



## MICHAEL L. MARKUSHEWSKI, B.S.M.E.T. PROFESSIONAL BIOGRAPHICAL OUTLINE

### BACKGROUND

Mr. Markushewski earned a Bachelor of Science degree in Mechanical Engineering Technology from Philadelphia's Spring Garden College and attended Pennsylvania State University for graduate courses in Engineering Science. Mr. Markushewski is highly qualified as a crashworthiness engineer. He has established a distinctive career in the field of accident reconstruction, crashworthiness, occupant crash protection, emergency escape, crash safety and survival, and life support engineering. His extensive experience focuses on research, design, test and evaluation of aircraft and vehicular seating systems, restraint systems, ejection seat design, crashworthy seating systems, seat belts and inflatable restraints and protective devices. As a result of demonstrated leadership in this area, he has held the positions of project engineer, team leader, systems engineer and project manager of significant occupant protection system design, development and test programs responsible for project progress from inception through completion. He has prepared and established program and hardware technical and performance specifications and manuals for many programs and vehicle platforms including aircraft and ground vehicles. Mr. Markushewski has acted, and currently acts as a lead investigator and mishap reconstructionist for military and civilian aircraft and automotive mishaps to evaluate occupant protection system performance and the evaluation of mechanisms of injury. Because of his experience and knowledge in the occupant crash protection area, Mr. Markushewski has been designated as a Subject Matter Expert (SME) on seating and restraint system design and performance by the United States Army. He is currently consulting with the National Hockey League on impacts and the performance of athletic equipment.

As a result of his in-depth knowledge and experience, Mr. Markushewski is a recognized leader in the field of accident reconstruction, crashworthiness and occupant protection. Mr. Markushewski is currently the Chief Technical Officer (CTO) for ARCCA, LLC.

### SUMMARY OF EXPERIENCE

- Investigates automotive vehicular mishaps to evaluate crashworthiness issues and occupant protection system performance
- Designed and tested occupant restraint system designs including lap belt and shoulder belt systems, inflatable restraints and their related hardware and seating systems
- Led and participated in many projects and programs addressing the research, design, test and evaluation of aircrew ejection seats and ejection seat subcomponents. Experience extends to assessment of aircrew station and cockpit designs
- Led programs involving advanced helicopter crashworthy seating systems and inflatable restraint systems
- Led programs to develop advanced vehicular seating and restraint system designs to improve occupant response to crash impact forces
- Led design change efforts during and following Desert Shield/Storm conflict in Kuwait resulting in improved cockpit and crew station design for navy fighter and attack aircraft
- Maintained a leadership role in live-subject and Anthropomorphic Test Devices (ATD) testing and evaluation for the U.S. Navy

- Led engineering teams in the Navy's ongoing efforts to evaluate prototype restraints, which led to significantly improved restraint systems for fighter and attack aircraft.
- Prepared and maintained technical specifications on occupant protection systems and restraint system for U.S. Navy
- Research, design, test and evaluate seating and restraint systems for U.S. Army ground vehicles and provide senior technical support in matters involving occupant survivability, escape and crash protection
- Designed, developed, tested and evaluated gunner restraint for HMMWV M1114 vehicle
- Prepared/s technical specifications on occupant protection systems and restraint system for U.S. Army vehicles
- Research improved occupant protection systems and devices for the United States Army ground vehicles
- Research, design, test and evaluate seating and restraint systems for U.S. Marine Corp advanced ground vehicles and provide senior technical support in matters involving occupant survivability, escape and crash protection
- Designated Subject Matter Expert (SME) on seating and restraint systems for the U.S. Army
- Designed, developed, tested, integrated and evaluated production seating and restraint systems for the U.S. Marine Corps under the MRAP program
- Manages technical programs, personnel and staff assignments as Chief Technical Officer for ARCCA, LLC

