

### **Kevin J. Mitchell, PE**

**Vice President, Kenexis Consulting Corporation**

#### **Fields of Competence**

Chemical Process Risk Management  
Process Safety Management (PSM)  
Cost Benefit Analysis (CBA)  
Risk Management Planning (RMP)  
Financial Risk Assessment (FRA)  
Safety Instrumented Systems  
Consequence Analysis  
Process Hazards Analysis (PHA)  
Facility Siting Analyses  
Fire and Explosion Analysis  
Quantitative Risk Assessment (QRA)  
Fault Tree Analysis (FTA)  
Reliability Analysis  
Emergency Response Planning  
Accident Investigation  
Site Security Analysis

#### **Experience Summary**

**Mr. Mitchell** has worked in the risk management and process safety fields for over ten years. Involved in over 100 projects covering such diverse operations as oil & gas production, refining, petrochemical, specialty chemical, plastic resin, transportation, and general manufacturing. Specializes in state-of-the-art assessment of the risk of toxic, flammable, and explosive materials on people, property, the environment, and ultimately, the business. Uses risk assessment and Cost-Benefit Analysis to assist in making engineering and business decisions.

#### **Credentials**

B.S., Chemical Engineering, University of Minnesota (1991)

Registered Professional Engineer (Chemical Engineering), State of Ohio

#### **Professional Affiliations**

American Institute of Chemical Engineers (AIChE)  
The Instrumentation, Systems, and Automation Society (ISA)

#### **Key Assignments**

Risk analysis of a pioneering new process for power generation that uses a solution of ammonia in water as the working fluid. The analysis evaluated safety instrumented systems to reduce risk and meet the client's corporate Risk Management criteria.

Implemented and audited Process Safety Management (PSM) programs for key clients in chemicals, plastic production, power generation technology, and petroleum fuels.

Comprehensive financial risk assessment of a LNG production complex located in Indonesia. The assessment evaluated the potential for financial loss from public or worker fatalities of injuries, property damage, or business interruption. The study produced recommendations to address high-risk elements of the process, and work toward the goal of optimizing the EHS investments.

Coordinated all aspects of implementing the requirements of EPA's Risk Management Program (RMP) Rule for a Fortune 500 company. The project included hazard analysis, prevention programs, and emergency response planning for 15+ sites. Business options were evaluated to minimize the RMP compliance requirements and costs.

Study of flammable and toxic risks associated with operation of Hydrofluoric Acid (HF) alkylation units for several major oil companies, including hazard identification, release modeling, fault tree analyses, and risk determination. Recommended high-integrity interlock systems and other alternatives for risk reduction.

Evaluated security risk and service outage at several information technology facilities. Included identifying potential threats to operation such as fire, sabotage, utility failure. The risk of each threat was quantified to prioritize site security and recovery-planning efforts.

### Key Projects - Continued

Conceptual design of safety instrumented systems for client in the resin manufacturing industry.

Comprehensive risk assessment studies for a major U.S. refinery and a large U.S. chemical facility processing numerous hazardous materials such as chlorine and phosgene. Included consequence modeling, fault tree analysis, and production of quantitative risk measures. Recommended improvements in risk-reduction technologies and safety management.

Analysis of security for a South American oil processing facility during detailed design-phase. Included evaluation of potential consequences of terrorist activities and potential business impacts. Made recommendations to improve facility spacing/layout to minimize loss of production.

Risk analysis of vapor cloud explosion effects and associated damage to critical facilities of on-shore oil/gas processing site, a major polyolefins facility, and several petroleum refineries. Included evaluation of control room siting to ensure personnel safety and operations integrity.

Risk assessment of flammable vapor venting from a series of crude oil storage tanks involving event likelihood, consequence modeling, and risk determination to exposed population.

Risk assessment of sulfide gas venting under upset conditions at a pulp mill, including analysis of employee exposure and mitigation options. Included fault tree analysis to determine event likelihood and recommendations to upgrade safety instrumented systems.

System Safety/Risk of Upset and Fire Protection analysis for a Supplemental Environmental Impact Report (SEIR) legislated under the California Environmental Quality Act (CEQA), involving risk determination for POPCO gas plant expansion project in Santa Barbara County, CA.

Risk of Upset analysis for a comprehensive Environmental Impact Report (EIR) involving risk assessment of possible toxic and flammable releases from a southern California refinery prior to and following implementation of Clean Fuels Project.

Evaluation of site security and business continuity planning for international petroleum headquarters complex. Included identification of threats such as aircraft impact, bombing, sabotage, and bio-terrorism. Study prioritized risks for the purpose of upgrades to security and enhanced business continuity planning.

Developed corporate guidelines for evaluating and implementing EPA RMP requirements for a Fortune 500 company. Developed model RMPs for several business units. Included training given to corporate-level and site-level personnel.

Financial Risk Analysis for an Alaskan refinery and pipeline determining financial losses associated with crude oil spill cleanup.

Facilitated numerous Process Hazard Analysis (PHA) studies required under OSHA PSM. Techniques included HAZOP and What-If/Checklist. Processes ranged from large refining operations, NGL processing, olefin processing, amine treating, sulfur recovery, and tail gas units to small specialty chemical operations and purification operations

Development of client customized versions of Process Hazards Analysis (PHA) software.

Development of a structured, efficient, hybrid PHA technique to be used by a U.S. chemical company to comply with OSHA's PSM standard.

Developed management guidelines for a major U.S. chemical company concerning Process Hazards Analysis and Management of Change elements of OSHA's PSM standard.

### Selected Publications

Mitchell, K.J., Shah, J.N., "Strategy for RMP Hazard Analysis and Communications Techniques", 31st Annual Loss Prevention Symposium, New Orleans, AIChE, 1998.

Mitchell, K.J., "Lessons Learned through Vapor Cloud Explosion Risk Assessments", Proceedings of the 1996 Process Plant Safety Symposium, AIChE, Houston, TX.

Mitchell, K.J., Morgan, R.S., Shah, J.N., "Explosion Overpressure Shielding and Channeling", 1997 International Plant Operations and Design Conference, AIChE, Houston, TX.

Mitchell, K.J., Shah, J.N., "Integrating Quality Management Principles into The Risk Management Process", 1997 International Conference - Workshop on Risk Analysis in Process Safety, Atlanta, GA.

Mitchell, K.J., Murphy, J., Joseph, G., Long, L., "Reactive Chemical Process Safety - What Do Existing Data Tell Us?" Mary Kay O'Connor Process Safety Center, October 30-31, 2001, Annual Process Safety Symposium