

Gulf Interstate Engineering

Statement of Qualifications



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**GULF INTERSTATE
ENGINEERING**

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Section 1 – About Us

Gulf Interstate Engineering Company (Gulf) serves the worldwide energy industry, providing project management, engineering, procurement and construction management for hydrocarbon production and transportation systems from the wellhead to the export terminal.

We are a company of specialists. For decades, Gulf has attracted and retained some of the finest engineers and project managers in the world. Our professionals are known for their extensive experience and are experts in engineering all aspects of oil and gas production facilities, transportation systems and storage facilities and have contributed to the success of some of the world's most complex oil and gas projects, many with demanding environmental requirements in some of the harshest natural conditions.

Since our formation in 1953, we have achieved a reputation for producing practical, cost-effective and unique solutions to difficult design problems, large and small. Recently, we have managed projects with a combined capital cost of more than \$6.0 billion. For those projects, we have procured and delivered more than \$2.0 billion in project materials and equipment.

We pride ourselves on our commitment to quality. We measure our performance and strive constantly to improve as evidenced by our ISO 9001 quality certification.

We are committed to staying at the forefront of our business, investing in the technology that will make a difference in your projects.

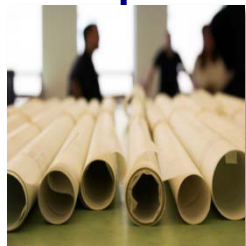
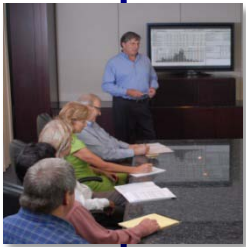
Experience, people, technology and flexibility to do it right – down the line – are the strengths that enable Gulf Interstate Engineering to exceed our clients' expectations and leave a positive impact in the communities they serve.

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Section 1 - Capabilities

Services We Provide

feasibility and economic studies

- system optimization
- capital and operating cost estimates
- tariff and cost of service analysis
- financial studies
- risk and sensitivity analysis
- facility appraisals

project management

- execution plan and procedures
- budget development & cost control
- planning and scheduling
- contract administration
- quality assurance
- project execution

right-of-way and land acquisition

- regulatory and ownership research
- permit applications and acquisition
- route selection
- alignment and topographical control
- surveys
- land acquisition and support
- aerial photography
- geotechnical and oceanographic investigation
- environmental assessment

engineering

- conceptual design
- preliminary engineering
- detailed engineering
- design basis documentation
- hydraulics and surge analysis
- civil / structural design
- stress analysis
- process, mechanical and piping design
- electrical and instrumentation design
- SCADA and communications design
- pipeline risk assessment / risk management
- pipeline rehabilitation
- HAZOPS and HSE analysis
- material and equipment specifications
- engineering and design quality control

procurement

- technical and commercial specifications
- bid solicitation and evaluation
- purchase order and contract development
- expediting and material control
- logistics, transport and field materials handling
- vendor surveillance and inspection



construction management

- construction planning and scheduling
- contractor pre-qualification
- contracting strategy and bid packages
- bid solicitation, evaluation and award negotiation
- field supervision, engineering and inspection
- contract administration and change control
- quality assurance and quality control
- certification and commissioning



operations and maintenance

- start-up assistance
- personnel training
- operation and maintenance manuals
- engineering support of operations
- contract operations and maintenance





The success of your project is driven by our ability to perform. This is why we are committed to attracting and retaining the best people in the industry. Our professionals provide the experience, knowledge and capabilities that consistently deliver the most effective solutions to your project challenges.

Section 2 – Gulf’s Organization

Gulf has provided quality project management and engineering services to the energy industry for more than 50 years and is recognized as one of the largest international consulting firms in the world, specializing in oil and gas production, transportation and storage system projects.

Our staff of more than 800 employees includes registered engineers and professional specialists in the major disciplines: pipeline, mechanical, electrical, instrumentation, civil, structural and marine. Specialty areas also include controls, communication, SCADA, corrosion, information technology and estimating. We also employ operations and maintenance specialists, and construction management and field inspection personnel.

The following information describing Gulf’s organization is provided in this section:

- 1) Executive Management
- 2) Corporate Organization Chart
- 3) Sr. Management Organization Chart

Executive Management



H. Doug Evans

President and CEO

Doug Evans, President and CEO of Gulf, has more than 40 years of industry experience, 30 of which have been spent at Gulf. Doug's vast career at Gulf includes project management, business development, company management and corporate leadership. A confident and honest leader, Doug leads Gulf's Senior Management team by example. Doug is a registered professional engineer in Alberta, British Columbia, Saskatchewan, and Ontario. Doug is an active member of IPLOCA, PLCA, PLCAC, Pipeliners Association of Houston and is a past Chairman of the INGAA Foundation.



Criss Shipman

Senior Vice President

Criss Shipman, Senior Vice President of Gulf, possess more than 35 years of international and domestic oil and gas experience. With more than 23 years of service at Gulf, Criss has held a variety of leadership roles, including positions as Vice President of Corporate Development and currently as the Senior Vice President. In his current position, Criss is active in corporate affairs, sets strategy for new business acquisitions and maintains a role in the development of alliances and collaborative associations with strategic business partners. Criss is an active member of the Project Management Institute, IPLOCA, PLCA, INGAA and the Pipeliners Association of Houston.



Rick Barnard

Vice President - Operations

As Vice President - Operations, Rick Barnard decisively leads and manages the efforts of Gulf's project teams using his extensive industry knowledge and experience at successful project completion. With more than 30 years of experience in the oil and gas pipeline industry, Rick has successfully held positions as a Field Construction Engineer, Superintendent - Field Construction, Technical Operations Superintendent, Director of Engineering & Design, Project Manager and as Vice President - Operations. Always focused on quality, Rick strives for operational excellence on all of Gulf's projects, anything less is unacceptable. Rick is a member of the American Society of Civil Engineers, Project Management Institute, PLCA, INGAA and the Pipeliners Association of Houston.



Bob Sprick **Vice President - Business Development**

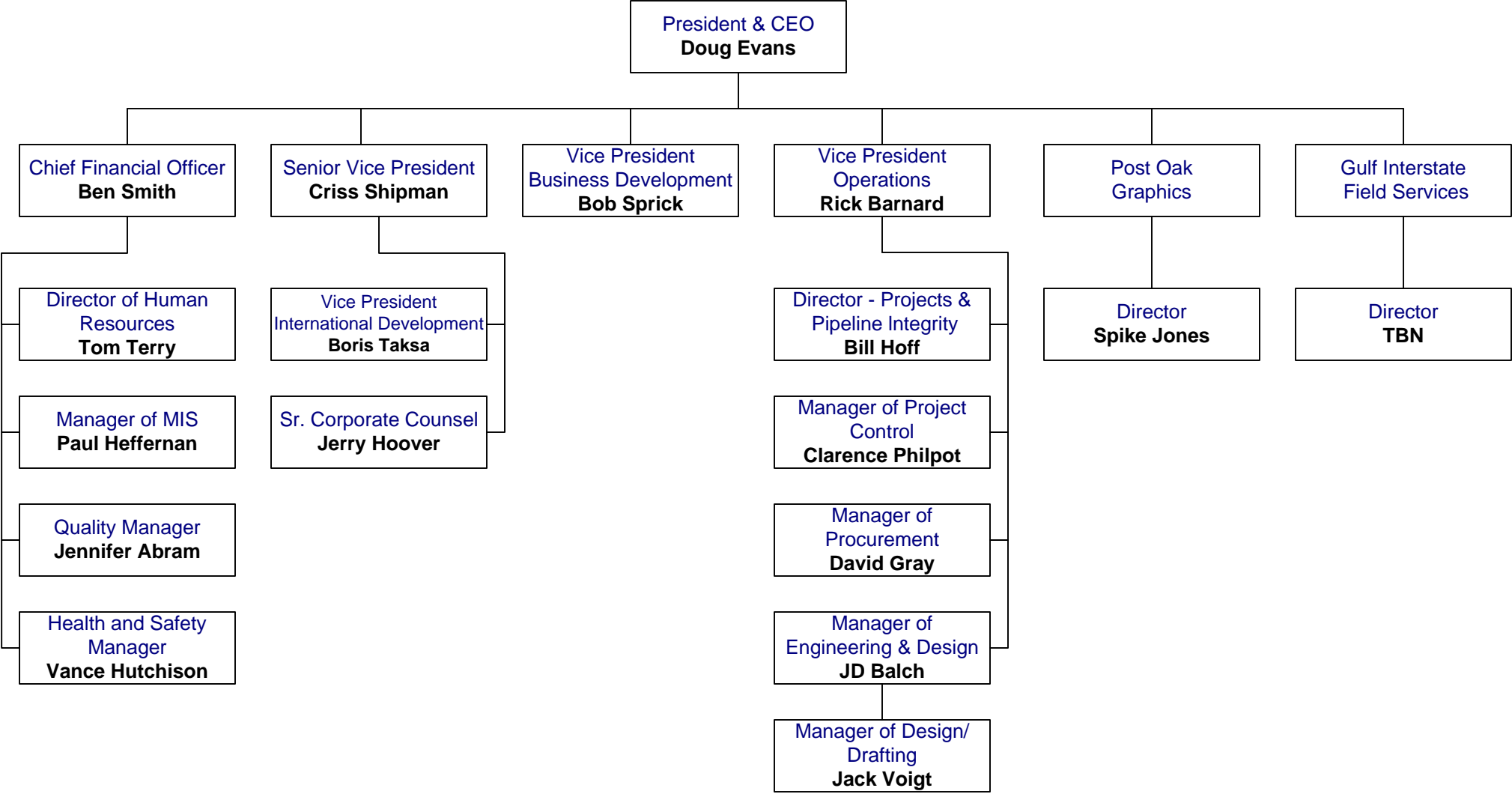
Bob Sprick, Vice President - Business Development of Gulf, possess more than 30 dedicated years of experience in the oil and gas pipeline industry, 20 of which have been spent at Gulf. Bob's extensive career at Gulf has included a variety of positions from Engineer, to Project Manager to Vice President of Business Development. Bob provides professional experience and guidance to Gulf's Business Development team, and is directly responsible for the Company's worldwide marketing and sales activities. He possesses a diverse and accomplished background in project management, marketing, planning, design, construction and in the operations of oil and gas pipelines and station facilities. This wide ranging industry experience is crucial to understanding client needs, and in offering them a unique, cost effective solution. Bob is an active member of PLCA, INGAA and the Pipeliners Association of Houston.



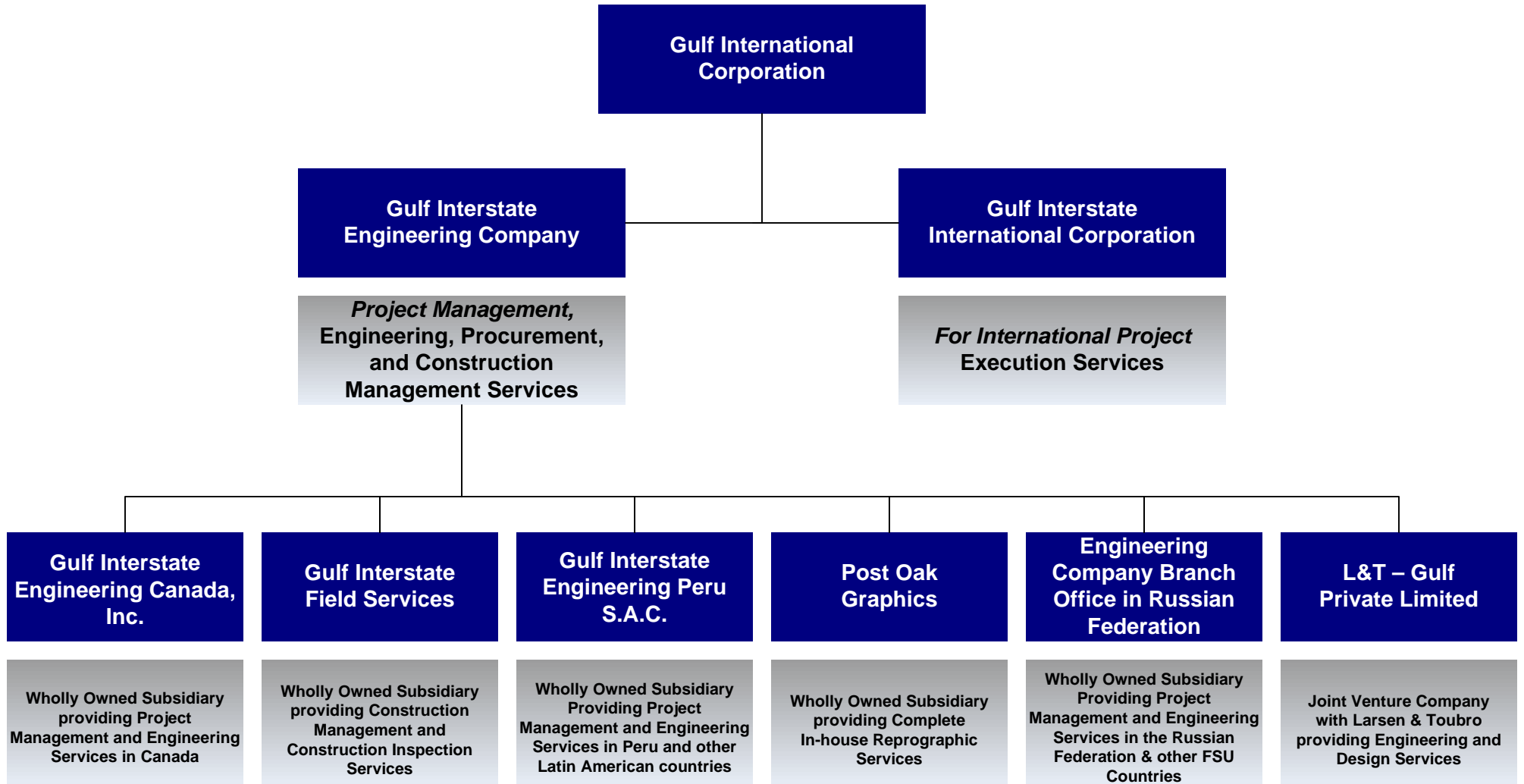
Boris Taksa **Vice President - International Development**

As Vice President - International Development, Boris directs the Company's international development and project execution activities, which consists of marketing, proposal efforts and managing project execution. Boris' international development activities are focused in Eastern Europe, Russia and other FSU countries. With more than 45 years of related industry experience in engineering, project management and business development, Boris adds an international insight to meeting the needs of our diverse clients around the world. Boris has also been instrumental in successfully managing and operating Gulf's bustling Moscow office. Boris is a member of the American Society of Mechanical Engineers and has written numerous publications on arctic pipelines and on Western and FSU Pipeline Code Comparisons.

