



AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

September 27, 2022

Department of Transportation (DOT)
Federal Aviation Administration
Docket Operations, M-30; U.S.
1200 New Jersey Avenue SE, Room
W12-140, West Building Ground Floor, Washington, DC 20590-0001

Request for Comments in Minimum Seat Dimensions Necessary for Safety of Air Passengers (Emergency Evacuation)

Agency: Federal Aviation Administration, [FAA]
Date: Federal Register; August 3, 2022
Agency/Docket Number: Docket No. FAA-2022-1001
Topic: Request for Comments in Minimum Seat Dimensions Necessary for Safety of Air Passengers (Emergency Evacuation)

Per direction of the August 3rd Federal Register announcement, we submit the following correspondence and attached materials to address the following:

In furtherance of the agency's implementation of Section 577 of the Act, the FAA invites public comments to assist the agency in determining what minimum dimensions (including pitch, width, and length) of passenger seats may be necessary for safety, including in particular airplane evacuation. The FAA has assessed what safety issues could be associated with seat dimensions and concluded that additional data regarding evacuations could be valuable.

The FAA invites comments on minimum seat dimensions necessary for passenger safety, especially during airplane evacuation, as the FAA examines whether new regulatory standards are necessary, in order to ensure such safety and comply with Section 577 of the Act. The FAA encourages commenters to review the CAMI report, and other materials in the docket, prior to commenting.



Working together for a safer, stronger future.® | assp.org



The [American Society of Safety Professionals \(ASSP\)](#) is the oldest society of safety professionals in the world. Founded in 1911, we represent over 36,000 professionals advancing workplace safety and health in every industry, in every state and around the globe. ASSP members have set the occupational safety and health (OSH) community's standards for excellence, ethics, and practice for more than 100 years.

Technical Insights

ASSP asked members, with expertise about the issue, with a request to offer any applicable insights and technical comments to the proposal.

Our members did note what they see three principal types of aviation accidents:

- 1.) Low enough energy that everyone survives, and seat size is mostly irrelevant.
- 2.) Medium energy that persons survive the initial impact but are too badly injured to evacuate before being overtaken by fire gases.
- 3.) High enough energy that it is un-survivable for most humans.

While not specifically part of this call for comments for seat dimensions, we would suggest that a lot of the current policies addressing aircraft evacuation is based on data and research from almost fifty years ago. An example would be the accepted "90 Second Rule" for aircraft evacuation. This does impact some of the issues addressing seat dimensions and the FAA request for insights. ASSP suggests that evacuation procedures need to be considered in their entirety and not only seat dimensions.

We do suggest that additional research on seat dimensions should be synergized with some of the issues below:

- ✓ Are practices such as the "90 second rule" still valid due to new methods of aircraft design and construction
- ✓ Real world testing would need to take place to address any potential changes with seat dimensions, passengers, and evacuation processes and procedures
- ✓ How do we validate and synergize the testing noted above with actual situations we are aware of and have validated findings for?
- ✓ The impact of new materials and methods on overall aircraft design and safety and then correlate/synergize to seating.





To the specific seat dimension issue being addressed by FAA, we commend the FAA for taking the initiative to ask for feedback and insight about this issue. Members of the Society suggested that FAA consider researching the following issues to evaluate airworthiness certification/operational requirements:

