

AMEC Paragon

Houston-based **AMEC Paragon** (www.amecparagon.com), originally founded as Paragon Engineering Services in 1980, provides engineering, design/drafting, procurement, inspection, and construction management services to the oil and gas, pipeline and midstream industries. For projects based in the Americas, AMEC Paragon serves as the hub for AMEC's onshore and offshore natural resources business. AMEC Paragon currently employs more than 600 personnel and has been growing steadily to meet customers' expanding needs.

As documented in the company's official "Ethical Will," AMEC Paragon focuses on doing the right thing for each project. We believe our customers' needs are much more important than our desire to maximize billings. This standard of professionalism builds long-term, productive relationships with customers while attracting and retaining hard-working, highly qualified employees.

Our customers are requiring more resources to bring their expanded investment plans to life. We respond with:

- Immediate access to personnel throughout AMEC's global operations
- Simultaneous project execution at multiple sites worldwide
- Aligned partnerships and joint ventures with other leading contractors

Our customers are executing more large-scale "mega" projects, many in challenging frontier areas. We respond with:

- Robust, proven project management and workflow processes
- Lessons learned from AMEC's history of success on large frontier projects and first-of-their-kind developments
- Project teams that develop innovative technical and logistical solutions

Our customers are often required to meet expanded local content requirements on international projects. We respond with:

- Designs that enable locally sourced fabrication, construction, operation and maintenance
- Responsive project organizations that foster local participation and input
- Locally targeted human factors engineering and health, safety, and environmental services

Our customers return – and our employees remain – because we provide:

- Integrated project teams, with the customer on board, to deliver programs of projects
- Opportunities to meet new challenges
- Automated work processes that reap the benefits of today's database-driven engineering and design tools
- A friendly working environment
- A healthy focus on volunteerism and community support

Milestones

- 2007** Anadarko El Merk: centralized facilities and pipelines for treatment and distribution of oil, condensate, and liquefied petroleum gas (LPG) produced from six fields in Algeria's Berkine Basin.
- 2007** Cottonwood subsea tie-back, Petrobras' first deepwater Gulf of Mexico project: 20 months from concept to first gas
- 2006** Launch of *AlphaSimplex*[™], a patented process for regasification of liquefied natural gas to meet pipeline transportation specifications
- 2006** Enbridge Southern Access Pipeline project to deliver oil from Canada's oil sands to markets in the U.S.
- 2006** Takula Gas Processing Platform topsides design contract with Samsung, building on three years of work for Chevron's large-scale Area "A" Gas Management Program in Angola
- 2004** Establishment of joint venture engineering services company in Angola (Paragon Angola Engenharia e Serviços, Lda.)
- 2001** Williams Canyon Station: shallow-water platform to handle deepwater production from three Gulf of Mexico fields – the Gulf's deepest subsea development at the time
- 2001** Comprehensive Owner's Engineer contract for Pluspetrol's Camisea Upstream Facilities Project in the Peruvian Amazon rainforest and Pacific Coast
- 2000** BP Mardi Gras Transportation System: large-scale shelf and onshore infrastructure project to support deepwater Gulf of Mexico developments
- 1998** Transco MarketLink: the first pipeline mapping project using AMEC Paragon's proprietary database-driven system
- 1998** Anadarko Hickory: AMEC Paragon's first full deck and topsides design using the PDMS 3D modeling system
- 1996** Amerada Hess Garden Banks 260A "Baldpate" facilities, installed on the deepest bottom-supported platform in the world at the time
- 1992** Conoco's Ardalin project in the Russian Arctic: the first grass-roots development of a new oil field by a Russian/Western joint venture
- 1990** Greenhill Petroleum: the first AMEC Paragon project to establish a Process Safety Management system for production facilities
- 1988** BP Mobile Block 821: AMEC Paragon's first sour gas project, treating the hot, high-pressure sour gas in the Mobile Bay area

Signature Projects

PETROBRAS AMERICA - COTTONWOOD

Overall Description:

AMEC Paragon is providing Owner's Engineer services for a high-pressure (15,000 psi) early production system that includes a 17-mile deepwater subsea tie-back to an existing shallow-water platform.

