NAFE Saturday Schedule (January 16, 2027)

Chad Ballard, PE (NAFE #1363A)
Principal Engineer
High Water Mark

Time: 8 to 9 AM

Title: From Rainfall to Liability: Using Computer Modeling to Determine Flood Causation

Abstract: The “Act of God” defense frequently serves as a primary legal shield against liability in flood-related litigation under the premise that extreme precipitation events constitute unanticipated natural occurrences for which no human is responsible. This paper presents a standardized forensic engineering framework utilizing two-dimensional hydrodynamic modeling to systematically evaluate the validity of “Act of God” assertions. By establishing a baseline model alongside comparative “but-if” counterfactual simulation(s), natural meteorological forcing can be isolated from man-made impacts. The proposed methodology establishes a five-phase process to: (1) reconstruct existing (“as-Is”) conditions; (2) benchmark site-specific rainfall events against jurisdictional design requirements and prevailing regional standards; (3) create a counterfactual “but-if” simulation matrix; (4) perform hydrodynamic differential analysis; and (5) generate clear reporting to effectively quantify and communicate findings. This framework quantifies extreme weather based on mandatory civil design standards, establishing a repeatable methodology for evaluating claims of unavoidable events. Through representative case studies, this paper demonstrates how 2D physics-based hydrodynamic modeling moves beyond merely identifying human factors to quantitatively apportion flood causation between natural meteorological forcing and anthropogenic site modifications.



Chad Ballard, PE, is a civil engineer specializing in hydrology, hydraulics, flooding, and drainage. He applies advanced numerical modeling and technical analysis to investigate complex flooding events, evaluate flood and erosion damage, and assess issues involving dam operations, dam breaches, and levee failures. Chad’s expertise includes forensic engineering and expert witness services, where he uses rigorous flood modeling to evaluate causation, assess infrastructure performance, and develop clear, defensible opinions. He is a professional engineer licensed in multiple states, a Certified Floodplain Manager (CFM), and a Board-Certified Water Resources Engineer (BC.WRE). In addition to his consulting practice, Ballard has taught professional education courses in hydrology and hydraulic modeling and served as an adjunct professor, teaching undergraduate and graduate courses. His technical expertise, investigative experience, and teaching background allow him to communicate complex engineering concepts clearly to attorneys, clients, and other stakeholders. He lives in the Boise, Idaho, area with his wife and five daughters.

Mathew Martonovich, PE (NAFE #968S)
Transportation Group Manager
Nederveld, Inc.

James Norris, PE (NAFE #791S)
Transportation Group Supervisor
Nederveld, Inc.

Shaun Andres, PE
Forensic Engineer
Nederveld, Inc.

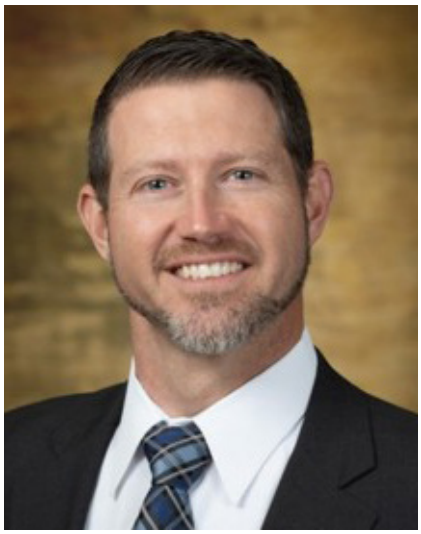
Time: 9 to 10 AM

Title: Forensic Engineering Analysis of Commercial Vehicle Electronic Logging Devices, Telematics, Dash Cameras, and GPS Units

Abstract: Starting in 2017 for interstate commercial vehicles, the Federal Motor Carrier Safety Administration (FMCSA) has mandated electronic logging devices (ELDs). ELDs not only replaced paper logbooks, but they also may provide other valuable information in the forensic analysis of a collision event. Other additional data sources, such as telematics (fleet monitoring), dash cameras, and GPS units, can form an interconnected network of data to assist the forensic engineer in understanding not only the collision scenario, but also the vehicle's pre-collision speeds, diagnostic trouble codes, movements, and the driver's actions. This paper provides insight into the availability and use of ELDs, telematics, dash camera, and GPS unit data as they relate to the forensic evaluation of heavy commercial vehicle collisions. These systems can vary from simple tracking to customizable event recording. The information presented provides the forensic engineer with an understanding of the recorded data potentially available from a heavy vehicle-involved collision. The paper also provides insight into how to obtain the data — and steps to properly interpret and apply that data to the analysis of heavy-vehicle-involved incidents.



