




# Vickie Norton MS ATP

Project Engineer, Airline Transport Pilot

## contact

 [vickie.norton@meaforensic.com](mailto:vickie.norton@meaforensic.com)

 949.273.1129

 Los Angeles

## expertise

Aviation Investigations

Human Factors

## areas of specialization

Aircraft Systems/Failure Analysis

Certification/Maintenance Compliance Analysis

FAA Operating Rules/Airworthiness Standards

Pilot Training/Evaluation/Human Factors

Aircraft Loss of Control/Emergency Landings

Engine Failures/Fires/Shutdowns

Adverse Weather/High Altitude Meteorology

Air Traffic Control Procedures/Airspace Requirements

Stabilized Approach Criteria, Glideslope/Localizer, Airspeed and Configuration Deviations

Vickie Norton is a senior engineer in MEA Forensic's Aviation Investigation group and a captain with a major commercial airline. With engineering and aviation backgrounds, Vickie investigates a variety of issues relating to aircraft incidents. She reconstructs accidents, looks at pilot actions, assesses system and powerplant malfunctions, analyzes failures, and examines operational, maintenance and regulatory issues. Vickie's education, training, and more than 30 years of experience in the aviation industry provide MEA's clients with unparalleled credibility and competence.

Vickie provides clients with unbiased and straightforward opinions. "Sometimes clients need an engineer to provide an expert opinion about a mechanical, system, or component failure; other times they can benefit from the opinion of an experienced airline pilot. I provide clients with both areas of expertise."

Vickie has a Bachelor's degree in Mechanical Engineering from Michigan Technological University and a Master's degree in

Aviation Safety from the Florida Institute of Technology. She holds type ratings on the B737, B757, B767, and A320 aircraft. She has held the prestigious FAA Designated Engineering Representative Certification as well as Certified Flight Instructor/Ground Instructor licenses and she currently holds her Private Rotorcraft-Helicopter license.

Vickie's work is based on an inviolate commitment to the truth. "I believe that factual, unbiased expert opinions help the pursuit of justice, and that's precisely what we are committed to providing."

## education

Masters of Science Aviation/Aviation Safety, Florida Institute of Technology, 2014

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Bachelor of Science Mechanical Engineering, Michigan Technological University, 1988

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## professional associations

Human Factors and Ergonomics Society, 2015

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National Association of Professional Women, 2015

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The Honor Society of Phi Kappa Phi, 2014

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Lawyer-Pilots Bar Association, 2010

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Airline Pilots Association, since 1995

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Aircraft Owners and Pilots Association, since 1994

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Southern California Professional Engineers Association, 1989 to 1994

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## professional experience

### MEA Forensic Engineers & Scientists

Project Engineer, 2009 to Present

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Responsible for technical investigations involving aircraft accident/incident reconstruction, system/powerplant malfunctions and failure analysis, operational, maintenance, regulatory and human factors effects. Case analysis includes NTSB report review; aircraft design/operating envelope, component design, assembly and installation; compliance with and adequacy of maintenance manuals and required inspection, repair and overhaul schedules, Service Bulletins and Airworthiness Directives; pilot-in-command training, licenses, ratings, proficiency and recency of experience; preflight planning and prevailing weather conditions, and the potential effects of "third party" (non-pilot) error, e.g. Air Traffic Control, flight dispatch, aircraft fueling/loading, airfield lighting/signage defects, etc.

### United Airlines

Captain, 1995 to Present

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Responsible for the safe operation and the final authority of commercial flights operated under FAA Part 121 Scheduled Air Carriers for United Airlines, 13,000+ flight hours with 5000 hours as Pilot-in-Command at UAL. Type rated in the B767, B757, B737 and A-320; B747 Flight Engineer qualified. Experienced in operations in the domestic U.S., Alaska, Hawaii and Canada; Latin America, including Mexico City and San Salvador, and the Pacific Rim, including Narita, Osaka, Beijing, Shanghai, Seoul, Guam and Saipan. Currently qualified and operating as a Los Angeles-based Airbus A-320 Captain.

