



National Transportation Safety Board



**April 29-30, 2008
Washington, DC**

INTRODUCTION TO THE UAS SAFETY FORUM

In 2006, the National Transportation Safety Board conducted its first investigation of an unmanned aircraft accident. NTSB investigators, in concert with the operator, manufacturer, and the Federal Aviation Administration, examined all aspects of the unmanned aircraft system to identify safety deficiencies and to determine the probable cause of the accident.

Over the course of this investigation, and culminating with the October 2007 Board Meeting on the accident, Board Members and staff recognized the interest of a variety of government and civil organizations to begin flying unmanned aircraft in the National Airspace System. Some of these organizations, including the Department of Defense, Federal and state agencies, local law enforcement, universities, and unmanned aircraft system manufacturers are already operating unmanned aircraft in the National Airspace System with the approval of the FAA.

As a result of the findings from its investigation, the NTSB issued 22 safety recommendations covering aspects of unmanned aircraft system design, operation, and safety management (the report is available at www.nts.gov). During the process of developing investigative findings and recommendations, significant questions were raised about how these unmanned aircraft systems will fit into the aviation system and what kinds of safety challenges such integration will present.

As a result, the Board decided to conduct a public forum to allow Board Members, staff, and other interested parties to learn more about unmanned aircraft system equipment and operations, as well as to consider the safety implications of integrating these systems into the National Airspace System. This forum will also provide an opportunity for various members of the unmanned aircraft system community to discuss and share safety lessons learned as well as allow the NTSB to expand its knowledge base on matters related to unmanned aircraft system accident and incident investigation.

To achieve these objectives, the NTSB has invited representatives from the military, industry, the FAA, and other government agencies involved in unmanned aircraft system operations to present and discuss their experience with these systems. A focal point of the forum will be how safety management programs will evolve with the continuing development of unmanned aircraft systems to ensure the safety of the National Airspace System.

The agenda for this two-day forum, presented on the following pages, includes an opportunity for the public to participate in the discussion.

THE SAFETY BOARD'S MISSION

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in the other modes of transportation -- railroad, highway, marine and pipeline -- and issuing safety recommendations aimed at preventing future accidents.

The NTSB is responsible for maintaining the government's database of civil aviation accidents and also conducts special studies of transportation safety issues of national significance. This forum is just one example of the Board exercising its authority to study emerging issues that could have significant impact on transportation safety and to evaluate the ability of transportation safety agencies to deal with these emerging technologies. Archives of recent forums and publications of safety studies and reports are available at www.nts.gov.

The NTSB opened its doors on April 1, 1967. Although independent, it relied on the U.S. Department of Transportation (DOT) for funding and administrative support. In 1975, under the Independent Safety Board Act, all organizational ties to DOT were severed. The NTSB is not part of DOT, or affiliated with any of its modal agencies.

Since its inception in 1967, the NTSB has investigated more than 124,000 aviation accidents and over 10,000 surface transportation accidents. In so doing, it has become one of the world's premier accident investigation agencies. On call 24 hours a day, 365 days a year, NTSB investigators travel throughout the country and to every corner of the world to investigate significant accidents and develop factual records and safety recommendations.

The NTSB has issued more than 12,000 recommendations in all transportation modes to more than 2,200 recipients. Since 1990, the NTSB has highlighted some issues on a Most Wanted list of safety improvements. Although the NTSB does not regulate transportation equipment, personnel or operations, and the NTSB does not initiate enforcement action, its reputation for impartiality and thoroughness has enabled the NTSB to achieve such success in shaping transportation safety improvements that more than 82 percent of its recommendations have been adopted by those in a position to effect change. Many safety features currently incorporated into airplanes, automobiles, trains, pipelines and marine vessels had their genesis in NTSB recommendations.

KATHRYN O'LEARY HIGGINS

MEMBER



Kathryn O'Leary Higgins was sworn in as the 36th Member of the National Transportation Safety Board on January 3, 2006.

Ms. Higgins brings 36 years of experience in the public and private sectors to her new appointment. She was most recently employed as President and CEO of TATC Consulting and was Vice President for Public Policy at the National Trust for Historic Preservation from May 1999 to January 2004.

Member Higgins served as Deputy Secretary of the U.S. Department of Labor (July 1997-May 1999), Acting Chair of the National Endowment for the Arts, and Vice Chair of the Presidential Commission on U.S. Coast Guard Roles and Missions.

Ms. Higgins served in the White House (February 1995 – July 1997) as Assistant to the President and Secretary to the Cabinet. In that capacity she worked closely with the NTSB, DOT, FAA, and Coast Guard on a number of matters, including the 1996 ValuJet 597 and TWA 800 accidents, formulation and implementation of hazardous materials regulations, increasing inspector staffing, FAA reauthorization, and creation of the NTSB Office of Family Assistance. She was awarded distinguished service medals by the FAA and Coast Guard for her work.

Ms. Higgins served as Chief of Staff to the Secretary of Labor (January 1993-February 1995), Chief of Staff to Congressman Sander Levin (January 1986 – January 1993), and Senior Legislative Associate and Minority Staff Director with the U.S. Senate Labor and Human Resources Committee (January 1981 –January 1986).

Member Higgins was with the White House Domestic Policy Council, serving as Assistant Director for Employment Policy (May 1978 –January 1981). She began her career in 1969 as a Manpower Specialist with the Employment and Training Administration, U.S. Department of Labor.

Ms. Higgins came to Washington from Yankton, South Dakota and earned a Bachelor of Science degree from the University of Nebraska. She was married to the late William J. Higgins and is the mother of two sons, Liam and Kevan.

DEBORAH A. P. HERSMAN

MEMBER



Deborah A. P. Hersman was sworn in as the 35th Member of the National Transportation Safety Board on June 21, 2004.

Member Hersman has chaired a number of public events hosted by the Board. In September 2006, she chaired a two-day public forum on motorcycle safety. In July, 2006, she chaired a two-day public hearing investigating the February, 2006 fire on board UPS Airlines flight 1307. She also chaired a three-day public hearing in June, 2005, on the Jefferson City crash.

Since her appointment to the Board, Member Hersman has been the member on scene at 10 major transportation accidents:

- November, 2007 - allision of a container ship with the San Francisco Bay Bridge resulting in the release of 58,000 gallons of fuel;
- August, 2007 - crash of a chartered floatplane in Ketchikan, Alaska;
- November, 2006 - school bus crash in Huntsville, Alabama
- October, 2006 - crash of a private aircraft into an apartment building in New York City;
- August, 2006 - crash of a commercial aircraft in Lexington, Kentucky;
- July, 2005 - head-on collision of two freight trains at Anding, Mississippi;
- April, 2005 - collision of a school bus with a trash truck in Arlington, Virginia;
- February, 2005 - crash of a charter aircraft into an airport warehouse at Teterboro, NJ;
- January, 2005 - freight train collision and hazardous material release in Graniteville, SC;
- November, 2004 collision of two Washington Metro trains at the Woodley Park Station in Washington, D.C;
- October, 2004 - participated in the on-scene investigation of the crash of an aircraft in Jefferson City, Missouri

Member Hersman holds a commercial drivers license with passenger, school bus, and air brake endorsements. She successfully completed a motorcycle basic rider course and holds a motorcycle endorsement. She also is a certified Child Passenger Safety Technician.

