

ROBERT L. COLLINS, PE, CSP, CIH

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PROFESSIONAL SUMMARY

Mr. Collins has broad domestic and international experience in environmental, health and safety including experience in chemical and specialty chemical manufacturing, consulting and education as well as scientific research and development.

EDUCATION

- B.S., Chemical Engineering, The Ohio State University
- M.S., Occupational Safety and Health with Concentration in Environmental Management – Columbia Southern University
- Master of Public Health, University of Texas School of Public Health in San Antonio

EMPLOYMENT HISTORY

- Embry-Riddle Aeronautical University – Adjunct Faculty
- Integrated Mission Support Services – Senior Industrial Hygienist
- Southwest Research Institute – Principal Engineer
- Stark State School of Technology – EH&S Program Coordinator
- Clayton Group Services - Manager, Occupational Health and Safety
- ATC Associates Inc. - Industrial Hygiene Division Manager
- RLC Consulting, Ltd. - President and Chief Environmental Hygienist
- Lawhon & Associates, Inc. - Senior Environmental Hygienist
- Franklin International, Inc. - Manager, Process Safety and Environmental Engineering
- Baker Environmental, Inc. – Senior Chemical Engineer
- RLC Consulting, Ltd. – President and Chief Environmental Hygienist
- Borden, Inc. – Process Safety Engineering Manager
- U.S.S. Chemicals – Manager, Safety and Environmental
- Borden, Inc. – Safety Coordinator

PROFESSIONAL REGISTRATIONS

- Registered Professional Engineer (OH, #53689)
- Certified Industrial Hygienist (#CP 7429)
- Certified Safety Professional (#7032)

PROFESSIONAL EXPERIENCE

Process Safety Management / Systems Safety

- While working at Southwest Research Institute, Mr. Collins developed and implemented a full Process Safety Management (PSM) program for a gas to fuels pilot refinery.
- Developed comprehensive PSM programs for 10 batch and 1 continuous reactor system as well as 10 mixing systems at an adhesives and sealants manufacturer in Columbus, Ohio.

- Led and/or recorded Process Hazards Analyses (PHAs) using the Hazard and Operability (HAZOP) study, What-If Analysis, Checklist and Combination What-If Analysis and Checklist methodologies for systems at an adhesives and sealants manufacturer in Columbus, Ohio.
- Developed comprehensive PSM programs for three (3) separate operations in Elkhart, Indiana and Mishawaka, Indiana.
- Developed a comprehensive PSM program for a company that makes cement sealers and concrete products.
- Led and recorded dozens of PHAs using the Hazard and Operability (HAZOP) study, What-If Analysis, Checklist, Combination What-If Analysis / Checklist and Failure, Modes, Effects and Criticality Analysis (FMECA or FMEA) PHA methodologies.
- Led and/or recorded multiple PSM compliance audits at many sites throughout the U. S.
- Performed a Transportation Risk Analysis for the movement of a reactive and flammable chemical from its point of manufacture in Indiana to two different subsidiary locations in West Virginia and Illinois.
- Performed a gross consequence analysis of all chemical process systems existing within a Fortune 500 company to determine which systems present the greatest risk to the public and the company. This was done to target future PSM efforts on the facilities presenting the greatest potential risk.
- Developed risk based criteria for sizing reactor vents, designing reactor venting systems and maximizing production by increasing batch sizes to the maximum safe operating limit.
- Provided process safety and auditing services to facilities of a Fortune 500 company located in Europe, South America and the Far East.

Project / Personnel Management

- While working at Franklin International, Mr. Collins managed the process safety and environmental engineering department consisting of four full-time engineers and one full-time administrative assistant.
- Mr. Collins served as overall project manager for the company performing remediation oversight and testing. The remediation oversight and testing portion of this project was budgeted at approximately \$175,000 while the overall remediation project was budgeted at approximately \$1.3MM. The oversight portion of this project required three-(3) full-time personnel with six-(6) additional part-time personnel.
- Mr. Collins served as overall project manager for the company providing Process Safety Management (PSM) services for a Fortune 100 company at two-(2) locations in Indiana. This project was budgeted at \$170,000 and required three-(3) full-time and three-(3) part-time personnel.

