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

- **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

- **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

- **Additional Capabilities**
  - Control systems process support
  - Operating procedure development
  - Operator and engineering staff training
  - On-site process engineering staff augmentation