



Exponent[®]
Engineering & Scientific Consulting

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Professional Profile

Dr. Dee applies the fundamentals of chemical engineering to help clients mitigate the risk associated with accidents, losses and injuries. Dr. Dee specializes in the areas of incident investigation, green manufacturing, clean energy, and high purity oxygen systems. Dr. Dee also has project experience in a variety of industries including chemical manufacturing, industrial refining, agricultural and food processing, utilities, consumer goods, green manufacturing and clean energy.

Dr. Dee provides incident investigation and process safety consulting services. As a certified fire and explosion investigator, Dr. Dee has led or assisted investigation teams on fires, explosions and chemical releases impacting residential, commercial and industrial facilities. He has also advised clients as they navigate product liability issues involving dozens of consumer goods and electronic components. Dr. Dee is also a specialist in high purity oxygen systems used in the industrial gas, medical, military and aerospace industry. He serves on two technical committees that focus on safety and design of oxygen systems: ASTM Committee G04 on Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres, and NFPA 53 - Recommended Practice on Materials, Equipment, and Systems Used in Oxygen Enriched Atmospheres. Dr. Dee also serves as an alternate member on NFPA 30B - Code for the Manufacture and Storage of Aerosol Products.

Dr. Dee applies his investigation experience to technology development consulting. He provides independent engineering evaluations for clients considering investment in new technologies at various stages of the engineering project development cycle. In particular, he focuses on projects that are related to alternative energy and sustainability, with a specific focus on biomass processing and conversion.

Dr. Dee earned his doctorate in Chemical Engineering at the University of California, Berkeley. His thesis focused on the production of biofuels from biomass. Dr. Dee studied the conditions necessary to use catalysts to break apart complex biomaterials into smaller building block molecules. At Exponent, Dr. Dee has helped clients characterize catalyst designs, and optimize industrial catalytic processes. Dr. Dee has also provided kinetic and thermal modeling services to clients on projects.

In addition to his chemical engineering degrees, Dr. Dee also received an undergraduate degree in Sociology focusing on deviant behavior, criminology, and law. He has earned certificates during his studies in entrepreneurship and new product development. He also previously worked in the polymer and specialty chemical industries.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of California, Berkeley, 2012

B.S., Chemical Engineering, Case Western Reserve University, magna cum laude, 2007

B.A., Sociology, Case Western Reserve University, magna cum laude, 2007

Licenses and Certifications

Licensed Professional Engineer, Arizona, #70561

Licensed Professional Engineer, Colorado, #PE.0058270

Licensed Professional Engineer, Illinois, #062.065967

Licensed Professional Engineer, Kentucky, #35469

Licensed Professional Engineer, Michigan, #6201069766

Licensed Professional Engineer, Missouri, #2020007484

Licensed Professional Engineer, New Mexico, #26757

Licensed Professional Engineer, Texas, #125884

Certified Fire and Explosion Investigator (CFEI), #18311-10103

Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with OSHA 29 CFR 1910.120

Professional Affiliations

American Institute of Chemical Engineers

National Association of Fire Investigators

National Fire Protection Association

- Principal member of NFPA 53 Committee on Oxygen Enriched Atmospheres
- Alternate member of NFPA 30B Committee on Aerosol Products

American Society for Testing and Materials

- Voting member of G04 Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres and subcommittee G04.02 Recommended Practices

National Association of Subrogation Professionals

Publications

Walters MS, Dee SJ, Ogle RA. Two plants, one fence line: Process safety management in shared facilities. CEP Magazine, February 2020; 39-44.

Dee SJ, Cox BL, Ogle RA, Walters MS. Evaluating inherently safer design with multiattribute utility theory. Process Safety Progress 2019; 38(3): DOI 10.1002/prs.12022.

Dee SJ, Cox BL, Ogle RA. When the fail open valve fails closed: Lessons from investigating the "impossible." Process Safety Progress 2019; 38(3): DOI 10.1002/prs.12031. This paper was also used for

a Process Safety Beacon highlight in June 2020 (<https://www.aiche.org/ccps/resources/process-safety-beacon/archives/2020/june/english>).

Dee SJ, Cox BL, Ogle RA. Development of a slip hazard: partially wetted floors and film formation. *Materials Performance and Characterization* 2016; 5(1): 272-287.

Dee SJ, Cox BL, Ogle RA. Process safety in the classroom: the current state of chemical engineering programs at US universities. *Process Safety Progress* 2015; 34(4): 316-319.