### Reno Air Express

First Officer, 1994-1995

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Operated British Aerospace Jetstream 31/32 twin turboprop aircraft as Second-in-Command for commercial flights under FAA Part

135 rules for commuter flights. Experienced in operations including no-autopilot, winter ops/icing, mountain flying and short-field takeoff and landing procedures.

## **McDonnell Douglas Corporation/Douglas Aircraft Company, (DAC)**

Project Engineer/Team Leader, 1989-1994

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Mechanical engineering applications ranging from product development through flight test, certification and product support engineering. Managed in-house design teams and commercial vendors from initial RFP through FAA certification. Authored technical information for airline training and maintenance manuals. Performed Failure Mode Analysis of both pre-certification as well as failed in-service components, including stress, strain, vibration and metallurgical analysis. Participated in multiple Twinjet and Trijet on-site flight test programs in locations ranging from Edwards AFB, CA to Yuma, AZ to Roswell, N.M. Oversaw and certified vendor design and dynamometer testing through company FAA Designated Engineering Representative (DER) status. Member of joint FAA/DAC Weekly Accident/Incident Investigations Board, including failure sequences through analysis and overlay of digital flight data and cockpit voice recorders. Primary FAA/NTSB contact for DAC Brake Systems and Engineering Department. Presented various DAC engineering reports and accident/incident summaries at annual Team Conference and industry events, as well as FAA/NTSB hearings.

## **research activities**

### **FAA Operating Rules/Certification Rules/Airworthiness Standards**

Goal: to specify and apply the pertinent standards across a wide variety of applications ranging from airframe certification to flight instruction to the FAA Part 91, 121 and 135 operating environments.

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### **Runway Takeoff/Landing Performance, Balanced Field Calculations**

Goal: to contribute in determining the MD-11 Aircraft Flight Manual (AFM) performance values with respect to takeoff decision speeds (V1), takeoff safety speeds (V2), accelerate-stop/accelerate-go distances, takeoff screen heights, second segment climb values, disabled brake landings, inoperative antiskid/autobrake/thrust reverser landings, contaminated runways, etc.

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### **Counterfeit Replacement Aircraft Components**

Goal: to investigate the infiltration and frequency of installation of counterfeit replacement aircraft components, especially Chinese-manufactured wheel assemblies, during the transport category aircraft wheel and brake overhaul process and methodologies to prevent future occurrences.

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### **Transport Category Wake Turbulence/Effects of Wingtip Vortices**

Goal: to quantify the known effects and frequency of occurrence of wake turbulence as it applies to both general aviation (GA) and commercial applications for the combined purposes of teaching in the GA environment and operating in the commercial environment. Considerations include FAA separation standards (e.g. "light-following-heavy", "heavy-following-heavy", etc), avoidance tactics, recovery maneuvers and known accidents resulting from wake turbulence upsets. Studied the 1993 accident of a Westwind jet on a charter flight landing in Santa Ana following too closely behind a 757, killing all aboard and leading to the above-mentioned FAA separation standards.

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### **Crimes Aboard Aircraft**

Goal: to assess the probability of future occurrence and methodology to prevent such crimes as interference with crewmember duties, crewmember assault, attempted murder and attempted air piracy. Witnessed cockpit of FedEx DC-10-30 subsequent to Flight 705 attempted murder/attempted air piracy incident; multiple incidents of assault on crewmembers and associated post-flight FBI follow-up; airborne on September 11, 2001 as UAL 737 Captain. Fully versed in operational procedures relative to crimes aboard aircraft with respect to all interested parties, including FAA, airline, Federal Flight Deck Officers (FFDOs) and Air Marshals.

