700 South Industrial Way
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NICOLAUS S. FAINO, P.E., M.S., CFEI
SENIOR STAFF CONSULTANT

nsfaino@engsys.com

Nicolaus Faino is a Senior Staff Consultant, mechanical engineer, and human factors expert who investigates incidents ranging from personal injuries to water losses and fires/explosions.

Mr. Faino's case work has included the forensic investigation of incidents related to human interactions with products, warnings and instructions, and other machinery and equipment. He specializes in product failure analysis, design of mechanical systems, and human factors. He has investigated equipment and component failures and has experience in the design and fabrication of mechanical components. Mr. Faino also has experience with slip, trip, and fall incident investigation and in matters involving building code requirements, such as doors, stairs, and walkways. He is also a certified XL Tribometrist (CXLT), NFSI Walkway Audit Certificate Holder (WACH), and conducts slipmeter testing.

Mr. Faino is a Certified Fire and Explosion Investigator and has performed a variety of fire investigations related to vehicles, machinery, and equipment. He is experienced with compressed gases, machinery components, and other mechanical systems, and has previous experience with installation of gas piping systems in laboratories. Prior work experience includes design and operation of high temperature systems, material processing, Finite Element Analysis (FEA) stress modeling, safety protocols, and the design, fabrication, operation, and analysis of instrumented test systems.

In addition, Mr. Faino also has extensive experience with water losses and appliance failures. Mr. Faino investigates residential and commercial domestic water plumbing, hydronic piping, and drain, waste, vent (DWV) failures related to water loss damage and construction defects in locations ranging from residential homes to high profile condo high-rises.

Mr. Faino holds a B.S. and M.S. in mechanical engineering from the Colorado School of Mines. His research and development background includes renewable energy applications, advanced aerospace energy system development, hydrogen and oxygen system design, alternative energy systems research, and ceramics processing for fuel cell applications. Additionally, he is currently pursuing an M.S. in human factors from the University of Idaho.

Areas of Specialization

Product Safety and Design
Warnings and Instructions
Human Factors
Plumbing and Piping Systems
Water Losses
Fire and Explosion

January 2025

Education

M.S., Psychology – Human Factors. University of Idaho. *(Anticipated 2026)*

M.S., Engineering – Mechanical Specialty. Colorado School of Mines. 2011

B.S., Engineering – Mechanical Specialty. Colorado School of Mines. 2009

Licensed Professional Engineer (P.E.)

State of Washington ..... License No. 57122

State of Utah ..... License No. 11635965-2202

State of Idaho .....License No. 19324

State of California ..... License No. M 40099

State of Hawaii ..... License No. PE-19067

State of Florida ..... License No. 90220

State of Oregon ..... License No. 96798PE

State of Montana ..... License No. PEL-PE-LIC-73527

NCEES Record ..... ID No. 16-955-41

Other Certifications

Walkway Auditor Certificate Holder (WACH)……..National Floor Safety Institute (NFSI)

Certified XL Tribometrist (CXLT)……...Excel Tribometers, LLC

Certified Fire and Explosion Investigator (CFEI) ..... NAFI, License No. 21247-12071

Safety Auditor Certificate (SAC)…… NASP

Classes 1, 4, 5 Forklift Trucks..... CertifyMe.net

Lift Equipment Operator…… Overton

Professional Affiliations

American Society of Mechanical Engineers (ASME)

National Association of Fire Investigators (NAFI)

National Association of Safety Professionals (NASP)

Human Factors and Ergonomics Society (HFES)

American Society of Testing and Materials (ASTM)

