Transport Airplane Risk Assessment Methodology

Committee

George T. Ligler

Chair

GEORGE T. LIGLER (NAE) is the proprietor of GTL Associates and the Dean’s Eminent Professor of the Practice at the University of North Carolina Chapel Hill and North Carolina State Joint Department of Biomedical Engineering. GTL Associates provides systems integration/engineering and product management services related to telecommunications, computer systems and hardware/software engineering, and information management to domestic and foreign clients. Ligler has extensive experience in information management and software and computer system engineering. Ligler received a Ph.D. in mathematics and computation from Oxford University, with his studies supported by a Rhodes scholarship. From 2015-2019, Ligler had a consulting assignment with the FAA’s Aircraft Certification Service (ACS).

Eric Allison

Member

ERIC ALLISON is the head of product at Joby Aviation. He most recently led the Elevate team at Uber, developing software tools that built on more than a decade of experience enabling on-demand mobility. His experience in aerospace research, electric propulsion, energy storage, vehicle autonomy, and composite structures led him to the CEO position at Zee Aero, where he spearheaded the development of Cora, an autonomous air taxi vehicle. Eric holds a PhD in Aeronautics and Astronautics from Stanford, an MS in Aeronautics and Astronautics from Stanford, and a BS from the Milwaukee School of Engineering.

John-Paul B. Clarke

Member

JOHN-PAUL B. CLARKE is a professor and Ernest Cockrell, Jr. Memorial Chair at the University of Texas at Austin (UT Austin). Prior to joining the faculty at UT Austin, Clarke was a faculty member at the Georgia Institute of Technology, the vice president of Strategic Technologies at United Technologies Corporation (now Raytheon), a faculty member at the Massachusetts Institute of Technology (MIT), and a researcher at Boeing and NASA JPL. Clarke has also co-founded multiple companies, most recently Universal Hydrogen, a company dedicated to the development of a comprehensive carbon-free solution for aviation. Clarke is a leading expert in aircraft trajectory prediction and optimization, especially as it pertains to the development of flight procedures that reduce the environmental impact of aviation, and in the development and use of stochastic models and optimization algorithms to improve the efficiency and robustness of aircraft, airline, airport, and air traffic operations. Clarke is particularly interested in leveraging his expertise to enable increasingly autonomous aircraft-enabled mobility, especially in urban and regional settings. Clarke received an Sc.D. in aeronautics and astronautics from the Massachusetts Institute of Technology.

Leticia Cuellar-Hengartner

Member

LETICIA CUELLAR-HENGARTNER is a data scientist at Los Alamos National Laboratory (LANL) in the Information Systems and Modeling group. Cuellar-Hengartner has worked in various groups at LANL, including Discrete Simulations Sciences, Information Sciences, Risk Analysis, and Decision Support Systems, and Intelligence and System Analysis. Cuellar-Hengartner has expertise in statistics, stochastic modeling, machine learning, and model validation. Cuellar-Hengartner’s work at LANL includes modeling transportation networks, modeling illegal trafficking of nuclear materials, modeling critical infrastructure, predicting disaster response, modeling telecommunication systems and networks, and methods development enabling soft cosmic ray tomography. These projects use stochastic modeling, agent-based simulations, modeling of human activity and behavior, graph theory and network analysis, and Bayesian networks. Cuellar-Hengartner is the principal investigator for an Ernst & Young founded project that focuses on developing forecasting models for audit quality and analysis of social networks, and the co-principal investigator on the Probabilistic Effectiveness Methodology project that performs probabilistic risk assessments of nuclear smuggling. Cuellar-Hengartner is the recipient of the LANL 2012 Distinguished Performance Award and the 2011 Los Alamos Award Program. Cuellar-Hengartner earned a Ph.D. in applied probability and stochastic processes from the University of California, Berkeley.