Ogle RA, Dee SJ, Cox BL. Resolving inherently safer design conflicts with decision analysis and multi-attribute utility theory. *Process Safety and Environmental Protection* 2015; 97: 61-69.

Dee SJ, Cox BL, Hart RJ, Farina R, Morrison DR. Effects of cooking on the thermal ignition behavior of vegetable oil. *Proceedings, 2015 Fire and Materials Conference*, San Francisco, CA, Interscience Communications Limited, London, February 2015, pp. 889-904.

Cox BL, Dee SJ, Hart RJ, Morrison DR. Development of a steel component combustion model for fires involving pure oxygen systems. *Process Safety Progress* 2014; 33(3): 299-304.

Dee SJ, Cox BL, Ogle RA. Using near misses to improve risk management decisions. *Process Safety Progress* 2013; 32(4):322-327.

Ogle RA, Carpenter AR, Dee SJ. Promoting commitment to process safety. *Process Safety Progress* 2013; 32(4):319-321.

Ogle RA, Morrison DR, Dee SJ. Using assessments to improve process safety culture. *Process Safety Progress* 2014; 33(2): 148-151.

Dee SJ, Bell AT. Effects of reaction conditions on the acid catalyzed hydrolysis of miscanthus dissolved in an ionic liquid. *Green Chemistry* 2011; 1467-1475.

Dee SJ, Bell AT. A study of the acid-catalyzed hydrolysis of cellulose dissolved in ionic liquids and the factors influencing the dehydration of glucose and the formation of humins. *ChemSusChem* 2011; 4:1166-1173.

Presentations

Dee SJ, Walters MS, Ogle RA. Writing in the margins: Considerations for safe operating limits. American Institute of Chemical Engineers, 2021 Spring Meeting and 17th Global Congress on Process Safety (virtual), April 18-23, 2021.

M. Balaster, Walters MS, Dee SJ, Ogle RA. How to leverage attorney-client privilege for effective incident investigations. American Institute of Chemical Engineers, 2021 Spring Meeting and 17th Global Congress on Process Safety (virtual), April 18-23, 2021.

Cox BL, Dee SJ, Ogle RA, Walters MS. Taking action on your DHA action items. American Institute of Chemical Engineers, 2021 Spring Meeting and 17th Global Congress on Process Safety (virtual), April 18-23, 2021.

Morrison DR, Dee SJ. Materials that set themselves on fire — Investigating spontaneous combustion. ADLA Seminar (virtual), March 25, 2021.

Dee SJ, Cox BL, Ogle RA. Combustible dust hazards and spray drying systems — Understanding NFPA 61's new requirements in a dust hazard analysis. American Institute of Chemical Engineers, 13th Midwest Regional Conference, March 17-18, 2021.

Nasir EF, Dee SJ, Smyth S. Understanding fire hazards in inert cryogenic systems. 13th Midwest Regional Conference, March 17-18, 2021.

Morrison DR, Dee SJ. Materials that set themselves on fire — Investigating spontaneous combustion. MCA/MDLA Joint Seminar (virtual), October 15, 2020.

Walters MS, Dee SJ, Ogle RA. Remember the à la mode: Lessons learned from ammonia release at frozen foods warehouse. Mary Kay O'Connor Process Safety Center, 2020 International Symposium (virtual), October 20-21, 2020.

Walters MS, Dee SJ, Cox BL, Ogle RA. Good practices for the control of hazardous waste emissions. 12th AIChE Southwest Process Technology Conference (virtual), October 1-2, 2020.

Dee SJ, Walters MS, Cox BL, Ogle RA. Is it time for an overhaul? Deciding between short-term and long-term solutions in aging infrastructure. American Institute of Chemical Engineers, 2020 Spring Meeting and 16th Global Congress on Process Safety (virtual), August 17-20, 2020.

Dee, SJ, Cox BL, Walters MS, Ogle RA. PPE – Can you have too much of a good thing? Mary Kay O'Connor Process Safety Center, 2019 International Symposium, College Station, TX, October 22-24, 2019.

Dee SJ, Walters MS, Ogle RA. Why some buildings don't explode: Lessons learned from an underground propane leak investigation. Propane Gas Defense Association, Fall Meeting, Las Vegas, NV, September 26-27, 2019.

Walters MS, Dee SJ, Ogle RA. Two Plants, One Fence Line: Understanding Process Safety Management Responsibilities in Shared Facilities. American Institute of Chemical Engineers, 2019 Spring National Meeting, 15th Global Congress on Process Safety, New Orleans, LA, April 1-4, 2019.

