

Résumé

PETER PAUL HOWELL, PE, CSP, CFEI, FAIChE

23 Edgewood Drive
Hurricane, WV 25526

Phone: 304.757.3997
email: phowell@markfive.com

OSHA Compliance . . . Safety Performance Improvement . . . Incident Investigation . . . Auditing for Compliance with: Recognized and Generally Accepted Good Engineering Practices (RAGAGEP), OSHA PSM Regulation, and EPA RMP Regulation . . . Process Hazards Analysis . . . Design, Operation, Maintenance and Management of Chemical and Refinery Equipment and Facilities

Progressive positions in chemical industry, from Group Leader to Vice President and General Manager. Diverse experience in plant engineering, operations, maintenance, safety and technical group management.

PROFESSIONAL EXPERIENCE

Mark V, Inc. Hurricane, WV
President

1996 – Present

Consult with federal/state agencies, organizations, and private industry on process safety, hazardous waste remediation, and accident investigation.

- Investigated approximately 146 incidents that occurred in chemical plants, refineries, pulp and paper mills and similar industries for attorneys, insurance companies and regulatory agencies. Determined the root causes using methodologies consistent with NFPA 921¹, Center for Chemical Process Safety², United Steel Workers³, and the National Safety Council.⁴ The root causes determined were based on the evidence, Recognized and Generally Accepted Good Engineering Practices and federal regulations. Prepared finding reports, gave approximately 40 depositions and on 16 occasions, provided testimony at trial.

The root causes of these incidents were almost always found to be failure to comply with OSHA's Process Safety Management regulation and/or Recognized And Generally Accepted Good Engineering Practices (RAGAGEP) such as: inadequate Process Safety Information (PSI); (Reactivity data, Corrosion data, Piping and Instrument Drawings (P&ID), Safety systems, alarms and interlocks); Process Hazards Analysis (PHA); Operating Procedures; Operator Training; Mechanical

¹ NFPA 921 Guidelines for Fire and Explosion Investigations; National Fire Protection Association, Quincy, MA

² Guidelines for Investigating Chemical Process Incidents; American Institute of Chemical Engineers – Center for Chemical Process Safety, New York, NY

³ *Triangle of Prevention (TOP) – Systems of Safety and Incident Investigation*; United Steel Workers; Pittsburgh, PA

⁴ Accident Prevention Manual for Business and Industry; National Safety Council, Itasca, IL.

Integrity (MI), (inadequate testing and inspection, Positive Material Identification (PMI)): and Management of Change (MOC); or Operator/Maintenance error.

- Develop new compliance directive for OSHA for their Process Safety Management regulation as it applies to reactive chemicals.
- Adjunct Professor – Marshall University Safety Engineering Department (Chemical Process Incident Investigation; Process Safety Management Fundamentals).
- Edited and helped to prepare *New Environmental Remediation Technologies: Guidance Criteria for Occupational Safety and Health*, published by the Operating Engineers National HAZMAT Program.
- Developed an Emergency Response Data Sheet, an innovative concept designed to minimize the risk to emergency responders responding to an incident. Published on the EPA - Emergency Response Team's website.
- Performed accident investigations and determined the root causes for a wide range of chemical, pulp & paper and refining processes.
- Performed process safety management compliance audits.
- Performed Process Hazards Analyses.
- Developed a Management of Change procedure for a World top-ten chemical company.
- Wrote and edited process safety management handbook which identifies Recognized and Generally Accepted Good Engineering Practices, which has been endorsed by OSHA and published by the Operating Engineers National HAZMAT Program.
- Evaluated EPA accident reports for completeness and ability to determine the root cause of the incident.
- Evaluated DOE hazardous waste site remediation technologies for use of recognized and generally accepted good engineering, environmental, health and safety practices.
- Evaluated the hazards and the safeguards provided against those hazards for a community concerned about an adjacent chemical facility.
- Assisted the New Jersey Department of Environmental Protection in updating their Toxic Catastrophe Prevention Act.

CDI ENGINEERING GROUP (Formerly MTI Group), Charleston, WV 1992 – 1995

Manager – Engineering and Chief Engineer (1994 – 1995)

Project Manager – OSHA Process Safety Management Project (1995)

Manager – Process Engineering (1992 – 1993)

Managed staff of 250 engineering/technical personnel in two regional offices; planned and administered annual budget of \$40MM and multiple projects ranging from \$1-75MM; trained 100+ engineers. Responsible for the execution, financial performance, and quality of all projects.

