

## **MELVIN C. (MEL) COKER, JR.**

### **EDUCATION**

B.S. Chemical Engineering, University of Tennessee, 1989 (GPA 3.11/4.0)

### **PROFESSIONAL QUALIFICATIONS**

29 years professional experience

#### **Industrial experience:**

- Petroleum refining
- Petrochemical production
- Chemical processing (batch and continuous)
- Pipelines and terminals
- Pulp and paper
- Waste handling and treatment
- Nuclear fuels processing.

#### **Engineering experience:**

- Process Hazard Analyses (PHAs)
- Safety Integrity Level (SIL) Selection Analyses
- Layer of Protection Analyses (LOPAs)
- Dust Hazard Analyses (DHAs)
- Failure Modes and Effects Analyses (FMEAs)
- Process safety management (PSM) program development
- Compliance auditing
- Process safety information development
- Project management
- Process design
- Relief valve sizing
- Flare header capacity evaluations
- Process control evaluations
- Operating procedures documentation and reviews
- Safety system reviews
- PHA training
- Process safety management training.

### **PROFESSIONAL HISTORY**

**1997-Present**

**Principal/Chief Process Engineer**

**Director of Process Safety and Risk Management Services**

**Process Engineering Associates, LLC, Oak Ridge, Tennessee**

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

**Responsibilities:**

- Company and project management
- Process hazard analyses, SIL selection analyses, layer of protection analyses, dust hazard analyses, compliance auditing, process design, process engineering, and operations support for chemical, petrochemical, petroleum refinery, and nuclear fuels processing facilities.

**Specific Experience:**

- Performed a PSM Regulatory Coverage Assessment of the Bimax, Inc. Plant in Glen Rock, Pennsylvania
- Performed a PHA of the CHS, Inc. – Energy Division propane terminal in Carrollton, Missouri
- Conducted a PHA and LOPA Training Course for personnel at the Emerald Polymer Additives, LLC plant in Akron, Ohio. The training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a Preliminary PHA of Project Marlin for the Veolia North America Regeneration Services, LLC Burnside Plant in Darrow, Louisiana
- Performed a Process Safety Management/Risk Management Program Compliance Audit at the Emerald Performance Materials, LLC plant in Henry, Illinois
- Conducted a Process Hazard Analysis (PHA) and Layer of Protection Analysis (LOPA) Training course and a PHA of the Scrubber Process at the Johnson Matthey Plant in Smithfield, Pennsylvania. The PHA Leader training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed PHAs of the Railcar and Asphalt Truck Loading Racks and the Crude Storage Tanks at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the R-1101 Reactor Process at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a PHA of the Refinery Sector Rule (RSR) Flare Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA, including addressing a Safer Technology and Alternatives Analysis (STAA) using an inherently safer technologies (IST) checklist, of the Flare Systems at the CHS, Inc. refinery in Laurel, Montana
- Performed PHA revalidations of the CHS, Inc. – Energy Division propane terminals in Glenwood, Minnesota; Hannaford, North Dakota; and Hixton, Wisconsin
- Performed a PHA of the Asphalt Emulsion Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a hazard and operability (HAZOP) analysis of the Municipal Solid Waste (MSW)-Based Electrical Generation Unit to be constructed at the Paradigm Manufacturing Company electrical generation facility in Barnesville, Georgia
- Performed a PHA of the Commercial Plant at the PureCycle Technologies facility in Ironton, Ohio
- Performed a PHA of the No. 2 Crude Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Waste Water Treatment Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a Reliability PHA of Boilers 11 and 13 at the Calumet Specialty Products Partners, L.P. refinery in Shreveport, Louisiana
- Performed complete redo PHA Revalidations of the HF Alkylation and Catalytic Polymerization Units at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the New NaHS Storage Tank Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Sour Water Stripper (SWS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Primary Crude Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Conducted a private PHA Leadership/Scribe Training Class for Process and Safety Solutions, LLC at Process Engineering Associates' offices in Oak Ridge, Tennessee. The PHA Leadership/Scribe Training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a PHA Revalidation of the Hydrocal Complex at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Conducted a publicly offered PHA Leadership Training Class in King of Prussia, Pennsylvania. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a PHA of the Arsenic/Selenium Project for the Waste Water Treatment Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Tire Pyrolysis Process at the Golden Isles Conservation Center in Nahunta, Georgia for Seven Islands Environmental Solutions, LLC
- Conducted a PHA Leadership Training Class for personnel at the Muti-Chem Group, LLC corporate offices in Houston, Texas. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a PHA Revalidation of the 5 MM SCFD Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a PHA Revalidation of the Hydrotreating Unit (HTU) at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Conducted a Process Hazard Analysis (PHA) and Layer of Protection Analysis (LOPA) Training course and a PHA of the TPS Electric Oven at the Johnson Matthey Plant in Wayne, Pennsylvania. The PHA Leader training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a PHA of the U-16, U-7, and U-3 Boiler Systems at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a Reliability PHA of the Flare Gas Compressors at the Calumet Specialty Products Partners, L.P. refinery in Shreveport, Louisiana
- Performed a Reliability PHA of Boiler 12 at the Calumet Specialty Products Partners, L.P. refinery in Shreveport, Louisiana
- Performed a Dust Hazard Analysis of the Coke Conveyor System in the Delayed Coker Unit (DCU) at the CHS, Inc. refinery in Laurel, Montana
- Conducted a PHA Leadership Training Class for personnel at the Nuclear Fuel Services (NFS) plant in Erwin, Tennessee. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, FMEA, and LOPA techniques
- Performed a PHA and LOPA of the Latex Unit at the Emerald Polymer Additives, LLC plant in Akron, Ohio
- Performed a PHA and LOPA of the Polysulfones Process at the KMCO, LLC facility in Crosby, Texas
- Performed a Management of Change (MOC) PHA of the Zone 1 Relief System Replacement Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Process Safety Management/Risk Management Program Compliance Audit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Hazard Review of the Stevia Processing Plants that are to be constructed in Brazil, including the Stevia Farm Plants and the Central Processing Plant, for Heartland Food Products Group
- Performed a PHA Revalidation of the Zone D Unit 1000 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone D Ultra Low Sulfur Diesel (ULSD) Unit (Unit 900) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone D Amine Unit (Unit 300), Sulfur Recovery Unit (Unit 400), Tail Gas Treating Unit (Unit 500), and Sour Water Stripper Unit (Unit 600) at the CHS, Inc. refinery in Laurel, Montana

**Melvin C. (Mel) Coker, Jr.**  
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- Performed a PHA of the Waste Water Treatment Plant at the W. R. Grace and Company plant in Albany, Oregon
- Performed a PHA of the Building 8 Fine Chemicals Unit at the W. R. Grace and Company plant in Albany, Oregon
- Performed a PHA of the Building 8 Single Site Catalyst Unit at the W. R. Grace and Company plant in Albany, Oregon
- Conducted a PSM Overview Training Class for personnel at the BAE Systems, Ordinance Systems, Inc., explosives manufacturing plant in Kingsport, Tennessee
- Conducted a PHA Leadership Training Class for personnel at the BAE Systems, Ordinance Systems, Inc., explosives manufacturing plant in Kingsport, Tennessee. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, and FMEA techniques
- Conducted a PHA Leadership Training Class for personnel at the Nuclear Fuel Services (NFS) plant in Erwin, Tennessee. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, and FMEA techniques
- Performed an audit of the process safety information of the MHC Unit, the No. 2 Crude Unit, the 15 MM SCFD Hydrogen Plant, the 5 MM SCFD Hydrogen Plant, and the HTU, which are due for PHA revalidations the following year at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA and LOPA of the Epoxy Unit at the CVC Thermoset Specialties Plant in Maple Shade, New Jersey along with Consequence Analysis Modeling in compliance with the New Jersey Toxic Catastrophe Prevention Act (TCPA) Program NJAC 7:31
- Performed an Update to the Safety Integrity Level (SIL) Selection Analyses of the Baker Hughes chemical manufacturing plant in Sand Springs, Oklahoma
- Performed a PHA of the Control Rooms at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Reverse Osmosis (RO) and Boiler House at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the LPG Bullet Tank Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the SWS Overhead to the new SWS Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the Ammonia Water Wash Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed an engineering review of the burner management systems of fired heaters at the Calumet Montana Refining, LLC refinery in Great Falls, Montana, including a comparison of the design of

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

existing systems to industry standards and best practices (e.g., American Petroleum Institute (API) Recommended Practice (RP) 556 and the International Systems and Automation (ISA) Society Standard for Safety Instrumented Systems, 84.00.01 – 2004)