Before joining the NTSB, Member Hersman was a Senior Professional Staff Member of the U.S. Senate Committee on Commerce, Science and Transportation from 1999 to 2004 where she was responsible for the legislative agenda and policy initiatives affecting surface transportation issues, including economic and safety regulation of railroads, trucks, buses, pipelines, and hazardous materials transportation. Prior to that appointment, she served as Staff Director and Senior Legislative Aide to Congressman Bob Wise of West Virginia from 1992 to 1999.

Member Hersman earned Bachelor of Arts degrees in Political Science and International Studies from Virginia Tech in Blacksburg, Virginia, in 1992, and a Master of Science degree in Conflict Analysis and Resolution from George Mason University in Fairfax, Virginia, in 1999. She is married and is the mother of three sons.

STEVEN R. CHEALANDER

MEMBER



Steven R. Chealander was sworn in as the 38th Member of the National Transportation Safety Board of the National Transportation Safety Board on January 3, 2007.

Mr. Chealander brings a wealth of both civilian and military aviation experience to the NTSB. Prior to joining the Board, he was with American Airlines, serving since 1991 as a pilot and Captain qualified on the DC-10, B-737, MD-80, and F-100 aircraft, and as a Chief Pilot in Los Angeles. At American, he also was a flight safety manager, performing safety and compliance audits and participating in investigations, and was most recently the Manager of Flight Operations Efficiency.

From 1964 to 1991, Mr. Chealander served in the U.S. Air Force, with tours of duty in Vietnam and Spain. An F-4 pilot and instructor pilot, and then a USAF Aggressor Pilot, Mr. Chealander was selected in 1981 to be a member of the USAF Air Demonstration Squadron, the Thunderbirds. He flew with the team until 1985, when he was assigned as a staff officer at Tactical Air Command Headquarters at Langley AFB, VA.

In 1986, Mr. Chealander was selected as Military Aide to President Ronald Reagan. In this capacity, he performed a variety of ceremonial and emergency preparedness duties, including custody of the President's emergency briefcase, "the football."

Subsequently, Mr. Chealander commanded an F-5 tactical fighter squadron at Williams AFB, AZ (1988-89), an F-16 squadron at Luke AFB, AZ (1989-91), and then was appointed Assistant Deputy Commander for Operations for the F-16 tactical fighter wing at Luke AFB. He retired from the Air Force in 1991 with the rank of Lt. Colonel.

Mr. Chealander received a B.S. degree in Business Administration from the University of Southern California and did graduate studies at the University of Utah. He is married and the father of two daughters.

FORUM AGENDA

Tuesday, April 29 (8:00 A.M. – 5:00 P.M.)

OPENING STATEMENT (8:00 A.M.)

- NTSB Board Member Kitty Higgins

CURRENT AND FUTURE UNMANNED AIRCRAFT SYSTEMS APPLICATIONS (8:10 A.M.)

- Andrew Hahn, NASA Langley Research Center

OVERVIEW: PURPOSE AND FOCUS OF SAFETY FORUM (8:25 A.M.)

- Dana Schulze, NTSB

REGULATORY ISSUES (8:35 A.M.)

Moderator: Dan Bartlett, NTSB

PANEL DISCUSSION

- Current National Airspace System (NAS) requirements
- Roadmap and rulemaking for large and small UAS applications
- Public verses civil use

PRESENTER: Doug Davis, FAA Unmanned Aircraft Program Office

QUESTION & ANSWER SESSION

MORNING BREAK (10:20 A.M.)

INTEGRATION OF UAS INTO THE NATIONAL AIRSPACE SYSTEM (10:35 A.M.)

Moderator: Dan Bartlett, NTSB

PANEL DISCUSSION

- Air Traffic Control (ATC) procedures and training for manned and unmanned aircraft, data links and lost link emergency procedures
- Concurrent use of manned and unmanned aircraft in proximate airspace

PRESENTERS

Ardy Williams, FAA Unmanned Aircraft Program Office

Lt. Col. Charles Kowitz, U.S. Air Force Safety Center

Darren Gaines, National Air Traffic Controllers Association

Lt. Col. Dallas Brooks, Department of Defense/Policy Board on Federal Aviation

Capt. Ellis Chernoff, Air Line Pilots Association

QUESTION & ANSWER SESSION

LUNCH BREAK (12:20 P.M.)

CURRENT CERTIFICATE OF AUTHORIZATION OPERATIONS AND LESSONS LEARNED (1:20 P.M.)

Moderator: Dana Schulze, NTSB

PANEL DISCUSSION

- Safety requirements
- Public use operations: safety policy and oversight
- Accidents, incidents, and resulting lessons learned

PRESENTERS

Brent Cobleigh, NASA

Randy Stewart, Department of Energy

Maj. Gen. Michael Kostelnik (Ret.), U.S. Customs and Border Protection

Janet Dobbs, Interagency Committee for Aviation Policy

Capt. Thomas Runyan, Houston Police Department

QUESTION & ANSWER SESSION

AFTERNOON BREAK (3:05 P.M.)

PERSPECTIVES OF OTHER NATIONAL AIRSPACE SYSTEM USERS (3:20 P.M.)

Moderator: Dan Bartlett, NTSB

PANEL DISCUSSION

- Impact of UAS on manned aircraft operations
- Safety concerns
- Mitigation strategies

PRESENTERS

Mont Smith, Air Transport Association

Capt. Ellis Chernoff, Air Line Pilots Association

Melissa Rutinger, Aircraft Owners and Pilots Association

QUESTION & ANSWER SESSION

Wednesday, April 30 (8:00 A.M. – 4:30 P.M.)

**UAS EQUIPMENT DESIGN STANDARDS, AIRWORTHINESS, AND MAINTENANCE
(8:00 A.M.)**

Moderator: Steve Magladry, NTSB

PANEL DISCUSSION

- Design requirements and standards
- Determining design airworthiness
- Manufacturing quality
- Maintenance programs

PRESENTERS

Thomas Bachman, AAI Corporation
James Martin, The Boeing Company
Frank Grimsley, U.S. Air Force
Alfredo Ramirez, Northrop Grumman
Sam Richardson, General Atomics Aeronautical Systems
Bernard Acker, U.S. Army
Peter Heasley, U.S. Navy

QUESTION & ANSWER SESSION

LUNCH BREAK (11:30 A.M.)

HUMAN FACTORS (12:30 P.M.)

Moderator: Dr. Evan Byrne, NTSB

PANEL DISCUSSION

- Pilot selection, certification, and training
- Human – machine interface
- Teamwork/communication and coordination

PRESENTERS

Mark Pestana, NASA Flight Research Center
Dr. Nancy Cooke, Arizona State University
Dr. Kevin Williams, FAA Civil Aerospace Medical Institute
Dr. Glen MacPherson, U.S. Air Force

QUESTION & ANSWER SESSION

AFTERNOON BREAK (2:15 P.M.)

