

# Overview of Typical Services

## Process Engineering Associates, LLC



Process Engineering Associates, LLC ([www.ProcessEngr.com](http://www.ProcessEngr.com)) specializes in providing independent services related to chemical engineering, process design, and process safety. We routinely provide the following services.

### ■ Process Design

- Conceptual / preliminary process design studies (Front End Loading FEL-0 / FEL-1)
- Feasibility studies
- Technology screening / selection support
- Capacity evaluations / revamp studies
- Independent 3rd party process design evaluation
- Utility evaluations
- Detailed process design; FEL-2 / FEL-3 / Pre-FEED (Front End Engineering Design)
- Process design packages Schedule A / BED (Basic Engineering Design)
  - Design basis development
  - Process alternatives technical & economic evaluations
  - Material & Energy Balance (M&EB) development
  - Process Flow Diagram (PFD) development
  - Piping & Instrumentation Diagram (P&ID) development
  - Process controls description / functional controls specifications
  - Preliminary equipment plot plans
  - Equipment duty specifications
  - Preliminary cost estimates (CAPEX and OPEX)
  - Relief valve sizing
  - Detail engineering design process engineering support
  - Process building ventilation design support



### ■ Process Safety Management

- Conducting Process Hazard Analyses (PHAs)
- HAZOP / What-If
- Conducting PSM compliance audits
- Resolving / implementing PHA recommendations
- Complete PSM / RMP program development
- Process safety information development
- Process safety training courses
- Dust Hazards Analysis (DHA)
- PRD safe atmospheric relief evaluations
- Electrical area classifications (Class I, Div II; etc.)
- Conducting Layer of Protection Analyses (LOPA)
- Development of Cause & Effect diagrams



### ■ Process Modeling / Simulation (CHEMCAD / AspenPlus / HYSYS / OLI, M-Star CFD, PHAST, etc.)



- Unit operations design
- Piping system hydraulics
- Relief or flare system design / evaluation
- Computational Fluid Dynamics (CFD) modeling of processes
- Plume dispersion modeling

### ■ Operations Support

- Commissioning plans / startup support / process troubleshooting
- Process evaluation
- Process optimization
- Debottlenecking
- Control systems process support
- Operating procedure development
- Operator and engineering staff training
- On-site process engineering staff augmentation
- PRD evaluations
- Flare System evaluations
- P&ID walkdown and update for 'As-built' drawing development
- Dust hazards engineering reviews
- Process ventilation evaluations

### ■ Additional Capabilities

- Plant investment process engineering due diligence evaluation
- Process / equipment bid package preparation
- Equipment vendor and EPC bid package support, evaluations, and recommendations
- Owner's process engineer
- Process equipment evaluations
- Acceptance testing witness / approval
- Facility decommissioning plans
- Systems requirements definition and systems engineering support