Committee Member, F15 – Consumer Products

Positions Held

Engineering Systems Inc., Seattle, Washington

Senior Staff Consultant, 2021 – Present

CASE Forensics / Jensen Hughes, Mountlake Terrace, Washington

Senior Mechanical Engineer, 2020 – 2021

Mechanical Engineer, 2015 – 2020

Versa Power Systems, Inc. / FuelCell Energy, Inc., Littleton, Colorado

Mechanical Engineer II – Systems Test, Safety Officer, 2012 – 2015

ITN Energy Systems, Inc., Littleton, Colorado

Fuel Cell Process Engineer, 2011 – 2012

Colorado School of Mines, Golden, Colorado

Graduate Research Assistant, 2009 – 2011

Graduate Teaching Assistant, 2009

Undergraduate Research Assistant, 2008 – 2009

ATK Space Systems / Launch, Corinne, Utah

NDE & S&E Tooling Engineer Intern, 2008

TANCO Engineering, Inc., Longmont, Colorado

Project Manager Intern, 2007

Continued Education

- PSYC 512: Research Methods, University of Idaho, 2024
- 36th Annual Product Liability Conference, University of Wisconsin-Madison, 2024
- ED 574: Qualitative Research, University of Idaho, 2024
- Internal Review Board (IRB) basic investigator, CITI, 2024
- Walkway Auditor Certificate Program, NFSI, 2024
- PSYC 561: Human Computer Interaction, University of Idaho, 2024
- PSYC 509: Human Factors in Engineering Design, University of Idaho, 2023
- PSYC 444: Sensation & Perception, University of Idaho, 2023
- PSYC 552: Ergonomics & Biomechanics, University of Idaho, 2023
- 35th Annual Product Liability Conference, University of Wisconsin-Madison, 2023
- Certified XL Tribometrist Certification Program, Excel Tribometers, LLC, 2022
- The Anatomy of Fatigue-Related Accidents, HFES webinar, 2022
- Construction Change Orders, LinkedIn Learning, 2022
- Construction Management: Reading Drawings & Specifications, LinkedIn Learning, 2022
- Construction Estimating: Specifications and CSI MasterFormat, LinkedIn Learning, 2022
- OSHA # 2045 Machinery and Machine Guarding Standards, University of Washington, 2022
- Using Warnings and Instructions to Increase Safety and Reduce Liability, University of Wisconsin-Madison, 2022
- Safety Auditor Certificate, National Association of Safety Professionals, 2021
- Wildland Fire Investigation, IAAI CFI Trainer, 2021
- Introduction to Appliances, IAAI CFI Trainer, 2021
- Explosion Dynamics, IAAI CFI Trainer, 2021
- Emerging Technologies in Fire Investigation, IAAI CFI Trainer, 2021
- The Deposition Part 1 & 2, IAAI CFI Trainer, 2020

- Understanding Undetermined, IAAI CFI Trainer, 2020
- Using Resources to Validate your Hypothesis, IAAI CFI Trainer, 2020
- Lift Truck Operations 1 & 2, Jensen Hughes Academy, 2020
- Water-Hammer Training Course, Jensen Hughes, 2020
- SOLIDWORKS: Simulation for Finite Element Analysis, LinkedIn Learning, 2020
- FARO Scene 3D Laser Scan Registration, LinkedIn Learning, 2020
- Matterport 3D Scanning and Visualization, LinkedIn Learning, 2020
- Laundry Exhaust & Make Up Air – Definitions, Theory, & Application, LF Systems, 2020
- Building and Elevator Systems, CED Inc., 2020
- Scientific Protocols for Fire Investigation, Washington State Association of Fire Marshals, 2017
- Closed Loop Systems – Open Tower/Heat Exchanger or Fluid Cooler, Baltimore Aircoil Company, 2017
- 54th Annual International Fire, Arson, & Explosion Investigation Training Program, NAFI, 2016
- FARO Focus 3D Scanner certification, FARO, 2016

Publications/Presentations

- **N. Faino**, "Risk Assessment and its Importance in Safe Design and Product Liability Litigation," 36th Annual Product Liability Conference, University of Wisconsin-Madison, Madison, WI, October 2024
- **N. Faino**, "Human Factors and its Role in Product Safety Design," IEEE Symposium on Product Compliance Engineering, Bloomington, MN, October 2024
- **N. Faino**, "Three-Dimensional (3D) Scanning in Forensics Investigations," Defense News, Washington Defense Trial Lawyers, 5 June 2018
- **N. Faino**, "3D Laser Scanning and Forensic Investigations," Fire Prevention Institute, Washington State Association of Fire Marshals, 2016
- **N. Faino**, W. Rosensteel, B. Gorman, N. Sullivan, "Progress Toward Inkjet Deposition of Segmented-in-Series Solid-Oxide Fuel Cell Architectures," SOFC XII Conference, Montreal, Canada, May 2011
- S. Babiniec, A. E. Richards, **N. Faino**, N. Sullivan, "Development, Fabrication and Testing of Perovskite-Based Anodes in Tubular SOFCs," SOFC XII Conference, Montreal, Canada, May 2011
- S. Babiniec, N. P. Sullivan, A. E. Richards, **N. Faino**, "Multi-Phase Tubular Perovskite-Based Anodes for use in Hydrocarbon-Fueled Solid-Oxide Fuel Cells", European Fuel Cell Forum, Lucerne, Switzerland, June 2010

