

news of engineering forensics


 MDE Inc.


Carl P. Anderson
joins MDE's staff

Carl P. Anderson, P.E. has joined MDE as an Associate Fire Protection Engineer (FPE). Carl has been active in the field of Fire Protection Engineering since 1986 and has been a licensed Fire Protection Engineer in the State of Washington since 1994.

Mr. Anderson brings nearly two decades of diverse engineering experience to MDE. Carl received his Bachelor's of Science in Civil Engineering in 1988 and later earned his Master's of Science in Fire Protection Engineering from Worcester Polytechnic Institute (WPI) in 1991. WPI is one of only two schools in the nation offering a Master's degree in Fire Protection Engineering.

For the past ten years Mr. Anderson has been the Principal Fire Protection Engineer (FPE) for the Fire Department in Tacoma, Washington. In his capacity as Tacoma's FPE, Mr. Anderson has been

responsible for fire code and fire protection system compliance for hundreds of construction projects within the City of Tacoma. Examples of these projects

include the new Tacoma Convention and Trade Center, the International Museum of Glass, Tacoma Art Museum, and the Washington State Historical Society Museum; hi-rise residential, office and hospital structures; prisons; and countless other smaller projects.

Mr. Anderson has been responsible for plan review and acceptance testing of smoke control, fire sprinkler, fire alarm, and other fire protection systems as well as overall fire code compliance for new construction.

Prior to joining the Tacoma Fire Department, Mr. Anderson worked as a Fire Protection Consultant in Boston and Chicago, was a Captain in the US Army, Engineer Branch, and worked for the Coast Guard Marine Fire Safety Research Branch.

At MDE, Mr. Anderson will focus on forensic engineering involving fire protection system design, installation and performance as well as associated Fire, Building and Life Safety Code issues. For new construction, Mr. Anderson will provide design and installation review and consultation related to fire protection systems, NFPA Standards, Fire Code and fire protection aspects of the Building Code.

You can contact Mr. Anderson at (206) 622-2007, or learn more about MDE and their diverse areas of expertise online at www.mde.com.



Upcoming Seminars

MDE professionals are scheduled to speak at the following courses / seminars:

- 5/10 – 5/14/04 at the 2004 Joint Conference of the Washington State Chapter International Association of Arson Investigator and Northwest Fire Investigators, -Paul Moore, P.E., CFEI will be presenting **"Electrical and Gas Fires"** on 5/12/04.
- Noel Putaansuu, CFEI will be presenting **"Fire Modeling with FDS"** on 5/10/04 and **"Electrical and Gas Fires"** (Classroom and Laboratory) on 5/12/04.
- Michael Schoenecker, CVFI, CFEI will be presenting **"Motor Vehicle Fires"** (Classroom and Laboratory) on 5/13/04.
- 8/5/04, Keith Cline, P.E. will be presenting **"Failure of a High-Capacity Forklift Fork"** at the Microscopy and Microanalysis 2004 Conference, Savannah, GA.
- 9/26/04 Susan Evans, CIH, CSP, P.E. will be presenting **"Drips, Runs and Errors"** (Otherwise Known as Water Infiltration, Mold Colonization and Construction Defects) at the 11th Annual Washington Construction Law Conference, in Seattle, Washington, sponsored by the Seminar Group.

Insulation Issues

The Pacific Northwest experienced unusually cold weather during early January of this year, which, in turn, led to a rash of sprinkler pipe freezing. The code requirements that govern the installation of water piping and the building's insulation can seem to be contradictory.

NFPA code requires that wet sprinkler piping be installed such that a minimum water temperature of at least 40°F is always maintained. When the piping is installed near the structure perimeter, it is critical that both a heat source is present and the pipe is well insulated. Problems can occur where the roof, insulation and the piping meet. Energy Code requirements may specify the minimum R-value of the insulation. Additionally, building codes require a sufficient air gap between the roof and the insulation to maintain proper ventilation. There must be sufficient space between the piping and the roof for the insulation and the air gap.

When the space is not sufficient for a "simple" installation, the insulation installer must determine how to proceed. Typically, the insulation is "tented" over the piping to maximize the available space and allow the building heat to keep the water above 40°. The localized insulation may not meet the R-value requirement but the overall function of the insulation will be maintained.

Freeze failures can and do occur if an alternative approach is used. Splitting the insulation and wrapping the pipe will cut off the heat supply from the building and reduce the insulating layer between the pipe and the cold temperatures outside the building. A properly designed system will take into account all the governing design criteria to minimize the risk of freeze failure of the piping. MDE has the multi-disciplined expertise and experience to thoroughly investigate and analyze these failures.

Keith G. Cline, P.E.



Electric receptacle failure due to a high resistance connection

Investigating Electrical Fires

In many fire cases, an origin and cause (O&C) investigator may be hired to determine the origin of a fire. The investigator may also attempt to identify possible causes. Often, fire investigators will blame fires on that which they understand the least – electricity. Electricity may be the cause of ignition but that doesn't define the heat source, the fuel ignited, or how the heat and fuel came together to cause a fire.

