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

<table>
<thead>
<tr>
<th>Unit / Scope</th>
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<tbody>
<tr>
<td><strong>Alkylation</strong></td>
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<td>New Iso Stripper Process Design Package, Project Engineering, Startup</td>
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<td>Acid Regenerator Project Engineering</td>
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<td>Base Case Simulation</td>
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<td>Conceptual Expansion</td>
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<td>Expansion Process Design Package</td>
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<td>Expansion Project Review</td>
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<td>HF Alkylation Unit Review</td>
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<td>Alky Unit Treating Study</td>
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<td><strong>Amine</strong></td>
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<td>Fuel Gas Amine Absorber Process Design Package</td>
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<td>Base Case Simulation and Troubleshooting</td>
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<td><strong>Coker</strong></td>
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<td>Revamp</td>
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<td>Refractionate Coker Naphtha</td>
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<td><strong>Crude &amp; Vacuum</strong></td>
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<td>HAZOP Assistance</td>
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<td>New Crude Debottlenecking (3)</td>
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<td>Feasibility Study for a New Crude</td>
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<tr>
<td>Vent Gas Compressor Conceptual Scoping and Process Design</td>
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<td>Operations and Startup Assistance</td>
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<tr>
<td>Grass Roots Conceptual Design</td>
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<td>Grass Roots Design for Heavy Oil Upgrader Demonstration Plant</td>
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<td>Grass Roots Design for Heavy Oil Upgrader</td>
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<td>Client EPC Representative</td>
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<td>Flash Point Study</td>
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</table>
"All of our employees are our ambassadors and keys to our success."

**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
### 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

"The final key to our success is that we value and respect you, our client."
## Design and Operating Experience

**Unit / Scope**

<table>
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<tr>
<th>Light Ends</th>
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<td>Sats Gas Plant Modifications for Specification Propane</td>
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<tr>
<td>Light Ends Recovery Design</td>
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<td>Base Case Evaluation (2)</td>
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<td>Conceptual Debottlenecking (2)</td>
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<td>Expansion Process Design Package (2)</td>
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<td>Butane Treating (2)</td>
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<tr>
<td>Light Ends Recovery From Fuel Gas Conceptual Study</td>
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<tr>
<td>NGL Stabilization Project</td>
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<tr>
<td>Gas Plant Conceptual Study</td>
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<tr>
<td>Butane Recovery Conceptual Study</td>
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</tbody>
</table>

**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
# 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

"Flexibility that meets your needs, not ours."
# Work Experience

<table>
<thead>
<tr>
<th>Year</th>
<th>Position and Company</th>
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<tbody>
<tr>
<td>1997 - Present</td>
<td>Owner and Engineering Consultant, Ascent Engineering, Inc.</td>
</tr>
<tr>
<td>1996</td>
<td>Owner and Engineering Consultant, Stratus Engineering, Inc.</td>
</tr>
<tr>
<td>1983 - 1988</td>
<td>Operating Engineer, Amoco Oil Co., Texas City, Texas</td>
</tr>
<tr>
<td>1979 - 1982</td>
<td>Engineering Technician (Cooperative Education student), PCI Consultants, Inc.</td>
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</tbody>
</table>

# Education

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

# Publications


