AIChE Midwest Regional Conference
March 3-4, 2016 – Chicago, IL

Process Safety Workshop

Friday, March 4, 2016
2:00pm – 5:45pm

Cost: $100 (requires a 1 day registration at the conference)

Process Safety Workshop Agenda

2:00pm-2:50pm	Process Hazards Analysis, Peter Hereña, BakerRisk
2:55pm-3:45pm	Safe Work Practices, Brenton Cox and Sean Dee, Exponent, Inc.
4:00pm-4:50pm	Quantitative Risk Analysis, Jesse Calderon and Mike Toraason, BakerRisk
4:55pm-5:45pm	Standard Operating Procedures, Sunil Lakhiani and Sean Dee, Exponent, Inc.

Workshop Abstracts and Instructor Biographies

Process Hazards Analysis 2:00pm-2:50pm

Instructor: Peter Hereña, BakerRisk

A Process Hazards Analysis (PHA) is a required activity for operating companies that must comply with OSHA 29 CFR 1910.119, the regulation that governs Process Safety Management (PSM). It is a good practice for any company, regardless of applicability of the PSM regulation, to understand and manage process safety hazards in a chemical processing environment. The concept has been successfully applied to many types of systems beyond the industrial manufacture of chemical products.

A PHA can consist of many different techniques, from the simple "What-If?" analysis, to the commonly applied Hazard and Operability Analysis (HAZOP), extending to sophisticated and detailed modeling of a Quantitative Risk Analysis (QRA). Besides the methods mentioned above, there are many more that reside under the umbrella of good PHA methods. This workshop will discuss the different methodologies, their advantages and disadvantages, and will promote discussion on factors to consider when deciding which method to choose for your application.

Peter G. Hereña, P.E. (Controls), ISA 84 Expert, Operations Manager,
BakerRisk, Chicago Office
pherena@bakerrisk.com

Instructor Biography: Mr. Hereña is a graduate of Northwestern University with a degree in Chemical Engineering. He leads reliability analysis, including Safety Instrumented Systems (SIS) performance. He also is a lead trainer and facilitator in PHA methods within BakerRisk and for external courses. He served as a technical leader at UOP while working on process unit startups worldwide. His background is in instrumentation and controls.

Safe Work Practices during Hot Work, Lockout/Tagout, and Confined Space Entry 2:55pm-3:45pm

Instructors: Dr. Brenton Cox and Dr. Sean Dee, Exponent, Inc.

Hot work, lockout/tagout, and confined space entry are examples of non-routine work activities where existing engineering and administrative controls may be bypassed, disabled, or replaced with temporary safeguards to facilitate work activity. In these scenarios, the risk of experiencing a process safety incident is heightened unless the hazards are otherwise effectively managed. Safe work practices including job safety analyses, work permits, and checklists are additional control measures employed to manage this risk.

This session will review a series of case studies involving process safety incidents that occurred during non-routine work activities, highlighting the hazards associated with these activities, along with issues related to regulatory compliance. We will also summarize guidance from various sources aimed at improving hazard mitigation, worker safety, and regulatory compliance.

Brenton L. Cox, PhD, PE, CFEI and Sean J. Dee, Ph.D., P.E., CFEI
Exponent, Inc., 4580 Weaver Parkway, Suite 100, Warrenville, IL 60555
bcox@exponent.com; sdee@exponent.com

Instructor Biographies: Dr. Brenton Cox specializes in the investigation and analysis of incidents involving fires, explosions, and chemical releases. These investigations have involved reactive chemicals, agricultural commodities, hazardous waste, and consumer products. Dr. Cox also consults on issues of process safety and has participated in risk assessments for consumer products and industrial facilities, including hazard and operability (HAZOP) studies, quantitative risk assessment (QRA), and consequence modeling.

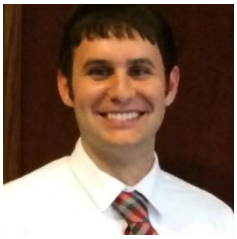
Dr. Sean Dee specializes in the investigation of fires, explosions, chemical releases, and process safety management. His expertise is applying fundamentals of chemistry, reaction engineering, and kinetics to accident evaluation and prevention. Dr. Dee's responsibilities include conducting origin and cause investigations of residential, commercial, and industrial fires; assisting with risk assessments and hazard and operability (HAZOP) studies; and evaluating consumer product failures.

Quantitative Risk Analysis 4:00pm-4:50pm

Instructors: Jesse Calderon and Mike Toraason, BakerRisk

Operating companies use consequence modeling to understand the onsite and offsite risk associated with release of flammable and toxic materials from chemical processes. Doing so helps a company provide countermeasures and controls that impacts to personnel.

The Quantitative Risk Analysis (QRA) method attempts to answer the following questions with respect to onsite and offsite releases: *What can go wrong? How likely is it? What are the impacts? So what should I do?* The approach utilizes a simple framework to quantify the impact of flammable and toxic releases. This quantification requires the assimilation of process information, site-specific data, offsite population densities, weather data, failure analysis and consequence modeling. The workshop will review basic terminology and describe how consequence modeling can be supplemented with a QRA to understand the likelihood of consequences and the total risk posed by the facility operation. The workshop will also describe the information that is typically needed to perform such a study, and what process engineers and technicians must know to be able to understand QRA results.



Jesse Calderon and Mike Toraason
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Instructor Biographies: Mr. Calderon and Mr. Toraason are both graduates of the University of Iowa with degrees in Chemical Engineering. They have led projects worldwide consisting of consequence modeling as well as quantitative risk modeling. They have performed over 100 studies in refining, bulk chemical processing, ethanol production, and fertilizer plants.

Standard Operating Procedures 4:55pm-5:45pm

Instructors: Dr. Sunil D. Lakhiani and Dr. Sean Dee, Exponent, Inc.

Standard operating procedures (SOPs) are an integral part of process safety and a critical layer of defense in the process industry. SOPs provide detailed, step-by-step instructions to operators/employees to perform the job safely. Due to the importance of the role of SOPs in work situations, especially critical tasks, it is important to have procedures which are not just technically accurate, but are free of error traps that may increase the likelihood for human errors and can lead to undesirable outcomes. The purpose of this workshop is to identify various error inducing factors that need to be considered and resolved during the development and review of SOPs. In addition, the workshop will cover guidelines for developing procedures that enhance comprehension and reduce the potential for human errors.

Sunil D. Lakhiani, Ph.D., P.E. and Sean J. Dee, Ph.D., P.E., CFEI
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Instructor Biographies: Dr. Sunil Lakhiani is a managing engineer at Exponent's Human Factors practice. He uses his background in chemical engineering and industrial engineering to evaluate the human factors issues in the process industry and occupational settings, including facility and equipment design, operating procedures and instructions, warnings and safety communication, training, accident investigations and human error analysis. Dr. Lakhiani's Ph.D. dissertation was focused on understanding relationships between human perception and response related to employees' near-miss reporting behavior. He is currently a licensed professional engineer in the state of Wisconsin.

Dr. Sean Dee specializes in the investigation of fires, explosions, chemical releases, and process safety management. His expertise is applying fundamentals of chemistry, reaction engineering, and kinetics to accident evaluation and prevention. Dr. Dee's responsibilities include conducting origin and cause investigations of residential, commercial, and industrial fires; assisting with risk assessments and hazard and operability (HAZOP) studies; and evaluating consumer product failures.