### AREAS OF SPECIALTY

- |                                   |  |
|-----------------------------------|--|
| ▪ Crashworthiness                 | ▪ Human Subject Testing                |
| ▪ Occupant Protection             | ▪ Human Tolerance                      |
| ▪ Injury Mechanisms and Causation | ▪ Seat Belts and Inflatable Restraints |
| ▪ Accident Investigation          | ▪ Seat Design                          |
| ▪ Athletic Equipment              | ▪ Child Restraints                     |
| ▪ Occupant Kinematics             | ▪ Cargo Retention                      |
| ▪ Mine Blast Injuries             | ▪ Crash Survivability                  |

### EDUCATION

- Bachelor of Science in Mechanical Engineering Technology, Spring Garden College, Philadelphia, PA 1985
- Bradley University, Peoria, IL, 1979
- Graduate Studies and Continued education: Pennsylvania State University, Drexel University, Philadelphia, PA



## PROFESSIONAL EXPERIENCE

**November 2009 – Present | ARCCA, LLC | Chief Technical Officer**

**May 2000 – 2009 | ARCCA, LLC | Vice President of Engineering**

**June 1994 – Present | ARCCA, LLC | Senior Engineer**

- Participates in research, development, test and evaluation of automotive and aircraft crashworthiness issues, seating and restraint systems and components
- Provides technical support to the U.S. Army on issues involving occupant survivability and crash protection for military personnel
- Test and evaluation of production ground vehicle seating and restraint systems for the U.S. Army and Marine Corps under the MRAP program
- Conducts research, design, testing and evaluation of occupant protection systems and devices
- Investigates vehicular crashes to determine restraint system performance
- Uses his diverse and in-depth background and experience as a crashworthiness engineer as well as his well-developed management skills in the position of Chief Technical Officer at ARCCA LLC
- Provides technical guidance and manages staff assignments as well as general workload tracking and progress
- Directs ARCCA's technical ongoing efforts to serve its clients in a professional, efficient and cost-effective manner

**August 1985 – June 1994 | Naval Air Development Center/Naval Air Warfare Center | Aerospace Engineer**

**1993 – 1994 | Navy's Survival Technology and Restraint Improvement Program, | System Engineer**

- Defined design and performance requirements and developed specifications for an advanced restraint system design for Navy fighter and attack aircraft
- Conducted testing and evaluation of prototype and production restraint and aircrew protection system designs on Hyge horizontal accelerator, vertical accelerator and sustained acceleration centrifuge testing
- Prepared and obtained approval for live-subject test protocols
- Conducted live-subject evaluations, including impact tests, parachute jump tests, rollover and inversion studies and human factors testing
- Conducted live-subject impact testing on the Navy Ejection Tower to evaluate occupant motion in response to vertical impact forces
- Conducted flight test evaluations in F/A-18 Hornet fighter and attack aircraft. The flight test regimen included exploiting the maximum performance of the aircraft to thoroughly evaluate the occupant restraint performance under high-g flight conditions
- Conducted extensive testing and evaluation using Hybrid-II and III, GARD, VIP, ADAM and SID anthropometric test devices (ATD) to evaluate occupant response to frontal, rear, side, upward and rollover acceleration forces

- Designed and developed improved aircrew restraint and occupant protection systems for Navy and Marine Corps tactical aircraft
- Participated in live-subject testing to qualify new design escape systems for Navy aircraft. This led to programs to assess biofidelity of anthropomorphic test devices to that of live subjects

### **1992 – 1994 | Helmet Mounted-Cat’s Eye Emergency Divestment System | System Engineer**

Led helmet development programs for both advanced head protection and night vision capability and integration into Navy and Marine fighter and attack aircraft with respect to impact performance and human tolerance

### **1988 – 1994 | I-NIGHTS Helmet system | System Engineer**

Led helmet development programs for both advanced head protection and night vision capability and integration into Navy and Marine fighter and attack aircraft with respect to impact performance and human tolerance

### **1993 – 1994 | Advanced Crashworthy Aircrew Survival System (ACASS) | System Engineer**

- Led an experienced team to define performance requirements and develop specifications for an advanced crashworthy seating system for future rotary aircraft
- Conducted inflatable restraint system design, testing and development on the Inflatable Body and Head Restraint System (IBAHRS). Integrated system design requirements into SH-60 rotorcraft
- Prepared test plans and initiated full scale crash testing of military rotorcraft
- Led effort during and following the Desert Shield/Desert Storm conflict in Kuwait to address existing safety of flight crew station design issues which resulted in immediate design changes in aircrew cockpit design on current and future fighter and attack fixed-wing aircraft and rotorcraft

