

REQUEST FOR PROPOSAL (RFP)

Mendoza, Garner and Powell

PROJECT OVERVIEW

Name: Chem Elizabethside Safety Compliance

Type: Safety Compliance

Location: Elizabethside, NJ (Refinery Zone)

Industry: Chemical Processing

Value: \$15,648,378

Complexity: 3/5

Date: April 09, 2025

Disciplines: Process Engineering, Mechanical Engineering

Regulations: NFPA Codes

SCOPE OF WORK

Scope of Work: Chemical Processing Plant Optimization Project

Project Goal: Optimize the existing chemical processing unit to increase production capacity by 15% while improving energy efficiency by 10%. This involves upgrading existing equipment and implementing minor process changes.

Discipline: Process Engineering

- Process Simulation and Optimization:** Develop a steady-state and dynamic process simulation model of the existing reactor system using Aspen Plus or similar software. The model will incorporate the proposed modifications, focusing on improving reaction yield and minimizing energy consumption. Deliverables include a validated simulation model, process flow diagrams (PFDs), and a detailed report analyzing the impact on production and energy efficiency.
- Heat Integration Study:** Conduct a heat integration study to identify opportunities for energy recovery within the existing process. This involves analyzing heat streams within the plant and proposing modifications, such as implementing heat exchangers (using 316L stainless steel) to recover waste heat and reduce energy consumption. Deliverables include a heat and mass balance diagram, detailed design specifications for the new heat exchangers (including dimensions and material selection), and a cost-benefit analysis.
- Control System Improvements:** Evaluate the existing process control system and propose modifications to enhance stability and optimize performance. This includes analyzing existing instrumentation and developing specifications for necessary upgrades or replacements, specifically focusing on improving temperature and pressure control in the reactor section. Deliverables include updated process instrumentation diagrams (P&IDs), specifications for new controllers (including PLC models and communication protocols), and a detailed implementation plan.

Discipline: Mechanical Engineering

- Reactor Vessel Modification:** Design and specify modifications to the existing 5-meter diameter, 10-meter high reactor vessel to increase its operating pressure from 500 kPa to 700 kPa. This will require Finite Element Analysis (FEA) to ensure structural integrity under the new pressure rating using ASME Section VIII, Division 1 codes and standards, including detailed stress analysis reports.
- Pump Upgrade:** Design and specify a replacement for the existing feed pump, increasing its flow capacity by 20% to accommodate the increased production rate. The new pump will be selected based on performance curves, cavitation considerations and must adhere to API 610 standards. Deliverables will include pump specifications, piping and instrumentation diagrams (P&IDs) for the pump integration, and a detailed cost estimate.
- Safety System Upgrade:** Evaluate and upgrade existing pressure relief valves (PRVs) on the reactor and associated piping according to NFPA standards. This will involve sizing and specifying appropriate PRVs (considering relieving capacity and backpressure considerations), including detailed specifications and material selection (e.g., 316 stainless steel).

Cross-Disciplinary Tasks

- HAZOP Study:** Conduct a Hazard and Operability (HAZOP) study jointly by process and mechanical engineers to identify and mitigate potential hazards associated with the proposed modifications. This will involve reviewing the PFDs, P&IDs, and other relevant documentation to identify potential hazards, recommending mitigation strategies, and documenting all findings in a HAZOP report.
 - Detailed Engineering Package:** Process and mechanical engineers will jointly develop a comprehensive detailed engineering package, including all necessary drawings, specifications, and calculations, to support the procurement, fabrication, and installation of the modified equipment. This will ensure seamless integration and avoid potential design conflicts between the process and mechanical aspects of the project.
- Complexity Impact Note: The project's complexity is rated as a 3/5 due to the involvement of multiple process and mechanical engineering disciplines requiring coordination and integration.

REQUEST FOR QUOTATION

Request for Quotation (RFQ): Chem Elizabethside Safety Compliance

Project: Chem Elizabethside Safety Compliance ? Refinery Zone, Elizabethside, NJ

Industry: Chemical Processing

RFQ Release Date: April 09, 2025

Questions Due: May 07, 2025

Proposals Due: May 14, 2025

Project Start Date: May 26, 2025

Project Duration: 17 Months

Contract Type: Time & Materials

1. Project Overview: This project aims to optimize a chemical processing unit, increasing production capacity by 15% and energy efficiency by 10%. The scope involves process and mechanical engineering modifications, including reactor vessel upgrades, pump replacement, heat integration, control system improvements, and safety system upgrades, all compliant with relevant regulations (ASME Section VIII, Division 1, API 610, NFPA). A HAZOP study is mandatory. Complexity: 3/5.

2. Scope of Work (Summary): Detailed scope is available upon request. Key aspects include process simulation & optimization (Aspen Plus), heat integration study (316L stainless steel heat exchangers), control system improvements (PLC specifications), reactor vessel modification (FEA analysis, 700 kPa pressure rating), pump upgrade (API 610 compliant, 20% increased flow), and pressure relief valve (PRV) upgrades (NFPA compliant). A comprehensive detailed engineering package is required.

3. Qualifications: Minimum 3 years of experience in chemical processing plant optimization and proven regulatory compliance in the chemical processing industry.

4. Proposal Requirements: Proposals should include:

- * A technical design summary (1-2 pages maximum) outlining the proposed approach and methodology.
- * A detailed cost breakdown.

5. Evaluation Criteria:

- * Technical Approach (50%)
- * Cost (30%)
- * Experience and Qualifications (20%)

6. Contact: Submit proposals electronically to procurement@chemicalprocessing.com

CONTACT

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TIMELINE

Include key dates such as submission deadlines, inquiry deadlines, and project start dates.