Karen Feigh

Member

KAREN FEIGH is a professor and associate chair for research at the Daniel Guggenheim School of Aerospace Engineering at the Georgia Institute of Technology. Feigh’s expertise is in cognitive engineering, and the aeronautical engineering multidisciplinary research areas of robotics, autonomy, and human interactions. Feigh has experience in fast-time air traffic simulation, conducting ethnographic studies of airlines and fractional ownership operation control centers, designing expert systems for air traffic control towers and NextGen concepts, and conducting human-in-the-loop experiments for concept validation. Feigh is a member of the AIAA, HFES, and VFS; received the Wilbur and Orville Wright Graduate Award; and was an Amelia Earhart Fellow, a National Science Foundation Graduate Research Fellow, and a Marshall Scholar. Feigh received a Ph.D. in industrial and systems engineering from the Georgia Institute of Technology.

Jeff Guzzetti

Member

JEFF GUZZETTI is the president of Guzzetti Aviation Risk Discovery, LLC (GuARD) which provides services to improve aviation safety through education, investigation, auditing, and consultation. With over 35 years of aviation safety experience, he possesses a wealth of knowledge regarding aircraft accident investigation. Guzzetti retired in February 2019 as the Director of the Accident Investigation Division at the Federal Aviation Administration (FAA) after five years in that position. While at FAA, he was involved in the development and assessment of corrective actions resulting from accident investigation findings. Prior to his work at FAA, Guzzetti served as the Assistant Inspector General for Aviation Audits at the U.S. Department of Transportation's Office of the Inspector General for four years and led audits of FAA aviation safety programs. His prior experience also includes 18 years with the National Transportation Safety Board (NTSB) where he served as an air safety field investigator, systems engineering specialist, major accident investigator-in-charge, and finally as the Deputy Director of Regional Operations. Before NTSB, Guzzetti was an air safety investigator with the Cessna Aircraft Company and also a systems safety engineer with the U.S. Naval Air Systems Command. He is a commercial-rated pilot with multi-engine instrument ratings in airplanes, seaplanes, and gliders. Guzzetti earned a B.S. in aeronautical engineering from Embry-Riddle Aeronautical University.

Ronald J. Hinderberger

Member

RONALD J. HINDERBERGER is an independent consultant and is retired as vice president of the Boeing Company after a 38-year career. Four years before retirement, Hinderberger was the vice president of engineering for the 787-program leading the engineering team through the initial deliveries of that airplane type. Prior to that assignment, Hinderberger was vice president of Boeing's Regulatory Administration organization and the FAA lead administrator of Boeing's Organization Designation Authorization (ODA). In this capacity, Hinderberger was responsible for overseeing all of Boeing's delegation activities and closely coordinating with FAA leadership. Hinderberger also held various engineering executive leadership positions at Boeing within the 787-propulsion systems team, and Aviation Safety organization, including Boeing's accident investigation team. Hinderberger was Boeing's representative to the FAA Commercial Aviation Safety Team (CAST) which brought forward specific recommendations to enhance the safety of all commercial airplane operations. Hinderberger has received special recognition from Jane Garvey, FAA Administrator, for leadership of the FAA's Aviation Rulemaking Advisory Committee Fuel Tank Safety Harmonization activity. Hinderberger has a B.S. in aeronautics from the Saint Louis University.

Zahra Mohaghegh

Member

ZAHRA MOHAGHEGH is an associate professor in the Department of Nuclear, Plasma, and Radiological Engineering in the Grainger College of Engineering at the University of Illinois Urbana-Champaign (UIUC). Mohaghegh established the Socio-Technical Risk Analysis (SoTeRiA) Research Laboratory at UIUC to advance risk science and applications for the safety of complex technological systems. She has conducted research on probabilistic risk assessment, probabilistic physics of failure analysis, human-system reliability modeling, risk-informed decision making, and uncertainty analysis, benefiting from grants awarded by the U.S. Department of Energy, National Science Foundation, Nuclear Regulatory Commission, Federal Aviation Administration, nuclear power industry, and the International Atomic Energy Agency. Mohaghegh received the Zonta International Award for conducting aviation safety research; the George Apostolakis Award in risk assessment; and the American Nuclear Society Mary Jane Oestmann Professional Women's Achievement Award for her pioneering in the introduction of human and organizational factors into the risk analysis of socio-technical systems in nuclear and other high-risk industries. Mohaghegh has a Ph.D. in Reliability Engineering from the University of Maryland, College Park.

