Jeff D. Colwell

PhD, PE

Principal, Regional Operations Manager

Dr. Jeff Colwell is a Principal Engineer at ESi, where he specializes in the engineering analysis of thermal and combustion processes, especially the cause, origin, and propagation of fires and explosions. Dr. Colwell has investigated fires and explosions in a wide array of applications, including motor vehicles, residential and commercial structures, wildfires, and industrial complexes associated with the chemical, drilling, refining, and mining industries.

Technical issues addressed have included cause and origin determination, burn pattern interpretation, evaluation of ignition mechanisms, smoldering and self-heating, fire spread, smoke transport, smoke detector operation, building evacuation, fire department response, carbon monoxide poisoning, and lithium-ion battery performance.

Dr. Colwell's research has focused on fire dynamics, burn patterns, and forced ignition mechanisms, including spark (electrostatic) and hot-surface ignition of combustibles, as well as ignition mechanisms associated with various types of electrical components. He has also conducted research involving complex two-phase flows, liquid atomization, and droplet transport.

Prior to joining ESi, he was a founder of Colwell Consulting and was previously a Principal Engineer at Exponent, where he worked for more than 18 years. Dr. Colwell also held research positions at AlliedSignal Aerospace, the Combustion Laboratory at Arizona State University, the High Temperature Gas Dynamics Laboratory at Stanford University, and the Thermal Sciences and Propulsion Center at Purdue University.

Education

PhD, Mechanical Engineering. Arizona State University.

MS, Engineering. Stanford University.

MS, Mechanical Engineering. Purdue University.

BS, Mechanical Engineering. University of Wyoming.

Licenses & Certifications

- State of Arizona P.E. License 31176

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ESi Scottsdale

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Areas of Specialization

- Thermal Sciences
- Combustion
- Fire Cause & Origin Determination

- State of California P.E. License M32037
- National Counsel of Examiners for Engineering and Surveying Council Record File 51102

Positions Held

Engineering Systems Inc., Scottdale, Arizona

- Principal & Regional Operations Manager, 2025 – Present

Colwell Consulting, Scottsdale, Arizona

- Principal Engineer, 2013-2025

Exponent

- Principal Engineer, 1995-2013

AlliedSignal Aerospace

Systems Analyst, 1993-1995

Continuing Education

- **Fire Cause and Origin Investigation 1A & 1B** – California State Fire Marshal
- **Fundamentals of Automotive Fuel Delivery Systems Course** – Society of Automotive Engineers
- **Advanced Cognitive Interviewing and Forensic Statement Analysis** – Behavior Analysis Training Institute

Professional Affiliations/Honors

National Fire Protection Association

- Principal Member, Technical Committee on Recreational Vehicles, responsible for NFPA 1192: Standard on Recreational Vehicles, and NFPA 1192: Standard for Recreational Vehicle Parks and Campgrounds, 2006 –2019

Society of Automotive Engineers

- Course Instructor, “Fundamentals of Motor Vehicle Fire Investigation,” 2009 – Present
- Associate Editor, SAE International Journal of Passenger Cars—Mechanical Systems, 2010–2021
- Lloyd L. Withrow Distinguished Speaker Award, 2012
- Excellence in Oral Presentation Award, 2009 & 2010
- Committee Chairman & Session Organizer, Fire Safety Sessions at SAE World Congress, 2008–2010

Omicron Delta Kappa

- Pi Tau Sigma, Mortar Board

Union Carbide Corporation

- Outstanding Research Award, 1994

Publications

“Evaluating Fire Propagation into the Passenger Compartment via Full-Scale Burn Testing,” M. Papageorge and **J.D. Colwell**, SAE Technical Paper 2024-01-2502, 2024.

“Full-Scale Vehicle Burn Test of a 2013 Sedan in a Wildfire Setting,” M. Papageorge, B. Knox, and **J.D. Colwell**, SAE Technical Paper 2024-01-2503, 2024.

“Reliability of Eyewitness Statements in Fire and Explosion Investigations,” **J.D. Colwell** and B. Knox, International Journal of Psychological and Behavioral Sciences, Vol. 16, No. 9, pp. 483–487, 2022.