### **1991 – 1994 | Escape System Programs | System Engineer**

- Responsible for establishing performance requirements and developing specifications for escape systems and ejection seat components
- Designed, developed and tested limb restraint systems, test fixtures, occupant cockpit mockups, helmet-mounted displays and equipment, ejection seat hardware, emergency detachment systems, emergency oxygen system design and escape-related electrical components
- Created system design specifications and overall system-level performance requirements for occupant protection devices

### **1987 – 1994 | Cognizant Field Activity (CFA) | Team Leader and designated Lead**

- Led research, development, testing, evaluation and in-service performance of ejection seat sub-systems
- Investigated numerous aircraft mishaps prior to the formation of, and as part of the Mishap Investigation Support Team (MIST) to determine performance of escape system and occupant protection and restraint designs
- Designated Navy and Marine Corps lead expert for testifying at Mishap Investigation Review Board on performance of ejection seat subcomponents and emergency oxygen systems following aircraft mishap

- Led team that designed and tested seat pan cushions for ejection seat platforms. Dynamic overshoot, or amplification of acceleration forces was reduced to provide maximum control of lower torso motion in response to upward acceleration forces
- Maintained Navy cognizance over emergency oxygen systems. Designed, tested and evaluated emergency oxygen systems
- Prepared and maintained Navy Escape System Maintenance Manuals (NAVAIR 13-1-6.3 series) currently in use today for F/A-18, F-14, F-4, A-6, A-7, A-4, AV-8A/B, T-45, T-2, S-3, C-1, C-2 Navy tactical aircraft
- Prepared and maintained Mil-S-81018 Technical Specification for restraint and emergency escape components currently in use today for F/A-18, F-14, F-4, A-6, A-7, A-4, AV-8A/B, T-45, T-2, S-3, C-1, C-2, E-2 Navy tactical aircraft
- Participated in preparation and update to Mil-S-18471 Ejection Seat Technical Specification for Navy ejection seat equipped tactical aircraft

### 1985 – 1987 | Aerospace Engineer

- Designed, maintained, and tested ejection seat subsystems for F/A-18, F-14, F-4, A-6, A-7, A-4, AV-8-A/B, T-45, T-2, S-3, C-1, C-2, E-2 Navy tactical aircraft
- Investigated in-service performance of life support equipment such as escape system components, harnesses and emergency oxygen systems
- Participated in aircraft mishap investigations to determine in-service performance of life support equipment
- Navy C-school graduate (Intermediate-level) for escape system subsystems and emergency oxygen systems
- Prepared and maintained control of Navy escape system maintenance manuals, specifications and warnings associated with life support systems and components
- Participated in numerous restraint system design, test and development efforts

### COURSES/TECHNICAL SEMINARS INSTRUCTED

Markushewski, M.L. Applied Crashworthiness. Occupant Crash Protection Training Course at the Naval Air Warfare Center (NAWC). Patuxent River, Maryland. November 1998.

Markushewski, M.L. Low Speed Collisions. Highlands Insurance Group. Lawrenceville, New Jersey. September 11, 2000.

Markushewski, M.L., D. Eisentraut. Accident Reconstruction—The Big Picture. Curtain & Heefner, LLP. September 29, 2000.

Markushewski, M.L., B. Probst. Low Speed Collisions. Farm Family Insurance. October 3, 2000

Markushewski, M.L., Proffering and Defending the Seat Belt Defense. Amica. October 18, 2000.

Markushewski, M.L., B. Probst. Low Speed Collisions, State Farm Insurance. Trenton, New Jersey. November 2, 2000.

Markushewski, M.L., B. Probst. Low Speed Collisions, Amica Insurance. Blue Bell, Pennsylvania. November 10, 2000.

Markushewski, M.L., B. Probst. Low Speed Collisions, CGU Insurance. Lehigh Valley, Pennsylvania. November 16, 2000.