AMEC Paragon's scope includes:

- Operations, maintenance and logistics planning
- Management of all contractors, suppliers and fabricators
- Conceptual design of complete subsea systems, flowlines, and topsides process module
- Detailed design of topsides process module
- Generation of request for quotation (RFQ) packages, review of resulting bids, and development of procurement recommendations
- Management of construction and installation as well as hook-up, commissioning and handover to operations



Project Highlights

- Achieved first gas 20 months from start of concept development
- Accommodated complex simultaneous activity on platform, including installation of pipeline end terminations and flowlines while drilling rig was on location
- Maintained concept flexibility as significant project parameters changed

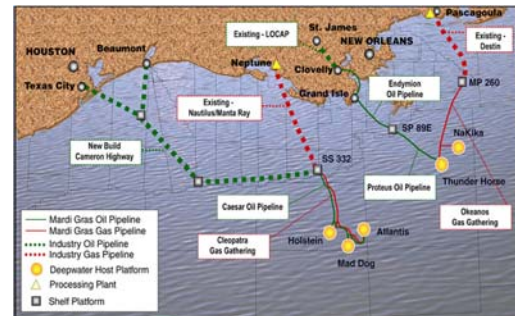
Signature Projects

BP - MARDI GRAS TRANSPORTATION SYSTEM

Overall Description:

AMEC Paragon was involved in multiple phases of work for BP's Mardi Gras Transportation System in the Gulf of Mexico area (offshore and onshore). Mardi Gras, an oil and gas pipeline system that supports deepwater developments, consists of five pipelines with total capacities of 1.2 million barrels/day of oil and 1.2 billion standard cubic feet per day of gas. AMEC Paragon provided project management services for the entire system and detailed engineering for the offshore shelf and onshore portions.

AMEC Paragon's system-wide scope included project management, project controls, procurement, inspection, logistics, expediting, construction management, and hook-up, commissioning and handover support. The company's detailed engineering scope included onshore and offshore oil and gas pipelines ranging from 20-inch to 30-inch diameter, an offshore platform capable of supporting 40,000 hp of pumps, and several onshore and offshore receiving facilities.



Project Highlights

Development and implementation of an industry-first web-based Health, Safety, and Environmental (HSE) Management System specifically for the project. This system facilitates the proper and timely resolution of all HSE action items generated during HAZOPs (hazard and operability studies), HAZIDs (hazard identification studies) and other design reviews.



Signature Projects

CHEVRON - AREA "A" GAS MANAGEMENT PROGRAM

Overall Description

Chevron's Area "A" Gas Management Program (AAGM), located in Angola, is designed to eliminate routine flaring in Block 0 offshore Angola and in the Malongo Terminal area onshore. One of the challenges faced was the need to develop a cost-effective design that incorporates "brownfield" modifications to existing facilities as well as development of new facilities while meeting aggressive schedule requirements.

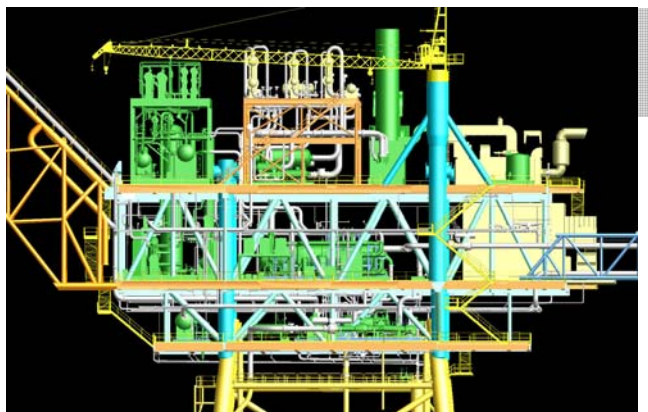
The program includes three projects: flare and relief modifications (FARM) to existing facilities in the Takula and Malongo fields; the new four-pile Takula Gas Processing Platform (TGPP) to compress the collected gas from the Takula field for processing, local gas lift and export to the Malongo field for injection; and the Cabinda Gas Plant (CGP), which will receive natural gas liquids (NGLs) extracted at the TGPP facility and the liquids collected from gas recovered at the Malongo Terminal.

AMEC Paragon's work has included conceptual and front-end engineering design (FEED) for all projects, detailed engineering for FARM, and, as subcontractor to Samsung, detailed engineering for TGPP. The complex contracting strategies developed for the various projects have included Engineer/Procure/Construct/Install (EPCI) with company-assigned equipment, EPCI with a reimbursable component, and PCI with engineering and construction support provided by AMEC Paragon.



