Major Projects – Compressor & Pump Stations (U.S. & Canada)

Compressor Stations

**Alliance Pipeline – Compression Facilities**
UniversalPegasus provided engineering, design, drafting and material procurement services for seven grass roots natural gas compressor stations and five meter delivery stations on the 888 mile, 36” diameter U.S. Portion of the Alliance Pipeline. The pipeline runs from Fort St. John, British Columbia to its associated NGL Plant at Tampico, Illinois, near Chicago. A total of 663,000 BHP of gas compression capability was included in the design package. The services included the preparation of the design basis manual, the project procedures manual, the project procurement manual; assistance in compressor station site selection; preparation of site layouts and plot plans, P&IDs, line lists, instrument lists, construction drawing packages for the civil/structural, process/mechanical, and electrical/instrumentation systems, material specifications and construction specifications; and provided vendor shop inspection, construction management and engineering support.

**Boardwalk Pipeline Partners - Gulf Crossing Pipeline Project**
UniversalPegasus provided survey, engineering design, mapping, drafting and project management for 357 miles of 42” high pressure natural gas pipeline extended from Sherman, Texas to Tallulah, Louisiana. The project also included two compressor stations in Texas and two compressor stations in Louisiana and five meter stations for the measurement and delivery of gas transported within the new pipeline system.

**Chevron - Carter Creek Gas Booster Compression Station Project**
UniversalPegasus performed the engineering design, equipment specifications and selection, bid preparation, review and procurement, design and routing of all electrical components together with the 3-D Modeling and Isometric pipe drafting for Chevron's Carter Creek Compressor Station upgrade in Wyoming.

**Columbia Gulf Transmission - Compressor Stations – Unit 412, 413, 507, 708 & 709**
UniversalPegasus provided engineering design, drafting, and material procurement assistance for the installation of three 15,000 BHP and two 18,000 BHP gas compressor units for a total of 81,000 BHP to replace the existing compressors at the Hampshire, Tennessee and Inverness, Mississippi compressor stations. UniversalPegasus provided detailed engineering design and analysis for new facilities and tie-in to existing facilities, and preparation of a complete set of bid and construction drawings including plot plans, P&ID's, line list, equipment list, instrument list, piping, civil/structural, electrical, instrumentation and other drawings required for purchasing, fabrication, and construction. Preparation of removal drawings for existing units including associated foundation and yard piping. New installation work included compressor building, control building, compressor yard piping, compressor yard valves including relief and blow-down, emergency shutdown system, station utilities, compressor and control building fire protection systems, yard lights, sidewalks and driveways.
Columbia Gulf Transmission - Delhi Compressor Station Project – Unit 811 & 812
UniversalPegasus completed the engineering for the removal of an existing GE LM-2500 turbine/compressor unit and a Pratt Whitney GT3 turbine/compressor and the installation of one new Solar turbine/compressors at Columbia Gulf Transmission's Delhi Compressor Station in Louisiana. The total project included a total of 34,400 BHP and the equipment included one Solar Titan 130 turbine/compressor unit, one Solar Mars 100 turbine/compressor unit (both units complete with all unit auxiliaries), two new compressor buildings, new prefabricated power and control room (PCR) building to serve both units, foundations, extension/modification of the existing unit suction and discharge headers and utility piping along with new turbine lube oil cooling, new unit controls and interfacing with the existing station control system, motor control equipment, unit shutdown system(s) and station emergency shutdown system (ESD) updates.

Enron Engineering and Construction Co. - Faribault, Minnesota Compressor Station Project
UniversalPegasus provided engineering design, drafting and material procurement assistance for a grass roots 15,000 BHP compressor station near Faribault, Minnesota. This station consisted of a Solar Mars Gas Turbine driving a Solar C-651 centrifugal compressor. The design scope for this complete and fully operational compressor station included the mainline block valves in existing 26” and 30” mainlines, the 24” and 30” sidegate valves, the 36” suction and discharge station piping and headers, an inlet gas scrubber, fuel gas conditioning equipment, a compressor building, a process control room building, an auxiliary building, a 300 KW diesel-fueled standby generator, two air compressors, an instrument air dryer, and all electrical power and control systems.

Enterprise Products Operating LP- Sherman Extension Pipeline– Wise and Collin Compressor Stations Project
UniversalPegasus provided engineering services for the installation of two compressor stations on the Sherman Extension 42” pipeline, located in Wise and Collin Counties, Texas. The project included three (3) 8,000 hp electric motor driven reciprocating compressors. Each unit included automated unit valves, process and service piping, lube oil and gas cooling, and unit control systems. A new electrical substation was designed to facilitate an incoming power drop and circuit breakers, two station transformers and secondary switchgear, along with any harmonic filters, utility transformers and power correction systems.