Markushewski, M.L. and B. Probst. Low Speed Collisions, NJM Insurance Group. Trenton, New Jersey. November 16, 2000.

Markushewski, M.L., B. Probst. Low Speed Collisions, State Farm Insurance. Runnemede, New Jersey. December 6, 2000.

Markushewski, M.L., D. Wirth. Transportation Mishaps, Liberty Mutual Insurance. Atlanta, Georgia. January 12, 2001

Markushewski, M.L., B. Probst, and D. Wirth. Slip, Trip, and Fall, State Farm. Marlton, New Jersey. January 24, 2001.

Markushewski, M.L., D. Wirth. Low Speed Collisions, Altoona Claims Association. Altoona, Pennsylvania. February 21, 2001.

Markushewski, M.L., D. Wirth. Low Speed Collisions, Marino & Dougherty. March 5, 2001.

Markushewski, M.L., D. Wirth. Low Speed Collisions, CGU Insurance. Camp Hill, Pennsylvania. March 8, 2001.

Markushewski, M.L., D. Wirth. Low Speed Collisions, State Farm Insurance. Oaks, Pennsylvania. March 21, 2001.

Markushewski, M.L., D. Wirth. Proffering the Seat Belt Defense, CGU Insurance. Mount Laurel, New Jersey. April 12, 2001.

Markushewski, M.L., D. Wirth, and G. Fylak, Low Speed Collisions. Penn National Insurance. Lawrenceville, New Jersey. May 17, 2001.

Markushewski, M.L., Investigating a Motor Vehicle Collision—A Look at the Big Picture. Vesper Law. Atlantic City, New Jersey. June 19, 2001.

Markushewski, M.L., G. Fylak. Low Speed Collisions, Bouck, Holloway, Kiernan & Casey. Albany, New York. August 27, 2001.

Markushewski, M.L., D. Wirth, and G. Fylak, Low Speed Collisions. Harleysville Insurance. Moorestown, Pennsylvania. October 10, 2001.

Markushewski, M.L., D. Wirth, Low Speed Collisions—Seat Belt Defense. Hanover Insurance. Piscataway, New Jersey. October 23, 2001.

Markushewski, M.L., G. Fylak. Low Speed Collisions, One Beacon. Florham, Park, New Jersey. October 26, 2001.

Markushewski, M.L., T. Jennings, and S. Clark. Transportation Mishaps, Liberty Mutual Insurance. Boston, Massachusetts. December 21, 2001.

Markushewski, M.L., T. Jennings. Low Speed Collisions, Liberty Mutual Insurance Company. Mount Laurel, New Jersey. December 2001.

Markushewski, M.L., G. Fylak, and J. Trabucco. Low Speed Collisions, New York State Chapter of Special Investigation Units. Syracuse, New York. January 23, 2002.

Markushewski, M.L. Low Speed Collisions. Amica. Boston, Massachusetts, February 12, 2002.

Markushewski, M.L., G. Fylak. Low Speed Collisions, Progressive Insurance, Newark, Delaware. March 13, 2002.

Markushewski, M.L., G. Fylak. Low Speed Collisions, Utica National Insurance Group. New Hartford, New York. March 27, 2002.