CASE STUDY: NASA'S IKHANA FIRE MISSION (2:30 P.M.)

Moderator: Dan Bartlett, NTSB

PANEL DISCUSSION

- Safety planning and preparation
- Lessons learned

PRESENTERS

Brent Cobleigh, NASA

Julie Stewart, U.S. Forest Service

John Mann, FAA Air Traffic Control

Ardy Williams, FAA Air Traffic Western Service Area

QUESTION & ANSWER SESSION

CLOSING REMARKS (4:15 P.M.)

- NTSB Board Member Kitty Higgins

PRESENTER BIOGRAPHIES

Bernard Acker is the Unmanned Aircraft Systems (UAS) Division Chief for the US Army Aviation Engineering Directorate. He is a member of the Joint UAS Airworthiness Committee, the Joint Unmanned Aircraft Systems (UAS) Integrated Product Team (IPT) and Radio Technical Commission Aeronautics (RTCA) Subcommittee 203. He earned his Mechanical Engineering Degree from Texas Tech University in 1984. Mr. Acker has 24 years of Army Aviation Experience including Chief of the Equipment Engineering Division, Corpus Christi Army Depot, and as Product Director at The Threat Simulation Management Office. He also served as Systems Engineer in the Aircrew Integrated Systems Program Office of the Program Executive Office (PEO) Aviation, Redstone Arsenal, and now serves in his current role as Division Chief in the Aviation Engineering Directorate, Huntsville, AL.

Mr. Acker is responsible for defining airworthiness qualification requirements and processes for Army Unmanned Aircraft Systems. His Division prepares all airworthiness releases for Army unmanned aircraft. He initiated the Joint Airworthiness Integrated Product Team to promote commonality of requirements and processes between services.

Thomas Bachman is Director of the One System Common Systems Integration team within the Unmanned Aircraft Systems Division for AAI Corporation Hunt Valley, Maryland. Mr. Bachman is responsible for the design and development of current and future Ground Control Equipment products for the Unmanned Aircraft Systems division. This includes ground control stations for Shadow, Pioneer, Sky Warrior and the Aerosonde unmanned aircraft. Mr. Bachman rejoined AAI Corporation in 2004 with over 27 years of defense and commercial industry experience. His industry experience includes Development Engineering, Program Management and Business Development of product technologies related to Flight and Electronic Warfare Simulation, Ground Control Equipment for Unmanned Aircraft and Target Drones, Software Development, Microwave Power Amplifiers for commercial telecommunications and defense, and Unmanned Vehicle Technology for domestic and international markets.

After joining AAI in 1977, Mr. Bachman developed flight and Electronic Warfare simulators for the B-52, EF-111, Sentinel Bright, and numerous other systems during his 13 year tenure at AAI. Following the deployment of the Pioneer system, Mr. Bachman became the Project Engineer for the Mission Planning and Control System, the first “glass” cockpit Ground Control System for controlling multiple types of unmanned aircraft simultaneously. Leaving AAI in 1989, he joined Rational Software in a Senior Management Consultant role, working with such companies as IBM and AT&T in implementing Object Oriented Design and integrating this technology into the management process.

In 1992, Mr. Bachman joined Vega Precision Laboratories and was the Director of Engineering in the development of a “glass” Unmanned Target Control Station. Following the sale of Vega in 1994, he started a management consulting firm, helping companies manage the transition to Object Oriented Analysis and Design. In 1997, Mr. Bachman joined Chesapeake Microwave as Executive VP and VP of Engineering. Chesapeake was the leading developer of Gallium Arsenide RF Power Amplifiers for both commercial and defense markets. In 1999, Chesapeake was sold to Andrew Corporation where Mr. Bachman operated as Business Unit Manager of the RF Power Amplifier division and later as Senior Sales Executive for RF Power amplifiers working with major base station manufacturers such as Siemens, Lucent, Nokia and Nortel. In

2004, he returned to AAI as the Director of Advanced Technology for the Unmanned Aircraft Systems division. In this role Mr. Bachman was charged with development and acquisition of advanced technologies as they apply to Unmanned Systems, including Sense and Avoid, payloads and payload processing, and Ground Control Systems. He also represented AAI in numerous meetings and committees dealing with Unmanned Aircraft Flight in the National Airspace, including working with the FAA and on RTCA SC-203. In 2006, Mr. Bachman assumed his current role as the Director of the One System Common System Integration. In this role he is responsible for the future roadmap and development of Unmanned Vehicle control technologies for AAI.

Lt. Col. Dallas Brooks is the Chief, Unmanned Systems Integration Policy, Department of Defense Policy Board on Federal Aviation, Washington DC. Lt Col Brooks is the principal author of the DoD/FAA Memorandum of Agreement on Unmanned Aircraft Systems Operation in the National Airspace System. This landmark agreement brokered increased DoD UAS access to the NAS and ensured DoD/FAA partnering on a host of UAS integration issues. More recently, he has also authored the Air Force UAS NAS Integration Action Plan, which defines the way ahead for Air Force UAS flight standards, medical qualifications, safety reporting, and procedural standardization. In his current capacity, he also serves as Department of Defense Liaison to the Federal Aviation Administration on UAS integration policy issues.

Prior to his current assignment, Lt Col Brooks worked a wide variety of communications assignments, including Joint Special Operations Command (Fort Bragg, NC), the Air Force Command, Control, Intelligence, Surveillance and Reconnaissance Center (Langley AFB VA), the US Air Force Academy (Colorado Springs, CO), the 51st Communications Squadron (Osan Air Base, Republic of Korea), and the USAF Battlestaff Training School (Hurlburt Field, FL).

A former Air Force air traffic controller and current Master Communications Officer, Lt Col Brooks holds Master's degrees in both Telecommunications and Aeronautical Science.

Capt. Ellis Chernoff is a member of the Air Line Pilot's Association, International's (ALPA) National Airspace Modernization Team. He has been a key member of ALPA's Unmanned Aircraft Systems (UAS) activities with RTCA and other government and industry UAS activities. He has been a member of RTCA's Special Committee 203 since its inception at the end of 2004. Capt Chernoff has taken an active role in air safety since 1975. As an ALPA pilot volunteer, he has participated on several safety issues including Class B Airspace operations, PRM/SOIA, LAHSO, and PRM.

Ellis began flying in 1970. He has been an air carrier pilot since 1977, been an instructor in light single engine planes and multiengine transports through the Boeing 747, and has been a Director of Flight Standards and Training as well as a key player in the certification of two regional air carriers. He has flown more than 16,000 flight hours in nearly 30 aircraft types.

Captain Chernoff holds a Bachelor of Science degree in Aeronautical Studies as well as an Associate in Aviation Management degree from Embry-Riddle Aeronautical University in Daytona Beach, Florida. A native of Los Angeles, he resides in Norco, California, and presently serves as a MD-11 Captain for FEDEX.