- Provided guidance and direction on the process design and detailed design of numerous facilities, expansions and improvements of chemical facilities. Increased revenues by 75% over 3 years by: instituting total quality management process;

project manager training to manage rather than monitor projects; developing and implementing project control procedures; and initiating the use of new technology (CADD, 3D-CADD, Photogrammetry).

- Planned and implemented \$50MM equipment information documentation project to ensure compliance with OSHA PSM Regulation 29 CFR 1910.119 (d) (3) by performing compliance audits and executing corrective engineering work.
- Wrote general operating procedures, maintenance procedures, and project reports. Prepared auditing protocols and compliance methodology for OSHA's Process Safety Management Regulation.
- Established Process Engineering Group (35 professional staff) providing Process Design Packages and performing PSM compliance work for numerous clients.

HANLIN GROUP (Formerly LCP Chemicals and Plastics), Moundsville, WV 1989-1992

Vice-President and General Manager (1991 – 1992)

Plant Manager (1990 – 1991)

Technical Manager (1989 – 1990)

Managed staff of 235 employees; planned and administered \$60 MM annual budgets. Responsible for all aspects of plant's operation: manufacturing, engineering, maintenance, personnel, safety, environmental compliance, quality, and financial performance.

- Converted adversarial labor-management relationship into a cooperative relationship, reducing grievances 97.5% in first year. Negotiated 3-year union contract, ratified by 8:1 majority.
- Initiated preventive/predictive maintenance program and the preparation of maintenance procedures, increasing plant's on-stream factor from 96 to 99%.
- Established safety program reducing first aid cases 62% and lost time injuries 77%.
- Initiated TQM and SPC program achieving status as ISO 9000 approved supplier.
- Coordinated efforts of insurance carrier, engineering and marketing departments to determine cause of accidents, get plant on-line, and minimize impact on customers.
- Completed \$50MM modernization project, reducing costs, improving product quality and reducing environmental emissions.
- Conducted incident investigations.
- Coordinated compliance program for CMA's Responsible Care Program and OSHA's PSM regulation.

PPG INDUSTRIES, Corpus Christi, TX; Pittsburgh, PA; Natrium, WV **1966-1989**

Department Technical Manager (1986-1989)

Principal Process Engineer (1983-1986)

Principal Process Engineer/Project Manager (1980-1983)

Group Leader, Operations and Maintenance Manager, Project Manager, Operations Foreman, Process Development Engineer (1966-1980)

Promoted during 23-year career through a series of increasingly responsible operating, maintenance, engineering, and management positions to Department Technical Manager. Responsible for process design for new equipment and process modifications, coordinating project-based construction and maintenance, and developing new technology. Completed start up and commissioning of new plants. Directed accident investigation teams.

- Led Process Hazards Analysis (PHA) teams for numerous facilities.
- Led accident analysis teams to determine the root causes of numerous incidents.
- Developed numerous operating and maintenance procedures and training programs.
- Prepared process designs for several new processes and assisted/approved designs performed by engineering contractors.
- Designed chemical process equipment and assisted/approved equipment designs prepared by engineering contractors.
- Developed/designed/installed a state-of-the-art air emission control process which brought the facility into compliance and produced \$8.5MM annual savings.
- Assisted in the startup of a novel Calcium Hypochlorite production facility. Assisted in the development of operating procedures and the training of personnel. Led efforts to improve the efficiency, safety and environmental compliance of the facility. Created new Calcium Hypochlorite sanitizing agent product line, increasing annual sales 15%.
- Led teams responsible for commissioning three new plants (total \$475 MM) in US and Canada.
- Created seven new chemical processes.
- Established program with community college to train maintenance personnel.

EDUCATION

Bachelor of Science, Chemical Engineering, University of New Mexico, Albuquerque, NM.

Postgraduate study towards, **Masters of Engineering/Business Administration (29 hours)**, Texas A&M University, College Station TX, and Marshall University Graduate College, South Charleston, WV.

Twenty plus Continuing Education Courses.