- Markushewski, M.L., Low Speed Collisions, AIG. Parsippany, New Jersey. April 15, 2002.
- Markushewski, M.L., Low Speed Collisions, State Farm Insurance. Egg Harbor, New Jersey. April 23, 2002.
- Markushewski, M.L., G. Fylak. Low Speed Impacts, One Beacon. Albany, New York. April 25, 2002.
- Markushewski, M.L. and G. Fylak. Accident Reconstruction, Amica. Mount Laurel, New Jersey. May 22, 2002
- Markushewski, M.L. Accident Reconstruction, Kent County Bar Association/Delaware Paralegal Association, Dover, Delaware, May 2002.
- Markushewski, M.L., Accident Reconstruction and Seat Belt Defense, NJ Cure. July 9, 2002.
- Markushewski, M.L., Low Speed Collisions. Amica. Hartford, Connecticut. July 13, 2002.
- Markushewski, M.L., Accident Reconstruction and Low Speed Collisions, Seat Belt Defense. Bond, Schoeneck & King, New York, November 13, 2002.
- Markushewski, M.L., Low Speed Collisions, AIG. Vestal, New York. November 14, 2002
- Markushewski, M.L., Accident Reconstruction—Low Speed Collisions, Security Indemnity Insurance Company. Neptune, New Jersey. November 20, 2002.
- Markushewski, M.L., Slip, Trip, and Fall. Security Indemnity Insurance Company. Neptune, New Jersey. November 20, 2002.
- Markushewski, M.L., Accident Reconstruction—Low Speed Collisions, Liberty Mutual Insurance. Hingham, Massachusetts. December 17, 2002.
- Markushewski, M.L., Accident Reconstruction—Low Speed Collisions, St. Paul Insurance Company. Boston, Massachusetts. December 17, 2002.
- Markushewski, M.L., Low Speed Collisions. Motorist Insurance Group, Pittsburgh, Pennsylvania. January 29, 2003.
- Markushewski, M.L., Slip, Trip, and Fall. Motorist Insurance. Pittsburgh, Pennsylvania. January 29, 2003.
- Markushewski, M.L., Low Speed Collisions. Amica. Boston, Massachusetts, February 12, 2003.
- Markushewski, M.L., Low Speed Collisions. AIG. Boston, Massachusetts, February 25, 2003.
- Markushewski, M.L. Low Speed Collisions, Insurance Crime Information Exchange. North Carolina. February 26, 2003
- Markushewski, M.L., Slip, Trip, and Fall, Insurance Crime Information Exchange. Boston, Massachusetts. February 26, 2003.
- Markushewski, M.L., Slip, Trip, and Fall, Insurance Crime Information Exchange. North Carolina. February 26, 2003.
- Markushewski, M.L., Low Speed Impacts, Pittsburgh Claims Association. Pittsburgh, Pennsylvania. March 13, 2003.
- Markushewski, M.L., Low Speed Impacts, National Society of Professional Insurance Investigators (NSPII). April 4, 2003.
- Markushewski, M.L., Low Speed Impacts and Black Box Recorders, Plymouth Rock. Plymouth Rock, Massachusetts. April 15, 2003.

Markushewski, M.L., Low Speed Impacts and Black Box Recorders. AIG. Marlton, New Jersey. June 3, 2003.

Markushewski, M.L., Low Speed Impacts and Black Box Recorders. AIG. Chaddsford, Pennsylvania. June 3, 2003.

Markushewski, M.L., Slip, Trip, and Fall. State Auto, Pittsburgh, Pennsylvania. June 17, 2003.

Markushewski, M.L., Low Speed Impacts, Chubb Insurance, Detroit, Michigan. August 6, 2003.

Markushewski, M.L., Low Speed Impacts, Auto One Insurance, Long Island, New York.

Markushewski, M.L., T. Jennings, Slip, Trip, and Fall. The Commerce Insurance Company. Webster, Massachusetts. October 14, 2003.

Markushewski, M.L., Low Speed Impacts. Chubb Insurance. New York, New York. October 24, 2003.

Markushewski, M.L., Low Speed Impacts. Liberty Mutual Insurance. Danvers, Massachusetts. November 18, 2003.

Markushewski, M.L., Low Speed Impacts. Chubb Insurance. Florham Park, New Jersey. February 12, 2004

Markushewski, M.L., Accident Reconstruction and Seat Belt Defense. CNA. Monmouth Junction, New Jersey. March 10, 2004.

Markushewski, M.L., G. Fylak, J. Plousadis, and D. Milber. Low Speed Impacts. Buffalo Claims Associations. Buffalo, New York. May 12, 2004.

Markushewski, M.L., Uncovering the Cause: Failure Analysis/Investigations. Western Pennsylvania Claims Conference, Pennsylvania, May 21, 2004.

Markushewski, M.L., G. Fylak., Low Speed Impacts. One Beacon. Long Island, New York. August 18, 2004.

Markushewski, M.L., G. Fylak., Low Speed Impacts. One Beacon. Buffalo, New York. September 30, 2004.

