

Mark E. Goodson, PE

Principal Engineer

mark@goodsonengineering.com

LICENSURE:

Arizona Professional Engineer, License 35588
Arkansas Professional Engineer, License 11459
California Professional Engineer License 17319
Colorado Professional Engineer License, 39558
Florida Professional Engineer License, 74398
Missouri Professional Engineer License, 032425
Nebraska Professional Engineer, License E15065
New Mexico Professional Engineer, License 16140
North Carolina Professional Engineer, License 033568
Oklahoma Professional Engineer, License 21609
South Carolina, Professional Engineer 31276
Texas Professional Engineer, License 56446
Utah Professional Engineer, License 13972173-2202
Virginia Professional Engineer, License 050653
NCEES Council Record 26095.

EDUCATION:

BSEE, Texas A&M, 1979
Research Statistics, UTHSC-D, 1983
Expert Testimony, SMU Law School, 1984
Fire Protection Engineering, El Centro, 1984
Traffic Engineering, UTA, 1983
NMR Imaging, UTHSC-D, 1984
Civil Litigation, El Centro, 1985
Medicolegal Death Investigation, UTHSC-D, 1986
Fire Cause and Origin, CCJC, 1987
Forensic Path, Lecture series, 1987-88, UTHSC-D
National Electric Code, Northlake JC, 2000

AFFILIATIONS:

FELLOW, American Academy of Forensic Sciences (AAFS)
MEMBER, Institute of Electrical and Electronic Engineers (IEEE)
MEMBER, National Fire Protection Association (NFPA)

EXPERIENCE:

Goodson Engineering, *Principal Engineer*, Denton, TX - 1984 - Present
TRW Optic Electronics, *Manager of Design Group*, 1980-1985
Rockwell International, *Electrical Engineer*, 1979-1980 (R&D in avionics, pacemakers)
Rockwell International, *Co-op student*, 1977-1979 (R&D in thin films, electroplating, wire welding)

APPOINTMENTS

Court Master, 116th Jud. Dist. of Texas, 1989-91 *Groom v. Schrmek* (Electrocution case)
Consultant for engineering related deaths, Dallas, Collin, and Tarrant County Medical Examiner Systems

Member, State of Texas, Electrical Board (ESAB), TDLR, 2003-2007

Editorial Board, 2006 to 2016, *Fire and Arson Investigator*

Member, State of Texas Fire Marshal's Office – Science Advisory Workgroup, appointed 2012

NFPA, Committee Member, 1033 *Fire Investigator Professional Qualifications*, appointed March 2014

Dept. of Commerce / NIST / Fire Scene and Explosives Subcommittee, appointed October 2014

Cabinet Appointee, Dept. Commerce US Patent & Trademark Office Patent Public Advisory Cmte. (PPAC) December 2014, Re-appointed December 2017. Head of IT Sub Committee.

UL Fire Safety Research Institute – Electrical Engineer member, Technical Panel.

NFPA Committee Member, 1321, *Fire Investigative Units*, 2018-2023

NFPA Committee Member, 1033, *Fire Investigator Qualifications*.

PUBLICATIONS:

"GFIs Prevent Electrocutions", *SDM Magazine*, August 1985

"Technical Shortcomings of Doppler Traffic Radar", *Journal of Forensic Sciences*, October 1985

"Evaluating Sound Discriminators", *SDM Magazine*, Sept. 1984

"Seatbelts that Don't Work: Eng. and Path. Findings", *Forensic Sciences Gazette*, August 1986 (W Dr. P E Besant Matthews)

"Effects of Radar Detectors on Traffic Speeds", *Journal of Police Science & Administration*, Dec 1987 (w Mike Ciccione, Jessica Pollner)

"Investigating Fires by Auger Electron Spectroscopy", *Forensic Sciences Gazette*, unpublished

"Electrically Induced Deaths Where Water Immersion is Present", *American Journal of Forensic Medicine and Pathology*, November 1993

"A Discussion of Deaths by Lightning", *Journal of Forensic Sciences*, November 1993

Handbook of "Electrical Hazards" (Book Review), *Journal of Forensic Sciences*, May 1999

"GFIs and Fire Investigations", *Fire and Arson Investigator*, January 1999

"Electrically Induced Fuel Gas Fires", *Fire and Arson Investigator*, July 1999 (With Dave Sneed, Mike Keller)

"Surge Suppressor Fires", *Fire and Arson Investigator*, January 2000

"Electric Water Heater Fire Causation", *Fire and Arson Investigator*, October 2000

"Circuit Breaker Performance in Cold Temperatures", *Fire and Arson Investigator*, July 2001

"Effects of P-U Foam Systems on Wiring Ampacity", *Fire and Arson Investigator*, July 2002