Industrial Hygiene

- Developed and implemented baseline and ongoing industrial hygiene monitoring plans for a Fortune 100 company in Florence, Kentucky, a privately held adhesives and sealants manufacturer located in Columbus, Ohio and a scientific research facility in San Antonio, Texas.
- Performed Industrial Hygiene sampling for:
 - Organic vapors including Styrene Monomer, Methyl Methacrylate Monomer, n-Butyl Acrylate Monomer, Vinyl Acetate Monomer, Acetone, Hexane, Toluene and others
 - Methylene Bis Phenyl Diisocyanate (MDI)
 - Dusts and particulates including nuisance dusts and inorganic lead
 - Noise
 - Heat Stress
- Developed and implemented Industrial Hygiene programs and procedures for:
 - Confined Space Entry

- Respiratory Protection
- Personal Protective Equipment
- Lockout / Tagout
- Hazard Communication
- Industrial Hygiene projects including:
 - Designed a local exhaust ventilation system for a dip tank used to apply varnish to wooden parts
 - Designed and installed continuous and demand-type purging systems to reduce operator exposures to organic vapors while reducing fire potentials in mixers using flammable liquids
 - Designed and installed bag dump systems for charging dry powder additives to mixers containing flammable liquids in a manner that not only reduces or eliminates static potentials but reduces nuisance dust exposures using local exhaust ventilation
 - Designed a local exhaust ventilation system for reducing organic vapor exposures to reactor operators
 - Designed and installed a bulk starch storage silo intended to reduce operator exposures to nuisance dusts during unloading
- Developed a mathematical relationship that could be used in estimating the risk of cancer from repeated low-level exposures to fuming sulfuric acid.
- Compiled, developed and estimated physical and toxicological properties for chemical warfare agents to be used in air dispersion modeling during the 1990 Gulf War.

Indoor Air Quality/Mold Remediation

- Provided technical oversight for an 8-week biocleaning and remediation project to remove biological contaminants in a 100,000-ft² school building. This project included the collection of more than 3,500 air and surface samples for mold/fungus and environmental bacteria. Also included periodic monitoring of containment systems using smoke tubes, particle counters and manometer.
- Performed monitoring for biological contaminants including mold/fungus and environmental bacteria in a newly constructed commercial office building with water damage in several heating, ventilating and air-conditioning (HVAC) systems. Provided technical oversight for the biocleaning and remediation project to remove *Stachybotrys* sp. and other biological contamination found.
- Provided baseline and ongoing monitoring of particle counts and mold/fungus on the surgical floor (including operating theatres) of a major central Ohio hospital. This hospital was adding two new floors onto the top of the surgical floor.
- Sought by local media as IAQ expert and expert on biological contaminants.
- Developed, implemented and marketed procedures for bio-remediation of commercial facilities contaminated with biological contaminants.
- Performed a variety of Indoor Air Quality (IAQ) investigations for commercial, industrial and residential clients.

Personal and Property Safety

- Developed and implemented accident prevention programs which resulted in a reduction in lost workday cases from 32 in 1978 to 2 in 1986 as well as a reduction in direct workers compensation costs from ~\$32,000 in 1978 to ~\$10,000 in 1986.
- Developed and presented a supervisory safety skills training program called "Program for Effective Accident Kontrol (PEAK)." The purpose of this training program was to present the tools for identifying potential and actual causes of incidents/accidents so that they could be corrected and/or eliminated, wherever possible, resulting in a reduction in incidents/accidents.
- Organized, equipped and trained a Plant Emergency Organization (P. E. O.) at a Fortune 100 company in Florence, Kentucky. This organization was equipped and trained to perform advanced first aid and

- CPR as well as to fight fires that go beyond the incipient stage and into the structural firefighting stage, if necessary.
- Developed and presented training programs including (among others):
 - Standard first aid
 - Cardio pulmonary resuscitation
 - Fork lift operations
 - Fire extinguisher operation
 - Principles of Accident Prevention
 - Defensive driving (National Safety Council)
 - Developed and installed the following engineered systems for protecting personnel and property:
 - A multiplex system for plant-wide fire and evacuation alarms at a Fortune 100 company in Florence, Kentucky. This system included both automatic and manual fire detection and alarm systems.
 - A fixed fire protection system for a computerized process control center at an adhesives and sealants manufacturer located in Columbus, Ohio.
 - Designed and developed a modified take-up roll for packaging continuous rolls of acrylic sheet at a Fortune 100 company in Florence, Kentucky. Continuous rolls of acrylic sheet were packaged by using a carbon steel shaft three inches in diameter and 12 feet long inserted inside of a fabricated wooden reel. This shaft weighed in excess of 200 pounds and operators were often required to manually lift and insert it into the reel without assistance leading to back injuries. Developed a new system using three inch aluminum tubing and an adjustable steady rest to perform the same tasks while reducing the weight of the shaft.

