

KEETER SUTHERLAND



Engineering
Asset Integrity
Custom Solutions
Training

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WWW.KEETERSUTHERLAND.COM

Peace of Mind knowing your project is in the hands of experienced Professionals.
Experts working hard and smart for you!



Engineering

An Intelligent approach to Engineering and Project Management. When you need Accurate, Timely, Cost Effective Solutions, KeeterSutherland delivers. Expect a thorough, thoughtful approach to each challenge. We have the expertise to satisfy your every requirement whether it is a FEED study, compressor station, or a new petroleum storage terminal.



Asset Integrity

KeeterSutherland has world class technical talent with expertise in structural analysis and numerical modeling, asset life cycle analysis and operational support, and risk assessment for hydrocarbon storage tank facilities. We also provide Condition Based Maintenance and Reliability Engineering, hands on monitoring and data collection.



Training

KeeterSutherland offers specialized certification training for your staff: Certified Maintenance and Reliability Professionals (CMRP), Certified Maintenance and Reliability Technician (CMRT), Certified Lubrication Specialists (CLS) and Oil Monitoring Analyst (OMA). Training courses include Vibration Fundamentals to Reliability Centered Maintenance. We currently offer 14 technical training courses and are expanding our offering to meet clients training needs.



Custom Solutions

KeeterSutherland offers software solutions for predictive maintenance, specialized modular equipment, chemical injections systems, advanced chemical blending systems, and state of the art leak detection systems. Additionally, through SKY Chemicals, our wholly owned subsidiary, KeeterSutherland can provide chemical solutions for upstream and downstream applications.

INNOVATION

KeeterSutherland
Houston, Texas
713-493-6437

Engineering



Engineering and Construction Techniques should be creative, utilize the best available technology and provide an economical solution. We bring this approach to every project.

Our Technical Services specialty includes Front End Project Development Support, Detailed Design, Material Selection and Procurement, Construction Management and Total Project Management of:

- Petroleum Storage Terminals
- Small to Midsize Modular Refineries
- Crude Oil and Refined Products Pipelines
- Natural Gas Pipelines
- Pump Stations
- Compressor Stations
- Truck, Rail, Barge and Ship loading & off-loading Facilities,
- Biofuel Production and Storage Facilities
- Chemical Blending Facilities
- Underground Salt Dome Storage Facilities

A sample of our Capital Projects includes: *pipeline facilities and grass-roots terminal construction, terminal expansions and modifications, port facilities installation, truck, ship and rail loading and offloading facilities, chemical plant optimization modeling, Hydrogen Sulfide mitigation, gas pipeline engineering, hydrostatic test modeling and procedures, and more.*

Whether you need Consultative Services or Full Engineering, Procurement, and Construction, KeeterSutherland has the expertise and ability to handle the project.

Please visit our website at www.keetersutherland.com for more information on our Engineering Capabilities.



ADVANCED STRUCTURAL ANALYSIS AND NUMERICAL MODELING

Blast/Fire Design, Assessment and Retrofit of Structures in Industrial Facilities.

- Occupied Buildings
- Storage Tanks
- Pipes and Vessels

Seismic Design, Assessment and Retrofit of Structures in Industrial Facilities

- Occupied Buildings
- Storage Tanks
- Pipes and Vessels

Facility Siting Study

Hurricane Assessment and Retrofit of Structures in Industrial Facilities

Root Cause & Failure Analysis

Fitness for Service

- Pressure Vessels
- Pipelines
- Structures
-

Inspection & Maintenance Planning

Corrosion Management & Materials Performance

Corrosion Analysis

Corrosion Management Planning

Fatigue Analysis

Engineering Criticality Assessment

Remaining Life & Life Extension Assessments

PROCESS SAFETY

Identification and ranking of hazards (HAZID, HAZOP, What If, etc).

Determination of major accident hazards (MAH) (including bowties, LOPA)

Comprehensive evaluation of risks from major accident hazards, including:

- Fire and Explosion Consequence and Risk Analysis
- Dispersion Analysis
- Escape, Evacuation and Rescue Analysis
- Smoke and Gas Ingress Analysis
- Temporary Refuge and Impairment Assessment

Quantitative Risk Analysis (QRA) and Facility Siting.

Identification and analysis of risk reduction measures and associated benefits.

Alarm Management for plant wide facilities.