Falcon Gas Storage – MoBay Storage Hub Project
UniversalPegasus is providing the engineering for Falcon Gas storage's MoBay Gas Storage Facility in Alabama. The MoBay Storage Hub facility was designed to facilitate withdrawal volumes and gas exchanges with compression, along with the bi-directional interconnections to the station with gas transmission pipelines. The compressor station hub included: eight (8) identical Caterpillar 3616 / Ariel JGZ6 reciprocating gas engine powered compressor units, inter-stage gas cooling and scrubbers, inlet slug catcher, suction gas filter-separation, compressor discharge filter-separation, TEG dehydration facilitates, TEG filter separators, liquid storage tanks and a pig receiver on the reservoir pipeline connection.
Florida Gas Transmission - Phase VI Expansion Project Compressor Stations 18 & 24
UniversalPegasus provided engineering design and drafting, engineered the equipment and selected materials, wrote specifications, requested and evaluated equipment proposals, requisitioned equipment and major materials and prepared the construction drawing package for the installation of a 7,200 HP natural gas turbine driven centrifugal compressor to expand two existing compressor station on the Florida Gas Transmission system in Orlando and Trenton, Florida. Engineered and designed facilities included a pulsations analysis of the existing five reciprocating compressor system, revamp of the station tie-in piping and valving, installation of turbine compressor components such as: suction scrubber; automated unit and station valving including surge and recycle valves; compressor fuel gas, seal air, lube oil and jacking oil systems; and, gas after coolers. Other systems engineered and designed for this project included the compressor building, power control room (PCR) building, emergency generation and its enclosure, VFD drive for the turbine starter motor, ESD and building shutdown systems and unit and station blowdowns with silencers.

Florida Gas Transmission - Phase VI Expansion Project Compressor Station 26
UniversalPegasus provided engineering design and drafting, engineered the removal of the existing compressor and associated auxiliary equipment, engineered and designed the installation of the replacement compression equipment, evaluated compressor drawings and documentation, requisitioned major materials and prepared the construction drawing package for the installation of a Rolls-Royce RFA 24 centrifugal compressor to expand the capability of an existing compressor station on the Florida Gas Transmission system at Lacanto, Florida. Engineered and designed facilities included installation of the compressor and associated components such as: compressor lube oil and jacking oil systems, unit control panel modifications and, redesign of suction and discharge unit piping to accommodate the new compressor nozzle locations.

Florida Gas Transmission - Phase VIII Expansion – Compressor Stations 11, 12, 13, 14, 15, 24, 26, 27, 29
UniversalPegasus is providing s FERC filing, detailed engineering design, as-built drawings, construction management, and inspection services for 240-miles of 24”, 30”, and 36” pipeline and 10 compressor stations with 15 compressor units for a total of 207,600 BHP from Mississippi to Florida.

Florida Gas Transmission – Turkey Point Compressor Station
UniversalPegasus provided engineering design and drafting, engineered the equipment and selected materials, wrote specifications, requested and evaluated equipment proposals, requisitioned equipment and major materials and prepared the construction drawing package for the installation of two 8,500 BHP electric drive centrifugal units for the Turkey Point Compressor Station in Miami, Florida.

Gulf South Pipeline Co. LLC - East Texas Expansion Project-Carthage, Vixen and Tallulah Compressor Stations Project
UniversalPegasus completed the engineering for three compressor stations for a total of 100,600 BHP on a 42” pipeline for Carthage Junction, Vixen, and Tallulah in East Texas. The Carthage Junction and Tallulah stations included designs for the installation of two Solar Mars 100 turbine/compressor units, and one Solar Taurus 70 turbine/compressor unit complete with all unit auxiliaries, one new compressor building, new power and control room (PCR) building to serve all units. The Vixen station included two new Mars 100 solar turbine/compressors.
Panhandle Pipeline Company - Cypress Compressor Station Project
UniversalPegasus provided engineering services for the installation of a new 7,000 HP electric motor driven centrifugal compressor package and all associated appurtenances, PCR building, substation, and modifications to the existing power distribution systems.

PetroChina Company Limited - Jingbian Compressor station No. 8 Project
UniversalPegasus provided engineering services and procurement assistance for the construction of a gas turbine driven compressor station at Jingbian, located on the 40” West to East Pipeline in Chaoyang District, Beijing, China. The compressor station facilities consisted of two 30,000 BHP Cooper Rolls-Royce RB 211 gas turbines driving RF 36 Centrifugal Compressors. UniversalPegasus assisted in the preparation of bid solicitation drawings and specification packages for materials and equipment, material procurement assistance, and the preparation of detailed 3D construction drawings, automated valves; unit suction, discharge and recycle piping; suction and discharge headers; lube oil and gas recycle coolers; associated Auxiliary Building and Compressor Building; uninterruptible backup power supplies; instrument air compressor/dryer reservoir system; unit and station control systems; low voltage motor control; station emergency shutdown system (ESD); and compressor unit shutdown system (USD). The station is designed for unmanned operation with remote monitoring and control.