Markushewski, M.L., T. Jennings., Low Speed Impacts. Arbella, Quincy, Massachusetts. October 13, 2004.

Markushewski, M.L., T. Jennings and S. Black, Low Speed Impacts. The Commerce Insurance Company. October 14, 2004.

Markushewski, M.L., T. Jennings, Low Speed Impacts. St. Paul Travelers. Middleborough, Massachusetts. October 15, 2004.

Markushewski, M.L., S. Dines, Low Speed Impacts. St. Paul Travelers. Pittsburgh, Pennsylvania. November 3, 2004.

Markushewski, M.L., B. Benda, Accident Reconstruction—Low Speed Impact. Metropolitan Transportation Authority, State of New York, Metro-North Railroad, New York, New York, November 29, 2004.

Markushewski, M.L., B. Benda, Seat Belt Defense. Metropolitan Transportation Authority—MetroNorth Railroad. New York, New York. November 29, 2004.

Markushewski, M.L., B. Benda, Accident Reconstruction—Low Speed Impacts. MTA, Metro-North Railroad. New York, New York. November 29, 2004.

Markushewski, M.L., How To Deal with Fraud—the Low Speed Collision. Metro-North Railroad. New York, New York. November 29, 2004.



Markushewski, M.L., B. Benda. Subrogation—an Expert’s Perspective. Metro-North Railroad. New York, New York. November 29, 2004.

Markushewski, M.L., Low Speed Impacts. St. Paul Travelers. Reading, Pennsylvania. January 26, 2005.

Markushewski, M.L., T. Jennings. Low Speed Impacts. Met Life. Rocky Hill, Connecticut. February 9, 2005.

Markushewski, M.L., T. Jennings, Slip, Trip, and Fall. Met Life. Rocky Hill, Connecticut. February 9, 2005.

Markushewski, M.L., T. Jennings, Slip, Trip, and Fall, Arbella Insurance Group. Boston, Massachusetts. February 10, 2005.

Markushewski, M.L., T. Jennings, Slip, Trip, and Fall, St. Paul Travelers. Middleborough, Massachusetts. February 10, 2005.

Markushewski, M.L., T. Jennings, Accident Reconstruction & Low Speed Impact. Met Life. Rocky Hill, Connecticut. May 24, 2005.

Markushewski, M.L., T. Jennings, Low Speed Impacts. Met Life. Warwick, Rhode Island. May 24, 2005.

Markushewski, M.L., T. Jennings, Low Speed Impacts. Met Life. Lowell, Massachusetts. May 25, 2005.

Markushewski, M.L., T. Jennings, Low Speed Impacts. 11<sup>th</sup> Annual Willis Construction Practice Construction Risk Management Conference. San Antonio, Texas. June 9, 2005.

Markushewski, M.L., S. Dines, Low Speed Impact. Chubb Insurance. Cleveland, Ohio. October 26, 2005.

Markushewski, M.L., S. Dines, Low Speed Impacts. Cleveland, Ohio. October 26, 2005.

Markushewski, M.L., T. Joganich and B. Loch, Biomechanical Analysis from an Insurance Perspective. (ARCCA Sponsored Seminar). October 27, 2005.

Markushewski, M.L., B. Benda, Why Gather Evidence and How to Use it Once Your Get It. Long Island Railroad. Long Island, New York. November 17, 2005.

Markushewski, M.L., B. Benda, Low Speed Impact. Long Island Railroad. Long Island, New York.

Markushewski, M.L., Low Speed Collisions. State Farm Insurance. Framingham, Massachusetts. June 6, 2002.

