



Chris W. Korinek | Sr. Principal Forensic Electrical and Mechanical Engineer, PE, CQE

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Professional Summary:

Chris provides forensic engineering analysis in the disciplines of electrical and mechanical engineering. His clients include insurance and legal companies, manufacturers, real estate groups, and construction and defense companies. Chris conducts fire investigations involving electrical systems, fireplaces and chimneys, appliances, vehicles, and structures. He analyses explosions, lightning damage, and injuries. Chris has spoken about electrical and mechanical fires, explosions, and failure analysis extensively in the United States and abroad. He has testified over 60 times in cases involving both State and Federal Courts. As an industry expert, Chris is involved in ongoing research and development in the areas of recreating, studying, and documenting electrical and mechanical failure modes for use in scientific forensic analysis. He is also involved with testing and designing products using his engineering skills.

Chris previously founded and operated a successful forensic engineering firm for over 27 years. In his previous role as a project engineer for a manufacturer, Chris assisted in building the engineering department, which resulted in a \$100 million increase in sales in less than a decade. He promoted the use of AutoCAD and Pro-Engineer software and oversaw the testing laboratory. As the lab manager, he was responsible for safety, tooling, fixturing, gauging and all engineering aspects for successful operation. As the wire connector product manager, Chris obtained UL/CSA listing, developed new products/systems, and implemented the Pro-Engineer computer aided drafting (CAD) and computer aided management (CAM) systems. He was also a member of Underwriters Laboratories (UL) Industrial Advisory Council (IAC) for 486C -Splicing Connectors.

As a product design engineer, Chris was involved in innovative automotive battery design, which included product design, CAD modeling, performance testing in electrical connectivity and mechanical structural integrity, design for manufacturing, safety, and cost analysis. In another project engineer role for a plumbing manufacturer, Chris developed new products and supervised drafters and lab test technicians. He was responsible for the design and manufacturing process, which included testing, creating drawings and operational manuals, and organizing efforts across the organization. As part of the testing procedures, Chris initiated the use of failure mode and effects analysis.

In another project engineer role, Chris designed a new product line of systems for the spa industry including directing test lab technicians to perform function, life cycle, safety, and UL tests. He wrote manuals and safety warnings for systems consisting of pumps, heaters, blowers, filters, and controls in a pre-plumbed and pre-wired configuration. He was a member of UL IAC for 1563 - Standard for Spas and Hot Tubs. He also coordinated sales, production, engineering, safety, and quality efforts concerning existing and new products.

Chris's areas of expertise include:

- Electrical Fire and Mechanical Failure Analysis
- Electrical Shock and Mechanical Injury Analysis
- Training, Research for Failure Modes
- Product and Process Design
- Quality Assurance and Reliability

Licenses and Certifications:

Professional Engineer, Wisconsin, #30414

Professional Engineer, Illinois, #062-056692

Professional Engineer, Michigan, #6201050939

Professional Engineer, Minnesota, #43174

Professional Engineer, Iowa, #16902

Professional Engineer, Indiana, #PE10403231

Professional Engineer, Florida, #87281

Certified Quality Engineer, ASQ. 30197

Certified Fireplace Inspector, F.I.R.E. Service, FP-175L

Professional Experience:

Synergy Forensic Engineering, Owner, Forensic Electrical and Mechanical Engineer, 1994 – 2021

Gardner Bender/APW Tools and Supplies, Senior Project Engineer, 1990 – 1999

Johnson Controls, Project Design Engineer, Jan. 1998 – Dec. 1998

Milwaukee Area Technical College, Instructor, 1991

Kohler Company, Senior Mechanical Engineer, 1986 – 1990

Sta-Rite Industries, Project Engineer, 1979 - 1986

Specialized Education:

Hazardous Waste Operations and Emergency Response (HAZWOPER), 40 hours, 8-hour refresher courses, Certified October 2013

International Association of Arson Investigators (IAAI) Wisconsin Chapter 25, General Fire Investigation Seminar, Topics: Internet Profiling & Intelligence Gathering, Case Study Burn Boston Burn Stevens Point, WI, June 2021

National Academy of Forensic Engineers (NAFE) On-line Conference - Forensic Engineering of Pedestrian and Fall Accidents, Electrical Shocks, Forklift Accidents, Ethics, Remote Forensic Inspections, Report Writing, and Publication Review, January 2021