CERTIFICATIONS

Licensed Professional Engineer: Texas and West Virginia

Certified Safety Professional

Certified Fire and Explosion Investigator

PROFESSIONAL ASSOCIATIONS

Fellow, American Institute of Chemical Engineers (AIChE) and Past Chairman of Local AIChE Section;

Emeritus Member, Technical Steering Committee, AIChE Center for Chemical Process Safety (CCPS) and the Engineering Practices Subcommittee that prepared the book “*Guidelines for Design Solutions for Process Equipment Failures.*”

Member, The Design Institute for Emergency Relief Systems (DIERS) of the American Institute of Chemical Engineers and member of the committee that prepared the 2ed edition of *Guidelines for Pressure Relief and Effluent Handling*;

Founding Member, Reactivity Management Roundtable of the Center for Chemical Process Safety of the American Institute of Chemicals Engineers and member of the Chemical Processing Essential Practices subcommittee;

Member, National Fire Protection Association and member of the Hazardous Chemicals Technical Committee that prepares codes pertaining to controlling the hazards of hazardous chemicals;

Member, American Chemical Society

Member, American Society of Safety Engineers and Past President of the local chapter;

Member, National Association of Fire Investigators;

Member, Kanawha Putnam Emergency Planning Committee and the Plan Implementation Evaluation subcommittee;

HONORS AND AWARDS

- Candidate for Presidential appointment to U.S. Chemical Safety and Hazard Investigation Board.
- Nominated for the West Virginia Environmental Achievement Award.
- Governor’s award for improving labor-management relations in the state.
- *Panelist*, National Science and Technology Council’s PPP 2000 Forum 14, *When Natural and Industrial Disasters Collide*;
- *Panelist*, DOE, SSEB, and NEETC’s Guidance Criteria for Occupational Safety and Health National Technical Workshop;
- *Member*, OSHA – EPA – Chemical Safety Board Roundtable on Reactive Chemicals

- Business Unit Technical Achievement Award for developing new air pollution control technology.
- Listed as a Safety Professional by the National Registry of Safety Professionals.

PUBLICATIONS & PRESENTATIONS

- Guidelines for Design Solutions for Process Equipment Failures; co-author, Center for Chemical Process Safety of the American Institute of Chemical Engineers (1998), New York, NY;
- Guidelines for Process Safety Concepts Assessment and Implementation, Protocol Development for Type II Innovative Environmental Remediation Technologies; P. Howell, International Union of Operating Engineers, National HAZMAT Program (1997), Beaver, WV;
- New Environmental Remediation Technologies: Guidance Criteria for Occupational Safety and Health; co-author, International Union of Operating Engineers, National HAZMAT Program (1998), Beaver, WV;
- Emergency Response Data Sheet (ERDS) Preparation Protocol (with worked example); P. Howell, International Union of Operating Engineers, National HAZMAT Program (1999), Beaver, WV;
- Essential Practices for Managing Chemical Reactivity Hazards, B. Johnson, S. Rudy & S. Unwin, Center for Chemical Process Safety of the American Institute of Chemical Engineers (2003), New York, NY (peer reviewer);
- Guidelines for Pressure Relief and Effluent Handling Systems, 2ed Edition; Center for Chemical Process Safety of the American Institute of Chemical Engineers (2017), New York, NY;
- *Relief System Design for Reactive Systems – Get the Facts*; P. Howell & G. Melhem (2003), ioMosaic, Salem, NH;
- *There Are Holes*; Peter Howell, July 2003, ioMosaic Quarterly Newsletter, Volume 2, Number 2, Second Quarter 2003; ioMosaic, Salem, NH;
- *Recommended Practice 101 – Control Of The Hazards Associated With Reactive Chemicals*; Reactivity Management Roundtable Conference, May 19, 2004, Boston, MA;
- Guidelines for Mechanical Integrity Systems, Center for Chemical Process Safety of the American Institute of Chemical Engineers (2006), New York, NY (peer reviewer);
- *Designing Emergency Relief Systems for Runaway Reactions*, Peter Howell and Georges Melhem; Chemical Engineering Progress, September 2005; the American Institute of Chemical Engineers, New York, NY;
- *Recommended Practice RP-101 Controlling the Hazards Associated with Reactive Chemicals*; 3rd International Symposium on Runaway Reactions, Pressure Relief Design and Effluent Handling, November 1-3, 2005 Cincinnati, Ohio, Organized by the Design

Institute for Emergency Relief Systems (DIERS) Users Group, 2005, the American Institute of Chemical Engineers, New York, NY;