Air Pollution Control

- Developed and submitted a Title V Air Operating Permit application to Ohio EPA using the STARShip software program developed by the Ohio EPA Division of Air Pollution Control.
- Completed and submitted numerous applications for PTIs for potential sources of air pollution.
- Reviewed and oversaw preparation of baseline and annual air emission inventories for a number of air pollution sources.
- Reviewed, oversaw preparation and submitted annual Fee Emission Statements air pollution sources using the STARShip software program.
- Coordinated the design and installation of numerous engineering projects intended to reduce emissions of air pollution from sources as well as monitor emission control devices.
- Coordinated the design and installation of the following engineering projects intended to reduce emissions of air pollution from sources at an adhesives and sealants manufacturer in Columbus, Ohio as well as monitor emission control devices:
 - A chiller to replace single pass cooling water effectively increasing the control efficiency of vapor condensers
 - Vent-back lines intended to return vapors vented from storage tanks to the mixers from which material is being transferred
 - A silo for the bulk storage of dry powder additives reducing emissions of particulates during unloading
 - Bag dump stations which collect and control particulate emissions during the dumping of dry powder additives from bags
- Designed and installed temperature sensors and data logging devices to track and record the temperatures of vapors leaving vapor condensers and/or water entering them to ensure that permit conditions are always satisfied and that no undesired emission events occur. If such events did occur, a record was made and personnel notified so that the impact could be minimized and reported.

Water Pollution Control

- Oversaw the preparation and submittal NPDES permit applications for storm water discharges and single pass cooling water from an adhesives and sealants manufacturer located in Columbus, Ohio.
- Oversaw the preparation, annual revision and certification of a Storm Water Pollution Prevention Plan for an adhesives and sealants manufacturer located in Columbus, Ohio as required under the applicable NPDES permit.
- Ensured that conditions of an existing pre-treatment permit were being satisfied (i.e., conducted periodic self-monitoring for categorical pollutants as well as worked with local regulatory personnel in implementing conditions of an existing Consent Order).
- Worked with local regulatory and facility personnel as well as outside contractors to obtain de-designation of wastewater discharges.
- Oversaw the operation and maintenance of a biological wastewater treatment plant.

Solid and Hazardous Waste Management

- Worked with a number of Potentially Responsible Party (PRP) groups as well as federal, state and local regulatory agencies to clean up several abandoned waste disposal facilities.
- Established and oversaw solid waste disposal programs at multiple facilities.
- Has managed solid and hazardous wastes since 1980 when RCRA regulations were first promulgated.
- Oversaw the preparation and submittal of one of the first Part B RCRA permit applications submitted in the United States.
- Established one of the first ground water monitoring programs in the United States.
- Provided environmental emergency response training as part of a team contracted to put on the 40 hour Hazardous Materials and Incident Response Operations (HMIRO) course originally created for training federal, state and local employees for first response to transportation incidents and abandoned hazardous waste sites. This training course later evolved into the 40-hour training course currently required under the OSHA Hazardous Waste Operations (HAZWOPER) standard.

Miscellaneous Environmental, Health and Safety Projects

- Integrated and jointly implemented the ISO 14001, ISO 9001, the OSHA Process Safety Management (PSM) Standard and EPA Risk Management Plan Rule for an adhesives and sealants manufacturer located in Columbus, Ohio.
- Presented training programs covering the labeling, packaging, placarding and manifesting of hazardous materials so as to satisfy Department of Transportation (D.O.T.) Regulations.
- Conducted a number of Phase I and Phase II Environmental Assessments for property transfer transactions. These were done for properties to be acquired by an adhesives and sealants manufacturer located in Columbus, Ohio as well as for private clients.
- Conducted a number of general environmental, health and safety inspections and audits for multiple industrial clients.