Project Highlights

- AMEC Paragon's role grew as more opportunities arose to eliminate flaring and achieve greater gas management efficiency and as each individual project progressed toward implementation.
- Chevron has worked alongside AMEC Paragon to develop an integrated team.
- Chevron has recognized over 80 AMEC Paragon employees for outstanding performance.
- AMEC Paragon is currently executing detailed design for Samsung on TGPP



Signature Projects

PLUSPETROL – CAMISEA UPSTREAM FACILITIES PROJECT

Overall Description

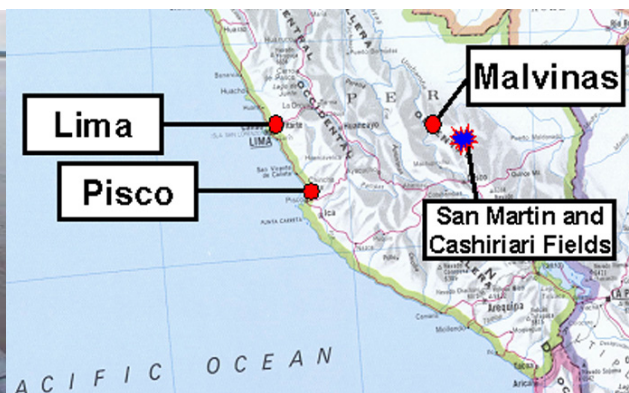
Pluspetrol's Camisea Upstream Facilities Project is located in the Peruvian rainforest and Pacific Coast. The project—a cornerstone of Perú's economic development plan—presented several engineering, environmental, and logistical challenges to AMEC Paragon's team as it managed development of safe, reliable operating facilities for the people of Perú, with minimal disruption to the environmentally sensitive region and to the indigenous tribes along the Urubamba and Camisea Rivers.

The project involves gathering of gas and condensate from two fields in the remote jungle and transporting this production to a new-build liquid separation/NGL recovery/gas compression plant at Malvinas, still in the jungle. A new pipeline (managed, designed and built by others) carries the NGLs over the Andes Mountains to a new-build gas fractionation plant on the Pacific coast. Fractionated C3, C4, naphtha, and diesel products are loaded onto ships from a new marine terminal for sale on the international and domestic markets.



Project Highlights

- Assisted in development and continual refinement of a total project execution strategy that allowed sufficient flexibility to ensure success
- Helped to develop an innovative subsea cryogenic pipeline to transport liquids to the marine terminal – avoiding the need for a locally unpopular 3 km trestle in Paracas Bay.
- Developed basic designs and prepared bid packages that helped to enable multiple EPC contractors to perform successfully and on schedule



Recent Publications

<i>Utilizing What We Know to Develop a New Source of Energy</i>	Francis S. (Scott) Key, Chi-Jen (Jeff) Chang, and Ken Arnold 2007 Offshore Technology Conference April 30 – May 3, Houston, Texas
Book: <i>Petroleum Engineering Handbook – Volume III: Facilities and Construction Engineering</i>	Ken Arnold, editor Mary Thro, author, <i>Chapter 1: Oil and Gas Processing</i> Ken Arnold, co-author, <i>Chapter 10: Safety Systems</i> Dinesh Patel, author, <i>Chapter 12: Electrical Systems</i> Greg Kreider, author, <i>Chapter 15: Project Management of Surface Facilities</i> Published by Society of Petroleum Engineers, 2007
<i>Accelerating Technology Acceptance: Is the Industry “Backbone” Strong Enough for Acceptance of New Technology?</i>	Ken Arnold 2005 Society of Petroleum Engineers (SPE) Annual Technical Conference and Exhibition
<i>EPC Contractor Selection and Management in a Full-Capacity Construction Environment</i>	Richard Rankin Presented at the Zeus Development LNG Contracting Conference
<i>A Cost-Effective Process for NGL Recovery from LNG</i>	Gary Winningham Gas Processors Association, European Chapter Annual Conference - 2005
<i>Fixed Platform and Pipeline Concepts for 200 to 300 ft (60 to 90 m) Water Depth Offshore Fields in the Black Sea</i>	Demir I. Karsan Offshore Petroleum Technology (OPT) - 2005 Symposium
<i>Stranded Gas Finds a Boat</i>	John Dunlap and Charles White, EnerSea Transport LLC; and Jay Hachen , AMEC Paragon E&P, September 2004.
<i>Erha: A Flow Assurance Case Study from Well Packer to Process Facilities</i>	Ikenna Onuoha, Esso Exploration & Production Nigeria Ltd., Rex Spahn, Consultant to ExxonMobil Development Company, Torgeir Vanvik, Scandpower Petroleum Technology Inc., Mark Utgard , AMEC Paragon, and Jean-Francois Saint-Marcoux, Acergy Offshore West Africa Conference and Exhibition, 2004
<i>Other Industries Have Wealth of Risk Management Experience</i>	Ian Sutton and Daniel Podobinski Pipeline & Gas Journal, September 2004
<i>New Unified Operating Plan Aids Kuwait in Managing Gas, Condensate Infrastructure</i>	Thomas F. Cross and David Arnold, Pipeline & Gas Journal, March 2004
<i>Mapping Progress Made</i>	Mark S. Zuniga World Pipelines, April 2004

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