- *NFPA 400 Hazardous Materials Code*; 1st Edition, co-author; National Fire Protection Association, Quincy, MA (2009); www.nfpa.org;
- Recommended Practice 101 – Control of the Hazards Associated With Reactive Chemicals; Mark V, Inc. (2009) www.markfive.com
- *Polymerization Reactor Explosion at the XYZ Chemical Company*; American Institute of Chemical Engineers 43rd Loss Prevention Symposium, paper 96e; April 29, 2009; Tampa, FL; www.aiche.org/ccps;
- *Plant Explosion Emphasizes Importance of Implementing PSM: Process Safety Progress*, Volume 29, No. 2, American Institute of Chemical Engineers, New York, NY (2010), www.aiche.org;
- *Reactivity Management Tool*, Free computer program for evaluating potential reactivity hazards – co-author/developer; American Institute of Chemical Engineers, Center for Chemical Process Safety (2012); <http://www.aiche.org/ccps/resources/software/reactivity-management-tool>;
- *NFPA 400 Hazardous Materials Code*; 2st Edition, co-author; National Fire Protection Association, Quincy, MA (2012); www.nfpa.org;
- *Pressure Relief Valves. Last Line of Defense?* DIERS 51st Users Group Conference, Las Vegas, NV April 17-19, 2013;
- *An Expert's View of Incident Investigation*; DIERS 53rd Users Group Conference, October 13-15, 2014, Mobile, Alabama;
- *Recognized And Generally Accepted Good Engineering Practice; What is it?* DIERS Conference, March 16-18, 2016, Houston, Texas.
- *Hazards of Combustible Dust*. DIERS Conference, October 24-26, 2016, Houston, Texas

Mark V, Inc. Incident Investigations

Incident	Material Involved	Facility	Client
Recycle gas compressor explosion – Chemical plant	Ethylene	Shell Chemical; Deer Park, Texas	U.S. Environmental Protection Agency
Wastewater storage tank explosion – Refinery	Hydrocarbon vapors	Pennzoil: Rouseville, PA	U.S. Environmental Protection Agency
Hydrocracker Explosion – Refinery	Naphtha	Tosco; Avon, CA	Contra Costa County Health Services
Oil well snubbing operation explosion – Oil exploration	Natural Gas	Sonat Exploration; Bienville Parrish, LA	U.S. Chemical Safety and Hazard Investigation Board
Polymerization reactor explosion – Plastic resin manufacture	Butadiene, Styrene, NBL (Normal Butyl Lithium)	Phillips Chemical; Pasadena, Texas	Attorney
Molten tar storage tank eruption – Asphalt manufacture	Tar, Naphthalene	AlliedSignal; Ironton, OH	Attorney
Wastewater sump explosion – Specialty chemical manufacture	Trinitromethane (TNM), Monochlorobenzene (MCB), Nitrous oxides (NOX)	Lomac; Muskegon, MI	Michigan OSHA
Pyrophoric material fire – Metal alkyl manufacture	TEAL (Triethylaluminum)	Akzo-Nobel; Deer Park, Texas	Attorney
Butadiene storage tank explosion – Plastic resin manufacture	Butadiene, butadiene polyperoxide, popcorn polymer	Phillips Chemical; Pasadena, Texas	Attorney
Toxic material release – Specialty chemical manufacture	Ketene, Diketene	Lonza; Bayport, Texas	Attorney
Toxic material release – Sodium	Sulfur Dioxide, Hydrogen Sulfide, Methanol	Celanese/Clariant; Bucks County, AL	Attorney

Incident	Material Involved	Facility	Client
hydrosulfite manufacture			
Unexpected equipment startup – Oriented Strand Board (OSB) manufacture	Rotary Airlock, Wood	Louisiana-Pacific; Silsbee, Texas	Attorney
Toxic material release – Specialty chemical manufacture	Ketene, Diketene	Lonza; Bayport, Texas	Attorney
Energetic release of energy – Fertilizer (ammonia and urea) manufacture	Carbon Dioxide	Agrium; Borger, Texas	Attorney
Waste boiler explosion – Wood pulp and paper mill	Black Liquor	Durango Paper; St. Marys, GA	Attorney
Unexpected equipment movement – Paper mill	Paper machine, Paper	Westvaco/Mead; Evadale, Texas	Attorney
Flash Fire – Refinery heat exchanger	Hexane	Sunoco, La Port, Texas	Attorney
Pyrophoric material fire - Hazardous waste recovery	Phosphorus	Glenn Springs, Columbia, TN	Attorney
Corrosive liquid exposure – Polypropylene resin manufacture	Caustic	Huntsman Petrochemical, Port Neches, Texas	Attorney
Paper Dryer Explosion – Paper mill	Steam	Knowlton Specialty Papers, Watertown, NY	Attorney
Butadiene reactor explosion, Butadiene storage tank explosion – Plastic resin manufacture	Butadiene	Phillips Chemical, Pasadena, Texas	U.S. Environmental Protection Agency & U.S. Department of Justice