Gulf Management Organization



Gulf Corporate Organization





One strength of an engineering firm is its experience. For more than 50 years, we have worked all over the world on some of the most challenging and demanding oil and gas transmission projects. As a part of our collaborative nature, we share our experiences with our clients and leverage this knowledge to enhance the services we provide on all of our projects.



Section 3 – Experience – Selected Projects

EPCM Services

Gulf's core business is the provision of project management, engineering, procurement and construction management (EPCM) services to the oil and gas industry. Our traditional project execution role is as the EPCM contractor. We have performed a full range of EPCM services for international upstream oil and gas projects, typically in an integrated management team (IMT) with the owner. The IMT approach builds a project team using personnel from the owner's organization and the contractor's organization.

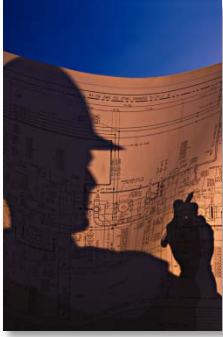
Our involvement often starts at the preliminary engineering stage as the FEED contractor and grows into the EPCM contractor role as the project progresses. Our contractual relationships with owners encompass a variety of commercial terms: reimbursable, lump sum, fixed fee and performance incentive contracts. To staff the management component of the IMT, we customarily provide a Project Manager, Engineering Manager, Procurement Manager, Quality Assurance Manager, and a Construction Manager.

These managers report to Project Directors managing these functions. We provide complete staff positions to fulfill the various project functions including:

- Cost and scheduling engineers
- Estimators
- Project and discipline engineers
- Technical consultants
- Procurement specialists
- HSE specialists
- QA/QC specialists
- Construction managers
- Inspection personnel

Our capability extends to large-scale oil and gas projects with billion dollar budgets and staffing demands for hundreds of personnel.

For a typical international oil and gas project our responsibilities to the owner are full-service. We provide general and administrative functions necessary to the day-to-day requirements of project execution and provide comprehensive project management reporting. We perform preliminary and detailed engineering, value engineering, technical analyses, and prepare project plans and detailed procedures. Our procurement services cover all requirements from vendor selection through ordering, delivery and final reconciliation upon project completion. Construction management responsibilities begin with consultation and progress to the provision of resident teams at the construction sites to provide field engineering, monitoring, reporting, construction quality assurance and inspection along with start-up and commissioning support. Our project close out activity provides job books, as-built documentation and transfer of complete archive of project documents.



Construction management of pipelines and station facilities has been a core competency at Gulf since our formation in 1953. From preliminary planning and contractor selection through construction monitoring, field engineering and inspection, to start-up and commissioning, we offer our clients the personnel and experience to manage the most complex construction projects. Our construction management personnel will ensure that your facilities are installed in accordance with the project procedures, specifications, and contract requirements.

Construction management services that we offer to our clients include:

- Construction planning and scheduling
- Contractor prequalification
- Contracting strategy and preparation of bid packages
- Bid solicitation, evaluation and award negotiations
- Field supervision, engineering and inspection
- Contract administration and change control
- Quality assurance and quality control
- Certification and commissioning

Gulf provides to its clients the use of our state-of-the-art construction field reporting system that provides real time information accessible over the Web. Gulf's field reporting system is designed to enable both Gulf and client personnel to obtain up-to-date status information regarding ongoing pipeline and facility construction activities. This information can be used to track progress, check contractor billing information and provide trend information for project controls. The ability to gather this information electronically and disseminate it quickly to all authorized parties in a secure manner is what sets this process apart from other field reporting systems.

Field personnel are able to utilize this Internet system to track the progress of work by activity. Moreover, home office personnel use this data to generate progress reports on a weekly or other project-specified basis, and are able to then post the completed reports to the Internet. These reports are immediately available on the secure server and can be instantaneously downloaded by any authorized user anywhere in the world.

Invitation to Tender (ITT) Packages

We have prepared numerous ITT packages for a multitude of international oil and gas projects for clients such as Saudi Aramco, Hunt Oil, and Occidental, to name but a few. Through our involvement with multinational oil and gas companies we have amassed a body of knowledge regarding contracting strategy for international pipeline and facilities construction projects and a practical understanding of the various contract forms utilized for these projects.

In addition to providing EPCM services, we participate in and contribute to the development of contracting strategies. We break down the separable components of the project into logical construction packages, determine the specific construction talents needed to install these components and confirm the availability of qualified international and national contractors who can deliver the necessary equipment, manpower, and expertise to accomplish construction. We analyze the project schedule to determine permit restrictions, host government approvals, weather windows, shutdown



requirements when operating facilities are involved, and other constraints that will have an impact on the timing and sequencing of construction activity. We consider material delivery, importing and storage issues and develop recommendations concerning the make-up and deployment of construction management teams.

Our engineering and construction management staff prepares comprehensive construction, inspection and testing specifications, descriptions of the facilities to be constructed and other technical documents that make up the job specification and technical requirements of the construction contract. Our project management and contracts personnel develop general terms and conditions or review and incorporate these sections if provided by the owner. Our team also prepares commercial terms and conditions, including detailed pay item breakdowns, equipment and personnel lists, and unit rate descriptions and measurement criteria. We are familiar with lump sum, time and material, unit rate, fixed fee, and other commercial approaches for construction contracts.

We prepare contractor pre-qualification documents and develop criteria and scoring systems to rank and qualify contractors and recommend a bid slate. We develop ITT packages including Instructions to Tenderers and tender forms, and combine these with the technical documents and pro-forma contract to provide a complete ITT package ready for issue to qualified contractors. During the tender cycle we prepare and coordinate responses to tenderer questions, conduct and participate in the technical and commercial evaluation of tenders and provide our recommendations for award.

Many of the international projects with which we have been involved feature local content requirements stipulated by the host country government. Most of these projects are executed in a combined manner with an international contractor in the prime-sub or joint venture relationship with a national contractor to fulfill the local content requirements. Our membership in the International Pipeline and Offshore Contractors Association provides us with useful contacts with whom we consult regarding their experiences with national contractors and to better understand the challenges of contracting in concert with local firms.

Experience – Selected Projects

To illustrate Gulf's worldwide oil and gas project experience as described above, we have provided descriptions of some of our selected projects from the following areas:

- Pipeline Systems (a pipeline system which may also include station facilities)
- Station Facilities (pump, compressor, metering and other facilities)
- Field Development (oil and gas field development)
- Consulting Engineering (feasibility studies, cost estimates and pipeline integrity assessments)

PREPA Via Verde Pipeline
Ray Architects & Engineers

contract award May 2010
completion Jan 2012

Gulf is providing advisory services to Ray Architects & Engineers to select a suitable route and configuration for the PREPA Via Verde Pipeline Project. The Project starts near the EcoElectrica LNG Terminal, traverses the island in a northerly direction and then proceeds eastward to PREPA's Palo Seco and San Juan Power Plants near San Juan, with the goal of transporting gas from the south coast to the north coast of Puerto Rico. Specifically, Gulf's scope includes providing advice for routing and constructability through densely populated areas, river and road crossings, pipeline and facility studies, and other pipeline issues. Gulf is preparing GIS mapping and data to support detail design and field reconnaissance, permitting and survey planning activities. Gulf will also advise during the development of detailed engineering and design deliverables to achieve Issue for Construction quality documents and drawings.

- project management
- engineering
- design / drafting services
- procurement
- integrity

White Kitchen to Yoakum 30in/ 36in
EPCO, Inc

contract award Aug 2010
completion Oct 2011

Phase I of the White Kitchen to Yoakum Project consists of approximately 80-miles of 30-inch gas pipeline from White Kitchen Compressor Station to Falls City Compressor Station. Phase II consists of approximately 67-miles of 36-inch gas pipeline from Falls City Compressor Station to Yoakum Compressor Station. In addition, each pipeline will have a launcher and receiver at each end, a launcher and receiver at the midpoint, a meter station at the beginning of each segment, a slug catcher, and condensate tanks at the termination of each section. The design will also include approximately 5-miles of 36-inch loop line that terminates at a receiver located at the Eagle Ford Tie-In Site. There will also be a 12-inch hot tap on an existing 20-inch pipeline located at the Falls City Compressor Station suction side; feeding a bidirectional meter station. Gulf's scope of work on the White Kitchen to Yoakum Project consists of project management and progress reporting, engineering, design/ drafting and material procurement. Gulf is preparing class location studies with GIS to support the gas pipeline expansion.

- project management
- engineering
- design / drafting services
- procurement
- integrity

Acadian Haynesville Extension
EPCO

contract award Dec 2009
completion Oct 2011

Gulf is providing project management, engineering, design, procurement, geotechnical engineering, HDD design, and construction support services for EPCO Inc.'s Acadian Haynesville Extension Project. Gulf is preparing class location studies with GIS to support the gas pipeline expansion. This telescoping 42-inch, 36-inch and 20-inch 250-mile natural gas pipeline traverses through the state of Louisiana, starting south of Bossier City, LA and continuing southeast to Napoleonville, LA. As designed, the pipeline is expected to transport from 1.8 Bcfd to as much as 2.1 Bcfd of natural gas from interconnects with interstate natural gas transmission systems through central Louisiana. This extension project will provide critically needed natural gas take-away from the Haynesville Shale area and will provide producers with access to additional markets.

- project management
- engineering
- design / drafting services
- procurement
- integrity

**CPC Expansion Front End Engineering and Design
Caspian Pipeline Consortium - R&K**

contract award May 2004
completion Jan 2011

Gulf has resumed work on the Caspian Pipeline Consortium Expansion Project - FEED Continuation. Gulf's scope of work on the CPC Expansion Project includes revising the Technical and Economic Substantiation of Construction (TEOC), project management, risk analysis, expert reviews, engineering, preparing Final Investment Decision (FID) package, and obtaining permits and approvals. Gulf is also responsible for reviewing existing technical specifications and requirements, submitting estimates for updating and revising the land management files, reviewing current plans and procedures, and preparing bidding documentation. This 1,500-km, 42-inch large diameter pipeline crude oil system with multiple pumping stations runs from Tengiz, Kazakhstan to an export terminal on the Black Sea at Novorossisk, Russia. The project includes 10 greenfield pump station facilities (eight in Russia, two in Kazakhstan), five facility upgrades (turbine driven and electric motor driven pumps) at existing pump stations (three in Russia, two in Kazakhstan), 88km of new 40-inch pipeline, six new 100,000m³ oil storage tanks at a terminal location, 5km of offshore pipeline, including an SBM and PLEM, and other associated facilities. Presently, this project is in the detailed design phase.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

**Alberta Clipper / Southern Lights Project
Enbridge Energy Company, Inc.**

contract award May 2007
completion Dec 2009

The Alberta Clipper Project included 326-miles of 36-inch diameter crude oil pipeline from the US/ Canadian border to Superior, WI and three new 12,000 hp pump stations. The Southern Lights Project consisted of 136-miles of 20-inch diameter crude oil pipeline and 190-miles of 20-inch diameter diluent pipeline. The Southern Lights Project also included four new 6,500 hp pump stations, one new 6,000 hp pump station, the reversal of flow at one existing pump station, conversion of two existing pump stations and seven new 250,000 bbl storage tanks. Gulf prepared GIS map exhibits and data to support preliminary route selection and aerial/land survey data acquisition and planning. Gulf provided the detailed engineering, design, and procurement services for these projects.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- integrity

**Peru LNG Export Project
Peru LNG S.R.L.**

contract award Jan 2004
completion Oct 2009

Gulf Interstate Engineering Peru SAC provided detailed engineering, design, and procurement services on the Peru LNG Pipeline Project. The project included the installation of a 34-inch diameter pipeline for the transportation of natural gas from Chiquintirca in the Andes Mountains, east of Ayacucho, to a LNG Plant at Pampa Melchorita, located in the coast area. The pipeline system is approximately 400 kilometers in length and includes metering facilities and SCADA system.