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### **Controlled Flight Into Terrain (CFIT)/VFR Flight into IFR Conditions**

Goal: to attempt to quantify the breakdown of known accidents by probable cause to include training, qualifications, onboard equipment, pilot overconfidence, navigational database currency/errors, inadequate preflight planning with respect to forecasted weather, etc. Multiple accidents researched, including the well-known San Diego, 1991 CFIT, resulting in the deaths of seven of Reba McEntire's band members; Martha's Vineyard, 1999, John F. Kennedy, Jr., spatial disorientation resulting from VFR into IFR, and Cali, Columbia, 1995, American Airlines 757 CFIT, killing 156 passengers and 8 crewmembers.

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#### **Air Traffic Control Clearance Readback/"Hearback" Errors**

Goal: to quantify the frequency of occurrence and clarify the responsibilities of each party with respect to FAA Air Traffic Control (ATC) communication errors resulting from blocked transmissions, non-standard phraseology, "covered" transmissions and uncorrected readbacks.

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#### **Aircraft/Rotorcraft Loss of Control/Emergency Landings**

Goal: to attempt to quantify frequency of occurrence and malfunction by type of aircraft, purpose of flight, prevailing weather conditions and percentage of fatal vs. non-fatal outcomes to further enhance training, maintenance and standard operating procedures.

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#### **Far Violations**

Goal: to study types and frequency of occurrence of the most common violations for the purposes of teaching in the GA environment, operating rotorcraft in the GA environment, and operating transport category aircraft in the commercial environment. More recent research also includes the plausibility of criminal charges filed against pilots, both domestically and internationally.

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#### **Slow Speed Flight Maneuvers/Stall-Spin Training and Recovery**

Goal: to successfully master and subsequently illustrate/demonstrate to students the aerodynamic principles and flight characteristics of slow speed flight, minimum controllable airspeed, approach-to-stall, actual stalls and spins such that immediate recognition and recovery from undesirable energy states or unusual aircraft attitudes resulted.

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#### **Adverse Weather/High Altitude Meteorology**

Goal: to have an instructional and working knowledge in all relevant areas of aviation meteorology, including but not restricted to local, domestic and international flight planning with regard to forecast and actual local/field conditions, distant and local Notices to Airmen (NOTAMs), Terminal Area Forecasts (TAFs) and the associated industry and ICAO abbreviations. To operationally quantify the effects of winds aloft, known and probable icing areas, pressure gradients, jet stream strength and width, probable areas of turbulence and/or mountain wave and convective activity, including thunderstorms and windshear events. Fully versed in transport category aircraft radar systems and their associated capabilities and limitations, such as attenuation, and how such events can contribute to aircraft accidents/incidents.

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#### **Fuel Starvation/Exhaustion/Contamination/System Mismanagement**

Goal: to attempt to quantify frequency of occurrence and impact of the various fuel system events by definition. Examined contributing factors for each event in order of highest percentage of occurrence: for starvation, running fuel tanks dry (intentionally or not) and engine(s) would not restart after switching tanks, running fuel tanks dry (intentionally or not) and using improper restart procedures, improper fuel tank selection for phase or operation of flight, switching fuel tanks in the traffic pattern resulting in fuel starvation, attempted takeoff or landing with auxiliary tanks selected and inadvertent mixture cutoff. For exhaustion, attempted flight beyond fueled range of aircraft, lack of visual confirmation of fuel level in preflight, performance of multiple missed approaches in low fuel state without diverting, knowingly overflying usable airports in a low fuel state, unidentified fuel leaks and distraction with irregular procedures checklists. For contamination (typically water), unrestricted access of rainwater/condensation to fuel tank(s), contaminated sources (e.g. fuel truck/storage tanks) and sabotage. For system mismanagement, examined improper pilot procedures including crossfeed valves, boost and engine-driven pumps, engine inlet and/or carburetor icing, high-altitude fuel icing, tank selector valves and rapid throttle movement. Multiple accidents researched, including United Airlines Flight 173, DC-8-61, 1978, fuel exhaustion; Air Canada Flight 143, B-767-200, 1983, fuel exhaustion; Singer/songwriter John Denver, Experimental Long-EZ, 1997, fuel system mismanagement; Air Transat Flight 236, A330-243, 2001, fuel exhaustion through system mismanagement.