- Performed a PHA of the PSM-Covered Utility Systems at the Calumet Montana Refining, LLC refinery in Great Falls, Montana, including the fuel gas system and pilot gas system
- Performed a PHA of the Non-PSM Covered Utility Systems at the Calumet Montana Refining, LLC refinery in Great Falls, Montana, including the cooling water system, instrument air system, plant air system, and steam boilers
- Performed a PHA of the PSM-Covered Storage and Loading Areas at the Calumet Montana Refining, LLC refinery in Great Falls, Montana, including pressurized storage, naphtha storage, gasoline storage and blending, truck loading for propane, butane, and gasoline, truck unloading for isobutane, and rail loading for gasoline and naphtha
- Performed a PHA of the Non-PSM Covered Storage and Loading Areas at the Calumet Montana Refining, LLC refinery in Great Falls, Montana, including hydrochloric acid storage, sulfuric acid storage, peroxide storage, and caustic storage
- Performed a simple update PHA Revalidation of the Merox Treater Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Process Safety Management/Risk Management Program Compliance Audit at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a Management of Change (MOC) PHA of the MANGAP Project and an MOC PHA of the Tank TK-47 Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Benzene Reduction Unit and Platformer Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Toluene Receiving and Distribution System at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a PHA of the 8500 Side Process at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a design hazard review of the Municipal Solid Waste (MSW)-Based Electrical Generation Unit to be constructed at the Paradigm Manufacturing Company electrical generation facility located in Barnesville, Georgia
- Performed an audit of the process safety information of the Merox Treaters, Utilities and Auxiliary Systems, and Plant Storage/Loading Systems, which are due for PHA revalidations the following year at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA revalidation of the Secondary Caustic Scrubber (SCS) and Sodium Hydrosulfide (NaHS) Units at the Calumet Montana Refining, LLC refinery in Great Falls, Montana

**Melvin C. (Mel) Coker, Jr.**  
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- Performed a simple update PHA revalidation of the Flare Gas Scrubber (FGS) Unit and Flare at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the CHS, Inc. – Energy Division LPG terminal in Nooksack, Washington
- Performed a PHA of the CHS, Inc. – Energy Division LPG terminal in Yakima, Washington
- Performed an Update to the Safety Integrity Level (SIL) Selection Analysis of the FCCU at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Western Refining, Inc. LPG terminal in Jal, New Mexico
- Performed a PHA of the 400 Side Process at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a PHA of the Specialty Distillation Process at the Emerald Kalama Chemical, LLC plant in Kalama, Washington
- Performed a Management of Change (MOC) PHA update of the No. 1 Crude Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Plant Air and Breathing Air Utility Systems at the CHS, Inc. refinery in Laurel, Montana
- Conducted two Management of Change (MOC) Hazard Review Leadership Training Classes for personnel at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Delayed Coker Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone E Sulfur Complex, including the Amine Unit, Sour Water Stripper Unit, Sulfur Recovery Unit, and Tailgas Treating Unit, at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Naphtha Hydrotreating (NHT) Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed an initial PHA of the Crude Storage Area at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA revalidation of the No. 1 Crude Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA revalidation of the Isomerization (Isom) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Mild Hydrocracker (MHC) Unit (Unit 200) at the CHS, Inc. refinery in Laurel, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed an initial PHA of the No. 3 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a Process Safety Management/Risk Management Program Compliance Audit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the propane terminal for Rockville Propane Terminal, LLC in St. Cloud, Minnesota
- Developed the PSM / RMP program manual for the Rockville Propane Terminal, LLC propane terminal in St. Cloud, Minnesota
- Performed a Gap Analysis of the PHA Program for the Emerald Kalama Chemical, LLC plant in Kalama, Washington. The objective of the Gap Analysis was to identify any improvements that could be made to the PHA program that would help ensure compliance with the OSHA PSM and EPA RMP regulations and/or to help improve efficiency of conducting PHAs and layer of protection analyses (LOPAs) at the Emerald Kalama plant
- Performed a Preliminary Prestartup Safety Reviews (PSSRs) of the Mild Hydrocracker (MHC) Unit and the Sour Water Stripper Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana. During the Preliminary PSSR, the team reviewed changes to the process design since the initial PHA, reviewed changes to the P&IDs, reviewed a Calumet PSSR checklist, reviewed prioritization of alarms, reviewed commissioning steps, and reviewed status of action items from the initial PHA
- Performed a PHA Revalidation of the No. 2 Crude Unit, at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the No. 1 Crude Unit, at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Firewater and Nitrogen Systems at the CHS, Inc. refinery in Laurel, Montana
- Performed a review of operating procedures for new process units being commissioned at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Hazard Review of the 2017 Turnaround Project for the Fluidized Catalytic Cracking Unit (FCCU) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone A Sulfur Complex, including the Amine Unit, Sulfur Recovery Units, and Tailgas Treating Unit, at the CHS, Inc. refinery in Laurel, Montana
- Participated in a P&ID Review of the Mild Hydrocracker Phase II Project at the CHS, Inc. refinery in Laurel, Montana
- Conducted a Process Hazard Analysis (PHA) Leader Training course and a PHA of the Heated Blend Stations of the One Pot Process at the Johnson Matthey Plant in Smithfield, Pennsylvania. The PHA Leader training course covered the HAZOP, What-If, Checklist, and FMEA techniques



**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Preliminary Prestartup Safety Review (PSSR) of the Flare Gas Scrubber (FGS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana. During the Preliminary PSSR, the team reviewed changes to the process design since the initial PHA, reviewed changes to the P&IDs, reviewed a Calumet PSSR checklist, reviewed prioritization of alarms, reviewed commissioning steps, and reviewed status of action items from initial PHA
- Attended a preliminary HAZOP review of the CEP Process and provided guidance for layer of protection analysis (LOPA) for Goldcorp, Inc. at the Fluor Canada Ltd. offices in Vancouver, British Columbia, Canada
- Performed an initial PHA of the 2-Stage Sour Water Stripper (2SSWS) Unit at the CHS, Inc. refinery in Laurel, Montana
- Conducted a PHA Leadership Training Class for personnel at the BAE Systems, Ordnance Systems, Inc., explosives manufacturing plant in Radford, Virginia. The PHA Leadership Training course covered the HAZOP, What-If, Checklist, and FMEA techniques
- Performed a Preliminary Prestartup Safety Review (PSSR) of the No. 2 Crude Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana. During the Preliminary PSSR, the team reviewed changes to the process design since the initial PHA, reviewed changes to the P&IDs, reviewed a Calumet PSSR checklist, reviewed prioritization of alarms, reviewed commissioning steps, and reviewed status of action items from initial PHA
- Performed a Preliminary Prestartup Safety Review (PSSR) of the NaHS Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana. During the Preliminary PSSR, the team reviewed changes to the process design since the initial PHA, reviewed changes to the P&IDs, reviewed a Calumet PSSR checklist, reviewed prioritization of alarms, reviewed commissioning steps, and reviewed status of action items from initial PHA
- Performed a Preliminary Prestartup Safety Review (PSSR) of the 15 MMSCFD Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana. During the Preliminary PSSR, the team reviewed changes to the process design since the initial PHA, reviewed changes to the P&IDs, reviewed a Calumet PSSR checklist, reviewed prioritization of alarms, reviewed commissioning steps, and reviewed status of action items from initial PHA
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Secondary Caustic Scrubber (SCS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed an initial PHA of the Secondary Caustic Scrubber (SCS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA revalidation of the Kerosene Hydrodesulfurization (KHDS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA Revalidation of the Naphtha Hydrodesulfurization (NHDS) and Catalytic Reformer Units at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a simple update PHA revalidation of the Fluidized Catalytic Cracking Unit (FCCU) at

**Melvin C. (Mel) Coker, Jr.**  
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the Calumet Montana Refining, LLC refinery in Great Falls, Montana

- Performed a Design Hazard Review of the Offsite Areas at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the CHS, Inc. – Energy Division LPG terminal in Ross, North Dakota
- Performed a PHA of the CHS, Inc. – Energy Division propane terminal in Biddeford, Maine
- Performed a PHA of the Natural Gas and Fuel Gas Systems at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Gasoline Storage and Blending Areas at the CHS, Inc. refinery in Laurel, Montana
- Performed a Design Hazard Review of the Secondary Caustic Scrubber (SCS) Unit and Ammonia Storage at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the BioKrush Process at the AES Environmental, LLC plant in Morgantown, West Virginia
- Performed a PHA Revalidation of the Unit 100 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of Unit 1000 at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Propane Distribution System at the CHS, Inc., Petroleum Terminal in Laurel, Montana
- Performed a PHA Revalidation of the Final Distillation Unit (FDU), the Asphalt Oxidizer (AO) Unit, and the Clay Treating Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a PHA of the Waste Water Treatment Plant Expansion Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Management of Change (MOC) Hazard Review of the Rail Expansion Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed an initial PHA of the Flare Gas Scrubber (FGS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the Cooling Water and Instrument Air Systems at the CHS, Inc. refinery in Laurel, Montana
- Developed the electrical classification drawings of the CCP Composites chemical manufacturing plant in Marshall, Texas and performed an electrical classification assessment with

**Melvin C. (Mel) Coker, Jr.**  
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recommendations for the plant to meet the requirements of American Petroleum Institute Recommended Practice (API RP) 500