Incident	Material Involved	Facility	Client
Hot, high pressure boiler water exposure – Refinery	Condensate/steam	BP Products North America Texas City, Texas	Attorney
Flash fire - Liquid hazardous waste fire– Cement plant	Hazardous solvent waste; Liquid waste derived fuel	Ash Grove Cement, Foreman, AR	Attorney
Pyrophoric material fire – Hazardous waste incinerator	Hazardous pyrophoric (TEAL) waste	Texas Eastman, Longview, Texas	Attorney
Plastics decomposition & fire – Chlorinated polyvinyl chloride (CPVC) manufacture and compounding	CPVC	Noveon, Inc. – Louisville, KY	Attorney
Toxic material release – Specialty chemical manufacture	Methyl Iodide	Texas Eastman, Kingsport, TN	Tennessee OSHA
Vapor cloud explosion and resulting fire – Refinery	Gasoline components, light naphtha, hexane	BP Products North America, Texas City, Texas	Attorney
Electrocution	Plastic Blow Molding	The Plastics Group Fremont. OH	Attorney
Hazardous material exposure – pipe & tank failure	Sulfuric Acid	Exide Technologies Laureldale, PA	Attorney
Crushing of man working under a load	Falling load of steel	Kemco Mobile, AL	Attorney
Tank explosion and fire at oil and gas well	Light hydrocarbons	Partridge-Raliegh Smith County, Mississippi	Attorney
Toxic material release - Exposure to fumes while welding in a hazardous waste tank	Tributyl phosphate, tributoxyethyl phosphate, Hydrogen sulfide, carbon monoxide	Akzo Nobel Functional Chemicals, Inc., Gallipolis Ferry, WV	Attorney

Incident	Material Involved	Facility	Client
Toxic material release - Runaway reaction in tank resulting in an explosion – Chemical plant	Toluene diisocyanate (TDI)	Bayer Material Science Baytown, Texas	Attorney
Flash fire in process sewer - Refinery	Light hydrocarbons	Pasadena Refining Systems Pasadena, Texas	Attorney
Toxic material release – Release of toxic vapors from acid storage tank - Refinery	Sulfuric acid, sulfur dioxide, hydrogen sulfide	Valero Refining Houston, Texas	Attorney
Burns from hot chemicals in pulp bleacher	Hot paper stock/water/chlorine dioxide	MeadWestvaco Escanaba, MI	Attorney
Burns from hot condensate	Hot water (condensate)	MEMC Pasadena, Inc. Pasadena, Texas	Attorney
Runaway reaction and explosion at hazardous waste disposal cement kiln	Cumene hydroperoxide	Von Roll America – Waste Technologies, Inc.	Attorney
Release of hazardous materials; Chemical exposure – Chemical plant	Glacial Acetic Acid	Equistar Pasadena, Texas	Attorney
Release of hazardous materials; Chemical exposure and burns – Refinery vacuum tower	Hot Pitch	ExxonMobil Torrance, CA	Attorney
Physical explosion of pressure vessel in oil production field	Natural gas	Dune Energy, Inc. Bayou Couba, LA	Attorney
Release of hot pitch and resulting flash fire – Refinery vacuum tower	Hot pitch	ExxonMobil Baytown, Texas	Attorney
Fired heater explosion – Ocean going barge	Diesel fuel	Penn Marine Barge Everglades	Attorney