Swift Energy - Northwest Alabama Gas District Project Gas Storage
UniversalPegasus provided conceptual as well as detailed civil, mechanical, process, instrumentation, and electrical design and engineering for a portion of the natural gas storage facility for the Northwest Alabama Gas District. This facility included five wells converted from pressure depletion production to storage, as well as compression facilities designed for both withdrawal and injection modes. The station was designed to operate with minimal support personnel utilizing automated rate and pressure controls. Work included design and engineering of the site layout, equipment foundations, process piping, plant utilities, instrumentation and controls, and support systems. Expediting, procurement, construction supervision, project management, startup and commissioning services were provided. UniversalPegasus worked closely with the client to develop DOT type operations manuals for the facility, as well as providing post commissioning engineering and technical support.

Transwestern Pipeline Company - Bloomfield Compressor Station Project
UniversalPegasus provided the detailed design for the installation of a 15,000 HP electric motor driven Solar C65 centrifugal compressor utilizing a Vorecon variable speed gear drive. This project included a new compressor building, new major gas piping additions, major piping rerouting, and two services of gas cooling and all associated electrical systems. UniversalPegasus also designed the High-to-Medium voltage (115 kV to 13.8 kV) substation including medium voltage (13.8~12.47 kV) distribution switchgear, medium voltage distribution to a Power Control Room (PCR) Building and the medium voltage motor control including autotransformer across the line starting in New Mexico.

Transwestern Pipeline Company - Red Rock Expansion: Klagetoh Station Project
UniversalPegasus provided engineering design, and procurement, assistance for to a 41,500 BHP gas turbine driven centrifugal compressor station upgrade at Transwestern’s Station #2 located at Klagetoh, Arizona. The project included tie-ins to two existing 30” pipelines comprising of two side gates and mainline block valves at each line, turbine/compressor, lube oil system, gas after-coolers, new compressor building, new control building, new dual generator prime power building, new high voltage switches.
efficiency gas scrubbers in each mainline, new PLC based control and ESD system, new power
distribution system for new and existing facilities, new roads, storage and drainage facilities, and the
removal of existing mainline scrubbers.

Transwestern Pipeline Company - Red Rock Expansion: Flagstaff and Leupp Compressor Station
Project
UniversalPegasus provided engineering design, drafting, specifications, RFQs, material selection and
take-offs, assistance with material procurement, and the preparation of the construction drawing
package for the addition of a 41,500 BHP ISO rated natural gas turbine driven centrifugal compressor
unit at each of four compressor stations for a total of 166,000 BHP in Seligman, and Luepp, Arizona. This
project included automated unit and yard valves, new station header piping, stress analysis of all new
piping, eight bay gas after-cooler, new compressor building, new control building, new emergency
power generation building, emergency shutdown and building shutdown systems, fuel gas systems
(process and domestic), instrument and utility air systems, new suction scrubbers, unit hot and cold
recycle/surge control valves and unit and station blow-downs complete with silencers. As at Stations #1
and #2, the facilities engineered included tie-ins to two existing 30” pipelines comprising of two side
gates and mainline block valves at each line, new PLC based control and ESD system, new power
distribution system for new and existing facilities, new roads, storage and drainage facilities and the
removal of existing mainline scrubbers.

Valero Gas Storage Company - Boling Gas Storage Project
UniversalPegasus provided project management, engineering, drafting, and material procurement
assistance for all above-ground facilities associated with a salt-dome gas storage facility located near
Boling, Texas. The required facilities included four 2,000 BHP natural gas engine driven reciprocating
compressors for a total of 8,000 BHP, flow measurement into and out of storage, two 200 MMSCFD gas
dehydration trains, site preparation and development, buildings and structures, auxiliary systems,
instrumentation and controls.

Pump Stations

Enbridge – CCPS Spearhead North Reversal and Sale Project
UniversalPegasus provided engineering design, drafting and material procurement assistance for the
addition of one new pump station, modifications of two terminals adding booster pumps, piping, quality
control, surge relief system, pressure control, deactivation and nitrogen purging for Enbridge to
accommodate the transportation of 130,500 BPD of heavy Canadian crude from Flanagan, Illinois to
Hartsdale, Indiana on Enbridge's Spearhead Pipeline System. The project was completed in the first
quarter of 2009.

Enbridge - CCPS Spearhead South Expansion Project
UniversalPegasus provided engineering design, drafting and material procurement services to Enbridge
for the expansion of nine crude oil pump stations and the addition of three new pump stations to
accommodate an increased from 120,000 BPD to 190,000 BPD of heavy Canadian crude from Flanagan,
Illinois to Cushing, Oklahoma on their Spearhead Pipeline system. The project was completed in the first quarter of 2009.

**Enbridge - Trailbreaker Line 6B Project**
UniversalPegasus provided classified TIC estimates, FEED, & detail design services to Enbridge for the expansion of seven crude oil pump stations and the addition of seven new pump stations to accommodate a capacity of 425,000 BPD of heavy Canadian crude from Griffith Terminal, IN to Sarnia, Ontario. The project was completed in 2011.