Dee SJ, Kornuta JA. More to the story: Cases of red herrings in failure analysis. Louisiana Association of Defense Counsel, North Louisiana Seminar, Shreveport, LA, March 22, 2019.

Sulmonetti T, Dee SJ, Fecke M. Chemical pretreatment of lignocellulosic biomass: Breaking down the challenges at the industrial scale. International Biomass Conference and Expo, Savannah, GA, March 19-21, 2019.

Stern MC, Bishop J, Dee SJ, Ibarreta A, Ogle RA, Myers TJ. Electrostatic hazards during pneumatic conveying of combustible dusts in flexible hoses. American Institute of Chemical Engineers, 2018 Spring National Meeting, 14th Global Congress on Process Safety, Orlando, FL, April 22-25, 2018.

Dee SJ, Cox BL, Ogle RA, Walters MS. Evaluating inherently safer design with multi-attribute utility theory. American Institute of Chemical Engineers, 2018 Spring National Meeting, 14th Global Congress on Process Safety, Orlando, FL, April 22-25, 2018.

Dee SJ, Sulmonetti T, Fecke M. Finding the hidden hazards in thermal conversion of biomass. International Biomass Conference and Expo, Atlanta, GA, April 17-19, 2018.

Rauchwerger D, Boardingham B, Dee SJ, Kearney J, O'Rourke A. Subrogating catastrophic industrial accidents: Finding the holes in the "swiss cheese." Claims Litigation Management, 2018 Annual Conference, Houston, TX, March 14-18, 2018.

Dee SJ, Kornuta JA. Epic fails: Case study insights to failure analysis techniques. Louisiana Association of Defense Counsel, North Louisiana Seminar, Shreveport, LA, February 23, 2018.

Garcia ME, Cox BL, Dee SJ. O2 no! – Safety considerations for oxidation reactions. AIChE Midwest Regional Conference, Chicago, IL, March 13-14, 2018.

Traina N, Cox BL, Dee SJ. The sweet smell of ammonia hazards. AIChE Midwest Regional Conference, Chicago, IL, March 13-14, 2018.

Walters MS, Cox BL, Dee SJ, Ogle RA. Defining "adequate" in "adequate ventilation." AIChE Midwest Regional Conference, Chicago, IL, March 13-14, 2018.

Dee SJ. What I wish I had learned. 2017 Archer Daniels Midland Sponsored Faculty Workshop. Safety and Chemical Engineering Education. Decatur, IL, July 27, 2017.

Dee SJ, Errera M. Investigating chemical contamination cases. Property & Liability Resource Bureau, Claims Conference & Insurance Services Expo, Boston, MA, March 26-29, 2017.

Cox BL, Dee SJ, Ogle RA. When the fail open valve fails closed: Lessons from investigating the "impossible." American Institute of Chemical Engineers, 2017 Spring National Meeting, 13th Global Congress on Process Safety, San Antonio, TX, March 26-29, 2017.

Dee SJ. Feedstock specifications: Interpretations of off-spec feedstock. International Biomass Conference and Expo, Minneapolis, MN, April 10-13, 2017.

Dee SJ. Evaluating fire hazards in oxygen enriched atmospheres. American Institute of Chemical Engineers, 2017 Midwest Regional Conference, Chicago, IL, February 28-March 1, 2017.

Morrison DR, Dee SJ. Combustible dust - a forensic incident investigation. 2016 Archer Daniels Midland Sponsored Faculty Workshop. Safety and Chemical Engineering Education, Decatur, IL, July 28, 2016.

Dee SJ, Fecke M, Morrison DR, Ogle RA. Becoming "wiser" in management of change. American Institute of Chemical Engineers, 2016 Spring National Meeting, 12th Global Congress on Process Safety, Houston, TX, April 10-14, 2016.

Dee SJ, Ogle RA. Lessons learned when evaluating the feasibility of emerging green technologies. American Institute of Chemical Engineers, 2016 Midwest Regional Conference, Chicago, IL, March 3-4, 2016.

Dee SJ, Ogle RA, Lakhiani SD. Procedural safeguard reliability. American Institute of Chemical Engineers, 2015 Spring National Meeting, 11th Global Congress on Process Safety, Austin, TX, April 27-April 29, 2015.

Morrison, DR, Kumar V, Dee SJ, Cox BL, Al-Shamary M, Al-Qabandi A. Fire from the cascading failure of an oxygen supply system. American Institute of Chemical Engineers, 2015 Spring National Meeting, 11th Global Congress on Process Safety, Austin, TX, April 27-April 29, 2015.