- feasibility / economic study
- project management
- engineering
- procurement

Gulf engaged the services of subcontractors to provide satellite imagery and perform control surveys, geotechnical investigations, hydrological investigations and topographic surveys. Subcontractors hired to perform fieldwork were all Peruvian companies.

East-West Gas Pipeline Project

Reliance Gas Transportation Infrastructure Limited

contract award Dec 2005
completion Mar 2008

This major project included the installation of a 1,385-km, 48-inch natural gas pipeline and associated spur lines. The East-West Gas Pipeline traverses across the country of India from the Onshore Gas Processing Terminal (OCPT) at Gadimoga near Kakinada on the east coast of India to Bharuch on the west coast of India. The pipeline system includes mainline block valves, pigging stations, compressor stations, metering and regulating (M&R) stations, cathodic protection system, SCADA system, process measurement and control instrumentation, fire alarm and fire protection system, control room & other buildings, and other associated facilities. Gulf's scope of work included process design and other engineering works required for the preparation of RFQ packages through successful completion of purchase / work orders for the long lead, critical items, construction work packages and related project management services. The pipeline system is designed to initially transport 60 MMSCMD and is forecasted to grow to 80 MMSCMD. Reviewed design of fault crossings.

- project management
- engineering
- design / drafting services
- procurement

Rockies Express Pipeline Project

Kinder Morgan, Inc

contract award Oct 2005
completion Nov 2009

Gulf provided Front-End Engineering and Design (FEED) services, including a detailed route selection, constructability analysis and the development of a project schedule. Created thousands of GIS exhibits and a number of GIS analysis data sets and tables for engineering, environmental, field planning, permits and FERC filing. After successful completion of the front-end engineering activities, Gulf was subsequently awarded the detailed engineering and design, procurement, and project management and construction management support services. This project included 1,679-miles of 42-inch diameter pipeline and associated facilities. The Rockies Express Pipeline LLP Project traverses eight states including Colorado, Wyoming, Nebraska, Kansas, Missouri, Illinois, Indiana and Ohio. The project included numerous railroad (31), highway (38), road (300), pipeline and utility crossings through several major metropolitan areas, including the cities of Indianapolis, Indiana, Columbus, Ohio and several other similarly congested areas.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management
- integrity

Escravos Gas Project 3B Pipeline

Chevron Nigeria Limited

contract award Mar 2005
completion Dec 2006

Gulf and its associated business unit for offshore engineering, Antares, provided FEED to perform the required studies and develop the recommended alternative for gathering, compressing and delivering associated gas from EGP 3B to the tie-in point on the EGP 3A pipeline to shore. EGP3B gathers the associated gas produced from the North Offshore Area, as well as Delta PP and Tapa PP in the South Offshore Area, compresses the gas and delivers it to the EGP 3A tie-in point. The ESP 3B project gathers associated gas from nine production platforms and consists of a gathering pipeline network of 9 pipelines ranging from 16-inch up 30-inch with wall thicknesses ranging from .344 up to .500 for a total of 125 km, plus overall project management. In May 2005, Gulf was additionally awarded basic engineering that included MTO's, engineered equipment and long lead items, Class 3 cost estimate schedule, EPCI contracting strategy, preliminary and final FEED report, and a lessons learned report.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Cypress Pipeline Project
Southern Natural Gas Company

contract award Jan 2005
completion Sep 2006

The new Cypress Pipeline provides an incremental 220 million cubic feet per day (MMcf/d) of takeaway capacity from Elba Island, Southern Natural Gas' liquefied natural gas (LNG) facility near Savannah, Georgia. From Elba Island, the 167-mile, 24-inch pipeline extends the SNG system into southern Georgia and northern Florida and interconnects with the Florida Gas Transmission system near Jacksonville, Florida. The project included managing a sizable volume of city, state and utility crossings through some of Georgia's highly populated areas and cities. Gulf provided support during the FERC phase of the project, including coordination of the civil and environmental surveys and developing the capital cost estimate, and provided project management, field engineering, detailed engineering and design support for the design phase of the project. Gulf provided additional follow-on engineering and transitioned to provide engineering support during construction and as-built drawings.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Mier - Monterrey Pipeline Project
Kinder Morgan, Inc.

contract award Jul 2002
completion Mar 2003

Gulf provided full EPC services for the Mier-Monterrey Pipeline in partnership with a U.S. and Mexican construction firm. This major project involved installation of 90-miles of 30-inch pipeline and three meter stations in Mexico, as well as an additional 9-miles of 30-inch pipeline and one meter station in the United States. The project supplies up to 375 MMscf/day from southeast Texas to an existing power plant near Monterrey. Our procurement team was responsible for competitively bidding, purchasing, expediting, logistics, transport and field handling of all materials and equipment. By working closely with our construction partner, we developed a seamless transfer of material from US vendors to workers in the field. The efficiency of material and equipment deliveries was crucial to avoid delays. During construction, Gulf's experienced team provided construction management and inspection services to ensure the pipeline and metering facilities were installed in accordance with the contract documents, design drawings, and regulatory permit requirements. Gulf also managed the commissioning and start-up activities. On March 20, 2003, Gulf and its partners completed the project one month ahead of schedule and within the project budget.

- project management
- right-of-way services
- engineering
- design / drafting services
- procurement
- construction management
- commissioning / start-up

Camisea Natural Gas & NGL Transportation System
Transportadora de Gas del Peru SA

contract award Jun 2001
completion Jun 2004

Gulf acted as Project Manager/Owner's Engineer (PMC) for this state-of-the-art natural gas and NGL transportation system in Peru. Running from the Malvinas gas plant and pumping station located near the Camisea field, this telescoping 32-inch, 207 km; 24-inch, 311 km; 18-inch, 211 km; 8-inch, 38 km gas system transits the Andes from Malvinas to Lima, for a distance of approximately 730-km. The NGL pipeline 14-inch, 454-km and 10-inch, 107-km parallels the gas pipeline for approximately 561-km, terminating at a fractionation facility on the coast at Pampa La Clarita. The gas system required an additional pressure reducing station and the NGL system contains three additional pumping stations and two pressure reducing stations. The pipeline system traverses approximately 195-km of Peruvian rainforest, 250-km across the Andes and 250-km across the Peruvian Coastal Plain. Reviewed design for fault crossing by ABS Consulting.

- project management
- engineering
- construction management

Kern River Expansion Project

Williams / Kern River Gas Transmission Company

contract award Feb 2002
completion May 2004

Gulf provided project management, FERC filing support, engineering, design and procurement services for the 2003 Kern River Expansion Project. This major expansion project involved the looping of approximately 717-miles of the existing Kern River System, increasing system capacity by 1 BCFD. The pipeline occurred in the states of Wyoming, Utah, Nevada and California. The pipeline traversed through environmentally sensitive areas and approximately 30-miles of densely populated land requiring the use of Class 2 and 3 pipe. Prepared design and specifications for HDD crossings for a 30-inch diameter high pressure gas pipeline for the following river crossings; Bear River, Wyoming 2,500 ft. crossing in rock and Weber River, Utah 4,800 ft. crossing in rock. In addition to pipeline looping, there were five-meter station additions and modifications at existing meter stations. Gulf prepared the scope of work, construction summary, preliminary P&IDs, plot plans and electrical one line drawings to define the detailed design, procurement, and construction of nine compressor stations. Detailed engineering was performed on an additional 15,000 HP Solar Mars 100 turbine compressor trains and auxiliary equipment at the existing Fillmore and Veyo stations; and installation of single 15,000 HP combustion turbine driven compressor trains and new station facilities at the new Dry Lake and the existing Good Springs stations.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

OCP Integrated Management Team (PMC)

Oleoducto de Crudos Pesados (OCP) Ecuador SA

contract award Jan 2001
completion Jun 2003

The Oleoducto de Crudos Pesados Project consisted of 313 miles (504 km) of 26-inch and 32-inch, 18 to 24 degree API heavy crude oil pipeline with four pumping stations, two pressure reducing stations, two terminal facilities and an initiating pump station at Lago Agrio and onshore storage terminal facilities and offshore tanker loading facilities at Esmeraldas, all within the Republic of Ecuador. The facilities included 1,200,000 barrels of working storage (equivalent to 3 days) at the originating Amazonas Oil Terminal and 3,750,000 barrels of working storage (equivalent to 8 days) adjacent to the offshore loading facilities at the OCP Marine Terminal near Esmeraldas.

- project management
- engineering
- design / drafting services

As part of the Integrated Team, Gulf provided the Project Management Consultancy (PMC) for the project and also performed construction management and inspection and incidental technical services in support of the project. Gulf was also responsible for the development of the preliminary engineering and design (FEED) for the pipeline, including preparation of engineering studies, calculations, hydraulic analyses utilizing Stoner software, and equipment specifications.

Pipeline Construction Program

TransCanada PipeLines

contract award May 1998
completion May 1999

Performed construction management services for TransCanada's Winter and Summer Pipeline Construction Program, Spreads 99B and 98E; approximately 61 km of 42-inch diameter pipeline, located between Longlac, Ontario and Matawa, Ontario and 87 km of 42-inch mainline loops located in the North Bay and Toronto areas. Gulf prepared project procedures, inspection guidelines, quality plans and other documents necessary to support construction management. The project team ensured contractor compliance with all applicable regulations, specifications and quality standards throughout the construction of the pipeline facilities. Construction progress was reported to TCPL over the Internet from Gulf Canada's online website.

- construction management

WGC Lateral Line Project
Wisconsin Gas Company

contract award Jul 1999
completion Jan 2004

Wisconsin Gas Company (WGC) installed a 35-mile natural gas pipeline lateral (30-, 24- and 16-inch) from the Guardian Pipeline Project. The pipeline is located approximately 30 miles to the west of Milwaukee in a densely populated area (Class 2 and 3). Gulf's scope of work consisted of four phases (1999-2003). Gulf established a field office in Wisconsin to perform route selection activities and preliminary engineering (FEED), plus coordinate activities of subcontractors. Gulf provided all detailed engineering design and procurement of equipment and material. Gulf provided all aspects of construction management including inspection, commissioning and start-up of the system. Specified soils data gathering program and performed detailed design for several crossings for a 30" pipeline for HDD crossings in glacial till soils ranging from solid bedrock and boulders and cobbles to soft clay and silt. Crossings included Capitol Drive 3,500 ft. crossing under area congested with utilities & street crossings, Oconomowac River 1,100 ft., Rock River 600 ft, Little Oconomowac River 2,000 ft., Bark River 1,400 ft. and Menomonee Avenue 1,400 ft.

- feasibility / economic study
- project management
- right-of-way services
- engineering
- design / drafting services
- procurement
- construction management

Hawiyah Gas Development
Saudi Aramco/Parsons

contract award Nov 1996
completion Jan 2001

This project included FEED and LSTK bid package development, including cost estimating, for various pipelines: 218-km, 56-inch dia.; 155-km, 48-inch dia.; 57-km, 30-inch dia.; and 20-km, 24-inch dia. natural gas distribution pipelines. Also included were four 20-km, 22-inch dia. and three 40-km, 26-inch. dia. natural gas transmission pipelines and 20 km of condensate pipelines. Additionally, an existing 150 km, 48-inch dia. crude oil pipeline was converted to gas service. These pipelines are located in the vicinities of Shedgum, Qatif, Hawiyah, Haradh and Riyadh. Additional facilities included scraper launchers and receivers for each pipeline; a pressure control and releasing station and gas cleaning and sales gas metering facilities supported with power and utilities. Our design included the evaluation of the use of fiber optic cable or an existing SCADA system for communications. All pipelines were cathodically protected and equipped with a leak detection system via pressure/temperature transmitters.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Venezuelan Extra Heavy Oil Project
Petrozuata

contract award May 1996
completion Jan 1998

This project included two parallel pipelines running between the Jose industrial complex on the north-central Caribbean coast and the Petrozuata heavy oil (bitumen) field in the Orinoco belt, approximately 200-km south of Jose. One pipeline carries diluent to the production field and the other pipeline carries a diluent-bitumen blend to Jose for refining and export. Each pipeline had an initial pump station using electric motor-driven centrifugal pumps ranging from 2,000 to 4,000 hp. Initial capacity of the blend pipeline was 160,000 BPD at 190°F. Initial capacity of the diluent pipeline was 40,000 BPD.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

Gas Transmission & Distribution System
Perusahaan Umum Gas Negara

contract award Mar 1995
completion Jun 2003

Gulf performed EPCM services for PGN in Indonesia. This project consisted of a 544-km, 28-inch diameter onshore natural gas pipeline from Gersik to Duri on the island of Sumatra and a 280 km, 28-inch diameter offshore pipeline between Sumatra and Bataam Island. A low pressure distribution system for Bataam Island was included as well as a SCADA and communications network for the entire pipeline system. This project was financed by the Asian Development Bank.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- construction management

Gulf also performed front end engineering and design (FEED), prepared EPC bid packages and was Project Management Consultant (PMC) for the EPC phase of the project.