Brent Cobleigh has 18 years experience working on NASA projects covering a wide variety of atmospheric flight research and Earth science. He recently accepted a position as the Deputy Mission Director for Exploration at NASA Dryden Flight Research Center.

From 2004 until February of this year, Mr. Cobleigh was the Project Manager for the procurement, development, and operation of NASA's Ikhana aircraft (a General Atomics Predator-B) and ground control systems. Recent activities include the Western States Fire Missions that used thermal infrared sensors to map wildfires in 6 states over missions up to 20 hours in duration. Ikhana also responded to the recent California wildfire disaster, providing imagery in near real-time to the emergency operations command centers and the individual fire incident commands over a 5-day period.

Starting in 2003, he participated in a one-year detail to NASA Headquarters as part of NASA's first Leadership Development Program (LDP).

From 2000 to 2002, Mr. Cobleigh was the chief engineer on the Autonomous Formation Flight project. He led all engineering activities and served as flight director during all missions. This project successfully measured detailed performance benefits on one aircraft flying in the wing vortex of another aircraft. From 1989 to 2000, Mr. Cobleigh served in numerous technical positions supporting disciplines such as flight mechanics, flight dynamics, aerodynamics, parameter identification, simulation modeling, wind tunnel testing, and advanced airdata systems on many flight projects including the X-31, F-16XL Supersonic Laminar Flow, SR-71 Aerospike, X-33, and X-37.

Mr. Cobleigh has authored or co-authored over 20 technical papers and earned three best technical paper awards, seven group achievement awards, 9 other NASA awards, two discretionary fund awards, and a patent. He has represented NASA on the California State Polytechnic University Aerospace Industry Council for 10 years.

Mr. Cobleigh holds a bachelors degree in Aerospace Engineering from California State Polytechnic University, Pomona and a Masters degree in Aeronautical Engineering from the George Washington University.

Dr. Nancy Cooke is a professor of Applied Psychology at Arizona State University at the Polytechnic Campus and is Science Director of the Cognitive Engineering Research Institute in Mesa, Arizona. She is also Editor-in-Chief of Human Factors. Dr. Cooke received a B.A. in psychology from George Mason University in 1981 and received her M.A. and Ph.D. in cognitive psychology from New Mexico State University in 1983 and 1987, respectively.

Her research interests include the study of individual and team cognition and its application to the development of cognitive and knowledge engineering methodologies, homeland security systems, remotely-operated vehicles, and emergency response systems. In particular, Dr. Cooke specializes in the development, application, and evaluation of methodologies to elicit and assess individual and team cognition.

Her most recent work includes empirical and modeling efforts to understand the acquisition and retention of team skill and the measurement of team coordination and team situation awareness especially through the analysis of communication. This work is funded primarily by the Air Force Research Laboratory, and the Office of Naval Research. Dr. Cooke has organized annual workshops on the Human Factors of Unmanned Aerial Vehicles since 2004 and has co-edited Human Factors of Remotely Operated Vehicles, published by Elsevier.

Kenneth “Doug” Davis is a career professional air traffic controller and manager with the Federal Aviation Administration. He is the manager of the Unmanned Aircraft program Office (AIR-160), Aircraft Certification Service, in the Aviation Safety Organization.

Mr. Davis began his FAA career in 1984 as an air traffic controller at the Jacksonville Air Route Traffic Control Center. He completed staff time in Traffic Management, Military Operations, and Airspace and Procedures and served as a first-line supervisor at the Atlanta Air Route Traffic Control Center before moving to FAA Headquarters, Washington DC in 1997. He worked as a specialist and then as the Requirements Team Lead for Satellite Navigation for the Air Traffic Services Requirements Organization. He then served a short stint as the manager of Enroute Procedures before going on to be the Special Assistant for Technical Operations to Mr. Steve Brown, the Associate Administrator for Air Traffic Services.

After the events of September 11, 2001, Mr. Davis was assigned to Colorado Springs as the FAA Liaison to Headquarters, NORAD. He returned to FAA Headquarters in August, 2004 as the Assistant Manager, Avionics Systems in Aircraft Certification, and was picked to be the Aircraft Certification Lead for Unmanned Aircraft. In December, 2005, he was selected as the first manager to stand-up, organize, and lead the newly created Unmanned Aircraft Program Office (UAPO), responsible for the safe integration of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS) by developing the procedures and regulations for certification, licensing, training, inspection, maintenance, and operations of UAS.

Mr. Davis has a B.A. in Business Administration.

Darren Gaines is an Air Safety Investigator for the National Air Traffic Controllers Association (NATCA) and is Chairman of the NATCA Air Safety Investigations Committee. He has also served two terms as Chairman of the International Society of Air Safety Investigators (ISASI) Air Traffic Services Working Group and as the ISASI representative to ICAO Air Traffic Management and Runway Safety awareness campaigns for the Asian Pacific and Middle-Eastern Regions. Mr. Gaines also serves as an associate instructor at the Transportation Safety Institute where he teaches a course in human factors. He was the recipient of the 2003 Meritorious Service Award from the Ohio Pilots Association. Mr. Gaines was recognized as the “2000 Rookie Controller of the Year” during the EAA AirVenture fly-in at Oshkosh, Wisconsin.

He holds a commercial pilots license with multi-engine, instrument, seaplane and instructor ratings. He has accumulated 2,000 hours flight time.

Frank M. Grimsley is the Director of Engineering, 303d Aerospace System Wing at Wright-Patterson Air Force Base, Ohio. He entered Air Force civil service in July 1979 as a scientist in the Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio, specializing in fatigue and fracture of metal matrix composites. In 1986, he transferred to the Aeronautical Systems Center, Wright-Patterson AFB, Ohio, where he served in various capacities as project engineer, Integrated Product Team Leader and Chief engineer.

Mr. Grimsley has over 28 years of experience in all aspects of aircraft technical integration, design and certification as well as airframe, systems and avionics integrity. He has had engineering responsibilities on both manned (B-2, C-17, RC-135, EC-130H, EC-130J) and unmanned (Predator, Reaper and Global Hawk) weapon systems. He also has engineering experience with KC-135, E-3, B-52, F-117, T-37, UH-60 as well as Department of Homeland Defense aircraft and others.

Mr. Gimsley holds a B.S. in Materials Science, a master's degree in Mechanical Engineering from the University of Dayton in Ohio, and a Masters in Business Management from Stanford University, Palo Alto, California.

Andrew Hahn has worked at NASA for over 25 years, all of it in Systems Analysis and aircraft design. He has worked on projects that span the full range of aeronautics from heavy lift and ultra high altitude blimps, through vertical takeoff jet fighters, Uninhabited Air Vehicles, Personal Air Vehicles, and commercial airliners, all the way to a small Mars airplane. He is currently leading a conceptual design study for a Short TakeOff and Landing Regional Jet to help identify what promising technologies should receive research priority.