- Consider the requests we have seen over the years for a potential design change[s] requiring passenger seats be faced rearwards. We do recognize there would need to be additional research and data on this issue, but ASSP would like to see additional findings from FAA on this overall design issue. Specifically, what would be required in regard to structural changes and the impact on aviation safety. We would be interested to see the data and analysis showing the impact from increasing the weight of the seat and impact on the aircraft overall.
- Research the feasibility of employing a minimum of a three-point harness system and/or seatbelt airbags (Identified as early as 1994. See reference below to Lillehei & Robinson.) We have heard from a number of ASSP members that all-belts-to-seat (ABTS) is a valid concept to consider, but the seatback would need to be reinforced and that would increase weight, which is an issue we also address in the first point above.
- Consider better attachment of seats to aircraft structural members (Identified as early as 1994. See reference below to Lillehei & Robinson.). We do understand that seat design safety has improved over the years but this issue warrants additional review.
- Implement the removal of infant-in-arms policies (NTSB recommendation)
- A process/procedure addressing enhanced review and control for passengers unable to assist in their own evacuation. The issue here for consideration would involve implementation and ways to identify and address such passengers without violation of privacy or applicable laws addressing disclosures and outreach. As an example, many of our members noted their experience indicates manufacturing specifications for large machines seats[s] are load rated typically at 350lbs.
- Consider the feasibility of additional engineering controls to prevent lower extremity fractures during the crash sequence. (See RTO-EN-HFM-113) - this may include a need to change seat pitch. This is a highly technical issue. One of our members involved in research on this issue noted that a study he was involved indicated the main direction of the deceleration affects lower limb injuries and spinal injuries. Femur fractures were often seen because they cantilever over the seat edge and the tibia/fibula can't support the knee because the feet kick out. Spinal fractures can also result because of





the direction of force and body position. It also needs to be considered that seat pans are not currently designed to attenuate the load.

- Simpler means of raising seat armrests in the post-crash sequence
- Consider removal or limitations on overhead baggage storage. We do note the issue may not be so much design as it is briefing passengers on not trying to retrieve baggage and/or personal belongings in the face of an emergency. This may also relate to articles and items being stored under seats.
- Enhance levels of training, preparedness, and physical fitness for aircraft personnel responsible for emergency response and assistance to passengers evacuating aircraft

Referenced Publications

ASSP recommends that the FAA review the publications and articles below since they do address some of the issues and comments above:

1. [A critical analysis of the fatal injuries resulting from the Continental flight 1713 airline disaster: evidence in favor of improved passenger restraint systems](#)
2. [Injuries in Fatal Aircraft Accidents: Mechanisms of Injury in Aircraft Accidents](#)
3. <https://www.sto.nato.int › EN-HFM-113-03>
4. [Aircraft Accommodation for People Living with Obesity: A Call for a Review of Existing Seating, Safety and Emergency Regulation](#)
5. [The ergonomics of airplane seats: The problem with economy class](#)
6. [The effects of seat width, load factor, and passenger demographics on airline passenger accommodation](#)
7. [FAA Final Rule 2005: Improved Seats in Air Carrier Transport Category Airplanes](#)
8. [FAA Final Rule 1988: Improved Seat Safety Standards](#)

We also suggest that the FAA may have interest in reviewing our American National Standard addressing Prevention Through Design. We believe the concepts in this standard are applicable to the information FAA is looking to gather. If FAA would like a copy of this standard please let us know via the ASSP Headquarters contacted provided at the end of this comment.





AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

[ANSI/ASSP Z590.3-2021](#): *Prevention through Design Guidelines for Addressing Occupational Hazards and Risks in Design and Redesign Processes*

Scope: This standard pertains principally to the avoidance, elimination, reduction or control of occupational safety and health hazards and risks in the design and redesign process.

Thank you for your time and attention to our comments. If we can be of any assistance in this matter, please feel free to contact ASSP.

Respectfully,

Christine M. Sullivan, CSP, ARM
2022-23 ASSP President



AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

ASSP Headquarters Contact Information

Timothy R. Fisher, CSP, CHMM, CPEA, CAE, ARM, STS, FASSP
Director, Standards Development and Technical Services
American Society of Safety Professionals
ASSP External Relations
520 N. Northwest Highway
Park Ridge, IL 60068
TFisher@ASSP.Org
847/768-3411

Sue Trebswether
Director, Marketing and Communications
American Society of Safety Professionals
ASSP External Relations
520 N. Northwest Highway
Park Ridge, IL 60068
STrebswether@ASSP.Org
847/768-3433