Shaybah Pipeline and Terminal Facilities
Saudi Aramco/Parsons

contract award Jun 1995
completion Dec 1995

Gulf's scope of work included capital cost estimate, FEED and LSTK bid packages for a 638-km, 46-inch diameter crude oil pipeline from the Shaybah Central Producing Facilities in the Rub' Al Khali to Abqaiq Plants with scraper launching and receiving facilities; instrumentation for pipeline leak detection; an impressed current cathodic protection system; and, remote area accommodations for pipeline operations and maintenance personnel. The pipeline was designed to transport 660 MBOD of Arabian Extra Light crude oil to Abqaiq Plants for stabilization. The scope also included modifications to existing pipeline facilities downstream of Abqaiq Plants to provide for the operational flexibility to export the crude oil from either the Ras Tanura or Juaymah terminals.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Seaway Pipeline Conversion - Stage 1
Arco Pipeline Company

contract award Jun 1994
completion Apr 1996

An existing 500-mile, 30-inch diameter natural gas pipeline was converted to crude oil service. The pipeline system originates in Freeport, Texas and terminates at a refinery in Cushing, Oklahoma. The project included: internal inspection, decommissioning and rehabilitation of the existing pipeline; installation of 7-miles of new 42-inch diameter pipeline; dredging operations and meter installation at the existing dock facility in Freeport, Texas; piping modifications and pump installation at the existing storage terminal located adjacent to the dock facility and installation of three new mainline pump stations on the converted pipeline.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

Chad-Cameroon Pipeline System
Exxon Company International

contract award Mar 1993
completion Jun 1995

Gulf prepared the FEED and EPC bid package for a 1,077 km crude oil pipeline system from an oil field in the Doba Basin area of Chad through Cameroon to a new offshore export terminal. The FEED and EPC bid packages were prepared in accordance with World Bank guidelines for subsequent phases to be financed by the World Bank. The system selected at the conclusion of work in 1995 was a 30-inch diameter onshore pipeline with four 12,000 HP (nominal installed) pump stations (three with direct-fired crude oil heaters), one pressure reducing station, an 11-km, 30-inch offshore pipeline and a floating storage and offloading (FSO) vessel connected on a single point mooring buoy (SPM). The FSO was a converted tanker of 300,000 DWT. When completed, this system would be the largest heated crude oil pipeline in the world.

- feasibility / economic study
- project management
- engineering
- design / drafting services

CO2 Pipeline System

Dakota Gasification Company

contract award Jul 1997
completion Dec 1999

This enhanced oil recovery project included a compression facility and a pipeline for transporting CO2 from the Great Plains Synfuels Plant near Beulah, North Dakota, U.S.A. to the Goodwater facility at an existing oil field near Weyburn, Saskatchewan, Canada. The compression included the installation of two (2) 40,000 total HP GHH Borsig/GEC Alstom compressor stations. The pipeline is approximately 205 miles long consisting of 14-inch and 12.75-inch diameter pipe, with maximum operating pressures of 2700 and 2964 psig, respectively. The minimum/maximum pipeline design temperature for buried pipe is 0°/120° F. The CO2 is used for enhanced oil recovery in this 40-year old field. In addition to development of the FEED, generation of the capital cost estimate, detail engineering, procurement, project management and construction management of the project, Gulf was also responsible for the North Dakota Public Utility Commission and the Canadian National Energy Board regulatory filing support efforts.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

PGT-PG&E Pipeline Expansion

Pacific Gas Trans./Pacific Gas & Electric

contract award Jan 1991
completion Jan 1995

Gulf provided preliminary engineering (FEED) and detailed engineering and design for an expansion to the natural gas pipeline system running from the Canadian border through Washington, Oregon and into California. The expansion included the addition of 745 miles of new 42-inch diameter and 100 miles of 36-inch diameter pipeline designed to accommodate 755 MMSCFD of additional gas supply. This project included modifications to 12 existing turbine compressor stations which added 350,000 extra horsepower for the expanded pipeline system. These modifications included additional turbine compressor packages and/or piping modifications to handle the additional flow. Two metering facilities were modified for the increased flow rates. This project involved 25 major river crossings, 10 railroad crossings and 23 major highway crossings. Gulf planned and designed the HDD crossings of the Sacramento River (over 4,000 ft. of 42-inch) and the San Joaquin River (over 2,500 ft. of 36-inch) in California. More than 4,000 engineering, design and procurement drawings were generated for this system expansion project.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Gulf prepared the design for pipeline fault crossings.

Alyeska Pipeline System

U.S. Department of the Interior

contract award Jun 1974
completion Aug 1977

The Alyeska Pipeline System is a 798-mile, 48-inch diameter above ground and buried crude oil pipeline running from the North Slope to Valdez, Alaska. The pipeline system included eight pump stations rated at 25,000 HP each. Gulf provided expert assistance to the U.S. Dept. of the Interior during the four year engineering and construction period. Gulf reviewed and provided recommendations on all engineering and design aspects of the pipeline portion of the project and reviewed, from a technical perspective, all construction permit applications. Gulf's resident field engineering audit staff on-site in Alaska monitored and reported on all construction activities for the pipeline. Gulf's resident staff averaged some thirty personnel from the beginning of haul road construction in 1974 through start-up and commissioning of the system in 1977.

- project management
- engineering
- design / drafting services

Gulf reviewed the pipeline design for seismic activity, including fault crossings, seismic shaking and slope stability. Review was performed for U.S. Department of Transportation in 1976 and 1977.

**Apex Expansion-Compression Detailed Engineering
Kern River Gas Transmission (KRG T)**

contract award Aug 2009
completion Jan 2011

Gulf is providing detailed engineering, design and construction support services on the compression facilities associated with the Apex Expansion Project. The project entails adding 75,000 incremental horsepower of compression at one (1) new and three (3) existing compressor stations, as well as replacing a compressor unit at another existing station. The five (5) new and existing compressor stations are described below.

- project management
- engineering
- design / drafting services
- procurement

Millford Compressor Station: Installation of one (1) Solar Titan 250 gas turbine-driven centrifugal compressor unit and associated piping, buildings and ancillary equipment at the grassroots facility in Utah.

Coyote Creek, Elberta and Dry Lake Compressor Stations: Addition of one (1) Solar Mars 100 gas turbine-driven centrifugal compressor unit and associated piping, buildings and ancillary equipment at the existing facilities in Wyoming, Utah and Nevada, respectively.

Fillmore Compressor Station: Replacement of existing Solar gas compressor and associated piping at the facility in Utah.

**Ruby Pipeline Compressor Stations
Ruby Pipeline, LLC**

contract award Mar 2009
completion Apr 2011

Gulf is providing project management, construction management, engineering, design/drafting, and procurement services for the Ruby Pipeline Compressor Stations Project. The Project includes the addition of four (4) compressor stations as part of Ruby Pipeline LLC's new 680-mile, 42-inch natural gas transmission pipeline system which commences at the Opal Hub in Wyoming and terminates at the Malin, Oregon interconnect near California's northern border. The grassroots facilities are described below.
(CS 1) Roberson Creek Compressor Station: Installation of three (3) Siemens 23,000 HP electrical motor-driven Solar centrifugal compressor units and electrical substation, mid-voltage switchgear, VFD buildings, associated piping, buildings and ancillary equipment. (CS 2) Wildcat Hills Compressor Station: Installation of two (2) Solar Mars 100 gas turbine-driven centrifugal compressor units and associated piping, buildings and ancillary equipment. (CS 3) Wieland Flat Compressor Station: Installation of two (2) Solar Titan 130 gas turbine-driven centrifugal compressor units and associated piping, buildings and ancillary equipment. (CS 4) Desert Valley Compressor Station: Installation of one (1) Solar Titan 130 gas turbine-driven centrifugal compressor unit and associated piping, buildings and ancillary equipment.

- project management
- engineering
- design / drafting services
- procurement
- construction management

Delevan K1 & K2 Replacement Project
Pacific Gas and Electric Company

contract award Jun 2008
completion Jul 2011

Gulf, in association with ARB, is providing engineering, procurement and construction services on the Delevan Compressor Station Units K1 & K2 Replacement Project. Specifically, Gulf's scope of services includes project management, project planning, design and engineering, procurement, construction, construction management, commissioning and QA/QC.

- project management
- engineering
- design / drafting services
- procurement
- construction management
- commissioning / start-up

The project scope of work includes the demolition of certain existing equipment and facilities and the installation of two (2) new 13,000 HP variable frequency electric motor-driven gas compressor units to replace the existing K1 and K2 units. Gulf will also perform various station upgrades to improve the Solar C650 operability of the Delevan Compressor Station. The modified Delevan Compressor Station will be capable of flowing 2.2 billion standard cubic feet per day of natural gas. All foundations and buildings included in the Unit K1 and K2 Replacement Project were designed for Seismic Criteria as required by Soil Report, and in accordance with ASCE 7-05 for Site Class D, Seismic Use Group II and Importance Factor 1.25. The design also included Seismic Design for Nonstructural Components per Chapter 13 of ASCE 7-05.

CenterPoint Stations - Cove, Beirne, Poteau
CenterPoint Energy Gas Transmission Company

contract award Jul 2007
completion Dec 2008

Gulf provided scope development, project management, detailed engineering, design/drafting and procurement services and construction support for three (3) grassroots compressor station projects in Oklahoma and Arkansas.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

The Cove Project included the installation of one (1) 10,300 HP Solar Taurus compressor turbine driven centrifugal compressor package and associate ancillary equipment.

The Beirne Project was to replace compression at an existing compressor station with one (1) 6,100 HP Solar Centaur 50 compressor turbine driven centrifugal compressor package and associate ancillary equipment.

The Poteau project included the installation of one (1) 15,000 HP Solar Mars 90 turbine driven centrifugal compressor package and ancillary equipment, and engineering support for the FERC application.

Los Algodones Compressor Station
Gasoducto BajaNorte

contract award Nov 2006
completion Apr 2008

Gulf, together with ARB, provided EPC services for the installation of the Los Algodones Compressor Station. Specifically, Gulf's scope of work on the project included project management, project planning, engineering, design/drafting, procurement, construction support, commissioning and start-up and QA/QC services. ARB and ARB Arendal provided construction management and construction services. This major cross-border compressor station project is located in Baja California, Mexico, near the border town of Los Algodones.

- project management
- engineering
- design / drafting services
- procurement
- construction management
- operations / maintenance
- commissioning / start-up

The grassroots facility included the installation of two (2) Solar Mars 100 gas turbine compressor units and gas discharge coolers, control systems, unit auxiliaries, buildings, station piping and a water system. The compressor piping allows the units to operate in parallel and series configurations. The station yard piping is capable of bi-directional gas flow. Since the facility was constructed adjacent to farmland, special consideration was given to the local environment; the final design and construction ensured containment within the facility for all process water and storm water runoff.

Vector Compression Expansion Project
Enbridge (U.S.) Inc.

contract award Jan 2006
completion Nov 2007

Gulf provided project management, detailed engineering, design and procurement services for the installation of two (2) grassroots compressor stations, as described below.

Joliet Compressor Station: Installation of one (1) Solar Mars gas turbine-driven centrifugal compressor unit and associated piping, buildings and ancillary equipment in Joliet, Illinois.

Romeo Compressor Station: Installation of two (2) Solar Mars gas turbine-driven centrifugal compressor units and associated piping, buildings and ancillary equipment in Washington Township, Michigan.

Gulf also provided FEED services including permitting assistance, basic engineering, additional engineering surveys, cost estimate, and schedule estimate for the above two (2) stations and a third station (Athens) with the third station also requiring a 15,000 HP Solar gas turbine/ compressor unit.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Spearhead Project
Enbridge (U.S.) Inc.

contract award Jan 2005
completion Dec 2005

Gulf provided project management, engineering, design, procurement and construction management services for refurbishment of seven existing pump stations, installation of one new pump station, and installation of the Hartsdale Lateral to achieve reverse flow for the Spearhead Pipeline. The pipeline consisted of 655 miles of 22-inch to 24-inch refurbishment pipeline from Hartsdale, IN to Cushing, OK. The pump stations are as follows: Hartsdale (new) and seven existing: Flanagan, Forest, Quincy, Key, Gunn, Caney and Cushing.

- project management
- engineering
- design / drafting services
- procurement
- construction management

Mayakan Project
Energia Mayakan

contract award Jul 2004
completion Dec 2005

Gulf, in association with ARB, provided engineering, procurement, and construction (EPC) services on the project for the installation of one compressor station (CS#2) with two (2) Solar Centaur gas turbine compressor packages, associated facilities and delivery station. Gulf's scope of work included project management, engineering, design, procurement, inspection and commissioning services, while ARB was responsible for constructing the facilities. Flow rate for the project is 200 MMSCFD.

- project management
- engineering
- design / drafting services
- procurement
- construction management
- operations / maintenance
- commissioning / start-up

Express Expansion Casper Terminal
Terasen Pipelines

contract award Mar 2004
completion May 2005

Gulf provided the engineering and procurement services for the installation of two new 150,000 BBL oil storage tanks and support facilities at the Casper Terminal located in Casper, Wyoming. The scope of the project included the addition of two (2) tanks, manifold tie-ins and new manifold skid. Gulf's role on the project was to provide the detail engineering, design, and procurement services for the expansion of the facilities at the Casper Terminal.