NAFE On-line Conference - Forensic Deposition and Court Testimony, Video Depositions, Evidence Handling, Engineering CV Preparation, Daubert Hearing Case Review, August 2020

International Symposium on Fire Investigation (ISFI) Science and Technology, National Association of Fire Investigators (NAFI), Itasca, IL - Explosions and Air Infiltration, Floating Neutrals, Alarm and Signaling Systems, Vehicle Fires, Lithium-Ion Battery Fires, Propane Explosion, Space Heater Fires, and Rooftop Solar Fire, September 2018

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Manitowoc, WI - Residential Electrical and Gas Fires, Semi-Tractor Trailer and Heavy Equipment Fires, Utility Theft, Statewide Information Sharing Systems, September 2017

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Steven's Point, WI - Fire Pattern Analysis, Basic Explosion Analysis, Identifying Deceptive Behavior, Dehumidifier Case Study, June 2017

ISFI Science and Technology NAFI, Scottsdale AZ - Lithium-Ion Batteries, Receptacle Overheating, Arc Mapping, Heating Elements, Circuit Breakers, Vehicle Fires, Case Studies, Corrugated Stainless Steel Tubing (CSST), Fan Coil Units, Battery Cables, Eastern Kentucky University (EKU) Fire Science Program Development, and Energized Structures, September 2016

Webinar by Cozen and O'Connor - Lithium Batteries & Subrogation, March 2016

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Green Bay, WI - Profiling the Fire Setter, Gas Explosions, Hazardous Materials for the Fire Investigator, and Marine Fires, September-October 2015

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Stevens Point, WI - Preparing for Daubert Challenges, Civil Litigation Issues, Case Studies, Analytical Interviewing Techniques, Materials and their Reactions to Fire, and Photography, National Fire Protection Association (NFPA) 1033 – 1.3.7 (1, 8, 10, 11, and 15), June 2015

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Green Bay, WI - Smoke detectors, Ignitable liquid research, evidence collection, forensic examination of fire debris, Vertical ventilation research study, and investigative programs for iPads and tablets, NFPA 1033 – 1.3.7 (2, 3, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16)., September-October 2014

National Association of Subrogation Professionals (NASP) Subro College 200 Training Session, Marshfield, WI - Investigation, expert reports, to litigation, to settlement, September 2014

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Stevens Point, WI -Managing Complex Scene Investigations, Fire Dynamics, and Fire Protection Systems, Forensic Examination of Fire Effects on Human Remains, Building Codes for Fire Investigators, Hazardous Materials (HAZMAT) Scenes and Case Study on Columbus, WI Chemical Plant Explosion, June 2014

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Brookfield, WI - Wildland Fire Investigation, NFPA 1033, Qualifications, Vehicle Fire Investigation, Arc Mapping, and Fuel/air Explosions, November 2013

Dane County Arson Response Initiative (DCARI), Steve Carson, Elevated Fires, September 2013

Chevrolet Volt Operation Presentation: Holz Motors, Milwaukee, WI, April 2013

Fire and Materials (FM) Conference, San Francisco, CA - Interscience Communications, January 2013

IAAI Wisconsin Chapter 25, General Fire Investigation Seminar, Pewaukee, WI, November 2012

IAAI Wisconsin Chapter 25, Advanced Seminar, Manitowoc, WI - Building Construction, CSST Fires, Arc Mapping, NFPA 921 Updates, Juvenile Fire setters, and Case Studies, November 2011

National Propane Gas Association (NPGA) Certified Employee Training Program, Green Bay, WI, 1.0 Basic Principles and Practices, July 2011

IAAI Advanced Seminar - Forensic Investigation of Vehicle Fires, April 2011

Education:

Bachelor of Science, Electrical Engineering, University of Wisconsin-Milwaukee, Milwaukee, WI, 2002
Bachelor of Science, Mechanical Engineering, Marquette University, Milwaukee, WI, 1979

Affiliations:

International Association of Arson Investigators (IAAI)
Fireplace Investigation Research and Education (F.I.R.E)

National Academy of Forensic Engineers (NAFE)
National Society of Professional Engineers (NSPE)
National Fire Protection Association (NFPA)
National Association of Fire Investigators (NAFI)
American Society of Mechanical Engineers (ASME)
Institute of Electrical and Electronic Engineers (IEEE)

Presentations:

