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Engineering & Scientific Consulting

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Professional Profile

Dr. Hart assists in the investigation and analyses of fires, explosions, and chemical process safety incidents. His investigations have focused on mid-scale to large-scale chemical production facilities, industrial material handling and processing facilities, power plants, refineries, and bio-fuel production facilities. The investigations have focused on fire and explosion cause analysis, origin determination, and evaluating root causes and contributory events covering the elements of process safety management. Additionally, Dr. Hart has experience in the design of high temperature and high pressure experimental techniques, chemical analysis, and analytical chemistry methodologies and interpretations.

Dr. Hart has also been trained in the use of the consequence and hazard analysis software tool PHAST. Dr. Hart has applied the PHAST tool and other consequence modeling methodologies in assisting clients with regulatory permit applications for LNG import/export terminals, assessing project risk in the pre-FEED stages of plant design, conducting facility siting studies, performing EPA Risk Management Plan (RMP) evaluations, evaluating natural gas blowdowns, and in fire and explosion investigations.

Dr. Hart is an active professional in local and national chemical process safety communities. In addition to his technical committee memberships and publications, he has served in leadership roles in the field of chemical process safety through process safety conferences sponsored by the American Institute of Chemical Engineers. Most recently, Dr. Hart chaired two sessions at the 12th Global Congress on Process Safety in 2016, which had approximately 100 domestic and international attendees from the fields of process safety and risk analysis attending both sessions. The focus of the sessions concerned the "enhanced application and sharing of lessons learned" and vibrant management systems, tenets of the CCPS Vision 20/20 program intended to improve process safety.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Georgia Institute of Technology (Georgia Tech), 2011

B.S., Chemical Engineering, University of Wyoming, 2006

Best Presentation Award, Fuels and Petrochemicals Division, AIChE Spring Meeting, 2013

Graduate Research Award in Separations Extraction, AIChE Separations Division, 2010

President's Fellowship, Georgia Institute of Technology, 2006-2010

Trustees' Superior Scholarship, University of Wyoming, 2002-2006

Licenses and Certifications

Licensed Professional Engineer, Illinois, #062065304

Licensed Professional Engineer, Texas, #138588

Licensed Professional Engineer Chemical, Louisiana, #0045069

40-hour OSHA Certification, Hazardous Waste Operations and Emergency Response

Professional Affiliations

American Institute of Chemical Engineers — AIChE (member)

American Chemical Society — ACS (member)

National Association of Fire Investigators — NAFI (member)

National Fire Protection Association — NFPA (member)

Publications

Ibarreta A, Hart RJ, Ponchaut N, Morrison DR, Kytömaa H. How does concrete affect evaporation of cryogenic liquids: Evaluating liquefied natural gas plant safety. ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering 2016; 2(1):011005-1-5.

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.

McInerney EH, Hart RJ, Morrison D, Kytömaa HK. New quantitative risk criteria for US LNG Facilities. Process Safety Progress 2014; 33(3):237-46.

Ibarreta AF, Ponchaut NF, Hart RJ, Morrison DR, Kytömaa HK. Using passive methods to reduce flammable release hazards at LNG facilities. FS-World Magazine "Oil & Gas Industry" edition, Spring 2014.

Medina-Ramos W, Mojica MA, Cope ED, Hart RJ, Pollet P, Eckert CA, Liotta CL. Water at elevated temperatures (WET): reactanc, catalyst, and solvent in the selective hydrolysis of protecting groups. Green Chemistry 2014; 16(4):2147-55.

Conference Proceedings and Invited Presentations

Morrison DR, Hart RJ. Fire science and investigation. Invited lecture to BME 4093 - Special Topics: Forensic Engineering, Lawrence Technological University, Detroit, MI, November 11, 2015.

Hart RJ, Morrison DR. The hazard we know: Comparing transportation risk of LPG and LNG. American Institute of Chemical Engineers, 2015 Spring National Meeting and 11th Global Congress on Process Safety, Austin, TX, April 26-30, 2015.

Ramirez JC, Morrison DR, Hart RJ, Hetrick TM. Atmospheric venting of flammable gas to a "safe area": comparing guidelines to calculations. SPE-15HSSE-P-305-SPE-MS. SPE E&P Health, Safety, Security, & Environmental Conference - Americas, Denver, CO, March 16-18, 2015.

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, pp. 889-904, February 2015.

Hart RJ, Morrison DR. Rail transportation risk assessment comparison: Ethanol versus LNG. 6th CCPS Latin American Conference on Process Safety, Buenos Aires, Argentina, September 15-17, 2014.

Ramirez JC, Morrison DR, Hart RJ, Hetrick TM. Venting flammable gas to a "safe area": An objective review of best practices and guidelines. American Institute of Chemical Engineers, 2014 Spring National Meeting, 48th Annual Loss Prevention Symposium, New Orleans, LA, March 30-April 2, 2014.

Morrison DR, Hart RJ. Utilizing risk assessment for Safe LNG bunker operations. Lloyd's Maritime Academy LNG Bunkering Seminar, Miami, FL, November 18-19, 2013.

Morrison DR, Hart RJ, Kytömaa HK, Ibarreta AF, Ponchaut N. How does concrete affect evaporation of cryogenic liquids: Evaluating LNG plant safety. American Society of Mechanical Engineers 2013 International Mechanical Engineering Congress and Exposition, San Diego, CA, November 15-21, 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.