Once a suspected electrical cause has been identified, the evidence is typically collected at the fire scene. Generally, it is then sent to an engineer for further laboratory examination and analysis. It is important to involve an engineer as soon as possible in the investigation, up to and including sending the engineer to the fire scene. This serves several purposes; most importantly

it allows the evidence to be viewed at the scene by the person who will ultimately determine the root cause of the fire. It also allows the O&C investigator and the engineer to independently determine the fire's origin, as well as its potential cause. This promotes seamless coordination between the engineer and the O&C investigator. It also helps to ensure that all of the evidence, including that

which has been ruled out, is identified and collected at the fire scene. Additionally, an on-site engineer can identify the suspected appliance (the cause) to a degree that allows a third party to be put on notice and given an opportunity to examine and document the fire scene before the evidence is removed. This should be done whenever possible to avoid any issues associated with spoliation.

MDE's engineers can perform a full O&C investigation, as well as any laboratory follow-up work. It is estimated that US households contain more than 2 billion electrical receptacles, and businesses probably contain billions more. Let MDE's Electrical Engineers assist you in the subrogation process from the initial on-scene investigation to expert courtroom testimony. Our goal at MDE is to provide unparalleled professional services to our clients in the insurance and legal communities.

Paul J. Moore, P.E.

Douglas J. Barovsky, P.E.



MDE Inc.

700 South Industrial Way
Seattle, WA 98108-5231

206/622-2007 Fax 206/622-2248
info@mde.com www.mde.com

Vern D. Goodwin, P.E.
Michael M. Fitz, P.E.
Gerard F. Schaefer, P.E.
Randy K. Kent, P.E.
Dale C. Mann, Senior Forensic Chemist
Paul J. Moore, P.E.
Keith G. Cline, P.E.
Douglas J. Barovsky, P.E.
Susan L. Evans, CIH, CSP, P.E.
Paul J. Josten, Forensic Technician
Michael V. Schoenecker, Master Mechanic
Noel Putaansuu, Fire Investigator
Carl P. Anderson, P.E.
Mark C. Lobo, PhD
Laura L. Kentala, Microbiologist
Roy G. Baggerly, PhD, P.E.
Mark G. Nordstrom, P.E.
J. Lee Durston, Lab Tech/Legal Graphics

VERN D. GOODWIN, P.E. *President, Mechanical Engineer* (206.957.2142)
Specializing in accident investigation, photography, documentation, engineering analysis, and accident reconstruction. Areas of investigation include: automobile, truck, motorcycle, pedestrian, bicycle and boat accidents; industrial machine accidents; mechanical failure of industrial machinery, vehicles, hydraulic systems, water plumbing, furniture, hand tools; slip or trip and falls; ladder and scaffold falls.

MICHAEL M. FITZ, P.E. *VP, Mechanical & Civil Engineer* (206.957.2140)
Specializing in fires, explosions, large loss expert coordination, and mechanical, material and electrical failures. Some examples include analysis of fire protection systems including suppression, detection and alarm, code and building construction analysis, piping, pumps, water supply, inspection and testing. Research involving the behavior of appliances and materials in fires and explosions, electrical arcing and related failures. Investigation into high temperature accelerants including chemical composition, ignition and burning temperatures, and full-scale testing.

GERARD F. SCHAEFER, P.E. *VP, Mechanical Engineer* (206.957.2143)
Specializing in fire and explosion cause and origin. Accident investigations and reconstructions including tractor semi-trailer, passenger car, motorcycle, bicycle, and industrial lift truck accidents. Perception-reaction time and visibility. Computer modeling and simulation of accidents, vehicle performance, and fires in structures. Mechanical failures.

RANDY K. KENT, P.E. *VP, Metallurgical Engineer* (206.957.2144)
Specializing in failure analysis of materials and components used in various systems, as well as manufacturing process design and troubleshooting. Forensic investigations include materials testing and failure analysis of metallic, rubber, and plastic components.

DALE C. MANN *VP, Senior Forensic Chemist* (206.957.2145)
Specializing in chemical analysis and research, and forensic investigations requiring analytical skills. Expertise includes fire and bombing scene origin and cause investigation, general forensic investigation, drugs/hazardous materials issues, chemical manufacturing/tampering, chemical failure analysis, environmental contamination, and general chemical-related investigation. Also responsible for the chemical and physical/microscopic characterization of paints, plastics, and polymers.

PAUL J. MOORE, P.E. *VP, Electrical Engineer* (206.957.2146)
Specializing in accident investigations and reconstructions including passenger car and low-speed collisions; perception-reaction time and visibility; computer modeling and simulation of accidents, and vehicle performance. Fire cause and origin. Electrical failures, evaluation and testing of consumer products to determine cause of failure; industrial equipment failure; and losses in power and utility systems.