Mr. Hahn has a Master's degree from Stanford and a Bachelor's degree from Embry-Riddle, both in aeronautical engineering.

Peter Heasley is the Unmanned Aircraft Systems (UAS) Deputy Division Head at the Naval Air Systems Command Airworthiness Office in Patuxent River, MD. This office is responsible for providing airworthiness certifications in the form of flight clearances to all Navy and Marine Corps aircraft, both manned and unmanned. Mr. Heasley also serves on the United States Delegation to a NATO Working Group charged with developing an airworthiness standard for fixed-wing UAS between 150 and 20,000 kg that intend to fly in non-segregated airspace. When ratified by NATO as STANAG 4671, this airworthiness code will represent the first international agreement on UAS airworthiness and is expected to UAS access to non-segregated airspace among participating nations.

Mr. Heasley has 18 years of engineering and acquisition experience at the Naval Air Systems Command. The majority of those years have been spent in the area of Test and Evaluation of Unmanned Systems. He has been the Government Flight Test Director on UAS programs such as X-45, X-47, DarkStar, and EagleEye.

Mr. Heasley received his Masters of Science in Engineering Management from Florida Institute of Technology, his Bachelors of Science in Aerospace Engineering from Penn State University, and is a graduate of United States Test Pilot School, Class 110.

Maj. Gen. Michael C. Kostelnik, (Ret.), USAF, is the Assistant Commissioner, Office of CBP Air and Marine, U.S. Customs and Border Protection. The mission of CBP Air and Marine is to protect the American people and Nation's critical infrastructure through the coordinated use of integrated air and marine forces to detect, interdict and prevent acts of terrorism and the unlawful movement of people, illegal drugs and other contraband toward or across the borders of the United States. To accomplish that mission, CBP Air and Marine utilize over 550 pilots and 270 aircraft, the largest federal law enforcement air force in the world, as well as 200 vessels.

General Kostelnik, a member of the Senior Executive Service, has worked for 35 years in the government. From 2002 to 2005, he served as the Deputy Associate Administrator for Space Station and Space Shuttle at the National Aeronautics and Space Administration (NASA). Previously, he spent 32 years on active military duty with the U.S. Air Force as a test pilot, instructor pilot, program manager and commander. He has had a prominent career in both management and aviation, accumulating over 3,300 hours of flight time in over 60 types of

aircraft. General Kostelnik has extensive management experience in requirements, development and acquisition, and testing of leading edge aerospace systems.

He graduated from Texas A&M University with a Bachelor of Science degree in mechanical engineering in 1969. The following year, he completed a Master of Science degree in industrial and management engineering from the University of Iowa.

Lt. Col. Chuck Kowitz is a 1988 graduate from the US Air Force Academy with a Bachelor of Science degree in Engineering Sciences. He also has a Master of Public Administration degree from the University of Oklahoma. He currently serves at the Air Force Safety Center (AFSC), Kirtland AFB, NM as the Chief of Unmanned Aircraft Systems Safety. He is also a mishap investigator for both manned and unmanned aircraft. Most notably he was an investigating officer for the recent F-15C in-flight breakup near St Louis, Missouri. Past duties for Lt Col Kowitz include serving as: program manager in the Reconnaissance Systems Program Office, EF-111 combat pilot and a T-38 instructor pilot. Recently he accomplished an Operational Safety Assessment for the Global Hawk flying in the National Airspace System at Beale AFB, California.

Dr. Glen MacPherson is the Chief of Human Factors Studies & Analyses at the Directorate of Human Performance Integration, Brooks City-Base, TX. Major MacPherson's current projects include studying health effects of UAV operations on Predator pilots, ground control station and heads up display redesign, pilot and sensor operator selection issues, teaching at the USAF School of Aerospace medicine, and responding to human systems integration input requests from the wider Air Force. He has held this position since June 2007. From 2005-2007, Dr. MacPherson became double board certified in Aerospace Medicine and Preventive Medicine at the US Air Force School of Aerospace Medicine. From 2002-2004 he was a flight surgeon at Vance Air Force Base in Oklahoma.

Major MacPherson earned a Bachelors degree from Dartmouth College in 1993. He earned his Medical Doctorate in 2001 from Washington University in Saint Louis and his Masters of Public Health from Johns Hopkins in 2005. He is a member of the Aerospace Medical Association and the Society of United States Air Force Flight Surgeons. Major MacPherson also holds a private pilot license and is trained as an FAA Aeromedical Examiner.

John Mann was hired by the FAA in September 1987. He worked as a Los Angeles Center controller until summer of 1999. In 1999, Mr. Mann was detailed by the FAA to assist with the integration of Center TRACON Automation System (CTAS) / Traffic Management Advisor (TMA) at Los Angeles Center and FAA system wide.

Beginning January 2003, Mr. Mann spent 18 months working with the Controller Pilot Data Link Communications (CPDLC) headquartered in D.C. and used by ATC at Miami Center. When that tool was no longer funded by the FAA, Mr. Mann returned to Los Angeles Center where he was assigned to work in the Traffic Management Unit (TMU) in July of 2004, one of my collateral duties was to work as a Mission Coordinator or (Military Operations Coordinator). It was in this capacity that Mr. Mann became familiar with and aided in the coordination of the Unmanned Aerial Systems that would impact the airspace and air traffic controllers at Los Angeles Center.

On April 13, 2008 Mr. Mann was assigned by the FAA as an area supervisor (Front Line Manager) at Los Angeles Center. Prior to his employment with the FAA Mr. Mann was an Air Traffic Controller in the USAF stationed at Nellis AFB, Las Vegas, NV.

James W. Martin is the Program Manager for the A160 Hummingbird program for Boeing Integrated Defense Systems. Martin has program management responsibility for all A160 program activities and customers. He is also the site executive for the Boeing facilities in Irvine, California and the A160 flight test facility in Victorville, California.

His most recent prior position was Director of X-45 System Test for Boeing Integrated Defense Systems. Mr. Martin was responsible for all system test activities for all variants of the X-45 including the recently completed X-45A demonstrator program managed by DARPA and the current Navy directed program. He has served as the Senior Manager for Joint Strike Fighter Test and Evaluation (T&E) where he was responsible for the development of a T&E plan to satisfy USAF and Navy requirements for the JSF System Design and Development program. He has served as Senior Manager of the F/A-18E/F Flight Test and T&E teams and has been the Engineering site lead for McDonnell-Douglas on the YF-23A program at Edwards Air Force Base.

Mr. Martin joined McDonnell Douglas as a Flight Test Engineer in 1977 following several years as Cooperative Engineering student employee at the USAF Flight Dynamics Laboratory in Dayton, Ohio.

Martin received a Bachelor of Science degree in Aeronautical and Astronautical Engineering from Purdue in 1976 and a Master of Science degree in Engineering Management from the University of Missouri-Rolla in 1986.