Hart RJ, Morrison DR, Ibarreta AF, Kytömaa HK. Guidelines for relative hazard ranking of refrigerants and siting considerations for LNG liquefaction units. American Institute of Chemical Engineers 2013 Spring National Meeting, 13th Topical Conference on Gas Utilization, San Antonio, TX, April 28-May 2, 2013.

Ibarreta AF, Hart RJ, Morrison DR, Kytömaa HK. A View of the evolving LNG regulations and associated exclusion zones from an industry perspective. American Institute of Chemical Engineers 2013 Spring National Meeting, 13th Topical Conference on Gas Utilization, San Antonio, TX, April 28-May 2, 2013.

McInerney E, Hart RJ, Morrison DR, Kytömaa H. New quantitative risk criteria for U.S. LNG facilities. American Institute of Chemical Engineers 2013 Spring National Meeting, 47th Loss Prevention Symposium, San Antonio, TX, April 28-May 2, 2013.

Hart RJ, Morrison DR. Chemical process safety and sustainable materials hazards. American Institute of Chemical Engineers 5th Annual Midwest Regional Conference, Chicago, IL, January 31-February 1, 2013.

Dee SJ, Hart RJ, Hetrick TM, Morrison DR. Hot surface ignition of bearing grease in horizontal and vertical orientations. ISFI 2012, Maryland, October 15-18, 2012.

Hart RH, Morrison DR. Jetting and Flashing of LNG. DNV User Conference, Katy, TX, October 16-17, 2012.

Morrison DR, Hart RJ, Kytömaa HK. Guidelines for jetting and flashing LNG vapor exclusion zone analysis. American Institute of Chemical Engineers, 2012 Spring National Meeting, LNG Plant Safety and Protection Session, Houston, TX, April 1-5, 2012.

Hart RJ, Morrison DR. Thermal safety of ionic liquids. American Institute of Chemical Engineers, 2012 Spring National Meeting, 46th Annual Loss Prevention Symposium, Houston, TX, April 1-5, 2012.

Ogle RA, Morrison DR, Hart RJ. Thermodynamic models for leak detection of natural gas in salt cavern storage. American Institute of Chemical Engineers, 2011 Annual Meeting, Minneapolis, MN, October 19, 2011.

Morrison DR, Hart RJ, Heckel P. Exposing the blurry lines between personal safety and process safety education: contrasting NIOSH prevention through design (PtD) with CCPS SACHE. American Institute of Chemical Engineers, 2011 Annual Meeting, Minneapolis, MN, October 18, 2011.

Morrison DR, Hart RJ. Guidelines for identifying and mitigating thermal hazards of sustainable materials. American Institute of Chemical Engineers, 2011 Spring National Meeting, 45th Annual Loss Prevention Symposium, Chicago, IL, March 13-15, 2011.

Hart R, Switzer J, Rohan A, Fahdel A, Eckert CA, Liotta CL. Design and development of reversible ionic liquids for post-combustion CO₂ recovery. Oral presentation, International Chemical Congress of Pacific Basin Societies, Honolulu, HI, 2010.

Hart R, Switzer J, Rohan A, Fahdel A, Eckert CA, Liotta CL. The design of reversible ionic liquids for post-combustion CO₂ recovery. Oral presentation, American Institute of Chemical Engineers' Annual Meeting, Salt Lake City, UT, 2010.

Hart R, Cope E, Eckert CA, Liotta CL. Nearcritical water for facile deprotection reactions and benign urea production. Oral presentation, American Institute of Chemical Engineers' Annual Meeting, Salt Lake City, UT, 2010.

Hart R, Eckert CA, Liotta CL. Unique class of sustainable solvents: Reversible ionic liquids. Oral presentation, 239th American Chemical Society National Meeting, San Francisco, CA, 2010.

Hart R, Cope E, Eckert CA, Liotta CL. Design and development of a sustainable DMSO substitute: piperylene sulfone. Oral presentation, 239th American Chemical Society National Meeting, San Francisco, CA, 2010.

Hart R, Cope E, Pollet P, Eckert CA, Liotta CL, Kjell DP. Nearcritical water for the benign removal of N-Boc protecting groups. Oral presentation, American Institute of Chemical Engineers' Annual Meeting, Nashville, TN, 2009.

Hart R, Blasucci V, Eckert CA, Liotta CL. Development of one-component reversible ionic liquids for energy applications. Poster presentation, American Institute of Chemical Engineers' Annual Meeting, Nashville, TN, 2009.

Hart R, Liotta CL, Eckert CA. Structure-property relationships for the optimization of reversible ionic liquid solvents. Oral presentation, American Institute of Chemical Engineers' Annual Meeting, Philadelphia, PA, 2008.

Hart R, Eckert CA, Liotta CL. Design of optimal solvent systems for post-combustion CO₂ recovery. Poster presentation, Interuniversity National Consortium (INCA) Green Chemistry Summer School, Venice, Italy, 2008.

Hart R, Dilek C, Llopis-Mestre V, Lu J, Liotta CL, Eckert CA. Chemical equilibria in 'smart' ionic liquids. Oral presentation, American Institute of Chemical Engineers' Annual Meeting, Salt Lake City, UT, 2007.