



January 31, 2018

The Honorable John Thune
Chairman, Committee on Commerce,
Science, and Transportation
511 Dirksen Senate Building
Washington, D.C., 20510

The Honorable Bill Nelson
Ranking Member, Committee on Commerce,
Science, and Transportation
716 Hart Senate Office Building
Washington, D.C., 20510

Dear Chairman Thune and Ranking Member Nelson,

I write to you on behalf of the Human Factors and Ergonomics Society (HFES) regarding modifications in the *Federal Aviation Administration Reauthorization Act of 2017* (S. 1405) to the current flight-hour requirement for commercial pilots. If implemented, the Society is concerned that the changes would jeopardize the safety and security of airline pilots, crew, and passengers.

With over 4,600 members, HFES is the world's largest nonprofit association for human factors and ergonomics (HF/E) professionals. HFES members include psychologists and other scientists, designers, and engineers, including researchers, practitioners, and federal agency officials, all of whom have a common interest in working to develop safe, effective, and practical human use of technology, particularly in challenging settings. HFES has a particularly strong aviation expertise and network with membership consisting of former FAA employees, pilots, industry representatives, academics, and other aviation experts.

The Society's concerns with S. 1405 focus on proposed changes to 49 U.S.C. 44701 that would allow academic knowledge related to aviation to qualify as experience under the current flight-hour rule (78 FR 42323). While important topics that underlie the performance of an airline pilot can be taught in the classroom, academic knowledge alone is not sufficient for enabling effective performance. Many skills, including situational awareness, communications, decision-making, and aircraft control "stick" skills require significant experience to attain proficiency.

For example, research has found that 88 percent of airline accidents involve poor situational awareness.¹ Expertise in situational awareness is gained through experience in a wide variety of situations including different types of weather, terrain, air traffic interactions, mechanical malfunctions, automation behaviors, airport types, Air Traffic Control and flight crew communications, and the interaction of these variations in the flight environment. This experience base is critical for allowing pilots to determine how to best allocate their attention, which information is important, developing an understanding of the significance of observed information, determining sources of potential errors or hazards, and for creating effective projections of likely or potential future events in order to inform

¹ Endsley, M.R., *A taxonomy of situation awareness errors*, in *Human factors in aviation operations*, R. Fuller, N. Johnston, and N. McDonald, Editors. 1995, Avebury Aviation, Ashgate Publishing Ltd: Aldershot, England. p. 287-292.

proactive decision making.^{2,3} Experienced pilots have also been shown in a number of studies to have significantly better situational awareness than more inexperienced pilots.^{4,5,6,7}

Based on the scientific peer-reviewed research, HFES is concerned that the proposed changes will not substitute for the current experience that qualifies a pilot with the proper skills required to ensure safe and effective flight operations. The Society and its members look forward to working with you on ways to improve this legislation while ensuring critical, evidenced-based safety standards are not jeopardized.

Sincerely,

A handwritten signature in cursive script that reads "Valerie Rice".

Dr. Valerie Rice
President
Human Factors and Ergonomics Society

² Endsley, M.R., *Toward a theory of situation awareness in dynamic systems*. Human Factors, 1995. **37**(1): p. 32-64.

³ Endsley, M.R., *Expertise and Situation Awareness*, in *The Cambridge Handbook of Expertise and Expert Performance*, K.A. Ericsson, et al., Editors. 2006, Cambridge University Press: New York. p. 633-651.

⁴ Endsley, M.R., *Expertise and Situation Awareness*, in *The Cambridge Handbook of Expertise and Expert Performance*, K.A. Ericsson, et al., Editors. 2006, Cambridge University Press: New York. p. 633-651.

⁵ Prince, C. and E. Salas, *Situation assessment for routine flight and decision making*. International Journal of Cognitive Ergonomics, 1998. **1**(4): p. 315-324.

⁶ Stokes, A.F., K. Kemper, and K. Kite, *Aeronautical decision making, cue recognition, and expertise under time pressure*, in *Naturalistic Decision Making*, C.E. Zsombok and G. Klein, Editors. 1997, Erlbaum: Mahwah, NJ. p. 183-196.

⁷ Weigmann, D.A., J. Goh, and D. O'Hare, *The role of situation assessment and flight experience in pilots' decisions to continue visual flight rules into adverse weather*. Human Factors, 2002. **44**: p. 187-197.