

Mark E. Goodson, PE

Principal Engineer

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LICENSURE:

Arizona Professional Engineer, License 35588
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California Professional Engineer, License 17319
Colorado Professional Engineer License, 39558
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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
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, International Association of Arson Investigators (IAAI)
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, *Fire Investigative Units*, appointed 2018

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 IFSI, 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. Icové)
- “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. Icové, Dr. Buc and Mr. May)

PUBLICATIONS UNDER REVIEW

Paschen’s Law and Electrical Burns, *Am. J. Forensic Med. & Pathology*, March 2020.

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
 16848835 Dental Irrigation Device I (Allowed August 2 2021)

PATENTS PENDING

Dental Irrigation Device II
 Beverage Mixing Device IV
 Beverage Mixing Device V
 Beverage Cooler & Heater III
 Escalator Sterilization Device
 Electrical Protection Circuit for Lighting Bollard