

Overview of Services - Process Engineering Associates, LLC

Process Engineering Associates, LLC (www.ProcessEngr.com) specializes in process chemical engineering, process design, and process safety. As such we provide the following services. Phone: +1 (865) 220-8722

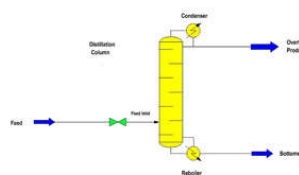
- **Process Design**

- Conceptual/Preliminary process design studies (FEL-0/1)
- Feasibility Studies
- Technology Screening/Selection Support
- Capacity evaluations/revamp studies
- Independent 3rd party process design evaluation
- Utility evaluations
- Front End Engineering Design – FEL-2, FEL-3 (Pre-FEED)
- Process design packages (Basic Engineering Design)
 - Design basis development
 - Process alternatives technical & economic evaluations
 - Heat & Material Balance (HMB) development
 - Process Flow Diagram (PFD) development
 - Piping & Instrumentation Diagram (P&ID) development
 - Process controls description / functional controls specifications
 - Equipment plot plan
 - Equipment duty specifications
 - Preliminary cost estimates (CAPEX and OPEX)
 - Relief valve sizing



- **Process Modeling/Simulation (CHEMCAD / AspenPlus / HYSYS / etc.)**

- Unit operations design
- Piping system hydraulics
- Relief or flare system design/evaluation
- User friendly simulation interface development



- **Operations Support**

- Commissioning plans and 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

- **Process Safety Management**

- Conducting Process Hazard Analyses (PHAs) (HAZOP/What-If)
- Conducting Safety Integrity Level (SIL) selection analyses for Safety Instrumented Systems (SISs)
- Conducting Layer of Protection Analyses (LOPA)
- Conducting PSM compliance audits
- Resolving/implementing PHA recommendations
- Complete PSM/RMP program development
- Process safety information development
- Process safety training courses

- **Additional Capabilities**

- Plant investment due diligence evaluation
- Process/equipment bid package preparation
- Vendor and EPC bid package support, evaluations, and recommendations
- Owner's process engineer
- Process equipment inspections
- Acceptance testing witness/approval

- **Safety Instrumented Systems / ISA Compliance**

- SIL selection analyses, including LOPA
- SIS design specifications (for new designs)
- Development of functional testing protocol and testing documents for ISA compliance
- Assistance with field testing, including existing systems or commissioning of new systems
- Development of Cause/Effect diagrams
- Training courses for process plant managers and engineers