- project management
- engineering
- design / drafting services
- procurement

**Kern River 2003 Expansion - Stations
Ranger Plant Constructional Co.**

contract award Feb 2002
completion May 2004

Gulf, working with Ranger Plant Constructional, provided detail engineering, design, procurement and construction services (EPC) for new compressor packages at four (4) compressor stations in Utah and Nevada for KRGT, and completed the build out of the existing station installed the previous year under the California Emergency Action Project. The project included one (1) turbine/compressor addition at Fillmore, UT; two (2) turbine/compressor additions at Veyo, UT; one (1) turbine/compressor at a new site at Dry Lake, NV; and two (2) turbine/compressor additions at Goodsprings, NV. The turbine packages were Solar Mars 100 units rated at 15,000 HP driving three different model compressors. Two of the four stations required the addition of an Auxiliary/Control Building in addition to the compressor building. The pipeline system was designed for an approximate flow rate of 1,850 MMSCFD. Gulf's scope of work included project management, engineering, design/drafting, procurement, construction management and commissioning services.

- project management
- engineering
- design / drafting services
- procurement
- construction management
- commissioning / start-up

**Clean Air Program
Transcontinental Gas Pipeline Corp.**

contract award Jan 2000
completion Jun 2007

Under an Alliance Agreement with Williams Gas Pipeline, Gulf performed engineering, design and procurement activities for the Clean Air Program (CAP). The CAP Project scope consisted of providing the infrastructure engineering and design to support the installation of high-pressure fuel injection (HPFI) on selected reciprocating engines in order to reduce exhaust emissions. Activities included the engineering and design of new high-pressure fuel gas systems at the stations, which typically consist of HP fuel gas yard piping from existing pipeline taps to the compressor building including a new HP fuel gas header. Initial work began in Georgia, Alabama and Louisiana and additional work continued for stations in Texas, South Carolina, North Carolina and Virginia. Over 60 units have been modified.

- engineering
- design / drafting services
- procurement

**FGT Phase IV - Compressor Stations
Florida Gas Transmission Company**

contract award Oct 1999
completion Jun 2001

Installation of one (1) grassroots compressor station equipped with gas turbine driven 10,350 HP centrifugal compressor, piping, buildings, automation and control systems. Expansion of two (2) existing compressor stations with addition of one (1) each 10,350 HP gas turbine driven compressor package and one (1) 7,150 HP gas turbine driven compressor package. Project scope also included piping modifications and re-wheeling of three (3) existing compressor units.

- project management
- engineering
- design / drafting services
- procurement
- construction management

The Chicago Project
Northern Border Pipeline Company

contract award Feb 1996
completion Apr 1999

This project expanded and extended Northern Border's existing 42-inch diameter natural gas pipeline system, beginning at the Canadian border in Montana to Harper, Iowa. The Pipeline system was extended to a point near Chicago in Manhattan, Illinois. Gulf began this project with the capital cost estimate, FERC filing support, and front end engineering and design (FEED). The compressor station modifications associated with this project included the addition of 6 new 35,000 HP gas turbine stations; 1 new 12,000 HP and 1 new 6,000 HP electric motor-driven stations; and retrofitting 5 existing gas turbine stations by removing the existing 20,000 HP gas turbine compressor packages and installing new 35,000 HP gas turbine compressor packages. Other station facility work included unit and station control system upgrades, re-aero and dry seal conversions, and the relocation of gas scrubber units. More than 3,300 design and procurement drawings were generated for this project. Gulf followed this project to the field and provided complete construction management and inspection services.

- feasibility / economic study
- engineering
- design / drafting services
- procurement
- construction management
- operations / maintenance

PGT-PG&E Pipeline Expansion
Pacific Gas Trans./Pacific Gas & Electric

contract award Jan 1991
completion Jan 1995

Gulf provided preliminary engineering (FEED) and detailed engineering and design for an expansion to the natural gas pipeline system running from the Canadian border through Washington, Oregon and into California. The expansion included the addition of 745 miles of new 42-inch diameter and 100 miles of 36-inch diameter pipeline designed to accommodate 755 MMSCFD of additional gas supply. This project included modifications to 12 existing turbine compressor stations which added 350,000 extra horsepower for the expanded pipeline system. These modifications included additional turbine compressor packages and/or piping modifications to handle the additional flow. Two metering facilities were modified for the increased flow rates. This project involved 25 major river crossings, 10 railroad crossings and 23 major highway crossings. Gulf planned and designed the HDD crossings of the Sacramento River (over 4,000 ft. of 42-inch) and the San Joaquin River (over 2,500 ft. of 36-inch) in California. More than 4,000 engineering, design and procurement drawings were generated for this system expansion project.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Gulf prepared the design for pipeline fault crossings.

Young Gas Storage
Colorado Interstate Gas

contract award Apr 1993
completion Dec 1994

Scope of work included the installation of gas compression and processing facilities including three 2,000 HP reciprocating compressor packages, a gas processing plant (including glycol dehydration), and measurement and automatic control systems for a natural gas storage facility in Colorado.

- engineering
- design / drafting services
- procurement

Sharjah-Dusup Gas Compression Upgrade
CCC/Amoco - Sharjah Oil Company

contract award Jan 1992
completion Jan 1994

Installation of an additional gas compressor and modification of two existing compressors, station piping and compressor accessories at an existing gas compressor station located in Sharjah, U.A.E.

- engineering
- design / drafting services
- procurement

Jilin Gas Plant
Jilin Oil Field Company

contract award Jan 1991
completion Jul 1992

A 18.7 MMSCFD modular gas compression and processing plant with 70% of the recovered product being propane. Included were two 1,000 HP electric motor-driven compressor packages and accessory equipment for installation in the Jilin oil field in China.

- project management
- engineering
- design / drafting services
- procurement
- construction management

1.8 MMBPD Phase 1 Development Project
WGI Middle East Inc./ADCO

contract award Jun 2007
completion Nov 2008

Gulf, in partnership with Washington Group International (WGI), was selected by Abu Dhabi Company for Onshore Oil Operations (ADCO) to provide conceptual engineering and front-end engineering and design (FEED) services on their 1.8 MMBOPD Phase-1 Development Project. Specifically, Gulf's scope of work was to perform the engineering and design services for the pipelines and associated facilities. The project included over 4,000 kilometers of crude oil, natural gas and water pipelines from 12-inch to 32-inch diameter pipelines. WGI was responsible for the engineering and design of the process facilities, including the necessary utility systems and infrastructure. The Qusahwira and Bab fields were developed first and additional fields may be added to the project at a later date.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Yemen LNG Upstream Project
Yemen Hunt LNG Company LLC

contract award Mar 2006
completion Apr 2008

Gulf provided Owner's Engineer (PMC) services to adapt and expand Yemen LNG's upstream gas processing and gas injection facilities in the Marib Block to support the Yemen LNG Export Project. This project included the modification of three existing gas plants, each rated at approximately 500 MMSCFD, including associated infrastructure and utilities (including glycol dehydration processes), and the addition of a new cryogenic plant designed to process an additional 420 MMSCFD of associated gas. Gulf prepared gas plant, power generation and gas injection compression bid packages, performed detailed engineering, HAZOPS, HAZIDS, reviewed, verified, coordinated and integrated vendor package designs into the overall facilities, designed fire and gas detection and fire protection systems, developed and maintained overall schedule and budget, and provided procurement, expediting and inspection services.

- project management
- engineering
- design / drafting services
- procurement

Nabrajah Field Development
DNO Yemen AS

contract award Aug 2005
completion Nov 2005

This oil field development project is located in the Sayun-Masila basin, in the Republic of Yemen. Gulf's scope of work included FEED services to determine the technical basis for gathering, processing and export facilities, determine equipment needs, optimize the process facilities, prepare cost estimates, perform an HSES review and HAZOPS, prepare long lead item requisitions and deliver final documents at an Approved for Design (AFD) status.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Alcaravan Field Development
Harken de Colombia

contract award Sep 1997
completion Feb 2000

This oil field development project was located in the Llanos Basin of Colombia. The field development included crude oil gathering systems, production facilities and pipelines to export up to 50,000 BPD of heavy crude oil. Gulf completed conceptual design, pipeline route selection and preparation of a detailed cost estimate. Engineering and procurement activities for the first stage of field development were performed for a pump station at tie-in to an existing pipeline.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

Aguada Pichana Gas Field Development
ABB Randall Corporation

contract award Jun 1994
completion Apr 1996

A gas field development in Argentina's Nuequen Basin which included a gathering system for 51 wells and four production clusters with natural gas and NGL product delivery facilities. The field development included 144 km of gathering pipelines, 120 km of gas and condensate export pipelines, metering stations, a power transmission network and a communications system.

- project management
- engineering
- design / drafting services
- construction management

Yemen-Masila Export Project
Nexen (formerly Canadian Occidental Petroleum Ltd.)

contract award Feb 1992
completion Aug 1994

This grassroots oil field development in the Hadramaut region of the Republic of Yemen, included: 31 well gathering system; 120,000 BPD central production facility, 36 MW central power plant with power transmission and distribution system; 5,100 HP pump station; 140-km 24-inch diameter crude oil export pipeline; marine export terminal with 2,500,000 bbls onshore storage; 5-km 36-inch diameter offshore loading line and single point mooring buoy for 300,000 DWT tanker capacity; export pump station for 60,000 BPH tanker loading rate; complete microwave telecommunications system and SCADA system serving all facilities; permanent operations and maintenance facilities including housing and services for up to 350 personnel. One of the unique characteristics of the project is the fact that the Masila system moves crude oil across widely varied terrain, including remote desert wells, mountains and rocky escarpments reaching a mile above sea level, and flash flood plains. As a part of the engineering scope, Gulf performed thorough hydraulic analyses utilizing Stoner software, and other engineering studies and calculations to alleviate these challenges.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

Payamino Field Development
Oryx Ecuador Energy Company & BP Development Ltd.

contract award Jan 1990
completion Nov 1992

Gulf provided EPCM services for an oil field development project located in the Amazon region of Ecuador. The scope of work included a 10,000 BPD production unit with manifold; two separators and one test separator; one 10,000 bbl wash tank, one 10,000 bbl surge tank and two 11,000 bbl storage tanks; circulating pumps, storage pumps and booster pumps; a power oil system, utilities, and a 32-km 8-inch diameter crude oil export pipeline with 30,000 BPD capacity. In 1990, BP Development transferred its concession rights to Oryx Ecuador Energy Company which awarded Gulf an EPCM contract for the installation of the facilities.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

Badin Gas Development
Union Texas Pakistan, Inc.

contract award Jan 1987
completion Jan 1989

A 135 MMCFPD gas production facility was installed in the Badin gas field of Pakistan that produced 1,700 BPD condensate from five separate fields. The installation included flow lines, inlet manifolds, production and test separators, glycol dehydrators, condensate stabilizer, fuel gas scrubbers, compressors, condensate storage, loading facilities, evaporation ponds, firewater system, power generators, utility systems, emergency shutdown systems, flares, industrial buildings and sewer system.

- project management
- engineering
- design / drafting services
- procurement
- construction management

**Cano Limon Production Facilities No. 1 and 2
Occidental de Colombia, Inc.**

contract award Jan 1985
completion Dec 1987

Field development and installation of a gathering system and production facilities to process 200,000 BPD of crude oil consisting of heaters, treaters, storage tankage, pumps, power generation and associated infrastructure.

- engineering
- procurement
- construction management

**Yemen Export Facilities Project
Hunt Oil Company**

contract award Jul 1985
completion Jul 1988

This grassroots oil field development in the Marib region of the Republic of Yemen included: 50+ well gathering system, 200,000 BPD central production facility designed for expansion to 400,000 BPD with the storage capacity at production facility; pentanes plus recovery plant, gas reinjection facilities, 40 MW central power plant with power transmission and distribution system; 420 km, 24-inch and 26-inch diameter crude oil export pipeline with three pump stations (one 12,000 HP and two 8,000 HP); two pressure reducing stations, 8 km, 24-inch diameter offshore loading line, turret-type single point mooring buoy and captive floating storage offshore tanker with 3,000,000 bbls capacity. The pipeline system is a 261-mile 26- and 24-in. pipeline installed over the mountains with up to 80-degree slopes to the coastal export marine facilities. At its highest point, the pipeline is 8,500 feet above sea level.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement
- construction management

**Waterflood Secondary Recovery
Occidental Petroleum Corporation**

contract award Jun 1978
completion Jan 1987

Field development and installation of a 68-mile, 10-inch secondary recovery and crude oil gathering system to collect 74,000 BPD from 1,500 oil wells. The system included 23 production batteries, treating/desalting facilities, gas lift compressors, metering systems, pump stations, power generation and oil field electrification.

- project management
- engineering
- design / drafting services
- procurement
- construction management

**Amazon Production - Block 1A and 1B Development
Occidental Peruano, Inc.**

contract award Jun 1975
completion Jan 1984

Full field development of Block 1A & 1B in the Peruvian Amazon jungle including a gathering system, treating/desalting plant, production processing unit, flowlines, metering, well manifolds, gas/oil/water separators, heater treaters, wash tanks, storage tanks, electric power generation equipment, pumps, gas lift, compression equipment and infrastructure facilities including camps, air strip, and water treatment.

