



Exponent[®]
Engineering & Scientific Consulting

Matthew S. Walters, Ph.D., P.E., CFEI

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Professional Profile

Dr. Walters' background is in chemical engineering, specializing in the areas of separations, process modeling, and process control. He has applied his expertise to a variety of pollution control technologies that are intended to prevent exposure to hazardous chemicals, mitigate environmental impacts, and comply with applicable regulations. He has specific project experience related to pollution control technologies that include scrubbers, thermal and catalytic oxidizers, baghouses, and liquid-liquid extractors. Dr. Walters leverages his knowledge of process systems to provide incident investigation and process safety consulting services, such as investigating fires, explosions, and chemical releases.

Dr. Walters frequently utilizes codes, industry standards, and recommended practices to perform hazard analyses, conduct technical assessments of novel systems or technologies, and evaluate claims made in civil litigation or international arbitrations. He has applied his knowledge of authoritative references to several clean energy systems; examples of such facilities include an anaerobic digester, a concentrating solar power plant, and a biomass boiler. Dr. Walters also has extensive experience with National Fire Protection Association (NFPA) standards related to combustible dust (e.g., NFPA 61, 652, and 654) and has used these standards to conduct dust hazard analyses (DHAs) at covered facilities.

Dr. Walters completed his Ph.D. at the University of Texas at Austin, where his dissertation focused on dynamic modeling and process control of carbon capture from power plants using amine scrubbing technology. Prior to joining Exponent, Dr. Walters worked as a software development engineer to provide process simulation capabilities for the gas treating and sulfur recovery industries.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Texas, Austin, 2016

M.S., Chemical Engineering, University of Texas, Austin, 2014

B.S., Chemical Engineering, Purdue University, 2011

B.S., Chemistry, Purdue University, 2011

Cockrell School of Engineering Thrust 2000 Fellowship, 2011-2015

Licenses and Certifications

Licensed Professional Engineer, Illinois, #062.070980

Certified Fire and Explosion Investigator (CFEI), NAFI

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40-Hour OSHA Certification, Hazardous Waste Operations and Emergency Response (HAZWOPER)

Prior Experience

Development Engineer, Optimized Gas Treating, 2016-2017

Process Engineering Intern, Dow Corning, 2015

Discovery Chemistry Intern, Eli Lilly and Company, 2009

Professional Affiliations

American Institute of Chemical Engineers (AIChE)

- Conference Chair: 2022 AIChE Midwest Regional Conference.
- Conference Co-chair: 2021 AIChE Midwest Regional Conference.
- Committee Member: Center for Chemical Process Safety – CCPS Project 291 responsible for the development of a CCPS guidelines book on managing abnormal situations.
- Session Co-chair: CCPS Tutorials in Process Safety, 10th Process Safety Management Mentoring (PSMM) Forum, 17th Global Congress on Process Safety, 2021.
- Session Co-chair: CCPS Tutorials in Process Safety, 9th Process Safety Management Mentoring (PSMM) Forum, 16th Global Congress on Process Safety, 2020.

National Fire Protection Association (NFPA)

National Association of Fire Investigators (NAFI)

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).

Walters MS, Osuofa JO, Lin Y-J, Edgar TF, Rochelle GT. Process Control of the Advanced Flash Stripper for CO₂ Solvent Regeneration. Chemical Engineering & Processing, 2016; 107:21-28.

Walters MS, Edgar TF, Rochelle GT. Dynamic Modeling and Control of an Intercooled Absorber for Post-combustion CO₂ Capture. Chemical Engineering & Processing, 2016; 107:1-10.

Walters MS, Edgar TF, Rochelle GT. Regulatory Control of Amine Scrubbing for CO₂ Capture from Power Plants. Industrial & Engineering Chemistry Research, 2016; 55:4646-4657.

Walters MS, Lin Y-J, Sachde DJ, Edgar TF, Rochelle GT. Control Relevant Model of Amine Scrubbing for CO₂ Capture from Power Plants. Industrial & Engineering Chemistry Research, 2016; 55:1690-1700.

Presentations

Dee SJ, Ogle RA, Walters MS. 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.

Walters MS, Balaster MM, 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, Walters, MS, Dee SJ, Ogle RA. 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, Walters MS. Materials that Set Themselves on Fire — Investigating Spontaneous Combustion. OCAAFII Quarterly Training (virtual), November 17, 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 Meeting and 15th Global Congress on Process Safety, New Orleans, LA, April 1-4, 2019.

Dee SJ, Cox BL, Ogle RA, Walters MS. Evaluating Inherently Safer Design with Multi-attribute Utility Theory. American Institute of Chemical Engineers, 2018 Spring Meeting and 14th Global Congress on Process Safety, Orlando, FL, April 22-25, 2018.

Walters MS, Dee, SJ, Cox BL, Ogle, RA. Defining "Adequate" in "Adequate Ventilation." American Institute of Chemical Engineers, 10th AIChE Midwest Regional Conference, Chicago, IL, March 13-14, 2018.

Walters MS, Jones C. Understanding Amine Absorber Operation. Euro Petroleum Consultants, 17th International Downstream Technology Conference, Dubrovnik, Croatia, May 16-17, 2017.

Jones C, Walters MS. Effect of Solvent Contaminants on Amine Selectivity. University of Oklahoma, 67th Annual Laurance Reid Gas Conditioning Conference, Norman, OK, February 26-March 1, 2017.

Walters MS, Edgar TF, Rochelle GT. Process Control of an Advanced Post-combustion Amine Scrubbing System. Texas Carbon Management Program, 3rd University of Texas Conference on Carbon Capture and Storage, Austin, TX, February 17-19, 2016.

Walters MS, Edgar TF, Rochelle GT. Regulatory Process Control of an Advanced Post-combustion Amine Scrubbing System. American Institute of Chemical Engineers, 2015 AIChE Annual Meeting, Salt Lake City, UT, November 8-13, 2015.

Walters MS, Edgar TF, Rochelle GT. Dynamic Modeling, Validation, and Time Scale Decomposition of an Advanced Post-combustion Amine Scrubbing Process. IEAGHG, 12th International Conference on Greenhouse Gas Control Technologies, Austin, TX, October 5-9, 2014.

Walters MS, Edgar TF, Rochelle GT. Dynamic Modeling of Post-combustion Amine Scrubbing. Texas Carbon Management Program, 2nd University of Texas Conference on Carbon Capture and Storage, Austin, TX, January 28-30, 2014.

Walters MS, Edgar TF, Rochelle GT. A Plantwide Dynamic Model of Post-combustion Amine Scrubbing with Aqueous Piperazine, American Institute of Chemical Engineers, 2013 AIChE Annual Meeting, San Francisco, CA, November 3-8, 2013.

Walters MS, Edgar TF, Rochelle GT. Dynamic Modeling of Advanced Process Configurations for Post-combustion Amine Scrubbing. IEAGHG, 2nd Post Combustion Capture Conference, Bergen, Norway, September 17-20, 2013.

Walters MS, Dunia RH, Edgar TF, Rochelle GT. Two-stage Flash for CO₂ Regeneration: Dynamic Modeling and Pilot Plant Validation. IEAGHG, 11th International Conference on Greenhouse Gas Control Technologies, Kyoto, Japan, November 18-22, 2012.

Chen E, Madan T, Sachde D, Walters MS, Nielsen P, Rochelle GT. Pilot Plant Results with Piperazine. IEAGHG, 11th International Conference on Greenhouse Gas Control Technologies, Kyoto, Japan, November 18-22, 2012.