- Performed a PHA Revalidation of the Fluidized Catalytic Cracking Unit (FCCU) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the CHS, Inc. – Energy Division propane terminal in Hannaford, North Dakota
- Performed a PHA of the CHS, Inc. – Energy Division propane terminal in Glenwood, Minnesota
- Performed a PHA of the CHS, Inc. – Energy Division propane terminal in Hixton, Wisconsin
- Performed a Safety Integrity Level (SIL) Selection Analysis of the 2-Stage Sour Water Stripper (2SSWS) Unit at the CHS, Inc. refinery in Laurel, Montana
- Developed the electrical classification drawings of the CCP Composites chemical manufacturing plant in Houston, Texas and performed an electrical classification assessment with recommendations for the plant to meet the requirements of American Petroleum Institute Recommended Practice (API RP) 500
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Sour Water Stripper (SWS) and Sodium Hydrosulfide (NaHS) Units at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed an initial PHA of the Sour Water Stripper (SWS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed an initial PHA of the Sodium Hydrosulfide (NaHS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Provided engineering support as a subcontractor to another engineering consulting firm for developing corporate engineering standards for the Avery Dennison Solvent Coating Operations at the Mentor, Ohio plant
- Subcontracted to conduct a Process Hazard Analysis (PHA) Leader training course for Pertamina, the Indonesian national oil company in Bali, Indonesia covering HAZOP, What-If, Checklist, and FMEA methodologies
- Performed a Process Safety Management/Risk Management Program Compliance Audit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA and PSM/RMP Regulatory Coverage Evaluation of the Crude Unloading System at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a Design Hazard Review of the new Sour Water Stripper (SWS) Unit, Sodium Hydrosulfide (NaHS) Unit, Secondary Caustic Scrubber (SCS) Unit, and Flare Gas Scrubber (FGS) Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed simple update PHA Revalidations of the HF Alkylation and Catalytic Polymerization

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

Units at the Calumet Montana Refining, LLC refinery in Great Falls, Montana

- Performed a management of change (MOC) hazard review of the Truck Loading Rack Expansion Project at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis and Recommended Practices Evaluation of Heater Burner Management Systems at the Calumet Specialty Products Partners, L.P. Cotton Valley refinery in Cotton Valley, Louisiana
- Performed a simple update PHA Revalidation of the HF Alkylation Unit at the Calumet Montana Refining LLC refinery in Great Falls, Montana
- Updated the Safe Operating Limits tables at the Western Gallup Refinery in Jamestown, New Mexico, including Safe Operating Limits for the reliability of rotating equipment
- Performed a Safety Integrity Level (SIL) Selection Analysis of Plant 5 and the Tank Farm at the Baker Hughes, Inc. Bayport chemical manufacturing plant in Pasadena, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the No. 2 Crude Distillation Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the No. 2 Crude Distillation Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Hydrocal Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a PHA of the Hydrocal Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a Design Hazard Review of the Mild Hydrocracker Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Mild Hydrocracker Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA of the 15 MM SCF/D Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the 15 MM SCF/D Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Design Hazard Review of the Crude Expansion Project at the Western Refining, Inc. refinery in El Paso, Texas at the Wood Group Mustang offices in Houston, Texas
- Developed the PSM Program Manual for the Baker Hughes, Inc., chemical blend plant in Leduc, Alberta, Canada

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Safety Integrity Level (SIL) Selection Analysis at the Baker Hughes, Inc., chemical blend plant in Leduc, Alberta, Canada
- Performed a PHA of the Baker Hughes, Inc., chemical blend plant in Leduc, Alberta, Canada
- Developed the PSM Program Manual for the Baker Hughes, Inc., chemical blend plant in Calgary, Alberta, Canada
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Baker Hughes, Inc., chemical blend plant in Calgary, Alberta, Canada
- Performed a PHA of the Baker Hughes, Inc., chemical blend plant in Calgary, Alberta, Canada
- Developed the PSM Program Manual for the Baker Hughes, Inc., chemical blend plant in Hobbs, New Mexico
- Developed the PSM Program Manual for the Baker Hughes, Inc., chemical blend plant in Kilgore, Texas
- Performed a PHA Revalidation of the Unit 1000 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Unit 900 Ultra Low Sulfur Diesel (ULSD) Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Propane and Butane Pressurized Storage at the CHS, Inc. refinery in Laurel, Montana
- Performed a Management of Change (MOC) Hazard Review of the Oxygen Enrichment Project at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a Preliminary Safety Integrity Level (SIL) Selection Analysis of selected burner management systems at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a PHA of the new Amine Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a PHA Revalidation of the HF Alkylation, Saturates Liquids, and Butamer Units at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of Plant 2 at the Baker Hughes, Inc. Bayport chemical manufacturing plant in Pasadena, Texas
- Developed the electrical classification drawings of the CCP Composites chemical manufacturing plant in Sandusky, Ohio and performed an electrical classification assessment with recommendations for the plant to meet the requirements of American Petroleum Institute Recommended Practice (API RP) 500

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- Developed the PSM Program Manual for the Baker Hughes, Inc., chemical blend plant in Bakersfield, California
- Performed a Safety Integrity Level (SIL) Selection Analysis of Plant 3 and Ethylene Oxide/Propylene Oxide Storage at the Baker Hughes, Inc. Bayport chemical manufacturing plant in Pasadena, Texas
- Developed the PSM Program Manual for the Baker Hughes, Inc., Houston Blend Plant in Houston, Texas
- Performed a Process Safety Management (PSM) and Risk Management Program (RMP) Compliance Audit for the Montana Refining Company refinery in Great Falls, Montana
- Performed a Design Hazard Review of the No. 2 Crude Distillation Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the No. 2 Crude Distillation Unit at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Management of Change (MOC) PHA of the Pump Addition Project at the Genesis Energy, LP bitumen storage and transfer terminal in Natchez, Mississippi
- Performed a PHA and Safety Integrity Level (SIL) Selection Analysis of the Delayed Coker Unit at the Axion Energy Argentina S.R.L. refinery in Campana, Buenos Aires, Argentina for Foster Wheeler Canada Limited
- Developed the electrical classification drawings of the CCP Composites chemical manufacturing plant in Chatham, Virginia and performed an electrical classification assessment with recommendations for the plant to meet the requirements of American Petroleum Institute Recommended Practice (API RP) 500
- Performed a PHA revalidation of the Hydrotreating Unit (HTU) at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA revalidation of the 5 MM SCF/D Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA revalidation of the 2 MM SCF/D Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the 2 MM SCF/D Hydrogen Plant at the Calumet Montana Refining, LLC refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Zone D Amine Unit, Sulfur Recovery Unit, Tail Gas Treating Unit, and Sour Water Stripping Unit (Units 300, 400, 500, and 600) at the CHS, Inc. refinery in Laurel, Montana
- Directed a project for developing the PSM/RMP program at the Baker Hughes, Inc. chemical manufacturing plant in Sand Springs, Oklahoma. Project elements included developing a program

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**Process Engineering Associates, LLC**

manual, performing PHAs of all covered process areas, performing Safety Integrity Level (SIL) selection analyses of all covered process areas, developing P&IDs, developing maximum intended inventories, developing the sizing basis for all pressure relief devices throughout the plant, developing the safety requirement specifications (SRS) for all SIL-rated safety instrumented systems, and developing ventilation design documents for occupied buildings

- Performed a Management of Change (MOC) PHA update of the Mild Hydrocracking (MHC) Project and the Crude Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class in Calgary, Alberta, Canada for personnel from the Baker Hughes, Inc. blend plants in Eastfield and Leduc, Alberta, Canada
- Conducted three Management of Change (MOC) Hazard Review Leadership Training Classes for personnel at the Western Refining, Inc. refinery in El Paso, Texas
- Performed a PHA Revalidation of the Acrolein Process at the Baker Hughes, Inc. chemical manufacturing plant in Taft, California
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Acrolein Process at the Baker Hughes, Inc. chemical manufacturing plant in Taft, California
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class for personnel at the Baker Hughes, Inc. chemical manufacturing plant in Sand Springs, Oklahoma
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class in Bakersfield, California for personnel from the Baker Hughes, Inc. chemical blend plant in Bakersfield, California and Baker Hughes, Inc. chemical manufacturing plant in Taft, California
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class in Rayne, Louisiana for personnel from the Baker Hughes, Inc. chemical blend plants in Rayne and Geismar, Louisiana
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class for personnel at the Baker Hughes, Inc. chemical blend plant in Hobbs, New Mexico
- Conducted a Management of Change (MOC) Hazard Review Leadership Training Class in Bayport, Texas for personnel from the Baker Hughes, Inc. chemical blend plant in Kilgore, Texas; the pilot plant in Bayport, Texas; the chemical manufacturing plant in Bayport, Texas; and the corporate office in Sugarland, Texas
- Performed a PHA of the entire Antelope Refining refinery in Douglas, Wyoming
- Performed a PHA of the entire process plant at the Baker Hughes, Inc. explosives manufacturing plant in Hampton, Arkansas
- Performed a failure modes and effects analysis (FMEA) of the BFW Pump Project (P-1350) for the CHS, Inc. refinery in Laurel, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a process safety Gap Analysis of the Baker Hughes, Inc. explosives manufacturing plant in Hampton, Arkansas
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. chemical blend plant in Bakersfield, California
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. chemical manufacturing plant in Taft, California
- Performed a PHA of the entire plant at the MultiChem, Inc. chemical blend plant in New Iberia, Louisiana
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. explosives manufacturing plant in Pine Island, Texas
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. Houston Blend Plant in Houston, Texas
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. chemical manufacturing plant in Bayport, Texas
- Performed a PHA Revalidation of the Merox Treater Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Covered Utility Systems at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Covered Tankage Processes at the Montana Refining Company refinery in Great Falls, Montana
- Performed a process safety Gap Analysis of the Baker Hughes, Inc. chemical manufacturing plant in Sand Springs, Oklahoma
- Performed a PHA of the Linde Process Plants, Inc., Tailgas Treatment and Light Hydrocarbon Recovery Plant for the Shaanxi Future Energy and Chemical Co., Ltd. Yulin Project
- Performed a Layer of Protection Analysis (LOPA) of the Linde Process Plants, Inc., Tailgas Treatment and Light Hydrocarbon Recovery Plant for the Shaanxi Future Energy and Chemical Co., Ltd. Yulin Project
- Performed a PHA and Layer of Protection Analysis (LOPA) for the SI Group chemical plant Franklin Project in Newport, Tennessee
- Managed a project for developing the PSM/RMP program at the Baker Hughes, Inc. chemical manufacturing plant in Barnsdall, Oklahoma. Project elements included developing a program manual, defining the limits of coverage on a plot plan, performing PHAs of all covered process areas, performing Safety Integrity Level (SIL) selection analyses of all covered process areas, developing operating procedures in a regulatory compliant format, developing P&IDs and PFDs, developing Safe Operating Limits with consequences of deviations and corrective actions,