- feasibility / economic study
- project management
- engineering
- design / drafting services
- procurement

**Kamennoi Field Development
TNK-BP**

contract award Nov 2007
completion Jul 2008

Gulf provided engineering services for the Concept Select Stage of the Kamennoi Field Development Project. The project consisted of seven oil and gas fields in Russia. Phase One of the project anticipated the recovery of 30 million tons of oil, with an estimated 330 wells being drilled with infrastructure and facilities to include up to 14 pads, an export pipeline, and an additional oil processing facility. Pending the successful completion of Phase One, Phase Two will consist of the long term development of the most reliable reserves.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Gulf assisted TNK-BP in the early planning stages of the major oil and gas production field. Specifically, Gulf's scope of work on the project included comparing development alternatives to determine the optimum configuration and recommended sequence of field development, providing and contributing to the development of deliverables, providing technical, commercial and a planning basis for subsequent stages, and developing the technical specifications and quality requirements for the long-lead items.

**Texas Access Project
ExxonMobil / Enbridge (U.S.) Inc.**

contract award Sep 2007
completion Apr 2008

Gulf was contracted by Enbridge to provide a Class V and a Class III cost/ schedule estimate. Phase 1 - Gulf prepared an Enbridge Class V cost estimate and schedule for a 740-mile, 30-inch pipeline from Patoka, Illinois to Beaumont/Nederland, TX. The pipeline is to transport 400,000 barrels per day of heavy crude oil. Also included was a 90-mile, 24-inch lateral pipeline from Nederland to Baytown. Phase 2 - Gulf prepared a Class III cost estimate and schedule. Gulf worked in close collaboration with Enbridge's engineering group, environment and land personnel (internal and external consultants) in the development and completion of this Class III estimate. Scope of services included: conduct station site visits to evaluate condition of existing stations and potential location of new stations, as required for detailed engineering, design, procurement and construction activities; conduct field reconnaissance of the existing pipeline corridor route, and proposed pipeline reroutes/deviations based on current on-ground conditions, future development plans and Enbridge provided data/ preferences; prepare Front End Engineering and Design (FEED) package of the proposed new pump stations and related facilities; and prepare pipeline alignment sheets and other drawings (mainline valves, launchers/receivers, typicals, etc) suitable for Class III estimating. The pipeline will cross four states (Illinois, Missouri, Arkansas and Texas), over forty county lines, several state parks and a large numbers of roads, wetlands and river crossings.

- feasibility / economic study
- project management
- right-of-way services
- engineering
- design / drafting services
- procurement

**Tuapse LPG Export Terminal
Litwin Management Services, LLC**

contract award Oct 2005
completion Mar 2007

Gulf performed basic engineering services for the Tuapse Export Terminal Project, including the preparation of drawings, studies, key piping plans, Western design standards, environmental assessment and technical documentation to meet the approval requirements of local and statutory bodies. Gulf prepared a conceptual 3D model of the proposed LPG and diesel terminal facilities that will be suitable for marketing the project.

- project management
- engineering
- design / drafting services

This project consisted of preliminary design of a new LPG and diesel storage terminal with cryogenic units and a pipeline to tanker loading docks, located in Tuapse, Russia. The facilities consisted of LPG and diesel railcar unloading facilities, pressurized and refrigerated storage, diesel storage, metering systems, export pipeline, ship loading systems for LPG and diesel, fire protection systems, power generation systems, and infrastructure facilities.

Oil Pipeline in East Siberia
OJSC Surgutneftegas

contract award Mar 2005
completion Sep 2005

Gulf managed the development of the preliminary economic feasibility study (TEO) for a grassroots crude oil pipeline system in eastern Siberia. The proposed route of the 500-km long pipeline system traversed areas of permafrost and discontinuous permafrost requiring special ditching and construction methodologies to preserve the integrity of the arctic environment while ensuring a sound pipeline installation. The pipeline system configuration consisted of an initial pump station including operational tankage, booster pump stations, delivery terminal with 3-days storage, and railcar loading facility. The system was designed to be constructed in stages to accommodate a multiphase increase in flow volume. Deliverables included a series of studies addressing route selection, integrated GIS for route selection and satellite imagery acquisition for route study and feasibility, alternate fuel / power sources, options for mainline pump drivers, steady-state hydraulic analysis, SCADA and telecommunications systems options, leak detection methodology, transportation / logistics and O&M organization plan. Other deliverables included PFDs, P&IDs, plot plans, route maps, and risk assessed CAPEX and OPEX estimates and project schedule.

- feasibility / economic study
- engineering
- design / drafting services
- integrity

Burgos-Monterrey LPG Pipeline Project
El Paso

contract award May 2004
completion Aug 2004

Gulf developed a Front End Engineering Design (FEED) and EPC bid package for the Burgos-Monterrey LPG Pipeline Project suitable for bidding purposes to potential EPC contractors and suppliers, a detailed cost estimate and schedule for the project and in conjunction with the client, or one of its subsidiaries, development of an implementation strategy that optimized cost and timing consideration for the project. The project consisted of an NPS1 12-inch pipeline capable of transporting LPG using API-5L line pipe, which was approximately 175-km long with a MAOP of 1200 psi.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Southwest Product Oil Pipeline Project
China Petro Chemical International Co. Ltd.

contract award Jun 2001
completion Sep 2003

The Southwest Product Oil Pipeline Project consisted of a 1,557-km trunkline including several lateral lines. The pipeline system included 18 pumping stations. The system was designed to transport #90, #95 gasoline, #0 diesel and jet fuel. Gulf provided the basic design and other technical documentation, including construction specifications, start-up and commissioning procedures, O&M manuals, etc. Gulf also provided technical assistance and technical training to SINOPEC.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Gulf developed the design criteria and design procedures necessary for the pipeline to accommodate the effects of seismic activity, including seismic shaking, pipeline stability in liquefiable soil, landslide and fault crossings.

**Baltic Pipeline System Investment Feas. Study
Joint Stock Company Transneft**

contract award Mar 1998
completion Mar 1999

The Investment Feasibility Study of the Baltic Pipeline System funded by the World Bank was executed in compliance with the most stringent Russian & Western standards and the requirements of the international financial and technical institutions supporting the project. The existing 2,100-km crude oil pipeline system will be expanded to deliver an ultimate future capacity of 30 MTA (650,000 BPD). Approximately 775-km of new pipelines were added to the system to deliver the product to Primorsk, Russia and, if economically justified, to Porvoo, Finland. Existing pump stations were expanded and four new pump stations were installed. Two marine terminals with crude oil storage were constructed to provide facilities to load tankers for exporting the crude oil to world markets. The scope of work also included an on-site audit of the existing facilities, analysis of the historical operation and maintenance records, and preparation of the report on the present condition of the system. A separate analysis of batching operations for new and existing sections of the pipeline (2800-km), including cost estimates, was also provided.

- feasibility / economic study
- project management
- engineering

**Lanzhou to Chengdu Products Pipeline
China Petroleum Pipeline Engineering & Construction**

contract award Dec 1998
completion May 1999

The 960-km pipeline was the first major products pipeline system developed in China. The pipeline begins at the Beitai tank farm near the Lanzhou Refinery and ends at a receiving station at Chengdu. The pipeline system was designed to transport refined products in batches with a flow rate of 5 million tons per year. A pump station was proposed at Linyao and distribution stations along the pipeline are located at Longxi, Tianshui, Chengxian, Guangyuan, Jiangyou, Mianyang and Deyang. A SCADA system was used for supervising and controlling the entire pipeline system. Satellite communication systems was used for pipeline operations and networking both data and voice communications.

- feasibility / economic study
- project management
- engineering
- design / drafting services

**Yuzhnyi-Brody-Plock Pipeline & Terminal
State Committee of Oil and Gas / USTDA**

contract award Sep 1998
completion Oct 1999

Gulf provided a feasibility study, technical analysis of engineering plans and cost estimates for construction and operation of a proposed new Black Sea oil terminal, 670-km pipeline from Yuzhnyi to Brody in Ukraine and 430-km extension to Plock in Poland. Expansion of the existing Druzhba oil pipeline system to service markets in Poland, Austria and Germany was also evaluated. This feasibility study was co-funded by the U.S. Trade & Development Agency. The general objective of the study was to: 1) assess the financial, environmental and technical feasibility of the construction and operation of the port and pipeline system; 2) provide potential shippers and crude oil marketers with provisional tariff structures which would apply to various destinations and capacity utilization factors and 3) provide potential investors with project reference documents which acquainted them with the anticipated technical features, economic parameters, financial characterizations, legal structures, operating structure and environmental features of the proposed port and pipeline project.

- feasibility / economic study

Sakhalin Oil Transport & Export Study
Exxon Ventures (CIS) Inc.

contract award Jan 1997
completion Jun 1997

The Arktun-Dagi oil field lies approximately 60-km off the northeast coast of Sakhalin Island, Russia, in 60 meters of water; a location which experiences some of the worst ice and storm conditions in the world. This feasibility study analyzed seven alternative pipeline routes up to 500 km in length and various arrangements of terminal locations capable of transporting 125,000 to 235,000 BPD of crude oil to a loading facility. Gulf suggested several options with the potential to reduce estimated costs, among these: the use of diesel engine drivers vs. turbines as the technology more appropriate for the location; using crude-fueled engines to avoid the cost of power lines or fuel gas pipelines to remote pump stations and terminals; and, using a simple equipment layout to facilitate maintenance along with waste heat recovery to heat the pump stations and terminals. The scope of work also included on-site evaluation of the existing 20-inch pipeline, including risk assessment and recommendations for replacement and upgrading.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Offshore Gas Pipeline
El Paso Energy Company

contract award Sep 1996
completion Jan 1998

This project included a 240-km, 36-inch diameter gas pipeline running from an LNG receiving terminal on the southwest coast of Taiwan to a storage field and a power plant in the northwest region of the island. The maximum water depth was 107 meters. Gulf prepared a variety of engineering studies for the feasibility study and carried out the detailed design of the pipeline, the engineering work, buckling propagation analysis, soil liquefaction evaluation, active fault crossings and sand waves crossings, directional drilling for shore approaches, pipe lay stress analysis and cathodic protection design.

- feasibility / economic study
- engineering

Oil Field Rehabilitation and Expansion
Varyeganneft

contract award Jan 1996
completion Jun 1996

Gulf performed an evaluation of existing oil field production facilities in the Tyumen region including a gathering system, central production facility, gas reinjection system and pipeline. Gulf performed field inspections, developed preliminary engineering and a cost estimate to support loan applications to implement rehabilitation of the field. Gulf also developed a conceptual design and cost estimate for installation of a gas-fired power plant as a solution for reducing flaring of produced gas.

- feasibility / economic study
- engineering

Priobskoye and Salym Oil & Gas Fields
Amoco Eurasia Petroleum Company, et al

contract award Jun 1995
completion Dec 1995

Route selections for a 160-km crude oil pipeline with pump stations, storage facilities and custody transfer metering facilities, and for a 160-km gas pipeline with compressor station facilities were performed in the Tyumen region of Russia. Gulf, in concert with a Russian engineering firm, performed a joint Russian and North American practices engineering evaluation of alternative routes, developed design basis definition and prepared capital cost estimates for selected alternative routes.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Caspian Crude Oil Pipeline System
Oil Capital Ltd., Inc.

contract award Jun 1994
completion Nov 1996

Oil Capital Ltd., Inc. (OCL) and other operators in the Caspian Sea area proposed to construct a 2,000-km pipeline and related facilities to gather and move regional crude oil production from the Baku area to the ports of Ceyhan in Turkey and/or Supsa in Georgia on the Black Sea Coast. Gulf performed a study of alternative routes, prepared preliminary engineering and developed comprehensive estimates for capital and operating costs and economic analyses. Activities included inspection visits to the site and FSU line pipe and equipment manufacturers, presentations and participation in executive meetings of OCL and partners, and a presentation to the International Finance Corporation in Washington, D.C.

- feasibility / economic study

Monterrey-Gomez Palacio Products Pipeline
Pemex Refinacion

contract award Jul 1994
completion Dec 1994

Gulf provided evaluation and recommendations for the complete rehabilitation and modernization of approximately 640-km of existing 10-inch and 14-inch diameter product pipelines and two associated pump stations. All facilities are located in northern Mexico. The 10-inch pipeline was originally installed in 1960 and the 14-inch line in 1979. The products transported through the system included various grades of gasoline and diesel fuel.

- feasibility / economic study
- project management
- engineering

Technical Audit of National Pipeline System
PetroPeru

contract award Feb 1994
completion Apr 1994

Gulf provided a report on the condition of an existing 1,100 km (306 km of 24-inch; 554 km of 36-inch; 252 km of 16-inch) pipeline system. This technical audit included the evaluation of both the pipeline system and the operation of ten pump stations. Leak histories and cathodic protection logs were reviewed. Safety procedures and operation and maintenance practices were also studied to determine system conditions. Environmental impacts identified during the above review were also reported. The report identified the steps to bring the system into conformance with international standards and was an important final product of this project.

- feasibility / economic study
- project management
- engineering
- design / drafting services

Gas Pipeline Feasibility Study
Shell International

contract award Mar 1993
completion Feb 1994

This feasibility study evaluated a 550-km gas pipeline with a 100 MM BTU/hour intermediate heating station to maintain the integrity of the buried pipeline traversing permafrost, discontinuous permafrost and non-permafrost soils in northern Russia. Gulf performed pipeline optimization and configuration studies and developed a capital cost estimate. The feasibility study included a set of hydraulic analyses with operating temperature ranges to protect the varying soil thermal conditions along with construction cost estimates based on arctic installation.