Mathew Martonovich, PE, has been a NAFE member since 2017. He holds licensure as a Professional Engineer (PE) in multiple states. He is the Transportation Group Manager at Nederveld, Inc., working out of the Rocky Mountain Service Center in Lakewood, Colorado. He has over 17 years of experience in collision reconstruction methods and a specialty in commercial vehicle collision analysis and mechanical systems. Martonovich has extensive training and experience in the analysis of commercial vehicle collisions, engine control module (ECM) data, GPS, electronic logging device (ELDs), antilock braking system ECU, and other sources of electronic data. He holds a master of science degree in Civil Engineering, with a Transportation Engineering emphasis from the University of Colorado. Martonovich has authored numerous technical articles included in the *NAFE Journal* as well as other forums in the forensic engineering field.



James E. Norris II, PE, has over 19 years of practice in Civil and Forensic Engineering, specializing in Traffic Crash Reconstruction. He has been a NAFE member since 2012 and holds licensure as a Professional Engineer (PE) in multiple states. He is the Transportation Group Supervisor at Nederveld, Inc., working out of the Knoxville Service Center in Knoxville, Tennessee. Norris has developed expertise in the engineering determination of vehicle speeds, incident timing and distances, collision avoidability, human factors, contributing factors related to incidents, and roadway design, among others. He has extensive training and experience in the retrieval and interpretation of data imaged from passenger vehicle Event Data Recorders (EDRs) and commercial vehicle electronic control units (ECUs). He has provided expert witness testimony in his areas of practice at both trials and depositions. He holds a bachelor of science degree in Civil Engineering and a master of science degree in Civil Engineering, with a Transportation Engineering emphasis — both from the University of Tennessee.



Shaun K. Andres is a mechanical engineer with a bachelor of science degree in Mechanical Engineering from Purdue University Northwest (formerly Calumet), and holds licensure as a Professional Engineer in multiple states. He has been a Forensic Engineer working out of the Chicago Service Center in Schaumburg, Illinois, since 2019. He has a background in energetic/explosive train design and testing, electrical switchgear and mechanical linkage design and testing, and experience in mechanical system failure investigation, building envelope investigation, fire and explosion investigations, and collision investigations. Andres has training and hands-on experience in the acquisition and analysis of engine control module (ECM) data, GPS, dashcam video and data, antilock braking system ECU data, surveillance video, and other sources of electronic data.

Michael Stall, PE (NAFE #955S)
President
Managed Response, Inc.

Brian C. Eubanks, PE (NAFE #962S)
Founder and Senior Principal Structural Engineer
Paragon Structural Engineering

Time: 10:15 to 11:15 AM

Title: When Engineering and Construction Expertise Come Together: An Expedited Structural Due-Diligence Evaluation

Abstract: A prospective purchaser retained a forensic engineering firm to evaluate observed deterioration within a two-story cast-in-place concrete parking garage supporting a four-story multi-family structure. The investigation identified distress at an expansion joint and column capitals, including concrete spalling and exposed reinforcement. The company developed a conceptual repair approach using supplemental steel columns and localized concrete repairs. With only eight days remaining before a planned $30-million acquisition, another forensic engineering firm was retained to perform an expedited prescriptive review of the original structural design and evaluate the proposed repair concept. This company reviewed the post-tensioned parking and podium slabs, cast-in-place columns and column capitals, expansion-joint dowels, CMU shear walls, geotechnical information, and proposed remedial steel columns. The evaluation identified conditions warranting additional investigation, including potential long-term corrosion of expansion-joint dowels and uncertainty regarding column-capital reinforcement, while concluding that the primary structural systems and proposed remedial columns were generally acceptable. This paper examines how two forensic engineering firms coordinated technical review, repair evaluation, and professional judgment under a compressed due-diligence schedule to support an informed property acquisition decision.