Safety Integrity Level (SIL) Assessment, including LOPA and SIL verification

Safety Critical Elements

Documentation of safety performance (ALARP demonstration, Safety Case)

Asset Integrity



OPERATIONAL SUPPORT

Troubleshooting process and control problems causing inefficient operation or unplanned downtime

Compressor control and system anti surge protection analysis

P&ID and PFD review and validation

PSV & PRV vent sizing - confirming adequate protection as normal operating conditions change

Control Systems validation

Process Simulation Training

HYSIS and ASPEN simulating

Process optimization and review



ASSET LIFE CYCLE ANALYSIS

Asset Operational readiness assessment

Asset Operational Assurance

Personnel Competency Assessment

CONDITION BASED MAINTENANCE AND RELIABILITY ENGINEERING

Vibration Data collection and Analysis on Rotating Machines and Equipment

Infrared Thermography data collection and analysis of data

Valve Maintenance, Repairs, Operation and Troubleshooting

Lubricant and used oil sampling and analysis

Motor Current data collection and analysis

Ultrasound and Leak detection

Training



KeeterSutherland provides exceptional, internationally recognized, training courses - necessary to better manage your assets and reduce operating expense. Courses are applicable across multiple industries.

Certification Training

Approved by the STLE '*Society of Tribologists and Lubrication Engineers*'

- CMRP 'Certified Maintenance and Reliability Professionals'
- CMRT 'Certified Maintenance and Reliability Technician'
- CLS 'Certified Lubrication Specialists'
- OMA 'Oil Monitoring Analyst'

Training Courses

- Vibration Fundamentals
- Lubrication Fundamentals
- Maintenance and Operation of Pumps
- Bearings and Seals
- Rotating Machinery Alignment
- Planning and Scheduling for Effective Maintenance Execution
- Infrared Thermography
- Valve Maintenance, Installation, Operation and Troubleshooting
- Maintenance, Operation and troubleshooting of Gas turbines and compressors
- Maintenance Management
- Hydraulic and Pneumatic Fundamentals
- Banksman / Spotter and Lifting
- Root Cause Failure Analysis
- Reliability Centered Maintenance



Custom Equipment:

Chemical Blending Systems in a modular, transportable package utilizing accurate, repeatable and cost effective mass measurement. It is extremely accurate and repeatable with an abundance of recipe options. No scales, no level indicators and no visual interpretations. The system can be fully automated and is capable of blending directly into any tank. It is capable of high pressure blending. Sequential or continuous blending operations are both possible. It is capable of both local and remote operation or a combination of both.

Modular and Transportable LACT Systems. LACT Units are “cash registers”. Who can afford to have a system in place that is not reliable and accurate? Your LACT unit is critical in ownership transfer of crude and other valuable products. Our Modular LACT unit has been designed and engineered to provide precise measurement in the harshest environment. It is packaged for safe and secure domestic and international transport. Since it is built into a standardized container, it allows for maximum portability. This comes in handy when managing production depletion or need to move it from one collection facility to another.

Vetting Services:

Are you looking at acquiring a new facility for storing your crude oil, fuel oil or refined products? Does it truly have the ability to meet your storage and throughput needs? Our Technical Evaluation Team has the knowledge experience, and training to Vet the facilities for you. The more you know about the Storage Terminal, the better you will be able to use those assets to your gain. Our post inspection reporting will provide you the information needed to make strategic decisions and help you negotiate the most desirable terms.

Time is a non-renewable resource. Don't waste another second using questionable data. Make better decisions and let KeeterSutherland help you achieve your desired results in the most practical, cost efficient way.

Custom Solutions



KeeterSutherland has over 20 years experience providing chemical additive solutions to the petroleum industry. Through SKY Chemicals, our wholly owned subsidiary, we provide custom blended and commodity chemical additives for Oil field, Refinery, and Finished Fuel clients. SKY Chemicals has several specialty chemicals for enhanced oil recovery and environmental bioremediation.

SKY Chemicals has an extensive network of transportation and logistics experts that allows for clients timely needs to be consistently met.

Chemical Portfolio

<i>Fuel Products</i>	<i>Oilfield Products</i>
H2S Scavengers	H2S Scavengers
Mercaptan Scavengers	Mercaptan Scavengers
Corrosion Inhibitors	Corrosion Inhibitors
Heavy Fuel Pour Point Depressants	Pour Point Depressants
Demulsifiers	Demulsifiers
Dehazers	Scale Inhibitors
Lubricity Improvers	Paraffin Dispersants/Inhibitors
Antioxidants / Stabilizers	Surfactants
Distillate Cold Flow Improvers	Defoamers
Fuel Additive Packages	Asphaltene Dispersants
Cetane Improver	O2 Scavengers
Combustion Improvers	Specialty Soapsticks
Dyes	All Natural Environmental Remediation

KEETER SUTHERLAND

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ADVANCED ENERGY SERVICES - INNOVATIVE TECHNOLOGY