Thomas J. Bajzek
PE, CFEI

Principal

Mr. Bajzek is an electrical engineer with experience in electrical and electronic systems design and analysis, electrical safety assessment, electrical accident reconstruction, and electrical equipment failure analysis. He has conducted complex, multidisciplinary failure investigations pertaining to industrial and consumer products, medical devices, vehicles, and aircraft. He has provided testimony in matters pending before both state and federal courts.

Mr. Bajzek has been involved in the investigation of electrical accidents, fires, and explosions for over 25 years. In addition, he has over 35 years' experience in research, product development, and design. This includes medical product development, analog and digital circuit design, and electromagnetic heating system design. His experience includes design consulting and laboratory and field testing.

Education

M.S., Electrical Engineering, Illinois Institute of Technology, 1985

B.S., Honors, Physics. Loyola University of Chicago, 1984

Licenses & Certifications

- State of Illinois License No. 062-052408

Contact Information

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Aurora, IL 60504

Areas of Specialization

- Failure analysis of electrical and electronic equipment
- Electrical safety
- Fire/Explosion Investigation
- Product design

Positions Held

Engineering Systems Inc., Aurora, Illinois

- Principal & Vice President, January 2021 to Present
- Principal & Director, January 2012 – December 2020
- Senior Consultant, Senior Managing Consultant, January 2001 - December 2011
- Senior Staff Engineer, August 1999 - December 2000x

LWG, Inc., Northbrook, Illinois

- District Manager and Senior Technical Consultant, April 1996 - August 1999

Baxter Healthcare Corporation, Fenwal Division, Round Lake, Illinois

- Senior Principal Engineer, November 1994 - March 1996
- Principal Engineer, May 1993 - November 1994

IIT Research Institute, Chicago, Illinois

- Research Engineer, February 1988 - April 1993

Northrop Corporation, Rolling Meadows, Illinois

- Electrical Engineer, January 1986 - February 1988

Pritzker Institute of Medical Engineering, Chicago, Illinois

- Research Assistant, June 1984 - December 1985

Continuing Education

2020 National Electrical Code

- IEEE IAS/IES Chicago Chapter, February 2020

Grounding and Bonding per NEC with Practical Application and Design Solutions

- IEEE IAS/IES Chicago Chapter, February 2013

Canadian National Advanced Fire, Arson & Explosion Training Program

- Fire Facts Inc. and National Association of Fire Investigators, October 2008

Fire Investigation Training Conference

- Illinois Chapter IAAI, June 2007

Commercial and Industrial Power Systems Overcurrent Protection

- Cooper Bussmann, December 2004

Electrical Safety Requirements & Procedures

- NTT OSHA Safety Division, January 2000

Advanced Cause and Origin

- International Training Association, Inc., April 1997

Hazardous Materials Site Worker Training

- University of Illinois, February 1992

Professional Affiliations/Honors

Institute of Electrical and Electronic Engineers (IEEE)

- Member
- Product Safety Engineering Society

National Association of Fire Investigators (NAFI)

- Member
- CFEI Certification No.: 13976-7287

Publications

“Safety Protocols for Forensic Inspections in the Time of COVID-19: An Approach to Protect Practitioners,” M.A. Mitolo, G. Zizzo, C.A Fox and **T.J. Bajzek**, *IEEE Industry Applications Magazine*, vol. 28, no. 1, pp. 26 30, January/February 2022, doi:10.1109/MIAS.2021.3114658

"New Generation Tester to Assess the Electrical Safety in Low-Voltage Distribution Systems", M.A. Mitolo, and **T.J. Bajzek**, *IEEE Transactions on Industry Applications*, Vol. 55, Issue 1, pp. 10 - 110. January/February 2019.

“Safety Against Burns from Hot Touchable Parts of Electrical Equipment,” M.A. Mitolo, and **T.J. Bajzek**, *IEEE Transactions on Industry Applications*, Vol. 52, No. 5, pp. 3699-3704. September/October 2016.

“Thermal Degradation and Ignition Characteristics of Clothes Dryer Lint,” **T.J, Bajzek**, R. Pape and D.E. Duvall, *Journal of Failure Analysis and Prevention* 12(4), pp. 341-347, 2012.

“Analysis of Heating by Friction in Plastic Clothes Dryer Components,” **T.J Bajzek**, D.E. Duvall and R.N. Koopman, *Journal of Failure Analysis & Prevention* 7(6), pp. 400-406 2007.

“Thermocouples: A Sensor for Measuring Temperature,” **T.J. Bajzek**, *IEEE Instrumentation & Measurement Magazine*, Vol. 8, No. 1, March 2005, pp. 35-40.

“Carbon Resistor Gauges for Measuring Shock and Detonation Pressures. III. Revised Calibration Data and Relationships,” **T.J. Bajzek** and others, *Propellants, Explosives, Pyrotechnics*, Vol. 20, 1995, pp. 159-169.