Michael Stall is a registered professional engineer (#65893) in Texas and is a National Academy of Forensic Engineers board-certified forensic engineer (DFE). Stall earned a master of science in civil engineering from Stanford University and a bachelor of science in architectural engineering from the University of Texas at Austin. He has worked as an expert witness in the resolution of design, construction, and property insurance settlement disputes over the past 15 years. He has more than 45 years of construction experience as a carpenter, ironworker, foreman, supervisor, engineer, scheduler, and construction manager for construction of shopping centers, single-family homes, multi-family buildings, manufacturing plants, power plants, and medical facilities. He has evaluated hundreds of buildings during the past 30 years that have suffered damage from fires, explosions, hurricanes, earthquakes, tornadoes, hail storms, design defects, and construction defects. He has published peer-reviewed articles in the *NAFE Journal* about construction defects and resolution of schedule delay claims and has made numerous presentations to industry and university

groups about construction management and disaster recovery. Stall is founder and president of Managed Response, Inc. (MRI), a Texas-registered professional engineering firm (#00546) and a general contracting company that specializes in evaluation and repair of distressed and damaged properties. MRI is a licensed general contractor in Florida and California and has been in business since 1998. MRI performs construction, renovation, disaster reconstruction, and forensic engineering.



Brian C. Eubanks, MSCE, PE, SE, MAC, D-IBFES, DFE, is Senior Principal Engineer and founder of Paragon Structural Engineering, LTD. With over two decades of experience, he leads a multi-disciplinary team in the structural design and forensic investigation of residential, commercial, and institutional projects. He is a Board-Certified Diplomate in forensic engineering by the National Academy of Forensic Engineers (NAFE) and the International Board of Forensic Engineering Sciences (IBFES) and holds professional engineering licenses in 15 states. Eubanks has been engineer-of-record on a diverse design portfolio and possesses significant proficiency in forensic investigations. He is recognized for expertise in structural systems, building envelopes, components and cladding, and construction defect evaluation. He is also a certified Mold Assessment Consultant (MAC), further supporting his forensic investigations involving moisture intrusion, indoor air quality, microbial growth, and building envelope failures. He is an active member of national and regional engineering committees, has authored numerous industry standards and technical publications, is a frequent expert witness in mediation, arbitration, and court proceedings, and served as an arbitrator. He regularly presents at engineering conferences and professional seminars, demonstrating his commitment to advancing best practices in engineering and forensic analysis.

Chad Williams, PE (NAFE #937M)
President and Principal Engineer: Forensics
Valor Technical Consulting, LLC

Time: 11:15 AM to 12:15 PM

Title: Advanced Understanding of Hail Damage to Asphalt-Composition Shingles

Abstract: Hail damage in the United States exceeds $2 billion annually. The most common type of roofing for residences is asphalt-composition shingles. At times, the causes or extent of hail damage to asphalt-composition shingles are disputed between property owners and insurance carriers — these disputes commonly involve forensic engineers. Disputes commonly relate to threshold sizing (the perceived size of hail necessary to cause damage to the roof assembly), the extent of damage due to a hailstone impact, and what caused a specific point of interest on a roof assembly. This paper focuses on further assessment of laboratory-simulated hail impacts of standardized sizes (¾-inch, 1-inch) to laminate-style asphalt-composition shingles of various ages and conditions from across the United States, a discussion of further assessment methodologies, including the use of light blocks to assess cracking to shingles, CT imagery, laboratory simulation of hail impacts under laboratory conditions, and the counter-current solvent extraction method (desaturation) of shingles to expose the internal fiberglass mat and conditions resulting from hail impacts. The intent of this research and these protocols is to further understanding of the conditions from more common, smaller hail impacts, and documentation methods for verifying damage to existing asphalt-composition shingles.