"Goals, Methodology, and Tools for Investigating Electrical Shocks", NAFE, January 2021
"Poor Electrical Connections: Physical Features, Material Characterization, and Newly Identified Characteristic Traits, Before and After Fire Exposure" (Copper-Copper, Brass-Brass), ISFI Science and Technology NAFI, September 2018
"Pre- and Post-Flashover Characteristics of an Electrically Heated Poor Connection between Copper and Steel", Fire and Materials Conference, Interscience Communications, January 2013
"Investigation and Insurance Litigation of a Fire" Forensic Electrical Engineering aspects of Fire Investigation, National Business Institute (NBI), December 2011
"Performing Engineering Investigations for Subrogation", National Association of Subrogation Professionals (NASP), June 2011
"Mechanical Systems, Principles, and Identification, including Heat Transfer, Venting, Fireplaces and Chimneys, and Chimney Testing", International Association of Arson Investigators (IAAI) Wisconsin Chapter 25, June 2010
"Advancements in Electrical Fire Investigation", Wisconsin Fire Loss Group (WFLG), October 2009
"Improving Electrical Safety in Tall Buildings", University of Cantabria, Santander, Spain, October 2006
"Electrical Poor Connections, What to Look for", Racine County Fire Investigation Task Force, March 2004
"Finding Evidence of Electrical Fires", Winnebago County Fire Investigation Task Force, July 2002
"Understanding Electricity and Electrical Fires", Core Engineering, 2002
"Electrical Overheating", International Association of Arson Investigators (IAAA), November 2001
"Understanding Electricity and Electrical Fires", International Association of Arson Investigators (IAAA), May 2001
"Electrical Overheating", Gateway Technical Institute, 2000.
"Understanding Electricity and Electrical Fires", Milwaukee County Safety Academy, 2000
"Electrical Overheating", Washington County Fire Investigation Task Force, 1999, 2000

Publications

Korinek, Chris. "Guide for Fire and Explosion Investigations" - NFPA 921, Fireplace and Chimneys, Building Systems Chapter, Heating Systems, 2020
Korinek, Chris. "The Basics of Electrical Overheating", Electrical Construction and Maintenance (ECM), June 2009
Korinek, Chris. "Safer Electrical Systems in Tall Buildings", International Congress, 2006
Korinek, Chris. Photos appearing in: "Ignition Handbook" by Vytenis Babrauskas Ph.D., Fire Science Publishers, 2003
Korinek, Chris. "Evaluation of Electrical Burn Injuries Using Impedance Measurements," University of Wisconsin – Milwaukee, Mechanical Engineering Department, 2002
Korinek, Chris. Select Chapters in "Kirk's Fire Investigation," John D. DeHaanas 5th, 6th, and 7th Editions, Prentice Hall, 2002, 2006, 2011
Korinek, Chris. "Classification of Electrical Overheating Modes," Fire and Arson Investigator, July 2001

Korinek, Chris. "Understanding Electricity and Electrical Fires," Video, May 2001
Korinek, Chris. "Understanding the Ground Fault Circuit Interrupter," Pool and Spa News, April 1984
Korinek, Chris. "Shedding Light on the Purposes of the Ground Fault Circuit Interrupter," Pool and Spa News, November 1982

Patents

Twist-on wire connector adapted for rapid assembly, 7/2/2002, No. 6,414,243
Twist-on wire connector with torque limiting mechanism, 6/26/2001, No. 6,252,170
Torque limiting socket for twist-on wire connectors, 3/6/2001, 6,198,049
Power operated torque driver for screw-on wire connectors, 7/28/1998, No. 5,784,935
Wire stripper with integral cable sheath cutter, 3/28/1998, No. 5,732,471
Twist-on Wire Connector, No. DES. 379,348
Insulating cover for a wire joint, 12/13/1994, No. 5,373,107
Shock absorber assembly for a table or the like, 3/20/1990, No. 4,909,473

Honors and Awards:

First Place - Senior Design Team Competition, University of Wisconsin – Milwaukee, 2002
General Manager's Award, Certificate of Excellence, Applied Power/Gardner Bender, H1/H2 Wire connector designs and manufacturing/tooling implementations, 2006
President's Award, Certificate of Excellence, Applied Power/Gardner Bender, G1/G2 Wire connector designs and manufacturing/tooling implementations, 2004
EMTI - Delavan Rescue Squad Inc., 1983-1986
Customer Care Award, Sta-Rite Industries, Portable Spa System Design - Fort Wayne Pools, 1983