Incident	Material Involved	Facility	Client
Toxic material release - Pipeline rupture resulting in vapor cloud explosion – Refinery HF alkylation	Isobutane, HF	Citgo Corpus Christi, Texas	Attorney
Toxic material release - Hose rupture releasing toxic gas – Chemical plant	Silicon tetrafluoride	MEMC Pasadena, Texas	Attorney
Pipeline rupture resulting in vapor cloud explosion – Refinery Sat Gas unit	Light Hydrocarbons	Delek refining Tyler, Texas	Attorney
Pump/pressure vessel rupture resulting in vapor cloud explosion – Refinery propylene distillation	Propane/Propylene	Alon USA Refinery Big Spring, Texas	Attorney
Runaway reaction – incompatible materials explosion during distillation	Sodium hydroxide Ethylene glycol	Air Products & Chemicals Pueblo, CO	Attorney/Insurance Company
Pressure vessel explosion – Gas transmission line filter separator	Nitrogen	Kinder Morgan pump station, Smith County, MS	Attorney
72 incidents resulting in emission events and or noncompliance with permits and orders - Refinery	Volatile Organic Compounds (VOC), Hydrogen Sulfide (H ₂ S), Sulfur Dioxide (SO ₂)	BP Products North America, Texas City, Texas	Texas Attorney General/TCEQ
Explosion/fire while welding on pipe/tank – Crude oil transmission line	Crude oil	Marathon, St. James, LA	Attorney
Explosion and fire from ruptured heat	Naphtha, hydrogen	Tesoro, Anacortes, WA	Attorney

Incident	Material Involved	Facility	Client
exchanger – Refinery hydrocracker unit			
Toxic material release - Release of hot, toxic hydrocarbons from a Flexicoker Heater during maintenance - Refinery	Naphtha, hydrogen sulfide, steam	ExxonMobil, Baytown, Texas	Attorney
Toxic material release - Centrifugal compressor failure and resulting emission event – Refinery hydrocracker unit	Benzene, hydrogen, sulfur dioxide, hydrocarbons	BP Products North America, Texas City, Texas	Attorney
Fireball/Dust explosion during maintenance – Rail car maintenance facility	Steel shot abrasive blasting and paint dust	Watco Mechanical Services Hockley, Texas	Attorney
Fireball/Fire during maintenance of underground LPG storage system – LPG Storage facility	Ethane Propane	Enterprise Products Partners Mont Belvieu, Texas	Attorney
Toxic material release - Explosion and fire resulting from runaway reaction – Chemical plant	Methyl isocyanate (MIC)	Bayer Agricultural Chemicals Institute, WV	US DOJ (EPA)
Fireball while performing maintenance on Flare Drum - Refinery	Hydrocarbons	Valero Memphis, TN	Attorney
Explosion and fire in pressure vessel while performing	Hydrocarbons	Chevron Phillips Chemical Port Arthur, Texas	Attorney

Incident	Material Involved	Facility	Client
maintenance – Chemical plant			
Toxic material release - Release of toxic vapors from storage tanks during catalyst pre-sulfiding – Refinery hydrocracker unit	Hydrogen sulfide, Methyl Mercaptan, Dimethyl Sulfide Dimethyl Disulfide Ethyl Mercaptan	BP North America Texas City, Texas	Attorney
Release of hot toxic liquid from reactor expansion joint – Chemical plant	Bisphenol A (BPA), Phenol, Hydrochloric acid	Haverhill Chemicals Haverhill, OH	Attorney
Vapor cloud explosion/fireball during pipeline pigging – Natural gas transmission line	Natural gas liquids (NGL)	Eureka Hunter Wick, WV	Attorney
Toxic material release - Release of hot, toxic liquid from cartridge filter – Chemical plant	Ammonium phosphate, Hydrogen cyanide, Ammonia	Dow Chemical/Rohm & Haas Deer Park, Texas	Attorney
Large bag of tools dropped onto head of employee working below	Hand and power tools	Chevron USA Richmond, CA	Attorney
Storage tank roof structure collapse	Construction methodology	TARSCO/Trafigura Corpus Christi, Texas	Attorney
Vapor cloud explosion – Release of hot naphtha due to vessel overflow, misdirected flow	Naphtha	International Wax, Inc. Smethport, PA	Attorney/Insurance Company
Fireball – Reactive chemical ignition during maintenance	Sodium Chlorate	Environmental Enterprises Columbus, OH	Attorney
Fireball – Hydrogen release during flare drum maintenance	Hydrogen	Marathon Petroleum Texas City, Texas	Attorney/Insurance Company