Dee SJ, Cox BL, Ogle RA. Ignition of flammable vapors in partially filled containers. American Institute of Chemical Engineers, 2015 Midwest Regional Conference, Chicago, IL, March 13-14, 2015.

Cox BL, Dee SJ, Ogle RA. Hazards inherent to batch processing: Lessons learned from case studies. American Institute of Chemical Engineers, 2015 Midwest Regional Conference, Chicago, IL, March 13-14, 2015.

Ogle RA, Cox BL, Dee SJ. Scaling analysis for confined dust flame propagation. American Institute of Chemical Engineers, 2015 Midwest Regional Conference, Chicago, IL, March 13-14, 2015.

Dee SJ, Cox BL, Hart RJ, Farina R, Morrison DR. Effects of cooking on the thermal ignition behavior of

vegetable oil. 14th International Conference, Fire and Materials, San Francisco, CA, February 2-4, 2015.

Dee SJ, Cox BL, Ogle RA. Process safety in the classroom: the current state of chemical engineering programs at US universities. American Institute of Chemical Engineers, 2014 Spring National Meeting, 10th Global Congress on Process Safety, New Orleans, LA, March 30-April 3, 2014.

Ogle RA, Carpenter RA, Dee SJ, Cox BL. Inherently safer design: lessons learned about the principle of simplification. American Institute of Chemical Engineers, 2014 Spring National Meeting, 10th Global Congress on Process Safety, New Orleans, LA, March 30-April 3, 2014.

Cox BL, Dee SJ, Ogle RA. Using near misses to improve risk management decisions. American Institute of Chemical Engineers, 2014 Midwest Regional Conference, Chicago, IL, March 10-11, 2014.

Dee SJ, Ogle RA, Morrison DR. Applying game theory to understand process safety culture. American Institute of Chemical Engineers, 2014 Midwest Regional Conference, Chicago, IL, March 10-11, 2014.

Viz MJ, Ogle RA, Dee SJ, Cox BL. Hydrogen sulfide exposure from molten sulfur — A forgotten hazard? American Institute of Chemical Engineers, 2013 Spring National Meeting, 9th Global Congress on Process Safety, San Antonio, TX, April 28-May 2, 2013.

Cox BL, Dee SJ, Hart RJ, Morrison DR. Development of a steel component combustion model for fires involving pure oxygen systems. American Institute of Chemical Engineers, 2013 Spring National Meeting, 47th Annual Loss Prevention Symposium, San Antonio, TX, April 28-May 2, 2013.

Dee SJ, Cox BL, Ogle RA. Using near misses to improve risk management decisions. American Institute of Chemical Engineers, 2013 Spring National Meeting, 28th Center for Chemical Process Safety International Conference, San Antonio, TX, April 28-May 2, 2013.

Ogle RA, Morrison DR, Dee SJ. Using assessments to improve process safety culture. American Institute of Chemical Engineers, 2013 Spring National Meeting, 28th Center for Chemical Process Safety International Conference, San Antonio, TX, April 28-May 2, 2013.

Ogle RA, Carpenter AR, Dee SJ. Promoting commitment to process safety. American Institute of Chemical Engineers, 2013 Spring National Meeting, 15th Process Plant Safety Symposium, San Antonio, TX, April 28-May 2, 2013.

Dee SJ, Hart RJ, Hetrick TH, Morrison DR. Hot surface ignition of bearing grease in horizontal and vertical orientations. National Association of Fire Investigators, International Symposium on Fire Investigation Science and Technology, College Park, MD, October 2012.

Dee SJ, Bell AT. Effects of reaction conditions on the acid catalyzed hydrolysis of miscanthus dissolved in an ionic liquid. American Institute of Chemical Engineers, 2011 Annual Meeting, Minneapolis, MN, October 20, 2011.

Dee SJ, Bell AT. A study of the acid-catalyzed hydrolysis of cellulose dissolved in ionic liquids and the factors influencing the dehydration of glucose and the formation of humins. North American Catalysis Society, 2011 North American Meeting, Detroit, MI June 9, 2011.

Dee SJ, Bell AT. Depolymerization of cellulose using mineral acids in ionic liquids. American Chemical Society Annual Spring Meeting, San Francisco, CA, March 24, 2010.

Dee SJ, Chidambaram M, Bell AT. Biomass dissolution and conversion to transportation fuels in ionic liquids. American Institute of Chemical Engineers Annual Meeting, Nashville, TN, November 11, 2009.