Patent Application

- Michael Stowell, Paul Thoen, Eric White, **Nicolaus Faino** (2014). Use of Microwaves in Annealing Fuel Cell Anode Materials and Plasma Deposition of Electrolyte Materials. U.S. Patent Application #61/947,176, filed March 2014. Patent Pending

Selected Project Experience

Human Factors Investigations

- Evaluated warnings and instructions manuals for both industrial equipment and provided input to improve documentation, including updating symbols and safety messaging to be consistent with applicable ANSI and ISO standards.
- Inspected premises related to a trip and fall incident and evaluated the location with respect to applicable building codes as well as human factors concepts related to perception. Determined that fixture layout was consistent with applicable clearance requirements and the alleged trip hazard demonstrated qualities such as high contrast color and different patterns that would increase conspicuity.
- Evaluated and tested chairs related to personal injury claims. Determined if the products met applicable standards. Tested the chairs under various configurations and loading conditions to simulate both expected and improper usage of the products, using the results to compare with the subject evidence.
- Evaluated and tested automatic doors, ranging from overhead parking lot doors to building elevators, related to personal injury claims. Tested their operation to determine if they met applicable codes and standards.
- Instrumented and conducted tests on various pallet jacks to evaluate operation and response times related to an alleged equipment failure, which included devising a safe testing method while also simulating the load and slope at the incident site.

Equipment and Mechanical Analyses

- Reviewed and evaluated designs of processing equipment for extraction of oils used in the cannabis industry with regards to an intellectual property infringement case and compared the various operating conditions and design elements.
- Developed SolidWorks finite element analysis (FEA) stress model of a large vehicle axle housing to test various configurations and loading conditions. An exemplar was 3D scanned and converted to a solid model for use with FEA. Model results were correlated with laboratory test data obtained from strain gage testing of exemplar axle housing subjected to various configurations and loads.
- Documented and determined the damage of an imploded wall was due to a design and controls failure of fresh air dampers for large backup generators in a newly constructed hospital. The improper hardwiring of the controls led to a large vacuum created in the generator room when two separate power switchgears were cycled in an abnormal sequence.

Fire and Explosion

- Developed a Mathematica thermal model to calculate the heat transfer of falling metal particles emanating from arced power lines and the final temperature and resting location. Incorporated data used from 3D scans of power poles to obtain dimensional data and analyze line sag to calculate and correlate the tension, sag, and intersection of the power lines depending on the pole locations, heights, and tilts.

- Propane explosion and fire resulting from an overturned tank. Developed a MathCad fluid model to calculate the volumetric flow rate of both gaseous and liquid propane escaping from tank manifolds, incorporating flashing flow.
- Instrumented and tested various exemplar and subject fire-related components and structures, ranging from small butane stoves to a full-size partially reconstructed wood frame house with an integrated wood fireplace and flue pipe. Analyzed the data which included temperatures, pressures, flow rates, and electrical power, and compared various operating conditions and configurations.

Plumbing, Piping, and Water Losses

- Evaluated the system designs and installation conditions related to large losses for high rises and other buildings that utilized polypropylene (PP-R) piping. Included identification of locations of interest and installation of temperature, pressure, and flow monitoring instrumentation for in-situ operation condition data collection.
- Conducted testing to determine the failure mechanism of a fractured copper stub-out, which included simulating the failed joint under various configurations including intentionally introduced installation defects and operating conditions. Combined with site visit documentation and water meter data was able to determine the most probable cause of failure.
- Inspected and evaluated an alleged failure of a well pump on a large residential property, which required multiple site visits, coordination of the pump removal, and documentation of the pump, well, house, and storage tank conditions and elevations.