Incident	Material Involved	Facility	Client
Dust explosion and fire in baghouse & ductwork	Wood sanding dust	Georgia Pacific Corrigan, Texas	Attorney
Toxic material release – Exposure to hydrogen sulfide while loading sodium hydrosulfide tank truck	Hydrogen sulfide Sodium Hydrosulfide Sodium Hydrogen Sulfide	Calumet Montana Refinery Great Falls, Montana	Attorney
Toxic material release – Exposure to hydrogen sulfide while gauging production tanks	Hydrogen Sulfide Petroleum hydrocarbons	EOG Resources Montague County, Texas	Attorney
Explosion – Internal pipeline explosion during maintenance	Crude oil	SUNOCO Logistics Nederland, Texas	Attorney
Explosion – Reactive chemical explosion in vacuum truck tank	Hydrogen Peroxide	PeroxyChem Pasadena, Texas	Attorney
Explosion and fire – Pipe failure due to Sulfidation corrosion	Light gas oil, naphtha	Chevron Richmond, CA	Attorney
Fire in Sulfur Recovery Unit during maintenance	Sulfur, Sulfur Dioxide Hydrogen Sulfide	Shell Chemical Deer Park, Texas	Attorney
Exposure to Toxic Materials at oil production facility	Hydrogen Sulfide	EOG Resources	Attorney
Fire in a Fluidized Bed Cat Cracker (FCCU) during maintenance	Wood Plastic/rubber	Marathon Oil Texas City, Texas	Attorney/Insurance Company
Steam release at boiler during maintenance	Steam	Graphic Packaging International Queen City, TX	Attorney

Incident	Material Involved	Facility	Client
Vapor cloud explosion and fire in Alkylation Unit during startup/maintenance	Isobutane	ExxonMobil Baton Rouge, LA	Attorney
Dust explosion in electrical control panel at powder coating facility	Epoxy paint dust	Aegion Coating Systems Conroe, Texas	Attorney
Explosions and Fires at Chemical Plant due to pipeline rupture	1,3-Butadiene, Butadiene Popcorn Polymer and other hydrocarbons	TPC Port Neches, Texas	Attorney
Fire at Chemical Plant	Confidential	Confidential	U.S. Chemical Safety & Hazard Investigation Board
Fire and Explosion at Chemical Plant	Confidential	Confidential	Attorney
Confined Space Asphyxiation	Argon	Ferguson McMoRan Copper Mine, Morenci, AZ	Attorney
Exposure to Toxic vapors while opening pipeline	Hydrofluoric Acid	Wynnewood Refining, Wynnewood, OK	Attorney
Fire and explosion in Refinery while opening pipeline	Hydrogen	Shell Convent Refinery, Port Allen, LA	Attorney
Fire and explosion in refinery while performing maintenance on a pipeline in a refinery	Hydrogen, Naphtha, Hydrogen Sulfide	ExxonMobil refinery Baytown, Texas	Attorney
Release of toxic and asphyxiant gases causing asphyxiation and neurological damage	Hydrogen, Nitrogen, Carbon Monoxide	OXEA Chemicals Bay City, Texas	Attorney
Fire and explosion in refinery during a process upset	Naphtha	BP-Husky Refinery Oregon, Ohio	Attorney

Incident	Material Involved	Facility	Client
Asphyxiation of a worker inside an inerted reactor	Nitrogen	Hunt Refining Tuscaloosa, Alabama	Attorney
Asphyxiation of a worker inside an inerted reactor	Nitrogen	HF Sinclair Refinery El Dorado, Kansas	Attorney
Asphyxiation of a worker inside a reactor containing an inert gas	Argon	CF Industries Nitrogen Donaldsonville, Louisiana	Attorney
Burns from hot condensate while modifying pipeline	Hot condensate	Clariant, Pasadena, Texas	Attorney
Acid burns in refinery Alkylation Unit	Concentrated Sulfuric Acid	Motiva, Port Arthur, Texas	Attorney
Fire, explosion and fatality due to tube failure in a furnace in the HDO unit in a refinery	Diesel and hydrogen	Marathon/TESORO Martinez, California	Attorney
Severe burns while dumping a coker unit	Coke and superheated water	Valero Norco, Louisiana	Attorney
Fatal fire due to structural failure of a hydrocarbon processing pump	Naphtha	Blanchard Refining Company (Marathon) Texas City, Texas	Attorney