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**Process Engineering Associates, LLC**

developing maximum intended inventories, developing the sizing basis for all pressure relief devices throughout the plant, developing a document control system for process safety information (PSI), developing the safety requirement specifications (SRS) for all SIL-rated safety instrumented systems, developing ventilation design documents for occupied buildings, developing the Management of Change (MOC) and Pre-startup Safety Review (PSSR) procedure, and conducting training sessions for all plant personnel on an overview of PSM and MOC/PSSR

- Performed a PHA of a project to install a new flare at the CHS, Inc. refinery in Laurel, Montana
- Performed a Process Safety Management (PSM) / Risk Management Program (RMP) Compliance Audit of Western Refining Company's refinery in El Paso, Texas
- Performed a Management of Change (MOC) Process Hazard Analysis (PHA) and Safety Integrity Level (SIL) Selection Analysis of the FCCU Revamp Project at the CHS, Inc., refinery in Laurel, Montana
- Performed a Management of Change (MOC) Process Hazard Analysis (PHA) and Safety Integrity Level (SIL) Selection Analysis of the Mild Hydrocracker Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a Management of Change (MOC) Process Hazard Analysis (PHA) and Safety Integrity Level (SIL) Selection Analysis of the Crude Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA revalidation of the Zone E Sour Water Stripper, Amine Unit, Sulfur Recovery Unit, and Tail Gas Treating Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA revalidation of the Zone E Delayed Coker Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a Management of Change (MOC) PHA of the Flare and Hot Oil Systems Project for the Baker Hughes, Inc., chemical manufacturing plant in Barnsdall, Oklahoma
- Performed a Process Safety Management (PSM) / Risk Management Program (RMP) Compliance Audit of the SI Group chemical manufacturing plant in Newport, Tennessee
- Performed a process safety Gap Analysis of the Mead WestVaco paper mill in Charleston, South Carolina
- Performed a PHA of the Algae Extraction Process at the SRS Energy, LLC pilot plant in Dexter, Michigan
- Performed a Management of Change (MOC) PHA of the Mobile Source Air Toxics (MSAT) Project, including the Isomerization Unit, at Montana Refining Company's refinery in Great Falls, Montana
- Performed a (SIL) Selection Analysis of the Mobile Source Air Toxics (MSAT) Project, including the Isomerization Unit, at Montana Refining Company's refinery in Great Falls, Montana

**Melvin C. (Mel) Coker, Jr.**  
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- Performed a PHA revalidation of the Crude and Sodium Hydrosulfide (NaHS) Units at Montana Refining Company's refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Crude and Sodium Hydrosulfide (NaHS) Units at Montana Refining Company's refinery in Great Falls, Montana
- Performed PHA Revalidations of the No. 1 Crude Unit, the No. 2 Crude Unit, and the Zone A Amine Unit, Sulfur Recovery Unit (SRU), and Tailgas Treating Unit at the CHS, Inc. refinery in Laurel, Montana
- Developed safe operating limits information using best-in-class techniques to refine the limits to safe operating parameters and normal operating limits for the HF Alkylation Unit at the Western Refining Company refinery in Gallup, New Mexico
- Performed a Management of Change (MOC) PHA of the Carlyle Pot Project at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA of the MK4 Gasifier at the Sierra Energy facility in McClellan, California
- Performed a Process Safety Management (PSM) and Risk Management Program (RMP) Compliance Audit for the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Fluidized Catalytic Cracking Unit (FCCU) at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Fluidized Catalytic Cracking Unit (FCCU) at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Kerosene Hydrodesulfurization Unit, the Naphtha Hydrodesulfurization Unit, and the Reformer Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed PHA Revalidations of the Kerosene Hydrodesulfurization Unit, the Naphtha Hydrodesulfurization Unit, and the Reformer Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Management of Change (MOC) PHA and Safety Integrity Level (SIL) Selection Analysis of the Unit 100 Hydrogen Plant Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Gasoline Storage and Blending Areas at the CHS, Inc. refinery in Laurel, Montana
- Conducted a Management of Change PHA Leadership Training Class for personnel at the Alon USA, LP refinery in Big Spring, Texas
- Performed a Management of Change (MOC) PHA of the BOC CO Plant at the Linde Gas North America, LLC Plant in Clear Lake, Texas

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Failure Modes and Effects Analysis (FMEA) of Boilers 9 and 10 at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Fluidized Catalytic Cracking Unit (FCCU) at the CHS, Inc. refinery in Laurel, Montana
- Directed a project that performed a Management of Change (MOC) PHA of the Mobile Source Air Toxics (MSAT) II Project at Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Served as an expert witness in discovery for a court case defending a refinery in Utah against OSHA citations that resulted from an NEP audit
- Performed a Process Safety Management/Risk Management Plan Compliance Audit for the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Directed a project that performed a PHA Revalidation of the Fuel Gas Treaters Unit at the Alon USA, LP refinery in Big Spring, Texas
- Subcontracted to teach two (2) hazard review technique courses, including HAZOP, Checklists, What-If, and FMEA methodologies, for Saudi Aramco in Dhahran, Saudi Arabia. Each of the 1-week courses was attended by approximately 20 engineers and managers from Saudi Aramco (October/November 2009)
- Performed a Management of Change (MOC) PHA of the Sulfur Recovery Unit and Tailgas Treater Unit (Units 400 and 500) Revamp Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Gas Treating Unit (GTU) at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PHA of the GTU at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Directed a project that developed refinery-wide Cause and Effect Diagrams and performed refinery-wide Safety Integrity Level (SIL) Selection Analyses for Wyoming Refining Company in Newcastle, Wyoming
- Directed a project that performed a Safety Integrity Level (SIL) Selection Analysis of the Cat Light Ends Unit at the Alon USA, LP refinery in Big Spring, Texas
- Directed a project that performed a PHA Revalidation of the Cat Light Ends Unit at the Alon USA, LP refinery in Big Spring, Texas
- Performed an MOC PHA of the Mobile Source Air Toxics (MSAT) Project at the Montana Refining Company refinery in Great Falls, Montana
- Directed a project that performed a PHA Revalidation of the Pressurized Storage Area at the Western Refining Company Gallup Refinery in Jamestown, New Mexico

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Safety Integrity Level (SIL) Selection Analysis of the Sour Water Ammonia to Ammonium Thiosulfate (SWAATS) Unit, the Amine Unit, and the Sour Water Stripper (SWS) Unit at the Wyoming Refining Company refinery in Newcastle, Wyoming
- Performed a PHA of the Sour Water Ammonia to Ammonium ThioSulfate (SWAATS) Unit, the Amine Unit, and the Sour Water Stripper (SWS) Unit at the Wyoming Refining Company refinery in Newcastle, Wyoming
- Directed a project that performed a Safety Integrity Level (SIL) Selection Analysis of the Gas Oil Hydrotreater in at the Alon USA, LP refinery in Big Spring, Texas
- Directed a project that performed a PHA Revalidation of the Gas Oil Hydrotreater at the Alon USA, LP refinery in Big Spring, Texas
- Subcontracted to perform a Relief System and Limited Process Safety Assessment for Enterprise Products Operating, LP Pump Station in Skellytown, Texas
- Directed a project that performed a PHA Revalidation of the Treaters Unit at the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Performed a Failure Modes and Effects Analysis (FMEA) of Boilers 11 and 12 at the CHS, Inc. refinery in Laurel, Montana
- Directed a project that performed a PHA Revalidation of the Saturates Gas Unit at the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Directed a project that performed a Safety Integrity Level (SIL) Selection Anaylsis of the Light Distillate Hydrotreater Unit at the Alon Refinery in Big Spring, Texas
- Directed a project that performed a PHA Revalidation of the Light Distillate Hydrotreater Unit at the Alon Refinery in Big Spring, Texas
- Directed a project that provided ISA training, developed Safety Requirement Specifications (SRS), and developed interlock testing procedures at the Montana Refining Company refinery in Great Falls, Montana
- Subcontracted to teach two (2) hazard review technique courses, including HAZOP, Checklists, What-If, and FMEA methodologies, for Saudi Aramco in Dhahran, Saudi Arabia. Each of the 1-week courses was attended by approximately 20 engineers and managers from Saudi Aramco (June 2009)
- Directed a project that developed operating procedures for the Final Distillation Unit, the Clay Treating Unit, and the Asphalt Oxidizer Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Served as an expert witness in discovery for a court case defending a refinery in Wyoming against OSHA citations that resulted from an NEP audit