Markushewski, M.L., Slip, Trip and Fall. 13th Annual Willis Construction Risk Management Conference. Nashville, Tennessee, May 10, 2007

Markushewski, M.L. Accident Reconstruction and Low Speed Impact. Penn National Insurance, Harrisburg, Pennsylvania, May 22, 2007

Markushewski, M.L., Slip, Trip and Fall, Commerce Insurance, Webster, Massachusetts, September 19, 2007

Markushewski, M.L., Low Speed Impact Biomechanics, Commerce Insurance, Webster, Massachusetts, September, 19, 2007

Markushewski, M.L., Impact Biomechanics, Key Note speaker, PA Association of Mutual Insurance Companies, Harrisburg, Pennsylvania, April 2, 2008

Markushewski, M.L. Impact Biomechanics, American Country Insurance, New York, New York, April 14, 2008



Markushewski, M.L., Impact Biomechanics, Hertz Corporation, Dallas, Texas, May 9, 2008

Markushewski, M.L., Impact Biomechanics, North Texas International Association of Special Investigative Units Conference, Dallas, Texas, May 9, 2008

Markushewski, M.L., Rentschler, A., Low Speed Impact Accident Reconstruction, Crashworthiness and Biomechanics, New England Chapter of the International Association of Special Investigative Units and New England Association of Insurance Fraud Investigators, Westford, Massachusetts, June 11, 2008

Markushewski, M.L., Rentschler, A., Slip Trip and Fall Injury Biomechanics, New England Chapter of the International Association of Special Investigative Units and New England Association of Insurance Fraud Investigators, Westford, Massachusetts, June 12, 2008

Markushewski, M.L., Gushue, D., Low Speed Impact Biomechanics and Slip, Trip and Fall Training Seminar, International Association of Special Investigation Units Expo, Atlanta, Georgia, September 10, 2008

Continued Training Seminars and Technical Lectures – through 2011.

## PROFESSIONAL AFFILIATIONS

- Society of Automotive Engineers (SAE)
- American Society of Mechanical Engineers (ASME)
- Safety and Flight Equipment (SAFE) International
- American Society of Safety Engineers (ASSE)
- Association for the Advancement of Automotive Medicine (AAAM)
- Association of the United States Army (AUSA)

## AWARDS

- Survival And Flight Equipment Association (SAFE), Junior Professional Achievement Award, 1989
- U.S. Department of Defense, United States Navy, Quality Step Increase, 1998

## PATENTS AND PETITIONS

- Seat-Mounted Occupant Crash Protection System, U.S. Patent No. 6,155,601, December 5, 2000
- Dual Stage Variable Load Energy Absorber for Vehicle Seating, U.S. Patent No. 8,162,374B2, April 24, 2012
- Co-inventor of Dual Stage Variable Load Energy Absorber for Vehicle Seating, U.S. Patent No. 8,439,420B2, May 14, 2013.
- Co-author and signer of ARCCA, Incorporated's Petition to NHTSA on FMVSS 207: *Petition to Amend 49 CFR 571.207, FMVSS 207-Seating Systems* (September 28, 2015).

## PUBLICATIONS

D'Aulerio, Louis, Whitman, Gary, Sicher, Larry, Cantor, Alan, **Markushewski, Mike**. (2018): Forensic Performance Analysis of Load-Limiting Devices in Automotive Seat Belt Retractors, *Journal of Forensic Sciences*, DOI:10.1111/1556-4029.13955.

*\*Chosen by the JFS Associate Editors and Editor-in-Chief as a 2019 Noteworthy Article*

**Markushewski, M.L.**, Gushue, D, et al. (2007) *When Driver Safety Fails – Then What? Vehicular Accident Analysis: The Big Picture, Low-speed Impact Analysis*, American Society of Safety Engineers, Safety 2007, Orange County Conference Center, Orlando, FL

Gushue, D.L., Joganich, T, Probst, B, **Markushewski, M.L.**, (2007) *Biomechanics for Risk Managers – Analyses of Slip, Trip & Fall Injuries*, American Society of Safety Engineers, Safety 2007, Orange County Conference Center, Orlando, FL

Benda, B. J., L. D'Aulerio, A. Cantor, **M.L. Markushewski**, et. al (2006). *Performance of Automotive Seat Belts During Inverted (-Gz) Rollover Drop Tests*. ICRAASH 2006--International Crashworthiness Conference, Athens, Greece, University of Bolton

Gushue, D., B. Probst, B. Benda, T. Joganich, D. McDonough, **M.L. Markushewski.**, (2006). *Effects of Velocity and Occupant Sitting Position on the Kinematics and Kinetics of the Lumbar Spine during Simulated Low-Speed Rear Impacts*. American Society of Safety Engineers, Safety 2006, Seattle, WA

