

ENGlobal Corporation (ENGlobal) recognizes the importance of **Sulfur Removal and Recovery** related projects to our Clients and therefore can provide a dedicated project team with proven ability to complete work on schedule, within budget and to a high degree of accuracy. ENGlobal engineers and designers have performed the conceptual engineering and detail design for numerous grass roots units and upgrade projects. ENGlobal personnel have extensive experience with sulfur recovery units, tail gas treating units, incineration/oxidation units, amine treating and regeneration units, and sour water stripping units.

ConocoPhillips, Inc. – Ferndale, WA

Sulfur Recovery Facility

ENGlobal provided engineering, design, procurement services and construction management for the installation of a 40 LTPD Sulfur Recovery Unit, Tail Gas Treating Unit and Incinerator with Waste Heat Recovery. The new SRU/TGTU Unit will be equipped with oxygen enrichment to allow for processing up to 60 LTPD of sulfur fresh feed and will be capable of processing both amine acid gas and sour water stripper acid gas streams.

Scope of Work included:

- Project management including scheduling, cost control, and safety
- Detailed engineering and design – process, mechanical, piping, electrical, instrument and civil/structural
- 3-D Modeling to allow for appropriate reviews and approval cycles
- Modular Fabrication of processing units and piperacks
- Procurement Services, including purchasing and expediting
- QA/QC and Inspection Services
- Construction Management
- HAZOP participation
- Facility Operating Manuals
- Pre-commissioning Activities
- Commissioning and Start-up Assistance
- Performance test assistance

Coffeyville Resources Refining and Marketing – Coffeyville, KS

SRU/TGTU Project

ENGlobal provided engineering and design services for a front-end engineering design (FEED) package and AFE quality (+/-15%) estimate for a 60 LTPD air basis (90 LTPD oxygen enrichment basis) sulfur recovery unit, tail gas treating unit, and incinerator. The facility was designed to process both amine acid gas and sour water stripper acid gas streams.



ENGlobal Corporation reached 18 million manhours in 2006 without a lost time injury.



Valero Energy Corporation – Lima, OH

New Claus 1 Sulfur Pit

ENGlobal provided engineering and design for a NEW Sulfur Containment Pit, NEW Liquid Sulfur Run-Down Lines, Process Vapor Relief System, Sulfur De-Gassing System and a NEW Sulfur Loading Station.

The newly designed Sulfur Pit has a working capacity of 315 LT. The Sulfur Containment Pit also has the capability to back-up SRU No. 2 in the event maintenance of emergencies in either unit. The transfer of Liquid Sulfur between SRU No. 1, SRU No. 2 and SRU No. 3 will be possible.

The existing Seal Leg, Seal Pots and Run-Down Lines will be replaced with NEW Jacketed Run-Down Lines and (4) NEW SULTRAP™'s. Due to the removal of the first pass Seal Leg a Process Vapor Relief System was Engineered and Designed to protect the SRU Equipment and Sulfur Containment Pit in the event the SRU is subjected to a tube rupture in the Waste Heat Boiler.

A NEW De-Gassing System was engineered and designed to bring entrained H₂S to 100 ppm or less in the Molten Sulfur.

Valero Energy Corporation – Lima, OH

SRU No. 2 Relief Study

ENGlobal conducted a Relief Study at the Valero Lima Refinery. ENGlobal provided a complete study of the hydraulics and sizing of a relief system vent to the Incinerator Stack. The SRU Relief Study included four (4) Design Cases.

Items ENGlobal included in the SRU No. 2 Relief Valve Study are the following:

- Detailed Process Report
- Process Calculations (Relief Options)
- Process Data Sheets (Relief Valves)
- Process Calculations (Steam Release)
- Process Data Sheets and Vendor Information
- Piping and Instrumentation Diagrams
- Budgetary Estimates

Sulfur Recovery Facilities:

Design Features: The Sulfur Recovery Facility, which comprises the Sulfur Recovery Unit (SRU), Tail Gas Treating Unit (TGTU) and Incineration/Oxidation Unit, includes proven design features that enhance the facility efficiency, operability, maintainability, reliability, and safety.

ENGlobal provides licensed process technology for the design of sulfur recovery facilities. Sulfur recovery technology is an open-art design where each sulfur technology company applies their own “Value Added Know How” to marketed simulation programs. ENGlobal utilizes this open-art technology along with our past experience for designing SRU's, TGTU's and Incineration/Oxidation Units.

Sulfur Recovery Unit – The SRU is a basic modified CLAUS process which includes the following proprietary and advanced design features:

- ENGlobal Burner
- High Temperature Thermal Reactor Refractory System
- Sulfur Entrainment Separators
- Indirect Reheat Exchangers
- Catalyst Selection and Catalytic Reactor Design
- Advanced Instrument Controls
- Infrared Pyrometers

Tail Gas Treating Unit – Tail Gas Treating process includes the following design features:

- Indirect Feed Heating
- Use of External Hydrogen Source
- TGTU Catalyst selection and Catalytic Reactor Design
- Quench System Design
- Generic MDEA Solvent
- Amine Filtration System

Incinerator/Oxidation Units – Incinerator/Oxidation process includes the following design features:

- Self-Supporting Stack
- Natural Draft, Lo-NOx Burner Design
- Adherence to Current EPA Emission Requirements
- CEMS Analyzer

Also Available:

- Incinerator Waste Heat Recovery Designs



ENGlobal Engineering, Inc.