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a PHA of the Final Distillation Unit, the Clay Treating Unit, and the Asphalt Oxidizer Unit at the Calumet Specialty Products Partners, LP refinery in Princeton, Louisiana
- Performed a Process Safety Management/Risk Management Plan Compliance Audit for the Alon Refinery in Big Spring, Texas
- Served as an expert witness in discovery for a court case defending a refinery in Montana against OSHA citations that resulted from an NEP audit
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Catalytic Polymerization Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA of the Catalytic Polymerization Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the HF Alkylation Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA of the HF Alkylation Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Management of Change (MOC) PHA of the FCCU Revamp Project at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Ultra Low Sulfur Diesel (ULSD) Unit (Unit 900) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Ultra Low Sulfur Diesel (ULSD) Unit (Unit 900) at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Unit 1000 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Unit 1000 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Pressurized Storage Areas at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a Process Safety Management (PSM) Compliance Audit for the Unilever plant in Clinton, Connecticut
- Performed a Management of Change (MOC) PHA of the addition of the Oven Fire Suppression System for the Johns Manville International fiberglass manufacturing plant in Willows, California
- Performed a PHA of the Sulfur Recovery Unit (SRU) on behalf of the Ortloff Engineers, Ltd. office in Midland, Texas for Presson-Descon International Private Limited in Lahore, Pakistan and the Oil and Gas Development Company Limited Gas Processing Plant in Dakhni, Pakistan

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Safety Integrity Level (SIL) Selection Analysis of the HF Alkylation, Saturates Liquids, and Butamer Units at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the HF Alkylation, Saturates Liquids, and Butamer Units at the CHS, Inc. refinery in Laurel, Montana
- Directed a series of Management of Change (MOC) PHAs and Layer of Protection Analyses (LOPAs) associated with the Benzene Reduction Project at the ConocoPhillips Company Refinery and NGL Complex in Borger, Texas for Kellogg, Brown, and Root, Inc. The MOC PHAs included 14 process units all within the scope of the project
- Performed a Management of Change (MOC) PHA of the Benzene Reduction Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a Layer of Protection Analysis (LOPA) of the Sulfur Complex at the Sinclair Tulsa Refining Company in Tulsa, Oklahoma for Linde Process Plants, Inc. in Tulsa, Oklahoma
- Performed a Process Safety Management/Risk Management Program Compliance Audit for the SI Group, Inc. chemical plant in Newport, Tennessee
- Performed a PHA of the Sulfur Complex at the Sinclair Tulsa Refining Company in Tulsa, Oklahoma for Linde Process Plants, Inc. in Tulsa, Oklahoma
- Performed a PHA of the Primary II (Crude) Unit at the Calumet Lubricants Company refinery in Princeton, Louisiana
- Performed a PHA Revalidation of the Pressurized Storage Unit at the CHS, Inc. refinery in Laurel, Montana
- Directed a PHA and Safety Integrity Level (SIL) Selection Analysis of the Diesel Desulfurization Unit, the Naphtha Desulfurization Unit, and the Ultraformer Unit at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PHA Revalidation of the HF Alkylation Unit at the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Performed a PHA of the Hydrocal Complex at the Calumet Lubricants Company refinery in Princeton, Louisiana
- Directed a series of PHAs and Safety Integrity Level (SIL) Selection Analyses of the FCCU, Southside Flare Unit, DHT Unit, HF Alkylation Unit, SRU-1/SCOT-1 Unit, SRU-2/SCOT-2/SWS Units, and the ULSG Unit at the Alon USA, LP refinery in Big Spring, Texas
- Managed a project to develop process safety information for the Zone E Sulfur Complex and Delayed Coker Unit for the CHS, Inc. refinery in Laurel, Montana. Project tasks included developing material safety data sheets (MSDSs), developing safe upper and lower operating limits and consequences of deviations tables, developing maximum intended inventories, developing material interaction matrices, compiling relief valve sizing information, compiling heat and mass balance information, and developing process descriptions that include process chemistry

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Management of Change (MOC) PHA of the Fuel Gas Treater Modification Project at the Alon USA, LP refinery in Big Spring, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the 2 MM SCF/D Hydrogen Plant at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the 2 MM SCF/D Hydrogen Plant at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the 5 MM SCF/D Hydrogen Plant at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Hydrotreating Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Hydrotreating Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a Preliminary PHA of the conceptual design of the NGL Consolidation Project at the ConocoPhillips Refinery and NGL Complex in Borger, Texas for SNC Lavalin-GDS in Houston, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Zone D Amine Unit, Sulfur Recovery Unit, Tail Gas Treating Unit, and Sour Water Stripping Unit (Units 300, 400, 500, and 600) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone D Amine Unit, Sulfur Recovery Unit, Tail Gas Treating Unit, and Sour Water Stripping Unit (Units 300, 400, 500, and 600) at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Oil Movements Unit at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Directed a project that performed a Safety Review of the Carbon Dioxide Capture Pilot Plant at the Wisconsin Energies Pleasant Prairie Power Plant for Alstom Power, Inc., in Knoxville, Tennessee
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Unit 100 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the FCC Feed Desulfurizer Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Unit 100 Hydrogen Plant at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the FCC Feed Desulfurizer Unit at the CHS, Inc. refinery in Laurel, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a PHA Revalidation of the Control Rooms at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Flare Systems at the CHS, Inc. refinery in Laurel, Montana
- Managed a project that performed a PHA Revalidation of the Distillate Hydrotreating (Ultra Low Sulfur Diesel) Unit for the Western Gallup Refinery in Jamestown, New Mexico
- Performed a PHA Revalidation of the Naphtha Hydrotreating and Platformer Units for the Western Gallup Refinery in Jamestown, New Mexico
- Performed a PHA Revalidation of the Crude Unit for the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Managed a project for developing safe upper and lower operating limits for all covered process units at the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Managed a project for developing maximum intended inventories for all covered process units at the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Performed a PHA of a 5 MM SCF/D Hydrogen Plant for the Montana Refining Company refinery in Great Falls, Montana
- Directed a project to perform a PHA of the Tantalum Production Unit at the Niotan, Inc. facility in Mound House, Nevada
- Managed a project to implement a PSM/RMP Program at the Calumet Lubricants Company refinery in Princeton, Louisiana. Project tasks included developing design information for the ventilation systems of two control rooms, developing safe upper and lower operating limits information along with consequences of deviation and manual corrective actions, documenting operating procedures, conducting a Management of Change (MOC) PHA training course, and conducting an Incident Investigation training course
- Performed a Process Safety Management/Risk Management Program Gap Analysis and developed a template PSM/RMP Program for the Calumet Lubricants Company refinery in Princeton, Louisiana
- Performed a PHA Revalidation of the Crude Unit for the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Performed a Process Safety Management/Risk Management Program Compliance Audit for the Western Refining Company Gallup Refinery in Jamestown, New Mexico
- Directed a project to develop flare emissions models for refrigerated ammonia storage tanks at six ammonia storage terminals for Koch Nitrogen Company, Wichita, Kansas. The project involved developing models using Excel spreadsheets of the ambient heat transfer into the refrigerated storage tanks to determine the amount of ammonia that vaporizes when the compressor systems are not operating. This ammonia evaporation rate was then used to determine the amount of uncombusted ammonia and NO<sub>x</sub> that was emitted from the tank flares. The program outputs were formatted for ease of reporting to regulatory agencies. The project also involved evaluating each



**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

flare to ensure that all required parameters of the New Source Performance Standard (NSPS) for flaring were met in order to assume a minimum destruction efficiency of 98%

- Managed a project for developing the Maximum Intended Inventories at the Navajo Refining Company refinery in Artesia, New Mexico
- Performed a PHA of 901 Tank at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Managed a project for evaluating the overpressure protection for 901 Tank at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Conducted a Management of Change PHA Leadership Training Class for personnel at the Western Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PSM Program Development Assessment for IBM Corporation at the IBM plant in Fishkill, New York
- Performed a PHA of the Delayed Coker Unit for the Nizhnekamsk Refinery in Nizhnekamsk, Russia for Foster Wheeler USA Corporation in Houston, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Combination Vapor Recovery Unit (VRU) and Coker VRU at the Giant Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PHA Revalidation of the Coker Vapor Recovery Unit (VRU) at the Giant Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PHA Revalidation of the Combination Vapor Recovery Unit (VRU) at the Giant Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a PHA of the Sulfur Recovery Unit at the Calumet Lubricants Company refinery in Princeton, Louisiana
- Performed a PHA of the Delayed Coker Unit at the Sinclair Refinery in Tulsa, Oklahoma for Foster Wheeler USA Corporation in Houston, Texas
- Performed a PHA of the PetroBeam 1,000 Barrel Per Day Electron Beam Heavy Oil Upgrading Pilot System at the Radiation Dynamics, Inc. facility in Edgewood, New York
- Performed a PHA Revalidation of the Merox Treater Unit at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Covered Utility Systems at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Covered Tankage Processes at the Montana Refining Company refinery in Great Falls, Montana

