



Process Engineering Consultants

Industry Expertise

DESIGN CONSULTANTS FOR THE ENERGY AND HYDROCARBON PROCESSING INDUSTRIES

Industry provides many opportunities for using consultants. These activities range from troubleshooting an operating problem, to design and construction of new facilities. Consultants can often offer a broad perspective gained from working in a variety of facilities. In addition, using consultants to assist the implementation of manpower intensive projects prevents diversion of resources from their primary activities. Ascent Engineering's goal is to enhance your firm's profitability by offering the best consulting and engineering services available.

Operating Philosophy

Ascent Engineering's operating philosophy is simple: Bring you the most efficient and cost-effective solutions. There are several key elements that drive our success:

- Quality personnel.
- Flexibility that meets your needs, not ours.
- Work methodology.
- Your trust and goodwill.

PERSONNEL

Ascent Engineering attracts knowledgeable and motivated employees by offering them a challenging and rewarding work environment. All of our employees are our ambassadors and keys to our success.

CLIENT NEEDS

Our problem-solving techniques are unique to your needs.

Flexibility. Before we begin any project, we discuss our proposed solution process internally and with you. The optimal project strategy depends on the nature and scope of each individual project. There is no "Ascent way" in which all projects must be tackled. Our projects range from a few hours of consulting, to minor equipment changes or full Process Design Packages, with or without detailed engineering, procurement, scheduling and project management.

Multidiscipline Skills. We do not require each project to have an engineer for each discipline. Our lead engineers have diverse skills allowing us to minimize costs and maximize productivity.

Integrated Problem Solving. We employ a cohesive project approach which attacks the various project disciplines simultaneously. For example, heat and material balances are developed in conjunction with hydraulic analyses. This is particularly advantageous during revamp work in which the heat and material balance must be adjusted to work within the constraints of existing equipment. We effectively use a cohesive project approach because our principal engineers are skilled in the following project areas: conceptualization, simulation, hydraulic analysis, equipment design and operation (tower, pump, exchanger, heater, drum, and instrument, etc.), PFD and P&ID development, procurement, scheduling and project management. This approach allows us to control costs, meet schedule and assure quality.

WORK METHOD

Ascent's focus and specialty is process design. This allows us to be experts on up front project scoping and design without the requirements of keeping a large detailed engineering project staff billable. We believe that project teams are best kept small until the project is well defined in order to prevent engineering recycle and wasted time and budget.

TRUST

The final key to our success is that we value and respect you, our client. On every project, we seek to perform as an extension of your team. Our engineering decisions are made according to *your* preferences and best interests. Your goodwill is our most valuable asset!



Capabilities

CONCEPTUALIZATION

Defining scope and project options for both grassroots and revamp projects.

PROCESS SIMULATION

Process simulation of refinery and chemical processing units to identify and define processing options.

EQUIPMENT SPECIFICATION

Engineering specifications for pieces of major equipment. These include reactors, towers and internals, pumps, exchangers, heaters, drums and instruments.

HYDRAULIC ANALYSIS

Assess and design hydraulic loops. This is often performed in conjunction with the process design during revamps.

COST ESTIMATIONS

Scope-quality cost estimates by process engineers. This is often done during the process design phase to select the most cost-effective processing options.

PROCUREMENT

The engineer specifying the equipment also can complete procurement. This allows for better vendor and equipment selection.

SCHEDULING

Our process engineers often schedule the projects as they are being completed. Defining the schedule keeps the process engineers on track for the overall project goals.

PROJECT MANAGEMENT

Serving as project managers for your activities.

TROUBLE-SHOOTING & PLANT SUPPORT

Supply the on-site effort necessary to help alleviate problems. Our engineers have worked in plants for extended periods of time for unit and turnaround support.

TURNAROUND SCHEDULING

We can efficiently schedule your turnaround especially when we have engineered your revamp.

