

33,000 lbs. also includes the passenger-carrying airplanes because of the switch to weight; however, the seat definition in the current rule is compatible with the proposed weight definition. The decision has already been made to not require a retrofit of TCAS equipment from one version to another. Retrofits are very expensive and, in this case, the FAA does not find the benefit of a retrofit to be worth the cost.

In response to Northern Air Cargo's comment that we should accept all Capstone participants, we note that Capstone currently applies to Alaska only (specifically, Bethel, Alaska). Although the FAA is pleased with the progress made during the Capstone demonstration, ADS-B is not a collision avoidance system and we have not received any application for its FAA approval as a collision avoidance system. Currently, the ADS-B equipment installed for the Capstone project is not equivalent to TCAS I or TCAS II. It currently would not be an acceptable alternative to TCAS under this proposal either inside Alaska or outside Alaska.

Northern Air Cargo's DC-6 weighs more than 33,000 lbs. If the FAA had adopted the existing rule language and simply added cargo airplanes and used the weight threshold, the DC-6 would have needed TCAS II. This rule provides significant relief to operators of large piston-powered airplanes, including those that operate in Alaska by requiring only TCAS I.

Economic/Risk Analysis/Alternatives

Comments

Several commenters specifically address the costs and benefits of the rule, the risk analysis used, and some alternatives to reduce the cost of the rule.

Ryan suggests that our estimated cost of equipage for TCAS I is low, suggesting that the estimate left out the cost of the elements themselves. It also states that if Mode S is required for TCAS I installations, the costs would be even higher, and recommends that we remove the Mode S requirement for TCAS I installations.

The CAA suggests that we overstated the benefits and minimized the costs in our analysis. It quotes from the cost section of the NPRM that we did not include the cost of air carriers that have voluntarily equipped their fleets with TCAS or that are equipped with TCAS as required by foreign governments. However, it states that our benefits section assumes that no cargo aircraft are equipped with TCAS. It argues that the numbers used for the benefits

section are either drawn from unknown sources or are misinterpretations of other existing documents. It recommends that we task MITRE Corporation to review the proposed rule and to submit comments on the benefits that the proposal might generate.

Another commenter indicates that the cost of installing TCAS on older piston-powered cargo aircraft is cost prohibitive. He believes this rule will ground these aircraft, putting small cargo aircraft companies out of business, depriving the public of much needed cargo service. He argues that these aircraft typically fly only a few hundred hours a year and are in their last 10 years' of service life.

USA Jet Airlines, Inc., questions the necessity of so many equipment requirements in the near future. It indicates that in the next 3 years, a DC-9 and Falcon operator will pay \$250,000 per aircraft for TCAS II, \$125,000 per aircraft for TAWS and a significant sum for the domestic RVSM system. It agrees that these systems have merit, but believes the cost of all the systems precludes implementation for many carriers.

UPS contends that the FAA misinterpreted the MITRE study, which the NPRM indicated that the risk of a mid-air collision with a passenger airplane in the United States would be reduced 17 percent if cargo airplanes were also equipped with TCAS. According to UPS, the study reported that the risk of a mid-air collision for passenger airplanes in the United States would be reduced by 1 percent. UPS criticizes the study for not calculating the reduction in the risk of passenger airplane runway incursion accidents if cargo airplanes were equipped with ADS-B.

UPS also believes that the benefits are uncorroborated. It believes that because the FAA did not quantify the benefit of TCAS equipage, it is not possible to calculate a cost-benefit. UPS further asserts that the mid-air collision risk over the next 20 years involving a cargo airplane (40 percent) is unsupported. It argues that because there has never been a mid-air collision in the United States involving a cargo airplane, it is difficult to comprehend how this value could have been computed.

FAA's Response

In response to Ryan's assertion that we left out the cost of TCAS I units, the FAA's cost estimate does include estimates for both equipment and installation costs. As noted above, TCAS I equipment does not need a Mode S to function, nor did we propose to require Mode S. Therefore, the cost of Mode S

is not considered to be a cost imposed by this rule.

To address the CAA's comments, in the final rule regulatory evaluation, air-cargo carriers' voluntary compliance has now been factored into both the cost and benefit sections. A large percentage of air cargo carriers voluntarily complied with the rule, even before the publication of the NPRM. Both the costs and the benefits are reduced by the extent of voluntary compliance. The FAA finds it unnecessary to task MITRE Corporation since we have made the corrections.

In response to the individual operating older piston-powered cargo airplanes, as previously discussed, the FAA has reduced the burden for those airplanes from TCAS II to TCAS I as much as we can. In response to USA Jet Airlines, Inc., the FAA realizes there is a cumulative effect of rules; however, in this case, the FAA is required by Congressional mandate to issue this rule.

UPS questioned the validity of a 40-percent chance of at least one mid-air collision involving a cargo aircraft in the next 20 years. That probability refers to the value in the Poisson distribution table when the mean of the distribution is 0.5. The Poisson distribution is an accepted probability distribution for rare events. Just because a collision has not occurred does not mean that the probability of a collision occurring is zero. The economic evaluation discusses the impact of near-miss situations on the FAA's analysis.

The 17-percent and 1-percent reduction in risk estimates, as mentioned in the full regulatory evaluation, are both correct. The MITRE study, which is in the docket, reports (pages 49 and 50), "If cargo aircraft were TCAS-equipped this relative risk would drop to 0.058 (as compared to the pre-TCAS baseline situation when no aircraft was TCAS-equipped). This corresponds to a Risk Ratio of $0.058 / 0.070 = 0.828$, which roughly corresponds to a 17-percent reduction compared to the current risk. The small proportion of encounters involving one passenger and one cargo aircraft means that equipping cargo aircraft with TCAS would only reduce the risk to the passenger aircraft by another one percent."

In response to UPS's assertion that the benefits of the rule are uncorroborated, the FAA sponsored a MITRE study to assist in the risk assessment of a mid-air collision. That report provided the basis of the safety benefits for collision avoidance for cargo aircraft. We made that study available in the docket, we provided a risk assessment, and we