Chad Williams is a licensed Professional Engineer and a board-certified Diplomate in Forensic Engineering with more than 22 years of engineering experience, including more than 17 years of forensic engineering and maintenance/operations engineering. Primary practice areas include evaluating residential, commercial, industrial, and institutional facilities to determine the causes and extent of damage related to improper design, construction defects, and damage due to weather events and other causes. In addition, Williams has experience in facilities and asset management through maintenance and operations engineering. He is also involved in technical research, tool and process development, and providing training in forensic engineering and roofing. Williams has served as executive leadership of professional engineering firms and not-for-profit engineering service organizations.

Michael Blaise, PE (NAFE #1373A)
Forensic and Mechanical Engineer
Precision 321 Corp.

Stephen Batzer, PhD, PE (NAFE #677F)
President
Batzer Engineering

Time: 1:15 to 2:15 PM

Title: Bowstring Derailment and Arrow Nock Fracture in a Compound Hunting Bow

Abstract: An experienced archer was permanently blinded in one eye while target shooting alone with a compound hunting bow owned for four years. At near full draw, the bowstring derailed from the bow's lower cam, was captured between limb and axle, and was pulled violently downward, shearing the arrow's polymer nock and fracturing the peep sight and then striking the archer's face. An opposing analysis concluded that inadvertent nock disengagement — or a pre-existing nock crack — initiated the derailment. Physical evidence — the post-incident position of three brass bowstring rings and the fracture morphology of the sheared nock — shows the derailment occurred first, and the nock failure was a consequence (not a cause) of the derailment. The bow's hybrid-cam system used shallow string grooves of common depth for the bowstring and its power and control cables, though only the bowstring is subject to unintentional archer-induced torque and derailment. To evaluate whether this groove-depth relationship is characteristic of hybrid-cam hunting bows, baseline measurements of groove geometry, axle-to-axle length, and cam configuration were carried out across bows from multiple manufacturers. This paper documents the derailment-first evidence and comparative measurements and discusses groove depth as a design parameter bearing on this recognized hazardous failure mode.



Michael Blaise founded Precision 321 Corp. in 2022 and serves as its President and Principal Engineer. He has completed more than 900 forensic evaluations and has provided expert testimony at trial and in depositions. His forensic work encompasses investigations of damage associated with soil movement, hurricanes, floods, other storm events, fires, design or construction activities and deficiencies, moisture intrusion, plumbing and HVAC failures, environmental exposure and deterioration, product defects and failures, and mechanical failures. He also specializes in the design, analysis, and testing of mechanical components and systems, including vapor-compression and HVAC systems, thermochemical reactors, fluid-solid separators, test equipment, and data-acquisition and testing software. Blaise earned a BS in mechanical engineering from the Colorado School of Mines and is pursuing an MS in mechanical engineering at the University of Florida.



Steve Batzer, PhD, PE, is a mechanical forensic engineer who consults with clients regarding patent infringement, firearms, and the forensic analysis of accidents and product failures. He has taught at five universities, served as a commissioned officer of the U.S. Army, and has worked as a manufacturing engineer in the Michigan automotive industry. He has testified at more than 50 trials and published more than 70 peer-reviewed engineering papers. Dr. Batzer is also a member of the Society of Automotive Engineers, the American Society of Mechanical Engineers, and is a fellow of the National Academy of Forensic Engineers. He is a Vice President of the Michigan Society of Professional Engineers and encourages all engineers to be licensed. He earned his BS in mechanical engineering from Michigan Tech, an MS degree in manufacturing systems engineering from the GMI Engineering and Management Institute in Flint, Michigan, and a PhD in Mechanical Engineering, again from Michigan Tech. Dr. Batzer lives with his wife in a log cabin in the Pere Marquette forest near Fife Lake, Michigan.

Chakradhar Gondi, PE (NAFE #1329A)
Project Manager and Forensic Structural Engineer
Pennoni Associates Inc.