"Fires Caused by Fractured Heating Elements", *Fire and Arson Investigator*, October, 2002

"Electric Cooktop Fires", *Fire and Arson Investigator*, October 2003

"Hidden Dangers of Halogen Lamps", *Fire and Arson Investigator*, January 2004

"CSST and Lightning", *Proceedings*, Fire and Materials 2005 Conference, January 2005

"The Link Between Lightning, CSST, and Fires", *Fire and Arson Investigator*, October 2005

"AC to DC Adapter Fires", *Fire and Arson Investigator*, October 2006

"Circuit Breaker Myths," Fire and Arson Investigator, October 2007
 "Engineering Labs," Fire & Arson Investigator, January 2008
 "Rope Lighting Fires," Fire & Arson Investigator, October 2008
 "Real Time Radiography," Fire and Arson Investigator, January 2011
 "Transformer and Cable Sectioning," Fire and Arson Investigator, July 2011
 "Electronic Ballast Fires," Fire and Arson Investigator, July 2011
 "Examination of Fire Damaged MOVs," Proceedings, PSES, IEEE, October 2011
 "CSST Lab Protocol," Fire and Arson Investigator, January 2012
 "Cleaning of Fire Damaged Wires," Fire and Arson Investigator, April 2012
 "Igniting Others to Action," Fire and Arson Investigator, April 2012
 "Analysis of the PSC Motor," Proceedings ISFI, October 2012.
 "The Application of CT X-ray to Analysis of Electrical Components," Proceedings ISFI, October 2012
 "Math and Fire," Fire and Arson Investigator, October 2012 (With Lee Green)
 "Forensic Usage of Computed Tomography," Fire and Arson Investigator, April 2013
 "Plasma Ashing of Fire Debris," Proceedings ISFI 2014
 "CT Analysis of IC Bond Wires," Proceedings ISFI 2014
 "Electrical Analysis of CSST Components," Proceedings ISFI 2014 (With Dr. Icove)
 "IC Fuse Analysis w CT," Fire & Arson Investigator, April 2015
 "Hidden CSST Dangers," Fire & Arson Investigator, October 2015
 "Influences of AFCIs on Arc Mapping," Proceedings ISFI 2016 (With KR Davis)
 "Effects of Plasma Cleaning on Soot Agglomeration Patterns," Proceedings, ISFI 2018 (Will Steward)
 "The State of Arc (Mapping)," NAFE Journal, June 2021. (with Dr. Icove, Dr. Buc and Mr. May)

PRESENTATIONS:

Traffic Radar, AAFS 1986 meeting
 Investigating Electrocutions, AAFS 1986 meeting
 The Compromised Security System, AAFS 1985 meeting
 Data Communications Security, IRS 1 week course, 1984
 Security Systems, seminar, SHSU CJC, Huntsville, Texas 1986
 Failures in Fire and Smoke Detection Systems, AAFS 1987 meeting
 Products Liability Aspects of Radar Detectors, AAFS 1987 meeting
 Forensic Evidence, Dallas County Bar, February 1987
 The Window Shade Restraint, 1990 AAFS meeting
 Abuse of FMVSS, 1990 AAFS meeting
 Killer TV Slits Woman's Throat - How?, AAFS 1990 meeting
 Death by Electric Fence Charger, AAFS 1994 meeting
 Thermal Switch Concepts in Electrical Fires, AAFS 1994 meeting
 Audio Tape Analysis, 1994 AAFS meeting
 Effects of Auto Emissions Systems on CO Deaths in Closed Spaces, AAFS 1996 meeting
 Investigating Electrocutions Where GFI's have Failed, AAFS 1996 meeting
 GFI's and Fire Prevention, accepted for AAFS 1997 meeting
 Surge Suppressors and Fire Causation, accepted for 1997 AAFS meeting