ENGlobal Corporation, a technology based engineering company, serves the global refining, gas processing and petrochemical industries with engineering design and construction capabilities related to sulfur removal and recovery solutions. ENGlobal's primary focus is Sulfur Recovery Units (SRU), Tail Gas Treating Units (TGTU), Incineration/Oxidation Units, Amine Treating and Regeneration Units (ARU), and Sour Water Stripping Units (SWS).

ENGlobal provides engineering support from project conception and formulation through process design and detailed engineering. Project execution includes P&ID preparation and reviews, HAZOP review support, SIL determination, and safety requirement specifications. All facets of detail engineering are covered, including process simulation, equipment bid evaluations, constructability reviews, operating manuals, operator training, construction management, pre-commissioning and start-up.

ENGlobal personnel have over 545 years of total experience in designing Sulfur Removal and Recovery Facilities and are dedicated to providing our Clients with what is best for their installation. ENGlobal personnel have incorporated new ideas and designs with lessons learned from past projects to provide our Clients with the latest technological advancements.

In addition to being a sulfur technology provider, ENGlobal Engineering, Inc. is a service-oriented company that provides engineering services beyond sulfur technology to our refining Clients. We have experienced personnel that have been involved in the engineering and design of most refining process units.

For Additional Information Contact:

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LA: Baton Rouge, Lake Charles

OK: Tulsa, Cleveland, Blackwell
Canada: Calgary, Alberta

CORPORATE OVERVIEW

ENGlobal Corporation (ENGlobal) has very quickly become one of the fastest growing engineering firms in the United States. The core company was established in 1985, however, the ENGlobal name was born in December, 2001 with the merger of Industrial Data Systems Corporation ("IDS") and Petrocon Engineering, Inc., whose roots date back to 1977. Today, the combined corporation provides a full range of engineering and systems services in all segments of the petroleum, gas, chemical, power, and petrochemical markets.

TOTAL SOLUTIONS

ENGlobal is a group of companies focused on providing innovative, cost effective engineering services to the petroleum refining, petrochemical, pipeline and process industries. We provide total solutions from wellhead to refinery, from our own backyard to projects around the world. The **ENGlobal** companies have been meeting our clients' needs and exceeding their expectations for many years. We are proud of our history, confident in today's market environment and enthusiastic about our future. We invite you to become a part of it.

ENGlobal provides **innovative, cost-effective solutions**. This has been our primary focus from our days as a small, local engineering and design company to our current position as an internationally recognized firm. We provide **total solutions** to the needs of our customers, whether responding with a single individual for an in-plant assignment to handling large EPC projects (Engineering, Procurement and Construction).

ENGINEERING SERVICES

ENGlobal is a multi-discipline professional engineering firm that includes project controls, information technology, procurement and construction management services along with our core engineering competencies. We have a long and successful track record of providing quality and value to our customers. Services range from feasibility studies to conceptual and detailed engineering services and extends through to total responsibility for turnkey projects and project financing.

QUALITY

ENGlobal establishes a clear definition of project requirements at the outset, measuring ourselves against those goals and maintaining open lines of communication with our clients through project completion. Our reputation for superior project execution is recognized throughout the industry



SAFETY

The **ENGlobal** safety record has won national recognition and delivers lowered costs and on-time completion to our clients. Our goal is not only to prevent accidents and control losses but also to instill a culture of care and compliance.

Our safety record EMR stands at the low value of 0.67, which testifies that our safety policy is not only sound, but also enforced. The total incident recordable rate (TRIR) for the corporation is 0.00.

REPUTATION AND RECOGNITION

We are actively earning an outstanding reputation for delivering improved quality and decreased costs to our clients and the industry is beginning to take notice. Some of the recent recognition we have received includes:

- *ENR – Engineering News Record Magazine*
 - **Top 500 Design Firms in the US for over 11 years**
 - **Top 10 Design Firms in Petroleum**
 - **Top 5 Design Firms in Pipelines**
 - **Top 10 Design Firms in Refineries & Petrochemical Plants**
 - **Top 10 in Cogeneration**
 - **Top 50 'Pure' Designers**
- *The Zweig Letter Hot Firm List: – #2 of 100*
 - **The 100 Fastest-Growing USA A/E/P & Environmental Consulting Firms**
- *Occupational Hazards Magazine*
 - **Safest Companies in America**
- *Business Week Magazine*
 - **Nation's Top Price-Performing Micro-Cap Companies**
- *The Houston Chronicle Newspaper*
 - **Houston's Leading Companies - #20 of 100**
 - **Most Revenue Growth - #1 of 100**
 - **Best Market Return - #2 of 100**

PARTIAL CLIENT LISTING:

- Alon
- AtoFina
- Citgo
- ChevronTexaco
- Coffeyville Resources, LLC
- ConocoPhillips
- ExxonMobil
- Frontier Refining Co.
- Giant Refining
- Marathon Petroleum
- Motiva
- Pennzoil
- Placid Refining
- Shell Oil
- Sinclair
- Sunoco
- Total Petrochemicals
- Valero



Global Thinking...Global Solutions

Sulfur Removal and Recovery Solutions