Time: 2:15 to 3:15 PM

Title: Forensic Evaluation and Repair of Distress in Precast Concrete Parking Structures

Abstract: Precast concrete parking structures are widely used because of their efficient construction, durability, and ability to accommodate large spans. However, exposure to moisture, environmental effects, and inadequate maintenance can result in significant deterioration. This paper presents a forensic engineering approach to evaluating common distress in precast parking structures, with emphasis on precast double-tee systems and their connections. Typical distress includes concrete cracking, spalling and delamination, corrosion-related deterioration, damaged or displaced bearing pads, connection distress, joint deterioration, and damage near double-tee stems and supports. The investigation process includes visual examination, documentation of distress patterns, review of available drawings and construction information, targeted nondestructive testing, and structural evaluation to determine the probable cause and severity of damage. Repair strategies are discussed based on the identified distress mechanism and structural significance, including concrete repair, crack repair, bearing and shim replacement, localized reconstruction, FRP strengthening, and temporary shoring or jacking. Case examples are used to illustrate forensic observations of various distress scenarios and demonstrate how these observations can be used to develop appropriate and durable repair solutions.



Chakradhar Gondi currently serves as a Project Manager and Forensic Structural Engineer T Pennoni Associates Inc. based in the Clearwater, Florida office. He is a licensed Professional Engineer with 12 years of experience in the inspection, design, analysis and retrofitting of new and existing structures in residential, commercial, telecommunication, solar and industrial fields throughout the United States. He specializes in the investigation and evaluation of existing structures for damages and deficiencies due to factors such as foundation settlement, weather events (wind/storm/flood activity, etc.), or design flaws.

Gerald Zadikoff, PE (NAFE #751M)
CEO and Principal Engineer
G.M. Selby, Inc.

Carlos Morales (NAFE #1380A)
Civil-Structural Engineer
G.M. Selby, Inc.

Ivan Zadikoff
Vice President
G.M. Selby, Inc.

Time: 3:30 to 4:30 PM

Title: Forensic Evaluation to Identify Source of Decades of Basement Water Intrusion

Abstract: This paper explains the forensic engineering investigation of a decades-long water intrusion issue inside the basement of a multi-story government building in South Florida, detailing the various methods of testing to find the point of entry for the water and determine what was causing it. This was necessary to be able to create a mitigation plan to address continuous water intrusion. Tidal data, rainfall data, continuous video camera documentation in the basement, drainage system inspections, salinity testing, infrared thermography, and structural evaluation of the foundation and slab were all different methods used to collect data. The data, in conjunction with a flooding event, were used in tandem with independent environmental and site-specific data identifying the rainfall influence and/or tidal and hydrostatic influences. The salinity tests helped correlate the water found in the basement with the nearby water bodies. Infrared imaging helped determine possible paths of entry for water. The team's investigation identified the recurring king tide cycles as the principal driver of the subsurface hydrostatic pressure and one of the main drivers of the water intrusion. The paper describes the investigative methodology, key forensic findings, and mitigation strategies developed to address the confirmed intrusion sources.



Gerald Zadikoff, P.E., F. ASCE, D. CE, D. FE, is the CEO and Principal Engineer of G.M. Selby, Inc., bringing more than 40 years of multi-disciplinary expertise in infrastructure design, telecommunications, coastal and ocean engineering, construction management, structural/civil engineering, and forensic evaluations. Holding a master of science in Ocean Engineering from the University of Rhode Island, a bachelor of science from the Florida Institute of Technology, and Professional Engineer licenses across six states (FL, GA, MS, NC, SC, and WA), he is a Fellow of the American Society of Civil Engineers (ASCE), a past member of the ASCE Industry Leaders Council, a Diplomate Forensic Engineer (D. FE), and a Diplomate of Coastal Engineering (D. CE). A LEED-certified practitioner and voting member of ASTM committees on Forensic Engineering and Building Envelope Structures, his leadership extends to public advisory service, including roles with the Miami-Dade International Trade

Consortium and the Export-Import Bank of the United States. Specializing in coastal structures, marine-related accidents, and structural damage assessments, he frequently serves as an authoritative expert witness in federal and state courts on complex cases involving high-rise failures, construction deficiencies, and mission-critical infrastructure projects.