“Full-Scale Burn Test of a 2014 Sport Utility Vehicle,” B.W. Knox, M. Papageorge, and **J.D. Colwell**, SAE Technical Paper 2020-01-0925, 2020.

“Full-Scale Burn Tests of Side-by-Side All-Terrain Vehicles,” **J.D. Colwell** and B.W. Knox, SAE Paper 2018-01-0279, 2018.

“High-Performance Rear- and Mid-Engine Vehicle Exhaust System Temperatures,” M. Papageorge and **J.D. Colwell**, SAE Paper 2018-01-1436, 2018.

“Full-Scale Burn Test of a 2007 Cargo Van,” **J.D. Colwell** and C.D. Henry, SAE Paper 2016-01-1403, 2016.

“Oxidation Patterns in Motor Vehicle Fire Investigations: Unraveling the Myths,” **J.D. Colwell**, Fire and Arson Investigator, pp. 26–36, January 2015.

“Full-Scale Burn Test of a 1998 Compact Passenger Car,” **J.D. Colwell**, SAE Paper 2014-01-0426, 2014.

“Full-Scale Burn Test of a 2001 Full-Size Pickup Truck,” **J.D. Colwell**, SAE International Journal of Transportation Safety, Vol. 1, No. 2, 2013.

“Full-Scale Burn Test of a 2001 Full-Size Pickup Truck,” **J.D. Colwell**, SAE Paper 2013-01-0214, 2013.

“Full-Scale Burn Test of a 1992 Compact Pickup Truck,” **J.D. Colwell** and M. Cundy, SAE International Journal of Transportation Safety, Vol. 1, No. 2, 2013.

“Full-Scale Burn Test of a 1992 Compact Pickup Truck,” **J.D. Colwell** and M. Cundy, SAE Paper 2013-01-0209, 2013.

“A Review of Oxidation on Steel Surfaces in the Context of Fire Investigations,” **J.D. Colwell** and D. Babic, SAE International Journal of Passenger Cars—Mechanical Systems, Vol. 5, No. 2, 2012.

“A Review of Oxidation on Steel Surfaces in the Context of Fire Investigations,” **J.D. Colwell** and D. Babic, SAE Paper No. 2012-01-0990, 2012.

"Ignition of Combustible Materials by Motor Vehicle Exhaust Systems: A Critical Review," **J.D. Colwell**, SAE International Journal of Passenger Cars—Mechanical Systems, Vol. 3, No. 1, pp. 263, 2010.

"Ignition of Combustible Materials by Motor Vehicle Exhaust Systems: A Critical Review," **J.D. Colwell**, SAE Paper No. 2010-01- 0130, 2010.

"Steady-State and Transient Motor Vehicle Exhaust System Temperatures," **J.D. Colwell** and K. Biswas, SAE International Journal of Passenger Cars—Mechanical Systems, Vol. 2, No. 1, pp. 206, 2009.

"Steady-State and Transient Motor Vehicle Exhaust System Temperatures," **J.D. Colwell** and K. Biswas, SAE Paper No. 2009-01-0013, 2009.

"Hot Surface Ignition of Automotive and Aviation Fluids," **J.D. Colwell** and A. Reza, Fire Technology, Vol. 41, No. 2, pp. 105–123, 2005.

"Use of Soot Patterns to Evaluate Smoke Detector Operability," **J.D. Colwell** and A. Reza, Fire and Arson Investigator, pp. 42–45, July 2003.

"De Novo VOC from Regenerative Thermal Oxidizers," R.J. Martin and **J.D. Colwell**, ASME Summer Heat Transfer Conference, Paper No. HT2003-40557, July 2003.

"Hot Surface Ignition of Jet-A Fuel by Conductive Deposits," **J.D. Colwell**, T.M. Korb, and R.E. Peck, Proceedings of the Combustion Institute, Vol. 29, pp. 297–303, 2002.

"Hot Surface Ignition of Jet-A Fuel by Conductive Deposits," **J.D. Colwell**, PhD Dissertation, Arizona State University, 2001.