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Process Safety Management/Risk Management Program Compliance Audit for the Montana Refining Company refinery in Great Falls, Montana
- Performed a Management of Change (MOC) PHA of the Crude Unit Revamp Project at the Countrymark Cooperative refinery in Mount Vernon, Indiana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the No. 2 Crude Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA revalidation of the No. 2 Crude Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a Process Safety Management/Risk Management Program Compliance Audit for the Navajo Refining Company refinery in Artesia, New Mexico
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Platformer Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA revalidation of the Platformer Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a Process Safety Management/Risk Management Program Compliance Audit for the Giant Refining Company Yorktown Refinery in Grafton, Virginia
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Safety Instrumented Systems in the Crude Complex and the Oil Movement and Storage (OM&S) Unit at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA Revalidation of the pressurized storage portion of the Oil Movement and Storage (OM&S) Unit at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA Revalidation of the Propane Deasphalting (PDA) Unit at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA Revalidation of the Naphtha Hydrodesulfurization (HDS) and Catalytic Reformer Units at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA Revalidation of the Crude and Vacuum Units at the Alon USA, LP refinery in Big Spring, Texas
- Performed a Management of Change (MOC) PHA of the Caustic Scrubber Systems Project at the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA of the Metal Melt 12H40 Container Pit Radioactive Waste Transfer Process at the Energy Solutions, LLC Bear Creek Facility in Oak Ridge, Tennessee
- Performed a Management of Change (MOC) PHA and Safety Integrity Level (SIL) Selection Analysis of the Zone A Olefin Splitter and Merox Treater Project at the CHS, Inc. refinery in Laurel, Montana
- Performed a Management of Change (MOC) PHA of the P-4707 Revamp Project for the for the SI

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Group, Inc. specialty batch chemical processing plant in Newport, Tennessee

- Performed PHA Revalidations of the Crude/Vacuum, Isomerization, and NaHS Units for the Montana Refining Company refinery in Great Falls, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Zone E Amine, Sour Water Stripper, Sulfur Recovery, and Tail Gas Treating Units at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Zone E Amine, Sour Water Stripper, Sulfur Recovery, and Tail Gas Treating Units at the CHS, Inc. refinery in Laurel, Montana
- Managed the project for development of process safety information, including electrical classification drawings, safety plot plans, process flow diagrams, safe upper and lower operating limits and consequences of deviations tables, maximum intended inventories, compressor building ventilation studies, and process safety information indexes, for 16 different ammonia terminal sites throughout the midwest and in Texas for Koch Nitrogen Company, Wichita, Kansas
- Performed Process Safety Information Audits at 12 ammonia terminal sites throughout the midwest and in Texas for Koch Nitrogen Company, Wichita, Kansas
- Performed a PHA of the Delayed Coker Unit at the CHS, Inc. refinery in Laurel, Montana
- Managed a project for developing process safety information, including material interaction matrices, maximum intended inventories, safe upper and lower operating limits and consequences of deviations tables, and process descriptions that document process chemistry for the Alon USA, LP refinery in Big Spring, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Naphtha Hydrotreating (NHT) Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Naphtha Hydrotreating (NHT) Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Coker Project Off-Sites Revamp of the FCC, ULSD, and GOH Units at the CHS, Inc. refinery in Laurel, Montana
- Performed a Management of Change (MOC) PHA of the Coker Project Off-Sites Revamp of the FCC, ULSD, and GOH Units at the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Delayed Coker Unit at the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Distillate Hydrotreater (DHT), Amine, Sulfur Recovery, and Sour Water Stripper Units at the Countrymark Cooperative refinery in Mount Vernon, Indiana
- Performed a PSM/RMP Compliance Audit for the Alon USA, LP refinery in Big Spring, Texas
- Performed a Management of Change (MOC) PHA of the Butamer Unit (Unit 4) Revamp Project at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas

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- Performed a Management of Change (MOC) PHA of the FCCU (Unit 40) Revamp Project at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Performed a PHA Revalidation of the NGL Front End Cleanup Unit (Unit 13) at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Performed a PHA Revalidation of the LPG Storage and Loading Areas at the Giant Refining Company refinery in Gallup, New Mexico
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Safety Instrumented Systems (SISs) in the Zone A Amine, Sulfur Recovery, and Tail Gas Treating Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the Zone A Amine, Sulfur Recovery, and Tail Gas Treating Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Safety Instrumented Systems (SISs) in the No. 1 Crude and Low Pressure Vapor Recovery (LPVR) Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the No. 1 Crude and Low Pressure Vapor Recovery (LPVR) Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the new design for the Ultra Low Sulfur Diesel (ULSD) process at the Alon USA, LP refinery in Big Spring, Texas
- Performed a PHA of the new design for the Thiosolv and Sulferox Units at the Giant Refining Company refinery in Gallup, New Mexico
- Performed a PHA Revalidation of the processes associated with the No. 6 Control Room at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Performed a PHA of the new design for the Amine and Sour Water Stripper Units at the Giant Refining Company refinery in Gallup, New Mexico
- Performed a PHA of a new design for the Waste Water Treatment Plant at the Nuclear Fuel Services (NFS) facility in Erwin, Tennessee
- Performed a PHA Revalidation of the Methyl Mercaptan Units (Units 45 and 46) at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Performed PHA Revalidations of the Aromex Unit, C-8 Column, North Side Flare, Saturates Light Ends Unit, and Propylene Recovery Unit (PRU) at the Alon USA, LP refinery in Big Spring, Texas
- Performed PHA Revalidations of the Crude Units (ACU-1 and ACU-2), the Vacuum Unit, the Sulfolane/BTX Unit, the Saturates Liquids Unit, the Refinery-Wide Flare Systems, the Isomerization Unit, the No. 2 Distillate Hydrotreater (DHT-2) Unit, and the Sour Water Stripper Unit at the Total Petrochemicals USA, Inc. complex in Port Arthur, Texas

**Melvin C. (Mel) Coker, Jr.**  
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- Performed PHA Revalidations of the FCC, Naphtha HDS, Catalytic Reformer, and Kero HDS Units for Montana Refining Company in Great Falls, Montana
- Performed a PHA of the new design for the Ultra Low Sulfur Diesel (ULSD) process at the Giant Refining Company refinery in Gallup, New Mexico
- Performed a PHA Revalidation of the processes associated with the No. 7 Control Room at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Managed the project to identify the scope for a comprehensive process design package for a uranium process line (CDL Process) at the Nuclear Fuel Services (NFS) facility in Erwin, Tennessee
- Performed a PHA of the P-4704 Project for the Schenectady International, Inc. specialty batch chemical processing plant in Newport, Tennessee
- Performed a PHA Revalidation of the NGL Liquid Gas Recovery Unit (Unit 12) and the Field Gas Gathering Unit (Unit 93) at the ConocoPhillips, Inc. refining and NGL complex in Borger, Texas
- Performed a Safety Integrity Level (SIL) Selection Analysis of the Safety Instrumented Systems (SISs) in the FCC/Gas Concentration Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA Revalidation of the FCC/Gas Concentration Units for the CHS, Inc. refinery in Laurel, Montana
- Performed a PHA of the Phthalic Anhydride Unloading System for the Schenectady International, Inc. specialty batch chemical processing plant in Toronto, Ontario, Canada
- Performed a PSM/RMP Compliance Audit for the Holly Refining Company refinery in Woods Cross, Utah
- Performed PHA Revalidations of the Naphtha and Mid-Distillate Unifiners Units for the CHS, Inc. refinery in Laurel, Montana
- Provided process engineering support for the design of a highly enriched uranium (HEU) downblending process for the Nuclear Fuel Services (NFS) facility in Erwin, Tennessee
- Performed a PHA of the P-4701 Project for the Schenectady International, Inc. specialty batch chemical processing plant in Newport, Tennessee
- Performed PHA Revalidations of the Sulfuric Alkylation Unit, Demex Unit (liquid-liquid extraction), Sulfur Recovery Unit No. 1 (SRU-1), Shell Claus Offgas Treating (SCOT) Unit, and Amine Unit at the Total Petrochemicals USA, Inc. complex in Port Arthur, Texas
- Performed a review of the Landfill Safety Analysis documentation for a classified landfill at the Y-12 Nuclear Weapons Plant in Oak Ridge, Tennessee
- Provided process engineering support for the decontamination and demolition project for the Neely

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Nuclear Research Reactor at the Georgia Institute of Technology campus in Atlanta, Georgia. Project tasks included performing an Environmental Site Assessment and Georgia Environmental Policy Act (GEPA) Audit report to support decontamination and demolition activities