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## **Robinson R22 Low-G Pushovers/Loss of Rotor RPM/"Settling with Power"/Dynamic Rollover**

Goal: to attempt to quantify the most frequent causes of accidents/incidents, avoidance techniques and flight/maneuver limitations of the R22 for operation in the GA environment. Examined accident type by pilot experience/proficiency level, aircraft maintenance history, prevailing weather conditions and type of mission.

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### **Ground Collisions/Runway Incursions**

Goal: to quantify frequency of occurrence, mitigating factors, operational responsibility and avoidance recommendations surrounding unauthorized intrusions onto runways. Examined events with regard to category (A-D), party responsible for deviation (pilot, vehicle/pedestrian or ATC), available reaction time, degree of necessary evasive/corrective action, environmental conditions, speed of aircraft/vehicle as a function of aircraft type and phase of flight and proximity of aircraft and/or vehicle. Research included but not limited to FAA Advisory Circular 120-74A, 2006 FAA/ALPA/United Airlines "Runway Incursions: Reducing Pilot Deviations" presentation, FAA Advisory Circular 150/5340-1J, and ALPA 2007 White Paper in response to NTSB "Most Wanted" Transportation Safety Improvements List to Stop Runway Incursions/Ground Collisions of Aircraft. Multiple collisions/near misses/incursions researched, including 1977 Tenerife double B-747 collision, 1991 LAX 737/turboprop collision, 1996 ONT double B-737 near miss and 2006 ORD B-747/B-737 near miss.

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### **Fixed-Wing and Rotorcraft Flight Below Minimum Recommended Altitudes**

Goal: to quantify frequency of occurrence of GA aircraft accidents/incidents as a result of intentional flight below FAA and aircraft manufacturer minimum recommended altitudes. Further, to assess causal factors to pilot decision-making such as inadequate training, lack of experience, pilot overconfidence and intentional disregard for safety through accident/incident investigation, NTSB Probable Cause Reports, pilot instructor/witness statements, etc.

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### **Pilot Expectation Bias/Cockpit Resource Management (CRM)**

Goal: to study the effects of pilot behavior in the commercial cockpit environment with regard to situational awareness, human error, lack of crewmember coordination, Captains' failure to assign tasks to other crew members, lack of effective crew supervision, mutual monitoring, early error detection/avoidance, improper response, human factors/ergonomics and improper or inadequate training.

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### **Robinson R22/R44 Active Safety Notices/Safety Alerts/Service Letters/Service Bulletins**

Goal: to study and quantify the effects of the aircraft manufacturer's recommendations as a result of various accidents/incidents and to maintain currency with regard to recently superseded, deleted or newly released information for maximum operational safety and proficiency. Most recent publications pertain to R22/R44 "Main Rotor Blade Skin Debonding" due to exposure of the bond line due to excessive erosion of the blade finish and R44 "Tail Rotor Leading Edge Fatigue Cracking" as a result of police helicopters frequently performing orbits with a nose-left yaw, using additional left pedal to force the aircraft to fly in an out-of-trim state.

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## **lectures & presentations**

March 2016 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

May 2015 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

November 2014 – Human Factors Considerations in General Aviation Accident Investigations, 2014 International Air and Transportation Safety Bar annual conference in New York, NY.

July 2014 – Pilot Duty of Care and the Role of the Human Factors Expert, 2014 American Association for Justice annual convention in Baltimore, MD.

April 2014 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

April 2013 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

May 2012 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

July 2011 – Court Reporting Tips from an Expert Witness, Sage College School of Court Reporting, Moreno Valley, CA.

May 2011 – Introduction to Aerospace Engineering, guest speaker at Long Beach State University, Long Beach, CA.

July 2010 – Top Three Things a Commercial Airline Pilot Would Change to Improve Aviation Safety. Aviation Section, American Association for Justice 2010 Annual Convention, Vancouver, BC.

May 2010 – Introduction to Aerospace Engineering, guest speaker at Long Beach State University, Long Beach, CA

February 2010 – Captain/Dispatcher Joint Authority under Part 121. Lawyer-Pilots Bar Association Winter Meeting, Hawks Cay Resort, FL.