PAPERS AND PUBLICATIONS

- “Using Failure Modes to Enhance What-If Analysis,” Process Safety Progress, Volume 33, Issue 3, pp. 231-236, September 2014.
- Cook ML, Kowalkowski MA, Collins R, Mathews C, Prosperie SL, Socias C, et al. “Trends in Occupation-Related Musculoskeletal Disorders in Texas and the United States (2003-2009);” Texas Public Health Journal 2013 Fall 2013; 65(4): Pages 11-15.
- “Heinrich’s Fourth Dimension,” Open Journal of Safety Science and Technology, Volume 1, Number 1, June 2011.

- “Heinrich and Beyond,” Process Safety Progress, Volume 30, Issue 1, Pages 2–5, March 2011.
- “Fatalities and the Changing Distribution of Business Types in the United States,” Process Safety Progress, Volume 29, Issue 4, Pages 318–321, December 2010.
- “Process Safety Management—What Is Your Goal?” Process Safety Progress, Volume 29, Issue 3, Pages 270–272, September 2010.
- “Integrating Job Safety Analysis Into Process Hazard Analysis”, Process Safety Progress, Volume 29, Issue 3, Pages 242–246, September 2010.
- “Process Hazard Analysis Quality”, Process Safety Progress, Volume 29, Number 2, pp. 113-117, June 2010.
- "Applying Process Safety Management Principles to Manage Indoor Environmental Quality", The Synergist (a journal of the American Industrial Hygiene Association), Volume 15, Number 10, pp. 40-41, October 2004.
- “Is This Space Contaminated With Mold?” Columns - Mold (a Mold Property and Personal Injury Litigation Magazine), Harris Martin Publishing, Volume 3, Number 6, pp. 8 & 62 - 64, April 2004.
- “Is Non-Viable Air Sampling Sufficient?” Columns - Mold (a Mold Property and Personal Injury Litigation Magazine), Harris Martin Publishing, Volume 3, Number 3, pp. 4, 5 & 57 - 59.
- "The Consultant's Dilemma – Who Gets the Results?" Co-Authored with Jeffrey M. Stumpf; The Synergist (a journal of the American Industrial Hygiene Association), Volume 14, Number 10, October 2003.
- “On the Origins and Efficacy of Aggressive Air Sampling for Fungal Contamination,” Columns - Mold (a Mold Property and Personal Injury Litigation Magazine), Harris Martin Publishing, Volume 2, Number 12, pp. 4, 5, 52 & 53.
- "The Consultant's Dilemma - Should He Cool It?" The Synergist (a journal of the American Industrial Hygiene Association), Volume 14, Number 2, pp. 17-18, February 2003.
- "Culturable Air Sampling for Fungal Contaminants - What is Actually Being Measured?" The Synergist (a journal of the American Industrial Hygiene Association), Volume 14, Number 1, pp. 27-29, January 2003.
- "When Are Building Assessments for Fungal Contaminants Necessary?" Claims Magazine, Volume 50, Numbers 10 & 11, October & November 2002.
- "Does ATP Testing Have a Place in Biocleaning and Remediation Projects?" The Synergist (a journal of the American Industrial Hygiene Association), Volume 13, Number 8, pp. 28–30, August 2002.
- "To Spray or Not to Spray," The Synergist (a journal of the American Industrial Hygiene Association), Volume 12, Number 5, pp. 29–30, May 2001.
- “Apply the HAZOP Method to Batch Operations,” Chemical Engineering Progress, Volume 91, No. 4, Pages 48-51, April 1995. This article was later re-published in a text entitled, "Practical Engineering Perspectives - Plant Safety," published by the American Institute of Chemical Engineers, pp. 103-106, 1996.
- Presentation to the 1995 Annual Meeting of the American Institute of Chemical Engineers, "Performing EPA-Mandated Hazard Assessments”, Co-Authored by Robert L. Collins and Gwendolyn M. Schell.
- “Applying HAZOP to Control Systems,” Professional Safety (Journal of the American Society of Safety engineers), Volume 40, No. 8, pp. 23-26, August 1995. This article was later re-published in the CSP Refresher Guide used to provide refresher training to individuals planning to take the Certified Safety Professional (CSP) licensing exam.

PROFESSIONAL ACTIVITIES

- Member, American Industrial Hygiene Association
- Member, American Conference of Governmental Industrial Hygienists
- Member, American Institute of Chemical Engineers