- Provided process engineering support for the process design for a greenfield coke manufacturing facility heat recovery, steam generating, condensate handling, and coke ovens offgas cleaning systems for the Sun Coke facility in Haverhill, Ohio. Process design tasks included: developing the process design basis; computer process simulation of multiple operating cases; preparation of process flow diagrams; preparation of process control system design and piping and instrumentation diagrams (P&IDs); preparation of equipment sizing, design, and specifications data sheets; and preparation of vendor bid packages and evaluation of vendor bids
- Performed PHA Revalidations of the HF Alkylation and Catalytic Polymerization Units for Montana Refining Company in Great Falls, Montana
- Performed a PHA Revalidation of the Propane Deasphalting (PDA) Unit for the CHS, Inc. refinery in Laurel, Montana
- Performed a PSM/RMP Compliance Audit for Montana Refining Company in Great Falls, Montana
- Performed a PSM/RMP Compliance Audit for the CHS, Inc. refinery in Laurel, Montana
- Performed PHA Revalidations of the Distillate Hydrotreater No. 1 (DHT-1) Unit, Unibon Unit, and Sulfur Recovery Unit No. 3 (SRU-3) at the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed a PSM/RMP Compliance Audit for Navajo Refining Company at both the Artesia, New Mexico and Lovington, New Mexico refineries
- Performed a complete Redo PHA of the HF Alkylation Unit for the CHS, Inc. refinery in Laurel, Montana
- Managed the project for evaluating the relief header capacity for the CHS, Inc. refinery in Laurel, Montana. Project elements included: determining governing scenarios for the relief header system, modeling the hydraulics of the relief system headers using the fluid flow package from licensed commercial process simulation software, identifying the location of excessive back pressures (i.e., inadequate capacities), modeling modifications that would increase system capacity, and developed additional recommendations to effectively reduce refinery relief loads
- Performed a PHA of the Covered Transfer and Storage Area for the CHS, Inc. refinery in Laurel, Montana
- Performed PHA Revalidations of a Distillate Hydrotreater Unit and a Hydrogen Plant for Montana Refining Company in Great Falls, Montana
- Managed the project for evaluating process relief valves for the Cenex refinery in Laurel, Montana. Project elements included: reviewing mass and energy balances, P&IDs, and equipment specifications; identifying overpressure scenarios; calculating both existing and required relief

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valve capacities; and resizing the relief valves if necessary. Licensed commercial process simulation software was used to generate thermophysical properties at relieving conditions. In-house spreadsheet programs were used for performing sizing calculations. Relief valves in the following process units were evaluated: two Crude Units, Platformer Unit, Propane Deasphalting Unit, FCC/Gas Concentration Unit, two Naphtha Unifiners, Mid-Distillate Unifiner, two Sulfur Recovery Units, Tailgas Unit, two Amine Units, Hydrogen Plant, Hydrodesulfurization Unit, Saturate Liquids Unit, HF Alkylation Unit, Butamer Unit, and Pressurized Storage

- Performed PHA Revalidations of the Hydrogen Plant, Hydrodesulfurization Unit, Sulfur Recovery Unit, Tailgas Treating Unit, Amine Unit, Sour Water Stripper Unit, Boiler House, Flare System, Cooling Towers, DCS, and Control Rooms for the Cenex Harvest States Cooperatives refinery in Laurel, Montana
- Provided process engineering/process safety support for the detail design of the Purification Prototype Facility, involving specialty batch dissolution and crystallization, at the Y-12 Nuclear Weapons Plant in Oak Ridge, Tennessee. Project elements included: interfacing with facility safety representatives and representatives from the detail design firm to ensure that concerns raised during facility safety reviews were addressed as part of the equipment detail design specifications
- Performed a PSM/RMP Compliance Audit for the Alon USA, L.P. refinery in Big Spring, Texas
- Performed a PHA Revalidation of the FCCU at the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed a PHA Revalidation of the FCCU (Unit 29) at the ConocoPhillips, Inc. refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Refinery Sulfur/Tailgas Unit (Unit 43) at the ConocoPhillips, Inc. refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the HF Alkylation, Butamer, and Saturate Liquids Units for the Cenex Harvest States Cooperatives refinery in Laurel, Montana
- Managed the broad-scope process engineering project for Koch Pipeline Company, L.P., Ammonia Division, in Hermann, Missouri. Major project tasks included: developing a comprehensive heat transfer computer model designed to predict product vaporization rates from cryogenic storage tanks in the event the refrigeration system shuts down; performing an alternatives evaluation and developing the design specifications of a vent control system designed to control product vapor rates to system flares; evaluating the operating condition of system flares relative to prescribed parameters conducive for efficient combustion of product vapor and developing recommendations for process modifications and upgrades; developing an orifice hydraulics computer model for predicting product loss rates from breaches in piping and equipment; evaluating ventilation systems in compressor buildings at cold storage facilities and developing recommendations for modifications and upgrades to the ventilation systems; developing computer process simulations and PFDs for refrigeration loops at cold storage facilities; evaluating the performance of a caustic neutralization sparging system and condenser system; and preparing the basis for performance parameters used for reporting flare emission rates to regulatory agencies
- Performed a PHA Revalidation of the No. 2 Crude Unit for the Cenex Harvest States Cooperatives

**Melvin C. (Mel) Coker, Jr.**  
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refinery in Laurel, Montana

- Performed PHA Revalidations of the Gasoline Rerun Unit (GRU) and the Toluene Disproportionation (TDP) Unit for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed PHA Revalidations of the Merox Treater Unit, the Covered Utility Systems, and the Covered Tankage Processes for the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Platformer Unit for the Cenex Harvest States Cooperatives refinery in Laurel, Montana
- Performed a PHA Revalidation of the NHT/Reformer Unit for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Managed the project for evaluating process relief valves for the Ultramar Diamond Shamrock refinery in Ardmore, Oklahoma. Project elements included: reviewing mass and energy balances, P&IDs, and equipment specifications; identifying overpressure scenarios; calculating both existing and required relief valve capacities; and resizing the relief valves if necessary. Licensed commercial process simulation software was used to generate thermophysical properties at relieving conditions. In-house spreadsheet programs were used for performing sizing calculations. Relief valves in the following process units were evaluated: Crude/Vacuum Unit, Hydrogen Unit, FCC Unsaturation Gas Unit, FCCU, Saturate Gas Plant, NHT/Reformer, Naphtha Splitter/Isomerization Unit, Sulfur Unit, SCOT Unit, Amine Unit, Cat Feed Hydrotreater, and HF Alkylation Unit
- Performed a PHA Revalidation of the Isomerization Unit for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed a PHA Revalidation of the LPG Loading and Storage Areas for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed an initial PHA of the Gas Oil Hydrotreating (GOH) Unit and the Sour Water Stripper Unit for the Navajo Refining Company refinery in Artesia, New Mexico
- Performed PHA Revalidations of the Crude and Vacuum Units, the Isomerization Unit, and the NaSH Unit for the Montana Refining Company refinery in Great Falls, Montana
- Performed PHA Revalidations of the Crude and Vacuum Units and the Platformer CCR Unit for the Countrymark Cooperative, Inc. refinery in Mount Vernon, Indiana
- Performed Management of Change PHAs of the Unit 43 B-Train Reliability Enhancements Project and the Unit 43 IBM Replacement Project for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Sulfolane, BTX, and Saturate Liquids Units for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas
- Performed a PHA Revalidation of the No. 1 Crude Unit (ACU-1), No. 2 Crude Unit (ACU-2), and Vacuum Unit for the Atofina Petrochemicals, Inc. complex in Port Arthur, Texas



**Melvin C. (Mel) Coker, Jr.**  
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- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in Benedum, Texas
- Performed the initial PHA of the Methyl Mercaptan Units (Units 45 and 46) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in Paola, Kansas
- Performed a PHA Revalidation of the Diesel Hydrotreater – 2 (DHT-2) and Sour Water Stripper Units for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed project engineering for a flare loading study for the Alon USA, LP refinery in Big Spring, Texas. Project elements included: identifying flare loading scenarios, modeling flare header hydraulics using computer process simulation to determine back pressures on individual relief valves and bottlenecks in the flare header, and preparing a project report that detailed the findings of the flare study and presented engineering recommendations for debottlenecking the flare system
- Performed the Management of Change PHA of the Unit 43 Triconex Project for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed the PHA Revalidations of the FCCU, the Naphtha HDS/Reformer Units, and the Kerosine HDS Unit for the Montana Refining Company refinery in Great Falls, Montana
- Performed the PHA Revalidation of the FCCU and Gas Concentration Unit for the Countrymark Cooperative, Inc. refinery in Mount Vernon, Indiana
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in East Chicago, Indiana
- Performed the PHA Revalidation of the Sulfuric Alkylation Unit for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a PHA Revalidation of the Penex Isomerization Unit for the Countrymark Cooperative, Inc. refinery in Mount Vernon, Indiana
- Managed the PHA Revalidation project of the NGL Treaters (Units 1.6/1.7/2.1) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Sulfur Recovery Unit – 1 (SRU-1), the SCOT Unit, and the Amine Unit for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a series of PHA Revalidations of the Light Distillate Hydrotreater Unit, the Gas Oil Hydrotreater Unit, the FCCU Light Ends Recovery Unit, the Propylene Fractionation Unit, and the Fuel Gas Treating Unit for the Fina Oil and Chemical Company refinery in Big Spring, Texas
- Performed a Process Hazard Analysis of the Aromax Unit for Phillips Petroleum Company at the Phillips Puerto Rico Core Petrochemical Complex in Guayama, Puerto Rico