## training and professional development

2016 – 50th Annual SMU Air Law Symposium, Dallas, TX.

2014 – Fatigue Risk Management Systems (FRMS), Capstone Project, Florida Institute of Technology.

2014 – Aviation Security, Florida Institute of Technology.

2014 – 48th Annual SMU Air Law Symposium, Dallas, TX.

2013 – Aircraft Accident Investigation, Florida Institute of Technology.

2013 – 47th Annual SMU Air Law Symposium, Dallas, TX.

2013 – Safety Management Systems, Florida Institute of Technology.

2013 – Advanced Aviation Physiology, Florida Institute of Technology.

2012 – Complex Aviation Systems, Florida Institute of Technology.

2012 – Human Factors in Man-Machine Systems, Florida Institute of Technology.

2012 – 46th Annual SMU Air Law Symposium, Dallas, TX.

2011 – Lawyer Pilots Bar Association, Carlsbad, CA.

2011 – 45th Annual SMU Air Law Symposium, Dallas, TX.

2010 – American Association for Justice 2010 Annual Convention, Vancouver, BC.

2010 – 44th Annual SMU Air Law Symposium, Dallas, TX.

2010 – Lawyer-Pilots Bar Association (LPBA) Winter Meeting, Hawks Cay Resort, FL.

2009 – USC Viterbi School of Engineering, Aviation Safety & Security: “Legal Aspects of Aviation Safety” Course.

2008 – FAA/United Airlines Runway Incursion/Operational Safety Course.

2005 – Private Rotorcraft – Helicopter license.

2004 – A-320 Type Rating.

2002 – United Airlines/FAA Advanced Security Training. (Domestic and International Operations)

2001 – 737 Type Rating.

1998-2001 – FAA Part 121 Extended Twin-Engine Over Water Operations (ETOPS)

1998 – 757/767 Type Rating.

1995 – Present – Annual Recurrent Qualification Training, United Airlines.

1995 – Present – FAA/UAL Security Training.

1995 – Present – Emergency Evacuation Training.

1995 – Present – Hazardous Materials Training.

1995 – Present – Takeoff and Landing Performance Calculations, (i.e. cluttered runway, bleeds-off, thrust-reverser inoperative, etc.)

1995 – Present – Windshear/Microburst Training and Recovery.

1995 – Present – Aircraft Unusual Attitude/Upset and Recovery.

1995 – Present – Winter Operations Training and Procedures.

1995 – Present – Proficiency Training/Proficiency Checks on currently qualified fleet in 9-18 month intervals.

1995 – 747 Flight Engineer License.

1995 – United Airlines “Actual Fire” Course. (Identification by fire type, location; methods of fighting)

1994-Present – Emergency Procedures Training for Commercial and Transport Category Aircraft Systems Failures/Engine Failures/Fires/Shutdowns.

1994-1996 – Consultant FAA DER with “Systems and Equipment” designation by FAA authorizing office ANM-130L.

1994 – Certified Flight Instructor (CFI) Airplane Single Engine Land, Ground Instructor. (non-current)

1992-Present – FAA Air Traffic Control Procedures/Airspace Requirements.

1991 – Awarded Company (Douglas Aircraft Co.) FAA Designated Engineering Representative (DER) with “Systems and Equipment” designation by FAA authorizing office ANM-130L.

1990-1994 – NTSB Probable Cause Report review/analysis.

1990-1994 – Presenter at annual Douglas Aircraft Company/Industry “Team Conference” Meetings.

1990-1992 – MD-11 FAR Part 25 Certification/Flight Test.

1990 – Accident Investigation Assistance Seminar. (Douglas Aircraft Company)

1989-1991 – Major Air Carrier Brake Overhaul/Maintenance Compliance Analysis.

1989 – Failure Mode Effects Analysis (FMEA) and Fault Tree Analysis (FTA) of Transport Category Aircraft Brake, Antiskid and Autobrake Systems.