Carlos Morales, E.I., is a Civil Structural Engineer at G.M. Selby, Inc., having joined the firm in 2022 as an intern before transitioning to a full-time role in September 2023. He holds a bachelor of engineering in Civil Engineering and a master of science in Civil Engineering with a concentration in Structural Engineering from Florida International University. Having passed the Principles and Practice of Engineering (PE) exam, he is actively finalizing state board credentialing for his Professional Engineer licensure. He conducts structural and forensic investigations, structural analyses, repair design, and field evaluations across residential, commercial, and municipal facilities, including milestone inspections, recertifications, and Structural Integrity Reserve Studies (SIRS). As an active diver, he also supports underwater structural assessments and coastal evaluations. Additionally, he prepares structural calculations, construction drawings, and permitting packages, and co-presented “Seawall Collapse and Mitigation” at the National Academy of Forensic Engineers (NAFE) 2026 Winter Conference.



Ivan Zadikoff, MBA, is the Vice President of Operations and owner at G.M. Selby, Inc., a South Florida engineering consulting firm, where he combines executive business acumen with over a decade of technical field experience. Holding a bachelor’s degree in international relations and an MBA from Florida International University, he oversees both the administrative governance and operational execution of complex projects, with a strong focus on client partnerships and scaling boutique engineering operations. He directs the firm’s specialized field investigations — spanning non-destructive testing, forensic evaluations, infrared thermography, groundwater and soil sampling, GPS data collection, and habitat mapping. A Certified Scientific Diver with a FLIR Level 1 infrared certification, he also deploys remotely operated vehicles (ROVs) and drones for building-envelope and underwater structural inspections, leading key regional efforts such as Miami-Dade County building recertifications and structural assessments at Port Miami.

Stephen Batzer, PhD, PE (NAFE #677F)
President
Batzer Engineering

Time: 4:30 to 5:30 PM

Title: Forensic Engineering Analysis of a Defective Muzzleloader Rifle Barrel

Abstract: This study examines the design and manufacture of the CVA Paramount long-range muzzleloader barrel and the analytical process used to evaluate its performance under normal service conditions. Prior to the model's recall, approximately three dozen barrels ruptured in use. Many (or most) of these ruptures resulted in injuries to the user. The investigation included comparison of multiple ruptured rifle barrels, in-depth metallurgical analysis including chemistry, hardness, metallography, and X-ray diffraction, finite element analysis of the rifling, and testing of various misloading scenarios. Fractographic analysis identified the nitrided bore surface as a key contributing factor. An incorrect external barrel taper near the breech combined with decorative external barrel flutes produced high local hoop stresses, which exceeded the ductility of the nitrided steel locally and initiated cracks along the rifling helixes during discharges. These cracks grew in length and depth with subsequent firings, ultimately leading to catastrophic rupture. In response, the manufacturer discontinued production of the rifle, improved the barrel profile, renamed the updated rifle, and then resumed production. Statements accompanying the recall attributed the barrel ruptures solely to user error, such as improper loading and obstructions, and did not acknowledge shortcomings in the design of the recalled product.



Steve Batzer, PhD, PE, is a mechanical forensic engineer who consults with clients regarding patent infringement, firearms, and the forensic analysis of accidents and product failures. He has taught at five universities, served as a commissioned officer of the U.S. Army, and has worked as a manufacturing engineer in the Michigan automotive industry. He has testified at more than 50 trials and published more than 70 peer-reviewed engineering papers. Dr. Batzer is also a member of the Society of Automotive Engineers, the American Society of Mechanical Engineers, and is a fellow of the National Academy of Forensic Engineers. He is a Vice President of the Michigan Society of Professional Engineers and encourages all engineers to be licensed. He earned his BS in mechanical engineering from Michigan Tech, an MS degree in manufacturing systems engineering from the GMI Engineering and Management Institute in Flint, Michigan, and a Ph.D. in Mechanical Engineering, again from Michigan Tech. Dr. Batzer lives with his wife in a log cabin in the Pere Marquette forest near Fife Lake, Michigan.