**Melvin C. (Mel) Coker, Jr.**  
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- Managed the PHA Revalidation project of the Diesel Hydrotreater (Unit 36) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in East St. Louis, Illinois
- Performed a PHA Revalidation of the Demex Unit for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed PHA Revalidations of the HF Alkylation Unit and the Catalytic Polymerization Unit for the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in Kankakee, Illinois
- Performed a PHA Revalidation of the HF Alkylation Unit for the Countrymark Cooperative, Inc. refinery in Mount Vernon, Indiana
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in Kansas City, Kansas
- Performed a PHA Revalidation of the Phillips Pipe Line Company terminal in Denver, Colorado
- Performed a PHA Revalidation of the HDS/Platformer Units (Units 2.2 and 7.0) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Distillate Hydrotreater - 1 (DHT-1) Unit for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Managed the PHA Revalidation project of the Johnson Tank Farm (Unit 68.4) Cavern Storage for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA Revalidation of the Unibon Unit for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a series of PHA Revalidations of the SRU-1, SRU-2, SCOT, Sour Water Stripper, and HF Alkylation Units for the Fina Oil and Chemical Company refinery in Big Spring, Texas
- Performed a PHA Revalidation of the Sulfur Recovery Unit - 3 (SRU-3) for the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a PHA Revalidation of Unit 6 (comprised of a Benzene Hydrogenation Process, Hexane Isomerization Process, Distillation Process, and a Heavy Alkylate Treating Process) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Managed the PHA Revalidation project of the Amine and Sour water Treating Unit (Unit 44) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Provided process engineering support as a subcontractor for a major architect and engineering firm to size relief valves for the Great Lakes Chemical Company facility in Newport, Tennessee. Specific project elements included: identifying overpressure scenarios for process equipment and

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

sizing pressure relief devices

- Performed a PHA Revalidation of the Hydrogen Reformer Unit (Unit 41) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed a PHA of the Liquid Hydrogen Unloading System for Phillips Chemical Company at the Philtex/Ryton Complex in Borger, Texas
- Performed PHA Revalidations of a Hydrogen Plant and a Hydrotreater and the initial PHA of a new Loading Rack Incinerator for the Montana Refining Company refinery in Great Falls, Montana
- Performed a PHA Revalidation of the Light Ends Fractionation Unit (Unit 26) and the Amine Treater (Unit 35) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Managed a project to perform a Hazard Assessment and prepare a Risk Management Plan for Calumet Lubricants Company in Princeton, Louisiana, to help Calumet comply with the requirements of the EPA Risk Management Program Regulation, 40 CFR 68. Specific project elements included: performing an offsite consequence analysis of release scenarios and preparing the Risk Management Plan for the refinery in a format suitable for submittal to the EPA
- Conducted a study to determine the extent of regulatory coverage by the OSHA Process Safety Management Regulation, 29 CFR 1910.119, and the EPA Risk Management Program Regulation, 40 CFR 68, for Calumet Lubricants Company in Princeton, Louisiana. Specific project elements included: conducting information meeting with client; researching regulatory coverage issues; and documenting justification for exclusion of certain areas of the refinery from coverage
- Performed a Process Hazard Analysis Revalidation of the Ethane Recovery Unit (Unit 11) for the Phillips Petroleum Company refining and petrochemical complex in Borger, Texas
- Performed several process engineering and process safety management projects for Fina Oil and Chemical Company in Big Spring, Texas. Specific project elements included: providing process engineering support for the HDS/Reformer Units PHA; verification and development of mass, energy, and vapor-liquid equilibrium calculations; sizing of pressure relief valves; calculation of maximum intended inventories; refinery-wide evaluation of adverse material interactions and documentation in the form of material interaction matrices; preparation of process descriptions; documentation of safe upper and lower operating limits; evaluation of pressure relief alternatives for the crude tower overhead relief system
- Performed a Process Hazard Analysis of the Fluidized Catalytic Cracking Unit (FCCU) for the Navajo Refining Company refinery in Artesia, New Mexico
- Provided process engineering support for the design of a hazardous waste thermal treatment unit for M4 Environmental in Oak Ridge, Tennessee. Specific project elements included: preparing detailed equipment specifications for the feed preparation equipment, documenting a process flow description, and documenting a process control description
- Performed a Hazard and Operability (HAZOP) analysis of the Feed Preparation System of a hazardous waste thermal treatment unit for M4 Environmental in Oak Ridge, Tennessee

**Melvin C. (Mel) Coker, Jr.**  
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**1990-1997**

**Process Safety Engineer**  
**JBF Associates, Inc., Knoxville, Tennessee**

**Responsibilities:**

- Project management for process hazard analyses
- Facilitating PHA meetings, documenting PHA results, training new PHA facilitators and scribes.

**Specific experience:**

- Performed a Process Hazard Analysis Revalidation of Ethylene Unit 33 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Hazard Analysis of LPG Pipeline Unit 58 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Hazard Analysis of the San Bernard Terminal for Phillips Petroleum Company in Sweeny, Texas
- Performed a Hazard Analysis of the Jones Creek Terminal for Phillips Petroleum Company in Jones Creek, Texas
- Performed a Process Hazard Analysis of Ethylene Unit 12 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of Ethylene Unit 24 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of Hydrogen Purification Unit 3.3 for Phillips Petroleum Company at the Phillips Puerto Rico Core Petrochemical Complex in Guayama, Puerto Rico
- Performed a Process Hazard Analysis of Hydrogen Purification Unit 26.2 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of Sulfolane Unit 2.4 for Phillips Petroleum Company at the Phillips Puerto Rico Core Petrochemical Complex in Guayama, Puerto Rico
- Performed a Process Hazard Analysis of the ethanol, methanol, and acetone storage and distribution systems and the product mixing and filling systems at the Colgate-Palmolive Sterno Plant in Texarkana, Texas
- Performed a Process Hazard Analysis of Ethylene Unit 22 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of the FCC Charge Hydrotreater Unit at the Ashland Petroleum Company refinery in Canton, Ohio

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Process Hazard Analysis of the Diesel Hydrotreater Unit - 2 (DHT-2) and the Sour Water Stripper Unit at the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a Process Hazard Analysis of the ammonia storage, recovery, and shipping facilities at the Monsanto plant in Luling, Louisiana
- Performed a Process Hazard Analysis of the digester system at the Georgia-Pacific paper mill in Crossett, Arkansas
- Performed a Process Hazard Analysis for CSW Development I, Inc. at the Mulberry Ethanol Manufacturing Facility in Bartow, Florida
- Performed a Process Hazard Analysis of Propylene Recovery Unit 18 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of the Demex Unit at the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a Process Hazard Analysis of the Reformer Unit at the Farmland refinery in Coffeyville, Kansas
- Performed a Process Hazard Analysis of the Sulfur Recovery Unit – 1 (SRU-1), the SCOT Tailgas Unit, and the Amine Unit at the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a Process Hazard Analysis of a chlorine unloading system at the Wisconsin Tissue paper mill in Menasha, Wisconsin
- Performed a Process Hazard Analysis of the Sulfuric Alkylation Unit at the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a Process Hazard Analysis of the Petrochemical Tankage System at the UNO-VEN Chicago Refinery in Lemont, Illinois
- Performed a Process Hazard Analysis of the Chlorine Dioxide Generation System at the Finch, Pruyn & Company pulp and paper mill in Glens Falls, New York
- Performed a Process Hazard Analysis of the Unisar Unit at the UNO-VEN Chicago Refinery in Lemont, Illinois
- Performed a Process Hazard Analysis of Diesel Hydrotreater Unit – 1 (DHT-1) at the Fina Oil and Chemical Company refinery in Port Arthur, Texas
- Performed a Process Hazard Analysis of Light Aromatics Recovery Unit 17 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis of the Unibon Unit at the Fina Oil and Chemical Company refinery in Port Arthur, Texas

**Melvin C. (Mel) Coker, Jr.**  
**Process Engineering Associates, LLC**

- Performed a Process Hazard Analysis of the Sulfonation Plant for the Colgate-Palmolive plant in Cambridge, Ohio
- Performed a Process Hazard Analysis of the LPG unloading and storage area at the S.C. Johnson & Son's Waxdale Facility in Racine, Wisconsin
- Performed a Process Hazard Analysis of the Pyro-Chek Unit at the Keil Chemical Company facility in Hammond, Indiana
- Performed a Process Hazard Analysis of the Isomax Unit at the Clark Oil Refinery in Blue Island, Illinois
- Performed a Process Hazard Analysis of Isomerization Unit 15 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a HAZOP review of the Plant 2 Pretreater and Reformer Units at the SUNOCO refinery in Sarnia, Ontario
- Performed a Process Hazard Analysis of an expansion project (the HAC project, HC-1024) for the Polypropylene Plant at the Phillips Houston Chemical Complex in Pasadena, Texas
- Performed a HAZOP review of Ethylene Unit 33 for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a HAZOP review of the Sweeny Environmental Control Unit (SECU), a hazardous chemical waste incinerator, for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a Process Hazard Analysis (Phase 2) of the Atmospheric Resid Desulfurization (ARDS) Unit for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas
- Performed a HAZOP review of the Atmospheric Resid Desulfurization (ARDS) Unit for Phillips Petroleum Company at the Sweeny Refining and Petrochemical Complex in Sweeny, Texas

**Professional Training and Courses of Study:**

- Layer of Protection Analysis, the Process Improvement Institute, 2008
- Hazard Assessment Using Consequence Analysis Techniques, the Process Safety Institute, 1992
- Human Reliability Analysis, the Process Safety Institute, 1991
- Hazard and Operability Analysis, the Process Safety Institute, 1991
- Hazard Evaluation – Quantitative Methods, the Process Safety Institute, 1991
- Hazard Evaluation – Qualitative Methods, the Process Safety Institute, 1991.

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