- feasibility / economic study
- engineering

**Yamal-Center Pipeline
Gazprom**

contract award Dec 1992
completion Jan 1994

This project funded by the USTDA included a 415-km, 56-inch diameter natural gas pipeline with three compressor stations and one gas chilling station located in the Yamal Peninsula region of Russia. The gas chilling was required to lower the gas temperature below freezing to prevent thaw of the frozen soil around the pipeline. This section is the northernmost segment of a proposed 2,400-km gas export pipeline system. Gulf's feasibility study included development of detailed specifications for a compressor station's major materials and equipment and the preliminary design of buildings, foundations and structures for installation in frozen soils.

- feasibility / economic study
- engineering

**Alaska Natural Gas Transportation System
Northwest Alaskan Gas Pipeline Company**

contract award Jul 1976
completion Dec 1981

Design of a 746-mile, 48-inch diameter pipeline from Prudhoe Bay to the Alaska-Yukon territory border. The pipeline connects to the Canadian portion of the system which combined with development of new large diameter pipelines in the continental United States will transport approximately 2.5 BCFD of natural gas for delivery to the West Coast and Midwest part of the United States. The Alaskan portion of the system was designed to operate at 1,260 psig with initial compression provided by approximately 13 (25,000 HP) compressor stations. The project was indefinitely deferred in 1981. Gulf developed preliminary design, cost estimate and all documentation required for filing with the Office of the Federal Inspector. Executed numerous studies and field investigations required to analyze and develop preventative measures for construction and operation of the pipeline in permafrost and seasonably frozen soils. Developed first draft of alignment sheets.

- feasibility / economic study
- engineering
- design / drafting services

Gulf developed the design criteria and design procedures necessary for a Trans-Alaska gas pipeline to accommodate the effects of seismic activity, including seismic shaking, pipeline stability in liquefiable soil, landslide and fault crossings.



Section 4 - Project Management Systems

Gulf has taken an innovative step of assimilating its many tools and modules into one integrated project management system – Gulf Project Management System (GPMS). This system allows data transfer and exchange between Gulf's financial, accounting, engineering, planning and scheduling, cost analysis, materials management, construction progress tracking, and project reporting applications. In addition, the GPMS also communicates with the many design tools that we use, e.g., the material takeoff tool is integrated with the materials management application. This holistic management approach results in improved work organization for us and reduced hours per deliverable for you.

GPMS couples GULF STREAM, Gulf's proprietary project control system, with a Primavera or MS Project schedule and our TDM system for document tracking and control. Gulf knows that effective project management is a critical component of a successful project. Gulf utilizes GPMS to organize, develop, plan, guide and control the project to achieve completion in an orderly and timely manner, and within budget.

Dependent on the breadth of the project at hand, aspects of project management may include:

- ❖ Budget Development & Cost Control
- ❖ Quality Assurance
- ❖ Earned Value Analysis
- ❖ Scope Definition
- ❖ Progress Measurement
- ❖ Contract Administration
- ❖ Resource Allocation Schedule
- ❖ Cost Accounting
- ❖ Planning and Scheduling
- ❖ Established Performance Goals
- ❖ Risk Management
- ❖ Forecasting
- ❖ Change Management System
- ❖ Status Reporting
- ❖ Activity Tracking Schedules
- ❖ Execution Plan and Procedures

With more than 50 years of experience in serving the oil and gas industry, project management has become our forte. GPMS utilizes the latest technology combined with experience, and attested management to serve our customers and complete projects of any magnitude or complexity.

On domestic and international projects, Gulf provides quality and comprehensive project management. GPMS is commonly used in conjunction with other engineering and design execution procedures and tracking systems, thus ensuring the project is completed and has met or exceeded contract goals.

In an industry that is constantly shifting and presenting new challenges, we recognize the necessity to remain flexible. We are positioned to meet your needs for large or small projects, from small single person studies to turnkey services, anywhere in the world. Gulf's approach is to involve the right people, technology and systems to make each project a success.

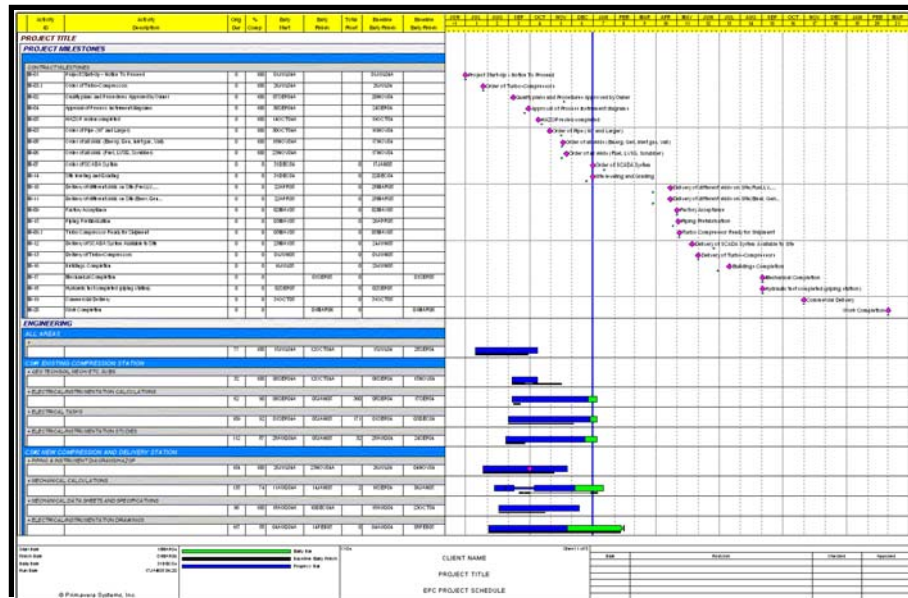
The following information describing portions of Gulf's Project Management Systems is provided below:

- Project Scheduling and Schedule Risk Assessment
- Project Cost Estimating / Control
- Project Measurement and Tracking
- Man Hour Budget and Productivity
- Project Website
- GEMMS
- Document Control System & Transmittal Process



Project Scheduling and Schedule Risk Assessment

We develop logic-based Critical Path Method (CPM) schedules utilizing Primavera® or MS Project software. We build schedules for complex projects, encompassing hundreds of activities, including the activities of subcontractors and third party participants to whom we provide templates, WBS and coding structures to facilitate import / export requirements for schedule updates and analyses. We design the CPM schedule utilizing Monte Carlo® software that interfaces with Primavera®. The deterministic CPM schedule is analyzed to develop probabilistic expectations by applying the Monte Carlo technique risk analyses.

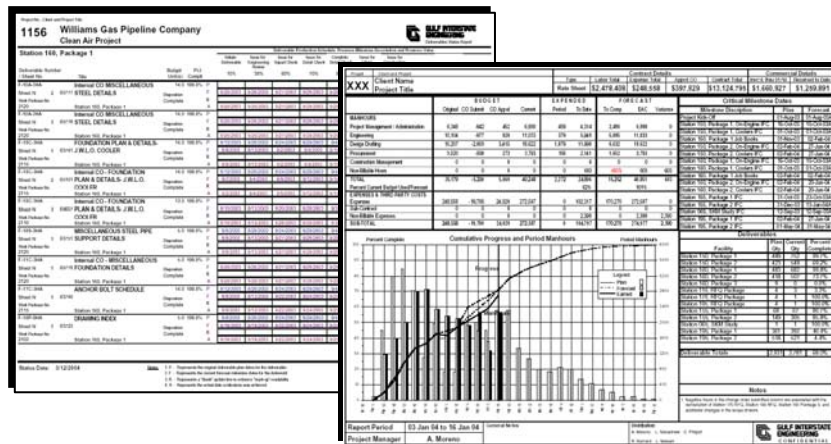


Project Measurement and Tracking

We use the earned value method for measuring and tracking project progress. A Work Breakdown Structure (WBS) is developed during the planning phase to organize the components of the project. For each WBS component, activities and deliverables are assigned a weight value in proportion to that item's relationship to the overall project budget. Our proprietary database application, GULF STREAM, accommodates the line item entry for each activity and deliverable required defining the engineering and procurement documentation for the project. Periodic production milestones for each item are defined and a date for each milestone is schedule. As the work progresses and milestones are achieved, the cumulative value of the work progress is calculated and compared to the plan. This physical percent complete information produced by the GULF STREAM program correlates with the actual man-hours and schedule time expended to yield an earned value with respect to the plan. Comparative analysis of this result indicates productivity achievements, supports predictions of future progress and directs project management attention to items that are lagging. Results are displayed in graphic and tabular formats for reporting and analysis purposes. Similar earned value techniques are used for monitoring the progress of Gulf's subcontractors or other contractors for whom we have reporting responsibility.

Man Hour Budget and Productivity

A database application provides the interface with our corporate financial system, AEGIS, and our GULF STREAM program to collect and process man-hour and cost expenditures for reporting and analysis. AEGIS features an electronic timesheet module, which the project team uses to post timesheets and record actual man-hour expenditures. The database application is the vehicle used to develop and format the man-hour and cost budget for our work via customizable screens to organize these items in accordance with the established WBS and code of accounts. Productivity measurements are derived from the information contained in AEGIS regarding actual expenditures as compared to the physical percent complete calculations performed by GULF STREAM described above. The database application and GULF STREAM produce a series of graphic and tabular reports to present the status of the project with respect to budget, man-hours, progress and productivity.



Project Website



Gulf's state of the art, web based project management and reporting tools allow clients as well as engineering team members to work collaboratively on projects, regardless of their work location. This sharing of information is invaluable for projects where several work locations are encountered. These tools also allow for accurate, timely reporting of project progress, whether in the design phase or during field construction.

Gulf has extensive experience in creating "real time" project data transfer via a project intranet/Website. The necessity for this type of "project connectivity" has been instrumental in successfully executing numerous large scale domestic and international projects where multiple office sites and companies were involved. This system enabled quick and seamless transfer of project data to multiple locations.

Gulf's project management and reporting tools are used during all phases of project execution from design through operations and maintenance training.

From the Project Home Page, major items pertinent to everyday project activities are accessible. This page is extremely helpful to Clients as they can quickly reference project data, receive project updates, and it supports the collaboration of project and management activities.

Gulf Interstate Engineering Materials Management System

Gulf's Materials Management function benefits from the application of "GEMMS"; an acronym for "Gulf Interstate Engineering Materials Management System". Gulf employs GEMMS to manage all aspects of material take-off, purchasing, expediting, delivery and field materials management.

GEMMS is a proprietary system designed to electronically integrate all facets of materials management, from design and specifications in the Materials Library, through purchasing to expediting, delivery and receipt in the field. Industry-standard database files provide maximum compatibility with data sources from vendors and clients, and provides for the ability to incorporate project procurement information across any other system. GEMMS can receive and transmit updates to remote locations via several electronic means including the Internet, direct modem connection, or physical transfer of media. GEMMS can be adapted to the specific needs of the client with regards to coding, tracking, reporting and analysis of all material data. Automatic drawing material take-offs are an optional feature that further automates the materials process.

GEMMS fully integrates material status and tracking from the drawing/design phase of the project, to receipt and issuance of material in the field. All requisitioned, quoted and purchased materials can be traced to specific material requirements for the project. The integrated design of GEMMS minimizes the effort of putting together purchasing paperwork, schedules and status reports.

GEMMS generates project documents such as Bills of Materials, Requisitions and Purchase Orders and provides a series of pre-designed reports. All reports can be customized to meet the specific requirements of the client including FERC coding or corporate accounting codes, work order information, facility locations and other data.

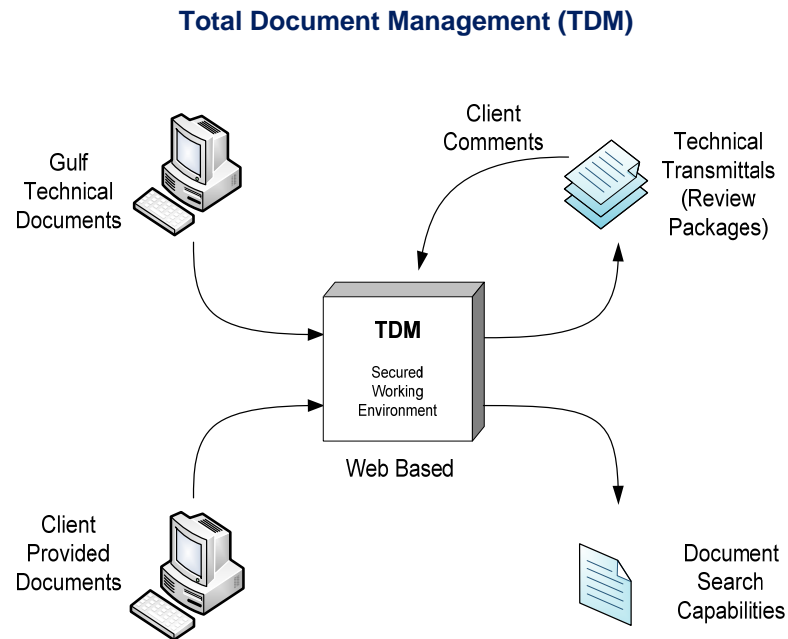
GEMMS incorporates an outline-based expediting module that decreases paperwork time and increases expediting efficiency. Screen expediting forms show what materials are on-time, late, or require contact with the vendor. Contact information for vendors is available for any Purchase Order. Field receipt and invoicing information can be displayed at any time. Expediting information can be arranged in several different ways, grouping by Purchase Order, vendor, and location. Color-coded displays highlight materials that require attention, and a scheduling tool gives the expeditor the ability to display and schedule contacts with vendors on all items.