KEITH G. CLINE, P.E. *VP, Materials Engineer* (206.957.2153)
Specializing in failure analysis of materials and components used in various systems, as well as material selection and heat-treatment consultation. Forensic investigations include plumbing fixtures, transportation, and industrial equipment. Extensive work with plastics.

DOUGLAS J. BAROVSKY, P.E. *VP, Electrical Engineer* (206.957.2141)
Specializing in investigation, testing, analysis and documentation of product failures involving electrical, electronic and gas appliances and equipment. Fire investigations in residential buildings and commercial facilities. Federal Aviation Administration (FAA) Designated Engineering Representative (DER). Aircraft accident reconstruction and failure analysis. Experience in design engineering and government regulatory compliance.

SUSAN EVANS, CIH, CSP, P.E. *Certified Industrial Hygienist* (206.957.2154)
Specializing in industrial hygiene investigations including indoor air quality, microbial contamination, water quality, worker exposure assessments, regulatory agency compliance, asbestos and lead management remediation, abatement support, construction safety, and WISHA/OSHA compliance. Investigation of construction for compliance with plans, specifications, and manufacturer's requirements.

NOEL PUTAANSUU, CFEI *Technical Specialist, Fire Investigator* (206.957.2152)
Specializing in fire scene investigation and forensic analysis. Consulting in fire scene reconstruction, ASTM test methodology, developing fire test equipment, fire mathematical modeling, fire litigation and building envelope wind and water penetration.

MICHAEL V. SCHOENECKER, CVFI, CFEI *Vehicle Fire Expert* (206.957.2147)
Specializing in inspection of all types of motor vehicles to determine causes of fire or system failures. Cases include passenger vehicles, light-duty trucks, heavy-duty trucks, motor-homes, buses, heavy equipment, logging equipment, and recreational vehicles. Forensic analysis of vehicles involved in fires, accidents, theft, and mechanical failures.

PAUL J. JOSTEN *Sr. Drafter/Designer, Forensic Technician* (206.957.2148)
Specializing in CAD design, model building, design and fabrication of unique test fixtures, installation of instrumentation, construction of data acquisition equipment, and operational testing.

LAURA L. KENTALA *Microbiologist*
Specializing in consulting work for identification of food borne micro organisms, identification of water borne organisms that cause forensic metallurgical problems, and microbial identification.

J. LEE DURSTON *Legal Graphics, Laboratory Technician*
Specializing in demonstrative evidence including models, diagrams, photo editing, animation, illustration, web based design, and presentations. Technical laboratory skills including SEM analysis, EDS analysis, destructive and non-destructive testing. On-site, aerial, and exam photography and photo-microscopy.

JAMES C. BUCHANAN *Fire Suppression Expert*
Specializing in fire suppression systems design, installment and code requirements, including residential and commercial properties.

MARK G. NORDSTROM, P.E. *Civil Engineer, Legal Graphics*
Specializing in forensic engineering, research, site investigation, and project management. Digital 3D modeling, graphics, animation and interactive multimedia.

MARK C. LOBO *Thermal, Structural, & Fluid Dynamics*
Specializing in thermal, structural and fluid dynamic analysis experience in the manufacturing, construction and aerospace industries. Research and development for new product design in cutting-edge technologies.

NILS F. JUHLIN, P.E. *Design, Finite Element Analysis*
Specializing in design analysis, failure analysis, and manufacturing analysis. Finite element analysis of complex, nonlinear problems related to buckling, large deflection, large strain, coupled heat transfer/mechanics, and nonlinear material behavior in elastomers, metals, plastics, and composites.

CARL P. ANDERSON, P.E. *Fire Protection Engineer*
Specializing in fire protection system design, review and inspection. Experienced in building plan review and inspection for compliance with fire code, non-structural provisions of building and life safety codes, and numerous fire protection standards.

ROY G. BAGGERLY, PhD., P.E. *Metallurgical Engineer*
Specializing in materials research and metallurgical failure analysis investigations. Evaluation of material properties and root causes of failure emanating from materials, design, manufacturing processes or service.

To start receiving MDE Inc.'s
quarterly newsletter via e-mail
please notify us at:
newsletter@mde.com

ADDRESS CORRECTION REQUESTED

700 South Industrial Way
Seattle, WA 98108-5231



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MDE Engineers, Inc. has changed it's name to MDE Inc. The name change was initiated to be more inclusive of all of our offered services. In addition to forensic engineering in the areas of mechanical, metallurgical, electrical, civil and fire protection, MDE Inc. also provides expertise to our clients in fire and explosion investigation, materials science, accident reconstruction, industrial hygiene, laboratory services, finite element analysis, building envelope investigations, fire suppression analysis, indoor air quality and microbial evaluations, and legal graphics services. MDE Inc. maintains a full forensic and analytical laboratory, and a fully equipped research and testing facility where we conduct small to full-scale reconstructions.

Attached to this newsletter, for your reference, is a list of key contacts and their areas of focus. Please feel free to contact individuals utilizing their direct numbers, or we would be pleased to direct your calls to our main number at 206-622-2007.

www.mde.com