Mark Pestana is a NASA research pilot and project manager at the Dryden Flight Research Center, Edwards AFB, Calif. He has logged more than 5,000 hours of military and civilian flight time, in more than 15 different aircraft types, from supersonic jet aircraft to single-engine piston and turboprops. He has flown NASA Earth Science expeditions ranging from hurricane research over the Caribbean Sea to ozone studies over the North Pole, atmospheric chemistry over the South Pacific, rain forest health in Central America, Rocky Mountain ice pack assessment, and volcanic and tectonic activity around the Pacific Rim.

Mr. Pestana previously served at the NASA Johnson Space Center, Houston, as a flight crew operations engineer in the Astronaut Office, developing the controls, displays, tools, crew accommodations and procedures for on-orbit assembly, test, and checkout of the International Space Station. He led the analysis and technical negotiations for modification of the Russian Soyuz spacecraft as an emergency crew return vehicle for space station crews. Mark's current research piloting experience includes flying NASA's MQ-9 Unmanned Aircraft System.

Mr. Pestana earned a Bachelor of Science in Natural Sciences from Loyola University, Los Angeles, in 1975, and a Master of Science in Systems Management/Research and Development from the University of Southern California in 1988. In 2005, he retired from the U.S. Air Force at the rank of colonel, with over 28 years of service.

Sam Richardson joined General Atomics Aeronautical Systems, Inc. (GA-ASI) as a Program Manager in 2007. His primary responsibilities are Liaison to the FAA for Aircraft Airworthiness Certification (Experimental) and Logistics Program Manager for the Sky Warrior/ERMP program.

Prior to joining General Atomics Aeronautical Systems, Inc. (GA-ASI) Mr. Richardson served as a naval aviator for 25 years retiring at the rank of Captain. Previous Navy assignments include shore tours as an instructor at the U.S. Navy Fighter Weapons School (TOPGUN), Director of the Tomcat Strike Fighter Weapons School, staff duties on the Joint Chiefs of Staff, and Chief of Staff for United States Third Fleet. Sea tours include command of Fighter Squadron Fourteen and command of Fighter Squadron One Zero One. He has logged over 4400 hours in tactical aircraft and flown over 60 combat missions.

Mr. Richardson graduated from the University of California at Los Angeles with a B.S. in Electrical Engineering.

Alfredo Ramirez is currently the Chief Architect for the High Altitude Long Endurance Systems Enterprise at Northrop Grumman Integrated Systems in Rancho Bernardo, California, home of the Global Hawk design and development team. He began his engineering career and involvement with Unmanned Aircraft Systems at Teledyne Ryan Aeronautical in 1985, after graduating from San Diego State University with a B.S. in Aerospace Engineering. While at Ryan, Mr. Ramirez worked in the Advanced Development group developing RPV and UAV concepts, some of which proceeded to prototype development stages, such as TRA's Model 350 Medium Altitude Long Endurance UAV, and others into EMD contracts, such as the BQM-145 Medium Range UAV.

In 1994, Mr. Ramirez was selected to participate in the concept definition phase of a High Altitude Long Endurance Reconnaissance UAV, which later became the Tier 2 Plus project under DARPA, and is now known as the RQ-4 Global Hawk UAS program, where he held various positions of increasing authority and responsibility, including Air Vehicle IPT Lead, Program Chief Engineer, and now HALE Systems Chief Architect

Melissa Rudinger is Vice President of Regulatory Affairs for the Aircraft Owners and Pilots Association. Having spent the past 25 years in the aviation industry, she has a strong general aviation background as both a pilot and aviation advocate. Her focus is on United States government policies affecting pilots and aircraft certification, air traffic, airspace, and the future aviation system. She uses her experience and leads a staff of professionals to address issues at the Federal Aviation Administration, Transportation Security Administration; as well as cabinet level departments.

Ms. Rudinger started her career at AOPA in Aviation Services as an aviation specialist. In 1991, she was promoted to Government Affairs, and in 1993 was appointed Director of Air Traffic Services. In 2000 she was named a Vice President.

A graduate of Millersville University, Melissa has FAA Academy training in Airspace Design and Management, Environmental Analysis, has served as an FAA Accident Prevention Counselor, and holds a commercial pilot certificate with a lighter than air rating. She lives in Frederick, Maryland.

Thomas Runyan graduated from Texas A&M University in 1976 and joined the Houston Police Department the next year, 1977. After working several years in Patrol, he promoted to the rank of Detective, in 1982, and worked in the Burglary & Theft Division. This service was followed by promotion to the rank of Lieutenant in 1988. Following assignments in the Jail Division and with a Patrol Tactical Unit working street-level crime initiatives, including those involving prostitution and narcotics, he promoted to the rank of Captain, overseeing the transition

of the HPD Emergency Communications Division to the Houston Emergency Center. Captain Runyan assumed command of the HPD Traffic Division during September of 2006. This Division was comprised of several Units, including the HPD Helicopter Unit. With the pending purchase of several additional aircraft, this Unit has recently been designated as a Division, with Captain Runyan named as the Division Commander. Captain Runyan is the primary point of contact for the Houston-based FAA/HPD UAS test project.

Mont Smith is the Director of Safety at the Air Transport Association. He holds an Airline Transport Rating in Multi-Engine Airplanes and Rotorcraft - Helicopters with type ratings in the C-130, Falcon DA-20, the Gulfstream, and the Sikorsky SK-61. Mr. Smith flew Coast Guard helicopters, jets and heavy turboprop transports for 20 years. He is an FAA-licensed Ground Instructor. Mr. Smith has investigated several major military accidents and two NTSB-reportable civil aviation accidents.

Mr. Smith graduated from the U.S. Coast Guard Academy in 1968, attended U.S. Naval flight school at Pensacola, Florida, in 1971 and earned a Master's Degree from the University of West Florida in Aeronautical Systems.

Julie J. Stewart. A decade of wildfire assignments led Ms. Stewart to a unique promotion in 1991 as the first Interagency Airspace Program Manager in a partnership with Bureau of Land Management and the US Forest Service. Ms. Stewart has been recognized as a leading disaster airspace authority in education, training, coordination and negotiations. She is frequently called on by the Department of Defense, FAA and FEMA for her expertise.

She was the very first recipient of the US Forest Service National Aviation Safety Award and she has also received the Secretary of Interior's National Safety Award for her outstanding contribution to aviation safety. She is responsible for obtaining the National Firefighting Transponder Code for firefighting aircraft and was the primary author and team leader of the Department of Interior/US Forest Service "Interagency Airspace Coordination Guide". Currently she is involved with the FAA in Unmanned Aircraft Systems (UAS) coordination.

Ms. Stewart developed the Field Airspace Coordinator positions which she manages during fire season which facilitates airspace coordination throughout the United States responding to wildfires, hurricanes and volcanoes. She was liaison to the FAA in Washington DC during the 9/11 tragedy and was the focal point for successful negotiations with FAA to allow fire fighting aircraft to fly during the nations "ground stop." She created the Tactical Aviation Desk for ESF-1 at FEMA Headquarters and coordinated tactical airspace issues during the 2002-2005 hurricane seasons including Katrina, Rita and Wilma.