Cantor, A., **Markushewski, M.L.**, et. al. (2005) *When Driver Safety Fails – Then What? Vehicular Accident Analysis: The Big Picture, The Risk Benefit Analysis of Seating System Design, Session 725*, American Society of Safety Engineers, 2005 ASSE Conference, New Orleans, LA

Joganich, T.G., **Markushewski, M.L.**, Cantor, A. et. al. (2000) *Cognitive Workload Effects on Automatic Restraint Systems' Manual Lap Belt Use* (SAE 2000-01-0174). SAE 2000 World Congress, Detroit MI, Society of Automotive Engineers

Whitman, Gary R., Brown, Kenneth A., Cantor, Alan, D'Aulerio, Louis A., Eisentraut, Donald K., and **Markushewski, M.L.**, (1997). *Booster-with-Shield Child Restraint. Case Studies*. Second Child Occupant Protection Symposium (A special joint session sponsored by Stapp, AAAM, and IRCOBI), Lake Buena Vista, FL

**Markushewski, M.L.**, Cantor, A., Muzzy III, W.H. et. al. (1997). *Assessment of Asymmetrical Anchor Points and Load-Limiting Loops with the Lap Portion of Automotive Occupant Restraints*. 35th Survival and Flight Equipment. SAFE Association. Phoenix, AZ

Eisentraut, D.K., Muzzy III, W.H., Cantor, A., Louis D'Aulerio, Whitman, G.R., Brown, K.A., and **Markushewski, M.L.**, (1997). *Assessment of Timely Retractor Lockup in Automotive Seat Belt Systems (No. 971515)*. Warrendale, PA, Society of Automotive Engineers

**Markushewski, M.L.**, *Aircrew Accommodation/ATLSS Breathing Regulator-Anti-G Valve (BRAG), Ejection Tower Test*. (1992)

**Markushewski, M.L.**, *Aircrew Accommodation/Windblast Testing of Prototype Leg Restraint System*. (1991)

**Markushewski, M.L.**, *Dynamic Response of Leg Restraint System, Ejection Tower Testing* (1991)

**Markushewski, M.L.**, *Flammability Performance of Fabrics Used for Clothing and Seat Kit Covers* (1989)

**Markushewski, M.L.**, *Accident Investigation; RSK-3 Seat Survival Kit (T-2 Aircraft) Low Operator/Aircrew Pull Force on Emergency Oxygen System Pressure Reducer During Maintainer Testing.* (1989)

**Markushewski, M.L.**, *Accident Investigation; SKU-3/A Seat Survival Kit (F/A-18 Aircraft) Oxygen/Communications Hose Assembly (P/N 253D900-1) Failure.* (1988)

**Markushewski, M.L.**, *Accident Investigation; RSK-3 Seat Survival Kit (T-2 Aircraft) Container Separation Failure.* (1988)

**Markushewski, M.L.**, *LR-1 Life Raft Failure, Engineering Investigation.* (1987)

**Markushewski, M.L.**, *Accident Investigation; SKU-3/A Seat Survival Kit (F/A-18) Oxygen/Communications Hose Assembly Failure.* (1987)

**Markushewski, M.L.**, *Accident Investigation; RSK-8 Seat Survival Kit (A-4, S-3, A-7 Aircraft) Multi-Release Assembly (Manual) Link Pin Failure and Design Options.* (1986)

**Markushewski, M.L.**, *Accident Investigation; RSK-8 (A-4, A-7, S-3 Aircraft) Manual Actuation Coupling Lanyard.* (1986)

**Markushewski, M.L.**, *Accident Investigation; RSK-8D/ESCAPAC Ejection Seat (A-7, A-4, S-3 Aircraft) Aircrewman Multi-Release Assembly.* (1986)

**Markushewski, M.L.**, *Accident Investigation; Aircrew Lap Belt Restraint System Investigation.* (1986)

**Markushewski, M.L.**, *LR-1 Life Raft Manual Actuation/C02 Cylinder Failure/Redesign.* (1986)

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