GEMMS' field receiving program displays the status of materials that are to be received, as well as inventory information for material on-hand and disbursed. All materials transferred to contractors are tracked to material requirements on construction drawings, and over, short and damage information is automatically tracked and available on the system. The remote transfer capabilities described above allow timely interface between the design office and field sites to resolve materials issues.

Document Control System & Transmittal Process

As a leading engineering company, Gulf recognizes that the management of project documents is paramount to the success of every project. Gulf is committed to bringing the most complete Document Management System to our clients in order to make sure each project we perform provides organized, secured and reliable project documentation.

Gulf uses Total Document Management (TDM) software to manage and control all technical documents. Some of the key features TDM offers includes native file storage, a transmittal writer, electronic review and mark-up capabilities and an easy search function. TDM is also a web based program offering access to project documentation worldwide.



Benefits to Our Clients

- **Facilitates Communication Between Client and Gulf on Technical Documents**
All official transmittals will be generated through the TDM software, linking back to the original native files stored in TDM. TDM also maintains a log of transmittals, and all associated documentation which offers search capabilities on those parameters.
- **Central Location for all Engineering Documents Including Native Files, Official Revisions and Client Comments**
Since all technical project data will reside in one secure central location, projects will reduce the risk of losing documentation including personal hard drive crashes, accidentally deleted files or overwriting of files. All client review packages will also be uploaded to the TDM system, allowing complete traceability of a documents creation.

- **Electronic Mark-Up Capabilities to be Used During the Review Process**
TDM has the ability to allow our clients to review and comment on documentation electronically through TDM. Clients will be notified by e-mail of review packages in TDM, and provided a hyperlink to the documents which need review. Built into TDM is a Document Viewer which allows users to view over 200 file types.
- **Document Revision Management**
TDM will capture all official revision levels of documents and help ensure a document is not issued under the same revision level multiple times. Also, when reviewing a document, all revision levels will be available for reference.
- **Web Based Program**
The program is web based, allowing access to project documentation worldwide.
- **Easy Search Capabilities**
Each document is given a number of attributes (department, discipline, document type, document number, etc.); the user can define any combination of these attributes to stipulate the search results. A list of all documents meeting the criteria will be listed for the user.
- **Backed-Up and Secured Working Environment**
All project documentation is saved on a secure server, which is backed-up daily. Also, on a document-by-document basis the security level can be set to restrict access to a designated group of users.
- **WebApproval**
WebApproval is Gulf's proprietary system that benefits our clients by enabling worldwide access to transmitted deliverables translating potential savings to our clients. Our system enables an effective and efficient means to download, approve and accept, and upload client comments / markups. Gulf projects have reduced review cycles from weeks to days because project teams can now collaborate and share ideas and concepts utilizing a centralized WebApproval system. Additional benefits include reduced communication and courier time and expense, and provide reliable electronic archive.

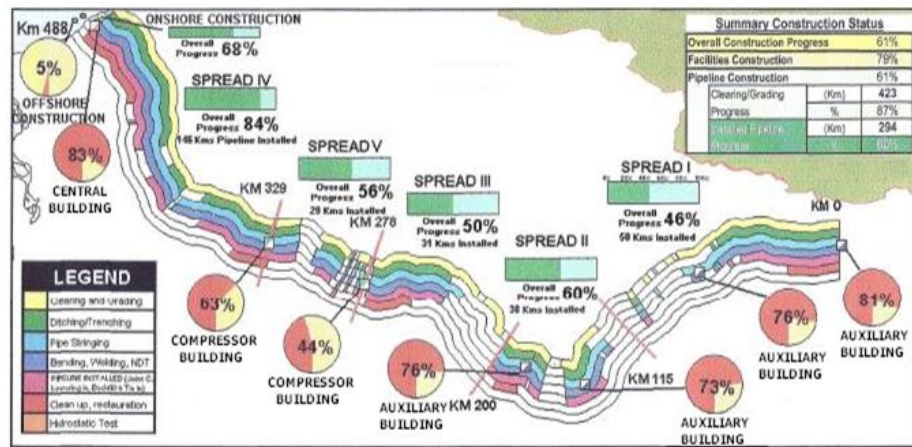
Construction Progress Reporting

Gulf has developed and offers to our clients a state-of-the-art Construction Progress Reporting System that provides real time information via a secure Project Website. The System is designed to enable both our Project Team and our Client's personnel with up-to-date status information regarding ongoing pipeline and facilities construction activities. This information can be used to track progress, check contractor invoices and provide trend Information for project controls. The ability to gather this information electronically and disseminate it quickly to all authorized parties in a secure manner is what sets this process apart from other field reporting systems.

Construction management and inspection personnel use this Web-based System to accumulate and communicate information on the construction activities being completed in the field. This information, which is transmitted securely over an encrypted Internet connection, is then stored in a central database at our home office location. Through the use of their web browser, approved personnel can easily reference the cost and progress information in the database. Furthermore, the information in the database can be used to generate pictographs showing progress per activity and other detailed reports.

Field personnel are able to utilize this System to monitor and track the progress of construction work activity, e.g., clearing, grading, stringing, welding, backfilling, etc. Moreover, home office personnel use this data to generate progress reports on a weekly or other project specified basis, and are able to post the completed reports to the Project Website. These reports are immediately available on the secure server and can be instantaneously downloaded by any authorized user anywhere in the world.

In addition to web based database reports, Gulf can represent construction progress via our GIS Server tool. Construction progress of any activity that can be related to geographic information can be represented on project maps and viewed through the use of a web browser. Some of the activities that could be shown include survey progress and welding progress.



Project Capital Cost Estimating / Risk Assessment

Gulf utilizes the AACE Estimate Category standards, as may be modified by our clients to reflect their categories and classifications to organize our capital cost and operating cost estimates in accordance with recognized industry practice. A Basis of Estimate is prepared to define the estimate components and stipulate estimate assumptions and contingencies. The Basis of Estimate collects and references project information including owner costs and soft costs; design basis documents; equipment and materials sizing; detailed drawings; material, equipment and construction specifications; construction conditions, the project schedule; and, operating and maintenance criteria.

Equipment lists and bills of material are developed from the drawings. Specifications are used to solicit budget quotes from vendors or estimates are made using material and equipment pricing from historical cost information accumulated from recent projects. Construction costs are developed from itemized equipment and labor requirements at the crew level using productivity tables factored for the project location and conditions. We often solicit comparative estimates from construction contractors with whom we maintain relations through our membership in industry organizations such as the International Pipeline and Offshore Contractors Association.

Sensitivity analyses are performed with commercial software using Monte Carlo techniques to qualify and quantify estimate risk parameters. Periodic comparative estimates and "what if" analyses are performed during the engineering phase to confirm that projected costs are falling within the established parameters and to support informed decisions about costs that are trending outside the range.

Gulf utilizes Timberline Estimating Extended as its primary estimating tool. Timberline is a database driven software that contains thousands of items typical to our industry with installation rates and costs for the U.S. Gulf Coast region. Because Timberline is a database driven software, it allows Gulf to quickly reference and select the required items. The estimate reports produced from Timberline show costs that can be detailed on a line item basis or summarized from work packages to entire facilities. Timberline can also arrange costs and man-hours by construction discipline, project segment, or as preferred by our clients quickly and easily. Amounts for contingencies, taxes, freight, royalties, financing, currency conversions, and other soft costs can be incorporated as required. For non-U.S. Gulf Coast work, Timberline has the ability to apply productivity factors to Gulf's historical rates on a line by line basis or to an estimate globally. Using these productivity factors, Gulf has been able to use Timberline to perform estimates in a multitude of regions worldwide.

Outlined below are the levels of Estimates Gulf prepares and the types of definition documents that are needed to refine the estimate to the corresponding accuracy level.

Level 5 Estimate (2-3 Week Duration)

+/-50 % level of Accuracy

Deliverables:

Scope of Work

Estimate Basis Memorandum

Estimate

Level 1 Project Schedule

Level 4 Estimate (3-6 Week Duration)

+/-40 % level of Accuracy

Deliverables:

Scope of Work

Estimate Basis Memorandum

Estimate

Level 1 Project Schedule

Process Flow Diagrams for Pipeline

Process Flow Diagram for Facilities

Preliminary Hydraulic Study

Plot of Possible Route – Desk Top Study

Level 3 Estimate (8-12 Week Duration)

+/-30 % level of Accuracy

Deliverables:

Scope of Work

Estimate Basis Memorandum

Estimate

Level 2 Project Schedule

Process Flow Diagrams for Pipeline

Process Flow Diagram for Facilities

P&ID's for Main Systems

Preliminary Plot Plan

Preliminary Piping Plan

Preliminary Hydraulic Study

Plot of Possible Route – Desk Top Study

RFQ's for Major Materials

Level 2 Estimate (Varies by Project, Detailed Engineering)

+/-20 % level of Accuracy

Refinement of the Level 3 Estimate based on actual data received from Purchase Orders, IFC Drawings, etc.

Level 1 Estimate (Varies by Project, Construction)

+/-10 % level of Accuracy

Refinement of the Level 2 Estimate based on actual Construction costs.





It is the policy of Gulf to provide quality engineering services to our clients; meeting or exceeding contract goals. Gulf recognizes the fundamental importance of an effective Quality Assurance Program as an integral part of Gulf's scope of work, and is committed to a process of continual quality improvement in the production of engineering work products and management services.

Section 5 – ISO & Quality

Gulf is certified to ISO 9001:2008, which determines our quality assurance approach for all of our work. Our Quality System is a proactive program designed to identify and resolve quality concerns before they become quality problems. This is accomplished through each employee's involvement with, and commitment to, our quality assurance process. Our Quality System has established a practical approach for performing our services, via comprehensive procedures documenting the methods to be utilized for each step of project execution. Quality control procedures applicable to project management, administration, engineering, drafting, materials management, and construction management are contained in our Project Procedures Manual. Specific quality control procedures applicable to the current project are determined by the Project Manager and are incorporated into a Project Execution Plan.

Gulf also utilizes a variety of methods to understand client expectations and ensure successful performance.

- Handoff Meetings: Upon contract award, our senior management and business development executives meet with the project manager and key personnel assigned to execute the project. A review of the contract is conducted to ensure the project team leaders understand Gulf's contractual obligations and can communicate these requirements to the full project team. Client expectations determined during the sales process are presented and basic strategy to achieve the expectations is discussed and outlined.
- Kickoff Meetings: Our project team meets with your project team to initiate the project. Further discussion of client expectations is an important focus point of the kickoff meeting. Building upon the strategy outlined in the handoff meeting, our project team will develop a full understanding of your goals for the project and work with you to delineate specific tactics to accomplish your objectives.
- Project Procedures: Our work processes are set forth in a collection of comprehensive execution procedures. All employees are indoctrinated by formal training sessions. Adherence to the procedures provides our clients with a quality work product that is fit for purpose and cost effective. Regular procedural training is provided periodically to ensure our staff is up to date with the latest procedural improvements.
- ISO 9001 Quality System: Our quality system is predicated on the principle of continuous improvement. Staff members are encouraged to suggest changes to our procedures based on applied experience. These suggestions trigger the review process, which frequently upgrades our procedures enabling incremental performance improvement.
- Project Managers Meetings: This weekly forum conducted by the Vice President of Projects involves all our project managers and features a round table discussion about their projects and lets them share thoughts and ideas as to how best to improve performance. The collective experience of our project managers garnered from a wide variety of oil and gas projects is a powerful resource for execution improvement.

- Team Building: We conduct team building workshops both internally and for combined exercises with our client's team members. We use professional facilitators to maintain focus and provide constructive criticism from the facilitators informed viewpoint. Many of our contracts include the provision for a steering committee comprised of company and contractor senior management that meet regularly to review performance, measure efforts to achieve project goals and advance the objectives of the project.
- Peer Reviews: Many of our contracts, particularly those with our multinational oil and gas company clients, involve peer reviews conducted with the project teams from both organizations. These reviews often involve representatives from the non-operator partner companies who are shareholders in the owner company. We also conduct internal peer reviews, respecting confidentiality requirements, involving personnel from the various projects under execution in our shop.
- Performance Recognition: Our corporate management approach includes performance recognition for our execution staff. The Project Manager's Award is presented to a team member who, in the Project Manager's estimation, has made a significant contribution to the success of the project. The President's Award recognizes an individual who has made an outstanding contribution affecting the overall success of the company's operation. Both awards feature a certificate memorializing the achievement along with a gift reward.
- Performance Incentives: Corporate management provides the project team with the opportunity to earn an incentive bonus for accomplishing successful project execution. Metrics to calculate the accomplishment include client satisfaction, achieving project goals, and performance in accordance with project budget, schedule, quality and safety requirements. We frequently perform our services under incentive-based contracts with our clients and we are willing to consider risk-reward commercial terms appropriate to the project conditions.

