

The Federal Aviation Administration (FAA) published draft Advisory Circular (AC) 120-27F "Aircraft Weight & Balance Control" for comment on November 7, 2013. We, the Society of Allied Weight Engineers (SAWE), are volunteering to lead an industry solution in the establishment of standard crew, passenger, and baggage weights, and respectfully submit the following comments.

The SAWE goals are to promote mass properties engineering as a specialized discipline and to provide a means for those interested in mass properties engineering to collectively further their professional goals. Since its inception in 1939, the SAWE has grown to include 22 chapters located in the United States, Canada, Central Europe, and the United Kingdom and has members from over 22 countries. The Society promotes technical interchange between its members through international and regional conferences, the Weight Engineering Journal, specialized training, technical papers and a growing number of professional publications.

Discussion and feedback on draft AC120-27F

For the past 46 years the FAA has taken the lead in the establishment of standard weights for passengers and baggage and documented this data in AC120-27. As currently proposed, Revision F has removed the standard weights option and allows only a survey based compliance option of weight establishment. The SAWE believes that departing from this long standing approach should proceed with great deliberation and significant consideration. If the FAA wants to relinquish the responsibility for maintaining a standard weight for passengers and baggage, a carefully established alternate plan must be implemented that includes and considers:

- 1) The appropriate representative weights for crew, passenger, and baggage.
- 2) Endorsement by aircraft regulators, operators, and manufacturers.
- 3) Inclusion of a progression plan that allows seamless transition from AC120-27E to AC120-27F.
- 4) A plan for accommodating future changes to but not limited to the following:
 - a. Passenger weights
 - b. Passenger checked baggage weight and quantity
 - c. Passenger carry-on weight and quantity
 - d. Airline business plans (e.g. additional fees for checked baggage).
- 5) The economic cost of implementing a new plan to the aircraft operators and the Original Equipment Manufacturers (OEM).
 - a. Any proposed survey based approach must recognize the cost of planning, performing, and documenting these surveys through a cost-benefit analysis and not compete for resources that would otherwise be used for other safety programs.
- 6) Recognition that the final answer may or may not look like AC 120-27E. The new passenger and baggage weights may vary as a function of the following:
 - a. Summer to winter operating environments
 - b. Adult male to adult female to youth passenger ratios
 - c. Domestic to international operations
 - d. Operating region (USA-Asia may be different that USA-Europe)
 - e. Number of people loaded
 - f. Type of people loaded (military, sporting teams, etc)

- g. Aircraft passenger capacity (regional jets and VIP airplanes may require different weights than larger airplanes)
 - h. Length of flight
 - i. Etc.
- 7) Address weight allowances such as passengers, crew, checked baggage, carry-on baggage, and crew baggage. Each may or may not require a survey. Although interrelated, these five allowances may be established with their own weight with their own basis. Also, a priority between these five allowances may be established as addressing all five at one time may be time prohibitive.
 - 8) Recognition that any standard weights established in the US will be utilized by many non-US operators because of the international use of US regulations and policy. In addition, the results of any new passenger and baggage weights should be communicated with other regulatory agencies, like EASA.
 - 9) A “survey only” philosophy does not have provisions to accommodate a start-up airline or an existing airline starting a new type of operation (e.g. a US domestic carrier starting operations to Europe).
 - 10) Standard weights are still required for airplane design by the OEM.
 - 11) Surveys may represent a significant privacy issue for airline customers.

Alternative solution to satisfy the intent of AC120-27F

The SAWE does not believe that there is any increased value to the traveling public or the aerospace community by requiring operators to conduct surveys to establish their own passenger and baggage weights. This method guarantees a significant amount of duplicated effort across the industry at a high cost with no clear indication that the current level of safety will be maintained or improved. In lieu of the FAA setting a standard, a recognized industry group should take this role. A Voluntary Consensus Standard which involves government participation and is aligned with U.S. National standards policy as outlined by the National Institute of Standards and Technology [1] is in fact the preferred method to approach this activity.

The SAWE is in a unique position to lead in the creation of standards for weights of passengers and baggage. We have been in the “business” of weight and balance since 1939 and our members not only span the industry but have been involved with passenger and baggage weights, including surveys, in support of some of the earlier versions of AC 120-27.

The SAWE is an American National Standards Institute (ANSI) member organization and pending ANSI certified Accredited Standards Developer (ASD). The SAWE would document the passenger and baggage weights to establish an eventual ASD developed ANSI standard for use by all interested parties, inclusive of the FAA, OEMs, and the airlines.

The SAWE would lead this project by addressing the issues and concerns listed above. If and when a survey is required, it will be the operators that will perform any survey under the direction and work distribution set up by an industry consensus body of interested parties. The SAWE, through its Standards and Practices Committee (SPC) defined process, would follow ANSI process requirements,

including soliciting for a consensus body whose actions will lead to development of any AC-120-27 maintenance actions. SAWE would solicit support from the FAA, all of the major airlines and industry groups representing other operators; and follow ANSI required process steps which ensure diverse representation from all parties with particular interest in this standards action.

Conclusion

It is the collective opinion and response from the SAWE that the proposed changes in AC120-27F are a burden to the aircraft operators and not in the best interest of the FAA, the airlines, or in the end the safety of the flying public. An alternative approach is to invoke a U.S. Standards Strategy based approach utilizing the SAWE to lead a voluntary consensus standards development process following ANSI ASD compliance requirements. This will result in an industry harmonized document which provides the desired updated weight allowances. The implemented development process would include regulators, airlines, OEMs, and others with particular interest; all working as a team to achieve the best possible projected weights for passenger and baggage in an evolving aviation environment. Potential to elevate a resulting U.S. ANSI standard to international recognition as an ISO standard is also available should such interest be sufficient.

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Works Cited

[1] NIST, "Standards Policy," [Online]. Available: <http://www.nist.gov/director/sco/index.cfm>.

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