Randy Stewart is currently a Senior Aviation Policy Officer for the United States Department of Energy (DOE) who advises senior management on the safety, effectiveness, security, and efficiency of the aviation programs that support the Department's missions. Mr. Stewart has over 40 years of civil and government aviation experience, holds an Airline Transport Rating in Rotorcraft, Airframe and Powerplant Mechanic ratings with an Inspector's Authorization, and is a trained aviation safety professional. After a 21-year civil helicopter aviation career operating, maintaining, managing and owning helicopters he retired from flying.

Mr. Stewart currently uses his military and civil business, safety, and operating experience to develop policy and conduct oversight of the DOE's aviation programs. He has served on seven accident investigation boards and three incident investigations during his career. Mr. Stewart has

also participated in various government and civil industry groups that developed standards, recommendations, and guidance on manned and unmanned aircraft operations that lead to improvements in safety and effectiveness.

Bruce Tarbert is employed by the Federal Aviation Administration assigned to the FAA's Aircraft Certification Service as the National Airspace System (NAS) Integration Team Lead for the FAA's Unmanned Aircraft Program Office (UAPO). The UAPO is responsible for safe integration of Unmanned Aircraft Systems in the NAS. Mr. Tarbert provides oversight of the Certificate of Authorization review process and is responsible for policy and guidance development relating to the integration of Unmanned Aircraft into the NAS. He serves as the primary point of contact for the Air Traffic Organization as well as a liaison for customer focus activities within the Unmanned Aircraft Program Office as well as the FAA's focal point for proposed regulatory changes to enable small UAS operations.

Mr. Tarbert holds a Bachelor of Science degree in Management Science from Florida Institute of Technology. He has over 30 years of progressively responsible positions within the FAA. His past duties include various positions within the FAA Air Traffic Organization consisting of facility certifications at several air traffic control tower and radar approach control facilities. Mr. Tarbert has experience as Air Traffic Control Specialist, Traffic Management Coordinator and Supervisor.

Prior to joining the Unmanned Aircraft Program Office, Mr. Tarbert was responsible for the development and oversight of policy, guidance and criteria to ensure successful implementation of RNAV and RNP procedures including both the terminal and enroute environments. These activities leveraged on the capabilities of aircraft systems to ensure operational benefits at major airports through out the National Airspace System.

Ardyth M. Williams (Ardy) is an Air Traffic Manager, Unmanned Aircraft Systems, for the Federal Aviation Administration's Air Traffic Organization; System Operations Services. She is also an FAA Corporate Pilot, Gulfstream III/IV.

Work Experience: Air Traffic: Journeyman Controller, Quality Assurance Specialist, Area Supervisor, Indianapolis ARTCC. Deputy Air Traffic Manager, New York ARTCC, Operations Manager, Eastern Region. Specialist, Branch, Division, and Deputy Program Manager in Washington HQ. Pilot: Chief Flight Instructor Part 141 School, Commuter and Corporate Pilot.

Industry: Received a Distinguished Leadership Award for Extraordinary Education in the Aviation Profession, International award from the 99's for Aviation Education and an Air Traffic Control Association Award for Aviation Education.

Ms. Williams graduated from Purdue University in 1979 with a Bachelor of Science Degree in Aviation Technology.

Dr. Kevin Williams is a research psychologist at the Federal Aviation Administration's Civil Aerospace Medical Institute (CAMI) in Oklahoma City, OK. Prior to joining the FAA in 1992, Dr. Williams worked in the Human Factors Engineering group at General Dynamics in Fort Worth, TX and was also team leader of a MANPRINT evaluation team during the operational test of an unmanned aerial vehicle (the Hunter system). Since joining CAMI, Dr. Williams has been involved in the development of training device specifications for Personal Computer-based

Aviation Training Devices (PCATDs), GPS design issues, and research on advanced primary flight displays.

He is currently involved in research on human factors and pilot qualification and training issues of unmanned aircraft systems. He has written several technical reports and two book chapters related to unmanned aircraft systems and is involved in several standards groups including RTCA SC-203 and SAE-G10.

Biographies not available: Janet Dobbs

NTSB STAFF BIOGRAPHIES

BOARD OF INQUIRY

Dr. Vern Ellingstad came to the Safety Board in June 1990 as deputy director, Office of Research and Engineering and was promoted to director in 1995. Dr. Ellingstad supervises the NTSB Materials Laboratory, Recorders Laboratory, and Vehicle Performance Laboratory, which provide scientific and engineering support for accident investigations in all modes of transportation. He supervises the Safety Studies and Statistical Analysis Division, which conducts transportation safety studies and manages the Board's Aviation Accident Database. He is responsible for primary scientific and technical review of the Safety Board's accident reports, studies and other major products. He also represents Safety Board positions on technical issues to government and industry.

As chairman of the Psychology Department, and Director of the Human Factors Laboratory and graduate program at the University of South Dakota (1969-1990), Dr. Ellingstad directed a variety of human performance, ergonomics, and transportation-related research in the areas of drug and fatigue effects on simulated driving performance. He also conducted studies of human factors issues in human-computer interaction, psychomotor, and cognitive performance; and large scale evaluations of traffic safety programs.

Dr. Ellingstad earned a B.A. in Psychology (1965) from Wisconsin State University-Eau Claire, and an M.A. (1967) and Ph.D. (1969) in Human Factors Psychology from the University of South Dakota.

Tom Haueter is the Director of the National Transportation Safety Board's Office of Aviation Safety and has over 25 years experience in aircraft accident investigation. Mr. Haueter joined the Safety Board as an aircraft structures investigator, then became an Investigator-in-Charge (IIC) of domestic air carrier accident investigations; he also served as the U.S. Accredited Representative for some foreign aviation accidents. Subsequently, Mr. Haueter served as the Chief of the Major Investigations Division and as the Deputy Director. In these roles, he provided management oversight of major aviation investigations such as the TWA Flight 800 and American Airlines Flight 587, and was responsible for the Safety Board's support of the FBI's investigation of the September 11, 2001, terrorist attacks.

Mr. Haueter was the IIC for the investigation of September 8, 1994 accident involving USAir flight 427, which resulted in the redesign of the rudder system on Boeing 737 series. Additionally, he was an advisor to the space shuttle Columbia accident investigation Board. As the Director of the Office of Aviation Safety, he is responsible for the investigation of all domestic civilian aviation accidents and the Safety Board's response to major foreign aviation accidents.

Mr. Haueter is an alumnus of Purdue University where he received a BS in Aeronautical and Astronautical Engineering; he received an MBA in Operations Research and International Business from George Mason University. Mr. Haueter holds a commercial pilot's license with multi-engine and instrument ratings and regularly flies a 1943 Stearman airplane that he restored.