Design and Operating Experience

Ascent since 1997

Unit / Scope

Alkylation

- New Iso Stripper Process Design Package, Project Engineering, Startup
- Acid Regenerator Project Engineering
- Base Case Simulation
- Conceptual Expansion
- Conceptual Debottlenecking
- Expansion Process Design Package
- Expansion Project Review
- HF Alkylation Unit Review
- Alky Unit Treating Study

Amine

- Fuel Gas Amine Absorber Process Design Package
- Base Case Simulation and Troubleshooting

Coker

- Revamp
- Refractionate Coker Naphtha

Crude & Vacuum

- HAZOP Assistance
- New Crude Debottlenecking (3)
- Feasibility Study for a New Crude
- Vent Gas Compressor Conceptual Scoping and Process Design
- Operations and Startup Assistance
- Grass Roots Conceptual Design
- Grass Roots Design for Heavy Oil Upgrader Demonstration Plant
- Grass Roots Design for Heavy Oil Upgrader
- Client EPC Representative
- Flash Point Study



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Unit / Scope

Crude & Vacuum

Crude Slop Stream Capacity Improvement

Improved Diesel Recovery

Vacuum Jet Troubleshooting

Modeling to Assist Pinch Study (2)

Pinch Study

Lubes Process Design Package for Multiple Cases

Unit debottlenecking Revamp Process Design Package

Dewaxing Conceptual Study

Crude and Vacuum Study

Maximize Distillate Production

New Crude Unit Design; Crude Unit Conceptual Studies (2)

Crude Unit Revamp

Transfer Line Evaluation

Unit Evaluation for Relocation (2)

Canadian Dilbit Design

Crude Unit Naphtha Debottlenecking

Crude Unit Review

Crude Unit Revamp Cold Eyes Review

Solvent Deasphalting Unit Review

Solvent Deasphalter Startup Support

Solvent Deasphalter- Solvent Loss to Product Troubleshooting

Design and Operating Experience

(Continued)

Unit / Scope

FCCU

- Debottlenecking
- Slurry Circuit Fouling Prevention
- Gas Plant Due Diligence Conceptual Study
- Gas Plant Modeling and Debottlenecking
- Base Case Evaluation
- Wet Gas Compressor Debottlenecking
- Conceptual Expansion Study
- Process Evaluation Study
- FCCU Gas Plant Modifications

Gasification

- Preheat Study

Geothermal

- Chemical Abatement Tower Review and Design
- Steam Drum Sizing
- Gathering and Reinjection Process Conceptualization
- Vent Gas Scrubbing Feasibility Study
- H₂S Emissions Reduction Study
- Geothermal Solids Filtering

Hydroprocessing

- Recycle Gas Expansion
- Scoping Expansion Study
- Process Design for a Revamp and Relocation of an Existing Unit
- Expansion Process Design Package



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Unit / Scope

Hydroprocessing

Grass Roots Conceptual Design

Client Representative During Licensor Process Design Package Development

Water Wash Installation Process Design Package

Drum Size Evaluation and New Specifications

Client EPC Representative

Hydrocracker Fractionation Troubleshooting

Hydrocracker Naphtha Fractionation Study

ULSD Revamp

Hydrogen Plant Client Representative

Hydrogen Plant Optimization

Feed and Product Offsites Design

PHA Assistance

Process Design for Increased Product Cooling

HDT Stripper Optimization

Gas Oil HDT Conceptual Study

Hydrocracker Fractionation Design

NHT Naphtha Splitter Fractionation Study

VGO HDT Conversion to DSL HDT

Design and Operating Experience

(Continued)

Unit / Scope

Light Ends

Sats Gas Plant Modifications for Specification Propane

Light Ends Recovery Design

Operations and Startup Assistance

Base Case Evaluation (2)

Conceptual Debottlenecking (2)

Expansion Process Design Package (2)

Butane Treating (2)