"Characterization and Control of Muscle Response to Electrical Stimulation," **T.J. Bajzek** and R.J. Jaeger, *Ann. Biomed. Eng*., 15,485-501, (1987).

"Design and Implementation of an Implantable Goniometer," P.R. Troyk, R.J. Jaeger, M. Haklin, J. Poyezdala, and **T.J. Bajzek**, *IEEE Trans. Biomed. Eng*., 33,215-222 (1986).

Mr. Bajzek has authored hundreds of reports addressing various topics including:

- Causes of Fires and Explosions
- Electrical and Electronic Component Failures
- Failure Analysis of Consumer Appliances
- Root Cause Analysis of Failures in Electronic Control Systems
- Performance of Equipment Relative to Industry Specifications and Standards
- Installation, Operation and Maintenance of Equipment
- Electrostatic Ignition of Flammable Vapors
- Lightning Damage to Electronic Equipment
- Causes of Electric Shocks and Electrocutions

Presentations

"Design, Risk, and Efficacy While Testing to Standards - Tradeoffs for Surge Protective Device," E.M. Schultz, L.F. Bilancia and **T.J. Bajzek**, 2024 IEEE International Symposium on Product Compliance Engineering (ISPCE), Chicago, IL, USA, 2024, pp. 1-6, doi: 10.1109/ISPCE61193.2024.1054114.

“Electricity and Fire,” Training Seminar presented at National Association of Fire Investigators, Fire Investigation Training Program, 2009, 2010, 2011, 2012, 2013, 2014, 2015, March 2018, July 2018, March 2019, July 2019, March 2020, September 2020, February 2021, July 2021, February 2022, July 2022, February 2023, June 2023, February 2024, June 2024.

"Forensic Evidence of Arc Tracking as an Ignition Source," **T. J. Bajzek**, E. A. Burns, R. P. Baron, B. M. May and J. P. Sommer, 2023 IEEE International Symposium on Product Compliance Engineering (ISPCE), Dallas, TX, USA, 2023, pp. 1-3, doi:10.1109/ISPCE57441.2023.10158750.

“Electricity and Fire,” Training Seminar presented at Central Illinois Fire Investigators Association (CIFIA), 28th Annual Conference, Peoria, IL., March 2019.

“Measuring the Electrical Safety in Low-Voltage Distribution Systems,” Seminar presented at IEEE Industry Applications Society 54th Annual Industrial & Commercial Power System (I & CPS), Niagara Falls, Canada, May 2018.

“Avoiding Hazards in Building Electrical and Mechanical Systems” Seminar presented at American Institute of Architects, Northeast Illinois Chapter, December 2017.

“Beach Rental Elevator Child Entrapment Safety Analysis,” D.B. Brickman, **T.J. Bajzek**, E.H. Knox, C.A. Fox, J.K. Lueck, and J.M. Petersen, Proceedings of the XXVIIIth Annual International Occupational Ergonomics and Safety Conference, Chicago, IL, pp. 23-28, June 9-10, 2016.

“Electrical Fire Investigation,” Seminar presented as part of Canadian National Advanced Fire, Arson & Explosion Training Program, Toronto, Fire Facts Inc. and National Association of Fire Investigators, Oct. 2009, 2010, 2011, 2012, 2013, 2014, 2015.

“Electricity and Fire,” Training Seminar presented to the City of Chicago Fire Department, Office of Fire Investigation, September 2006, March 2008, August 2008, April 2009, June 2010, May 2012.

"Hydrocarbon Removal by In Situ Heating of Soil by Electrical Energy," H. Dev and **T.J. Bajzek**, Proceedings of Environmental Restoration Technology Transfer Symposium. U.S.A.F. Center for Environmental Excellence, Jan. 26-28, 1993, San Antonio, TX.

"Investigation of the Electrostatic Hazards of Bulk Bags," R. Pape, **T.J. Bajzek**, and R. Mancini, Proceedings of the Eighteenth International Pyrotechnics Seminar, Breckenridge, CO, July 13-17, 1992.

M.S. Thesis: "System Identification and Closed Loop Control of Functional Neuromuscular Stimulation.”

Patents

- Radio frequency heating apparatus for rendering medical materials safe, Patent No: 5,641,423
- Apparatus for rendering medical materials safe, Patent No: 5,609,820
- Method and apparatus for rendering medical materials safe, Patent No: 5,543,111
- Method and apparatus for rendering medical materials safe, Patent No: 5,523,052
- Method and apparatus for rendering medical materials safe, Patent No: 5,476,634
- Robust electrical heating systems for mineral wells, Patent No: 5,070,533
- Corrosion inhibition apparatus for downhole electrical heating, Patent No: 4,919,201