TECHNICAL PANEL

Dan Bartlett is an Air Traffic Investigator for the NTSB; he has been with the Safety Board since October 2006. Between 1999 and 2006, Mr. Bartlett was an air traffic control specialist supporting the Chief of Naval Operations, Office of Air Traffic Control and Airspace where he assisted with U.S. Navy and U.S. Marine Corps air traffic control and airspace policy and procedure development, implementation and oversight.

Prior to retiring from the U.S. Navy in 1998 after serving 24 years, Mr. Bartlett performed a myriad of air traffic control duties at numerous air traffic control facilities and aboard U.S. Naval vessels. Mr. Bartlett also served as a Naval Air-crewman aboard SH-3 helicopters as an anti-submarine warfare operator and search and rescue crewman.

Mr. Bartlett holds a Bachelor of Science degree in Professional Aeronautics from Embry Riddle Aeronautical University.

Dr. Evan Byrne is a Human Performance Investigator in the NTSB's Office of Aviation Safety; has been employed at the Safety Board since June 1996. He previously held the positions of Acting Deputy Director, Division Chief, and Aviation Psychologist. During his tenure at the Board, he served as human performance investigator in more than a dozen major investigations, including SilkAir flight 185 in Indonesia; American Airlines flight 1420 in Little Rock, AR; FedEx flight 14 in Newark, NJ; Fine Airlines flight 101 in Miami, FL; Emery Worldwide Airlines flight 017 in Sacramento, CA; Delta Air Lines flight 1288, in Pensacola, FL; Continental Airlines flight 1493 in Houston, TX; the Sunjet Aviation Learjet 35 accident in South Dakota; the Air Midwest flight 5481 accident in Charlotte, NC; Pinnacle Airlines CRJ accident in Jefferson City, MO; and the Comair CRJ accident in Lexington, KY.

Before joining the Safety Board, he was a research associate conducting NASA-sponsored research on automation at the Cognitive Science Laboratory at the Catholic University in Washington, DC. He earned his Ph.D. and M.A. at the University of Maryland – College Park in 1993 where he studied physiological measures of mental workload. He graduated with a B.S. in psychology in 1986 from the University of Wisconsin – Madison. He is an active instrument-rated private pilot and owner of a Cessna 172.

Steve Magladry joined the Safety Board in May 2000, working in the Office of Aviation Safety, Aviation Engineering Division, Systems Group. He has performed the responsibilities of Systems Group Chairman or assisted international investigations for the following accidents and incidents: the October 2000 Singapore Airlines 747-400 accident in Taipei, Taiwan; the March 29, 2001 Avjet, Gulfstream III accident in Aspen, Colorado; the November 2001 American Airlines Airbus A300 accident in Belle Harbor, New York; the August 2003 Colgan Air Beech 1900D accident in Yarmouth, Massachusetts; the November 2004 Business Jet Services Gulfstream III accident in Houston, Texas; the May 2005 NWA DC-9/A319 accident in Minneapolis, Minnesota; the August 2005 Malaysia Airlines 777 pitch upset incident in Perth, Australia; the December 2005 Chalks Ocean Airways Grumman Mallard accident in Miami, Florida; the April 2006 DHS Customs and Border Protection Predator B accident near Nogales, Arizona; the June 2007 American Eagle, EMB135 accident in Boston, Massachusetts; and the January 2008 British Airways 777 accident in London, UK.

Mr. Magladry has helped advance investigative techniques in the areas of computer modeling of airplane systems and components, and non-destructive testing using computer aided tomography and 3D rendering techniques.

Prior to coming to the Safety Board, he earned a BS degree in Electrical Engineering from the University of Washington in 1985; he worked for The Boeing Company in Seattle for 13 years. At Boeing, he started his career by writing maintenance and troubleshooting documents for analog and digital auto flight systems, as well as numerous other avionics systems. He transitioned to mechanical systems, and finished his career at Boeing in Service Engineering, providing technical assistance to airline operators in the areas of 747, 767, and 777 flight controls, hydraulics, and landing gear.

Jeff Marcus has been with the Safety Board's Safety Recommendations Division since 1999 where he is involved in evaluating responses to aviation Safety Recommendations and advocating for their implementation. Prior to the Safety Board, Mr. Marcus was with the Federal Aviation Administration's Civil Aerospace Medical Institute (CAMI) in Oklahoma City for 7 years where he was the Acting Manager of the Aeromedical Research Division, and the Manager of the Protection and Survival Laboratory. Before his experience at CAMI, he worked for 12 years for the National Highway Traffic Safety Administration where he headed the head injury research program and evaluated crash dummy design and interpreted impact signals in terms of injury potential.

Mr. Marcus holds an MS in Mechanical Engineering from Michigan State University, and a BS in Mechanical Engineering from the University of Maryland, College Park. He is the author or co-author of over 30 technical papers on biomechanics, transportation safety, and computer modeling. For over 20 years he has also taught computer science part time in the evening programs of several universities and community colleges.

Dana Schulze is the Chief of the Major Investigations Division in the Office of Aviation Safety for the National Transportation Safety Board. In this role, she oversees an organization responsible for investigating accidents and incidents involving domestic and foreign major air carriers. Ms. Schulze joined the Safety Board in 2002 as a subject matter specialist in system safety engineering and worked as a group chairman on numerous domestic and international investigations involving airworthiness issues. Prior to joining the agency, she worked in the commercial aerospace industry in a variety of engineering and engineering management roles related to design, system safety, reliability, and quality.

Ms. Schulze has a B.S. degree in Space Sciences and Mechanical Engineering from the Florida Institute of Technology and an M.S. degree in Mechanical Engineering from the State University of New York. She has also completed an Executive Leadership Program at the University of Virginia's Darden Graduate School of Business. Ms. Schulze is a member of the Society of Automotive Engineers (SAE), the System Safety Society, and the American Society for Quality.

Pam Sullivan began her career with the Safety Board in the Chicago Regional Office in 1983 when she was hired as an Air Safety Specialist. Between 1985 and 1990, she worked in the Safety Board headquarters as an Aviation Analyst, an Air Safety Investigator, and a Supervisory Aviation Analyst. She transferred back to the Chicago Regional Office in 1990 as a Supervisory Air Safety investigator. She currently works in the Chicago office as a Senior Air Safety Investigator.

Ms. Sullivan has been the Investigator-in-Charge on more than 1,200 accidents and incidents, including several major investigations. In addition, she was the Investigator-in-Charge of the first Safety Board investigation of an accident involving a UAS.

Ms. Sullivan graduated from Kent State University with a Bachelor of Science degree in Aerospace Technology, which included receiving commercial instrument and flight instructor certificates.

EXHIBITORS

AAI

Airborne Law Enforcement Association

Association for Unmanned Vehicle Systems International

AV AeroVironment

Blackfly

The Boeing Company

Defense Research Associates, Inc.

Insitu

Northrop Grumman Corporation

SimAuthor

FORUM ARCHIVES

Within several days after the conclusion of the forum, the webcast and all presentations will be archived and available on the NTSB website at

http://www.nts.gov/Events/symp_UAS/symp_unmanned_aircraft.htm

A PDF of this document will also be available on the page referenced above.