Light Ends Recovery From Fuel Gas Conceptual Study

NGL Stabilization Project

Gas Plant Conceptual Study

Butane Recovery Conceptual Study

Operations

Interim Technical Manager

Turnaround Support

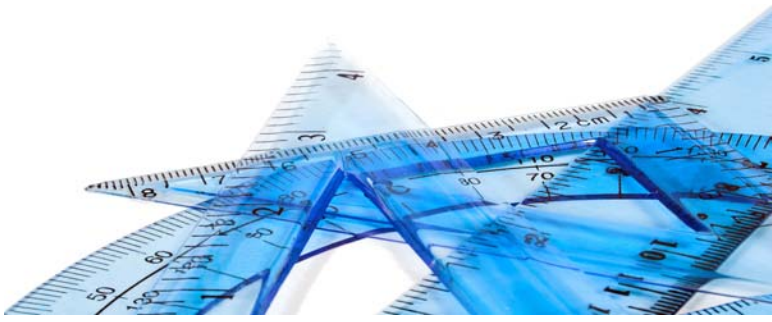
Operations Support

Renewable Energy

Water in RTO Feed Troubleshooting

Solar Project P&ID Development

New Biodesulfurization Conceptual Design Assistance



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Unit / Scope

Reformer

Debutanizer Simulation
Effluent System Modeling for Severity Reduction

SRU

Incinerator Debottlenecking

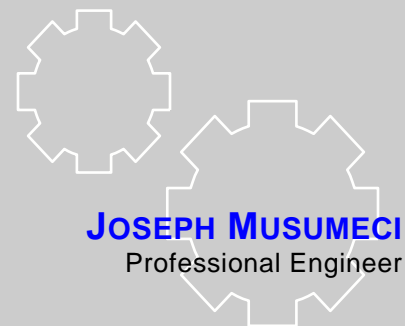
Utilities

Cooling Water System Debottlenecking and Piping Design
Cooling Water System Debottlenecking
Cooling Water System Hydraulic Modeling and Debottlenecking
Condensate System Improvement Study
Sour Water System Improvement Study
Sour Water Stripper Troubleshooting
Pump Hydraulic Analysis (2)
Vent Gas Scrubbing
Hydrogen Balance and Flaring Reduction Study
Vent Gas Scrubbing
Waste Incineration Scrubber Review
Caustic System Evaluation

Miscellaneous

Refinery Conceptual Expansion Optimization
Technical Training
Used Oil Reprocessing Simulation
MSAT II Compliance
Filter/Incineration Optimization Study
Relief valve Studies (Multiple)
Plant Wide PSV and Flare Studies
HD Petroleum Distillation Design

REACH YOUR GOALS WITH ASCENT



WORK EXPERIENCE

1997 - Present	Owner and Engineering Consultant, Ascent Engineering, Inc.
1996	Owner and Engineering Consultant, Stratus Engineering, Inc.
1988 - 1996	Vice President, MPEC Inc. Process engineering consultant.
1983 - 1988	Operating Engineer, Amoco Oil Co., Texas City, Texas
1979 - 1982	Engineering Technician (Cooperative Education student), PCI Consultants, Inc.

EDUCATION

Texas A&M University, 1982 Cum Laude, B.S. Chemical Engineering.

PUBLICATIONS

"Deep Cut Vacuum Tower Processing Provides Major Incentives," *Hydrocarbon Processing*, November 1997.

"Analysis of Alky Unit DIB Exposes Design, Operating Considerations," *Oil & Gas Journal*, September 30, 1996.

"Refiners Match RVP Reduction Measures to Operating Problems," *Oil & Gas Journal*, February 3, 1997.

"Optimal Diversification Strategies Given A Distant Planning Horizon," *Pensions, Savings, and Capital Markets*, 1996.

"A Dynamic-Programming Approach to Multiperiod Asset Allocation," *Journal of Financial Services Research*, 15:1 5-21 (1999).



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