Investigating Electrical Fires, West Texas F&A Investigators, May 1997
Investigating Electrical Fires, North Texas F&A Investigators, October, 1997
Electrical Fire Causation, West Texas Fire Service Conference, December 1997
Deaths Following Exposure on Presumed Non-lethal Electrical Sources, AAFS, Feb 1998
Mechanical & Electrical Fire Causation, Okla. Ch. IAAI, October 1998
Exploding Multi-meters, AAFS, February 1999
Shock Prevention Schemes for Electric Power Tools, AAFS, February 1999
Electrical Fires, NFPA 921, North Texas Fire Investigators, October 2001
Electrical Fires, NFPA 921, State Arson Conference, March 2002
Smoke Detector Design, AAFS, 2002
Electric Deficiencies of Foam Insulation, AAFS, 2002
Electrical Fire Investigation, West Texas IAAI, April 2003
Latent Failures of Type NM After Ground Energization, February 2004
CSST Failures, Propane Defense Association, October 2004
Lightning Induced CSST Fires, Inter-science Fire and Materials, San Francisco, Jan 2005
Arson Issues – TCDLA, October 2008
Deaths Caused by Hyperthermia in Suicide Involving Automotive Exhaust, AAFS, 2010
Energized Gas Line Fires, IAAI 2010 AGM, May, 2010
Energized Gas Line Fires, OAAI, Columbus, Ohio, August 2010
Arson Investigation, TCDLA December 2010
MOV Fires, PSES, San Diego, October 2011
CSST Fires, Missouri IAAI, Kansas City, March 2012
Analysis of the PSC Motor,” ISFI October 2012.
The Application of CT X-ray to Analysis of Electrical Components, ISFI, October 2012
Arson Investigations, Texas State FMO Symposium, Houston, Texas, January 2013
CSST Fires, Texas State FMO Symposium, Plano, Texas, April 2013
Arc mapping, Texas State FMO Symposium, Houston, Texas June 2013
Arson & Actual Innocence – Texas CCA Center for Am. & International Law, Aug 14, 2013
IEEE PSES, Austin, Texas, Oct 9, 2013 (w Michael Custer) Use of IC Bond Wires as Fuses
Texas State FMO – Plano, Texas – Eutectic Binary Alloying in Fires
Texas State FMO – Corpus Christi, Texas – Fires from E Cigarette
Texas State FMO, Garland, Texas – National Electric Code & Fire Investigations, March 2014
Texas State FMO, Plano, Texas - CSST Fires, May 2014
Texas State FMO, Plano, Texas - Smoke & Heat Detection, May, 2014
Texas State FMO, San Antonio, Texas CT Scanning for Bond Wires, August 2014
ISFI 2014, Baltimore, Plasma Ashing of Fire Debris
ISFI 2014, Baltimore, CT Analysis of IC Bond Wires
ISFI 2014, Baltimore, Electrical Analysis of CSST Components
ISFI 2014, Baltimore, The Texas SFMO SAW – w Chris Connealy, Dr. Icove
Texas State FMO – Plano, Texas Ignitability of Poly Styrene Building Materials
AAFS 2015, Orlando, The Texas State Fire Marshal Science Advisory Workgroup (w John Lentini)
West Texas Fire Investigators, / Texas SFMO Lubbock Conference – CSST Fires
Texas SFMO May 2016, College Station, Radiography

Texas SFMO November 2016, San Antonio, Electricity in Residences
 Texas SFMO May 2017. Fort Worth changes in NEC and Residential wiring
 Texas SFMO Dec 2017. Beaumont Electrical Code provisions
 Texas SFMO Feb 2018. Corpus Christi. Electrical Fire Causation
 IAAI AGM 2018, Frisco, Texas, CSST – A Decade of Experience
 ISFI 2018, Chicago Plasma Ashing of Smoke Detector Piezo Horns
 NAFE 2019 Orlando, Status of Arc Mapping (w EC Buc, Thomas May, David Icove)
 N. Texas Fire Marshal's Assoc., Electrical Fires, Grapevine, Texas February 6, 2020
 AAFS, 2021 Meeting, *Paschen's Law and Electrical Burns*

PATENTS ISSUED

7562448	Method of preventing electrically induced fires in gas tubing (See IPR)
7821763	Device for preventing electrically induced fires in gas tubing (See IPR)
8251085	Leak prevention method for gas lines
8905058	Apparatus and Method for Detection and Cessation of Unintended Gas Flow
9093831	Electrical Wiring System and Method I
9093832	Electrical Wiring System and Method II
9097389	Apparatus and Method for Detection and Cessation of Unintended Gas Flow
9610533	Beverage Mixing System and Method I
9634474	Electrical Wiring System and Method III
9793049	Capacitor Protection Method I
9845177	Sanitary Drinking Cup
9909251	Clothes Dryer with Dielectric Flange
9947967	Capacitor Protection Method II
10105665	Beverage Mixing System and Method II
10119640	Fuel Gas Connector
10276022	Obstructive Sleep Apnea CPAP With Improved Patient Safety
10330225	Lightning Resistant Gas Tubing
10502345	Lightning Resistant Gas Tubing II
10667637	Beverage Cooler and Heater
10669668	Fire Resistant Clothes Dryer
10926233	Beverage Mixing Device III
10905268	Beverage Cooler and Heater II
11028528	Fire Resistant Clothes Dryer II
11202696	Dental Irrigation Device I
11278855	Beverage Mixing Device IV
11357607	Dental Irrigation Device II