Oral Statement of

Dr. Najmedin (Najm) Meshkati

Professor
Sonny Astani Department of Civil/Environmental Engineering
Daniel J. Epstein Department of Industrial and Systems Engineering
USC Aviation Safety and Security Program
Viterbi School of Engineering

Professor
International Relations
Dornsife College of Letters, Arts and Sciences

University of Southern California

Before the

Committee on Commerce, Science, and Transportation United States Senate

— On —

FAA Organization Designation Authorization (ODA) Expert Panel Report

Washington, DC • April 17, 2024

Good morning, Chairman Cantwell, Ranking Member Cruz, and distinguished Members of the Committee. Thank you for inviting us – the FAA Expert Panel members- to testify before you today.

I am Najm Meshkati, a professor of engineering and international relations at the University of Southern California (USC). I am also a senior faculty member of the 72-year-old USC Aviation Safety and Security Program, and an Associate (ex-Research Fellow) with the Project on Managing the Atom at the Belfer Center for Science and International Affairs at the Harvard Kennedy School.

For the past four decades, I have been conducting interdisciplinary research on system safety, human factors, safety culture, and risk reduction of complex, safety-critical technological systems. These systems include aviation, oil and gas drilling, pipeline and refining, nuclear power, and healthcare. System failures in these industries can have a deadly impact on humans and the environment.

At USC, I have had the privilege of developing and teaching several undergraduate, doctoral, and executive training courses on human factors in aviation and process safety management, mental workload measurement, root-cause analysis, High Reliability Organization (HRO), nuclear safety culture, and engineering diplomacy.

I have been an eyewitness to the unfolding of several disasters' consequences. I worked with the U.S. Chemical Safety and Hazard Investigation Board as an expert on human factors and safety culture in the investigation of the BP Refinery explosion in Texas City in 2005, which killed 15 and injured 180 people. I was a member of two committees, which were convened by the National Academies (NASEM) and the National Research Council, and investigated two major accidents, the BP Deepwater Horizon, and the Fukushima nuclear plant disasters. I have visited and studied many complex systems, including more than a dozen nuclear plants around the world, including Three Mile Island, Chernobyl, Fukushima Daiichi and Daini.

My participation in the FAA Expert Panel and working with my great colleagues on this Panel have further corroborated what my research experience has taught me: That safety culture is the foundation of any process and operation in an organization; it could make or break the system. And as my mentor, Prof James Reason, succinctly put it, "safety culture…can affect all elements in a system for good or ill."

I believe safety culture is analogous to the human body's immune system, which protects it against pathogens and fends off diseases. And it is incumbent upon the leadership to strive for immunizing, and constantly boosting! the healthy safety culture of the company. A healthy safety culture is based on competence, trust,

transparency, and accountability. A primary evidence of a healthy safety culture is that equal or at least proportional attention paid to safety versus production/profitability goals.

Another equally important lesson that I have learned and participation in the Panel reinforced that is human operators of safety-critical systems, such as pilots in an airplane, always constitute the system's both first and last layer of defense against a catastrophic failure. As such, as our Panel found and recommended, human factors and human-systems integration considerations should receive attention commensurate to their importance in aviation safety in aircraft design and operation. Human factors, as a cross-cutting science, should become a formal, stand-alone, and highly prioritized technical discipline and "design practice" at Boeing and within companies such as Boeing.

Our 24-member strong panel and support staff, under the exemplary leadership of Mr. Michael Bartron and Keith Morgan, worked diligently for almost a year on this unprecedented report, which includes 27 findings and 53 associated recommendations to Boeing and the FAA. These recommendations are vital, and we hope that all of them are implemented in their entirety.

And finally, my research experience has taught me that a world-class engineering company that makes or operates a safety-critical system such as an aircraft must be run by world-class engineers who are also thoroughly trained to understand, respect and implement human factors and a healthy safety culture.

Our written testimony further elaborates on our points, which we have submitted for the record, and I'll be delighted to answer questions about those issues, as well as the issue at hand.

Thank you once again for your attention to our Panel's report and inviting us to appear before you today.