030. If the agency selects a different year, it should be on the order of a decade from its baseline.

Recommendations For Future Work

The group was unable to make final recommendations about two key components of a safety metric at this time, but instead summarizes below what the SAT has concluded and presents the recommended next steps the FAA should take as part of its work to establish a post-2018 GA safety metric and goal.

Initial Recommendation 4 in Preparation for Future Work on the Safety Improvement: The FAA should establish a GA safety metric, which is an improvement (i.e., reduction of the rate of fatal accidents) in the baseline years.

Some voices have expressed an interest in simply “maintaining safety” for general aviation in the post-2018 environment. This is not acceptable to the SAT, because the aviation industry always strives to enhance aviation safety. Further, the SAT does not believe that the lowest reasonably achievable fatal accident rate has been reached.

The FY2014, 2015, and 2016 data point to a change in GA safety in which the rate of GA fatal accidents has shifted from approximately 1.10 fatal accidents per 100,000 hours to 0.90 fatal accidents per 100,000 hours. This recent trend follows a decade during which the GA fatal accident rate had been mostly stable occurring at a rate between 1.09 and 1.17 fatal accidents per 100,000 hours. Due to this recent and notable change in GA safety, the group concluded that it is premature to make a specific recommendation to the FAA about target for GA safety improvements post-2018.

Instead, the group recommends that FAA and industry monitor the FY16, FY17, and early FY18 data to help inform a decision about the post-2018 safety target. The FAA – working through the GAJSC – should reconvene with the industry stakeholders in 2018 to update Recommendation 4, about the rate of safety improvement post-2018.

Initial Recommendation 5 in Preparation for Future Work on the Baseline Years: The FAA should establish a set of baseline years for the GA safety metric to ensure the combination of Safety Target (see Recommendation 4) and Baseline Years are congruent.

As noted above, the recent GA safety data indicates a change in the accident rate which, at the current trajectory, will make the “baselining” exercise for the post-2018 metric more difficult. The current baseline (i.e., average of FY2007, 2007, and 2008) was based on the three safest years previously recorded in general aviation, but the accident rate was also mostly stable at 1.09, 1.12, and 1.14 during these three years. The recent accident rates, however, have changed from 1.09 (final), to 0.99 (final) to 0.91 (preliminary), which poses greater variance.

The group recommends that FAA and industry monitor the FY16, FY17, and early FY18 data to help inform a decision about the post-2018 fatal accident rate baseline. The FAA – working through the GAJSC – should reconvene with industry in 2018 to update Recommendation 5 about the rate of safety improvement post-2018 and to consider whether only three years should be used for the new metric and associated goal’s baseline fatal accident rate.

Other considerations: The SAT, in addition to the above five recommendations, also noted that a post-2018 goal should be easy to understand for all stakeholders, including those external to the aviation

community. As an example, the group considered a 20 percent improvement by 2030 (i.e., “20 percent by (20)30”), which would be an annual improvement of approximately 1.5 percent compared to the past decade’s one percent per year improvement. Although the SAT did not recommend a specific goal, it did agree that one of the benefits of the current goal is the ease of communicating it (i.e., one per 100,000 hours by 2018).

The SAT also recommended that the FAA review whether other jurisdictions have safety metrics for general aviation. It was noted that exposure data about general aviation is limited outside the United States, but that the FAA may want to review safety plans from Australia, Canada, and the United Kingdom. (Note – EASA is currently in the process of developing a GA survey, but its results are not expected until late 2017.)