Paul Morell

Member

PAUL MORELL is an independent consultant and retired vice president of safety, security, regulatory compliance, and environmental at American Airlines. Morell's areas of expertise are aviation safety, managing aviation risk, implementing and evaluating the effectiveness of FAA Safety Management Systems to identify and mitigate risks. Morell was the industry co-chair of the FAA Commercial Aviation Safety Team (CAST) and industry co-chair of the FAA Aviation Safety Analysis and Information Sharing program (ASIAS), programs that utilize an integrated, data-driven proactive strategy to reduce the commercial aviation fatality risk in the United States. Morell holds an M.B.A. from National University.

Jan C. Schilling

Member

JAN C. SCHILLING (NAE) is a retired chief engineer for advanced products at General Electric Aviation (GE Aviation). Schilling's interests include the utilization of advanced components and materials into existing, new, and future aviation propulsion systems. Schilling's career at GE Aviation included leading the team that designed, developed, and certified the GE90-115B engine for Boeing's 777-300ER/200LR aircraft. Schilling served as GE Aviation's chief engineer and general manager with responsibility for product integrity, flight safety, and compliance with regulations for all fielded and development engines. Schilling has an M.S. in aerospace engineering from the University of Cincinnati.

Robert E. Voros

Member

ROBERT VOROS is the System Safety Lead at Merlin Labs LLC. Previously, he was the manager of the Engineering Processes Team at Textron Aviation, Inc. (Cessna and Beechcraft) which is responsible for integrating and improving engineering processes involving the Textron Aviation Organization Designation Authorization, development assurance (based on SAE ARP4754A), and system safety (based on SAE ARP4761). Robert is a key interface on these topics to industry organizations and Certification Authorities. Since 2017, he has served as the chairperson for the SAE International S-18 Aircraft and System Development and Safety Assessment Committee, for which Robert was inducted into the 2019 SAE Top Contributor Class. Mr. Voros has a B.S. in mechanical engineering from Rose-Hulman Institute of Technology, Terre Haute, Indiana.

Amir Yacoby

Member

AMIR YACOBY (NAS) is a professor of physics and applied physics at Harvard. Following a bachelor's degree in aeronautical engineering and a master's degree in theoretical physics Professor Yacoby turned to experimental condensed matter physicist. His PhD work focused on understanding coherence in quantum dots and was the first experimental demonstration that electrons preserve coherence while traversing a quantum dots. During his postdoc at Bell lab Prof. Yacoby developed new techniques to explore electrical conduction in quantum wires and was the first to observe spin-charge separation, a hallmark of one dimensional transport.

As a faculty at the Weizmann Institute of Science Professor Yacoby developed a new technique for imaging electrical charge. This technique provided the first thermodynamic measurement of fractional charge and was later applied to detect the e/4 fractional charge of the 5/2 fractional quantum Hall state. Professor Yacoby joined the Harvard faculty in 2006. His current interests are in understanding the behavior of low-dimensional systems and their applications to quantum information technology. Yacoby's research topics include quantum computing; quantum metrology; high precision sensing and imaging; and quantum Materials. Yacoby is also a private pilot with instrument rating and with over 500 hours of flying time.

Arul Mozhi

Staff Officer

Arul Mozhi is study director, Aeronautics and Space Engineering Board, at the National Academies of Sciences, Engineering, and Medicine. Since 1999, Dr. Mozhi has been directing projects in the areas of defense and broader science and technology carried out by numerous committees of Laboratory Assessments Board, Army Research Laboratory Technical Assessment Board, Naval Studies Board, Air Force Studies Board, and the National Materials and Manufacturing Board. Prior to joining the National Academies, Dr. Mozhi held technical and management positions in systems engineering and applied materials research and development (R&D) at several small- and mid-size high tech R&D and consulting companies in the Washington, DC, and Boston areas—UTRON, Roy F. Weston, and Marko Materials. He received his M.S. and Ph.D. degrees (the latter in 1986) in materials engineering from The Ohio State University and then served as a postdoctoral research associate there for two years. He received his B.Tech. in metallurgical engineering from the Indian Institute of Technology, Kanpur, in 1982.