"Characteristics of Soil-Tripped Rollovers," N.K. Cooperrider, S.A. Hammoud, and **J.D. Colwell**, SAE Paper No. 980022, 1998.

"An Experimental Study of the Structure of Supercritical Fluid and Conventional Air Paint Sprays," D.W. Senser, **J.D. Colwell**, and R.M. Smith, 22nd Waterborne, High-Solids, and Powder Coatings Symposium, pp. 161–170, February 1995.

"An Experimental Study of Workpiece Interaction Regions and Impact Velocities of Supercritical Fluid Spray," D.W. Senser, **J.D. Colwell**, and K.A. Nielsen, 4th Annual ESD Advanced Coatings Technology Conference, pp. 369–379, November 1994.

"A Comparison Between the Structure of Supercritical Fluid and Conventional Air Paint Sprays," D.W. Senser, **J.D. Colwell**, and K.A. Nielsen, 7th Annual Conference on Liquid Atomization and Spray Systems, pp. 35–39, May 1994.

"Influence of Pressure and Temperature on the Structure of Supercritical Fluid Coating Sprays," **J.D. Colwell**, MS Thesis, Purdue University, 1993.

"Influence on Temperature on the Structure of Supercritical Fluid Coating Sprays," **J.D. Colwell**, D.W. Senser, and K.A. Nielsen, 6th Annual Conference on Liquid Atomization and Spray Systems, pp. 39–43, May 1993.

"Passenger Vehicle Fires (Ed.), Fire Protection Handbook, 20th Edition," A.E. Cote, R.T. Long, **J.D. Colwell**, R. Ray, H.L. Grossman, B. Thomas, and R. Strassburger, National Fire Protection Association, Vol. 2, Sect. 21, Chap. 1, pp. 21.3–21.14, 2008.

Presentations

"Vehicle Fire Investigation," **J.D. Colwell**, California Conference of Arson Investigators, San Luis Obispo, CA, November 10, 2010.

"Case Study on Evacuation Rates within the World Trade Center Towers on September 11, 2001," **J.D. Colwell**, R. Mongia, and A. Reza, 49th Annual Human Factors and Ergonomics Society Conference, Orlando, FL, September 26–30, 2005.

"De Novo VOC from Regenerative Thermal Oxidizers," R.J. Martin and **J.D. Colwell**, ASME Summer Heat Transfer Conference, Las Vegas, NV, July 21–23, 2003.

"Ignition of Jet-A Fuel by Silver Oxide Deposits," **J.D. Colwell** and R.E. Peck, 18th International Colloquium on the Dynamics of Explosions and Reactive Systems, Seattle, WA, August 2001.

"Ignition of Jet-A fuel on Silver Oxide Deposits," **J.D. Colwell** and R.E. Peck, 2nd Joint Meeting of the U.S. Sections of the Combustion Institute, Oakland, CA, March 2001.

"An Experimental Study of the Structure of Supercritical Fluid and Conventional Air Paint Sprays," D.W. Senser, **J.D. Colwell**, and R.M. Smith, 22nd Waterborne, High-Solids, and Powder Coatings Symposium, New Orleans, LA, February 1995.

"An Experimental Study of Workpiece Interaction Regions and Impact Velocities of Supercritical Fluid Spray," D.W. Senser, **J.D. Colwell**, and K.A. Nielsen, 4th Annual ESD Advanced Coatings Technology Conference, Dearborn, MI, November 1994.

"A Comparison Between the Structure of Supercritical Fluid and Conventional Air Paint Sprays," D.W. Senser, **J.D. Colwell**, and K.A. Nielsen, 7th Annual Conference on Liquid Atomization and Spray Systems, Bellevue, WA, May 1994.

"Influence of Temperature on the Structure of Supercritical Fluid Coating Sprays," **J.D. Colwell**, D.W. Senser, and K.A. Nielsen, 24th Annual Meeting of the Fine Particle Society, Chicago, IL, August 1993.

"Influence on Temperature on the Structure of Supercritical Fluid Coating Sprays," **J.D. Colwell**, D.W. Senser, and K.A. Nielsen, 6th Annual Conference on Liquid Atomization and Spray Systems, Worcester, MA, May 1993.