KENT A. PENNYBAKER, President

SUMMARY OF QUALIFICATIONS

River City Engineering, Inc., Lawrence, Kansas USA 1994-Present

Process Engineering Consultant for the Oil & Gas Industry providing design and technical support for gas and liquids processing/handling projects.

- Detailed engineering for debottlenecking relief and drain system at a large mid-Continent storage terminal. Developed options and presented to client. Worked with mechanical engineering contractor on piping layout, tie-ins, and other details.
- Owner's engineer for a 50,000 BPD condensate splitter that produces 7 products. Reviewed EPC contractor's work, PHA participant, and supported environmental and commercial groups.
- Concept selection for a new 300 MMSCFD propane recovery plant located in the Caribbean targeting 98% propane recovery.
- Detailed engineering for a new transmix fractionator at a products pipeline terminal. Work included sizing and specification of all equipment, valves, and controls.
- Part of owner's project team responsible for review and development of a pre-FEED study for a 3-4.5 MTPA FLNG project. The LNG scheme was the dual mixed refrigerant process.
- Part of owner's project team responsible for review and development of a pre-FEED study for a 3 MTPA FLNG project. The LNG scheme was a dual expander based nitrogen-methane process.
- Conducted FEL-1/2 studies for arsenic removal from natural gasoline product. Identified technologies and vendors and coordinated with vendors to obtain proposals. Used vendor data to develop high level cost estimates and select vendor.
- During visit to an existing gas plant identified an alternative operating mode that had been lost during multiple plant ownership transitions. Operations made valve adjustments to operate in the alternative mode with a resulting 10% increase in NGL production.
- Performed conceptual study for small scale LNG facility. Study included high level assessment of various technologies available for small scale liquefaction.
- Preliminary and detailed engineering for a new 50 MMSCFD CO_2 compression facility. Facility includes inlet separation, compression, dehydration, and other support utilities. Planned for future expansion in phases.
- Supported client during preliminary engineering for a new 350 MMSCFD propane recovery gas plant in West Africa. Facility dense phase pipeline, condensate stabilization, cryogenic gas plant, LPG fractionation, storage, and offloading.
- Provided preliminary engineering for new projects utilizing Compressed Natural Gas (CNG) transportation. Several projects were evaluated and the loading and unloading process refined. Further studies on optimizing the overall process were integral to development of project plans.
- Provided review for EPC contractor during bidding process and subsequently detailed engineering on a new 250 MMSCFD propane recovery gas plant, PBC pipeline, and 547 MT LPG fractionation plant with storage in Indonesia.
- Detailed engineering for a storage expansion at an existing facility. Developed work scope, P&ID's, specified new equipment, tie-in plans, and coordinated review of contractor piping plans. Project included new spheres, refrigerated atmospheric propane storage tank, and a atmospheric natural gasoline tank.
- Owner's engineer responsible for process review of EPC contractor's work on a new butane splitter column to produce iso and normal butane products.

SUMMARY OF QUALIFICATIONS – (continued)

River City Engineering, Inc.

- Preliminary and detailed engineering for a 25 MMSCFD CO2 re-injection facility. The grass-root facility includes inlet compression, gas pre-treatment, membrane separation, LPG recovery and treating, sales gas export, CO2 re-injection compression, and pipelines and gathering system modifications.
- Owner's engineer responsible for process review of EPC contractor's work on a new 600 MMSCFD, 95% propane recovery gas plant.
- Preliminary and detailed engineering, along with start-up assistance for a 5 MMSCFD membrane separation facility. Membranes and associated new equipment were added to an existing plant to produce a saleable gas stream along with re-injection CO_2 for enhanced oil recovery.
- Performed several PHA Revalidation reviews for existing plants. This consisted of a site review to examine procedures, protocols, and philosophies and ensure that all changes made since the last PHA followed the PSM and client mandated guidelines.
- Detail engineering support for upgrading of an existing amine unit used in ethane treating. Specified replacement heat exchangers and new trays to increase capacity.
- Conceptual study of a new gathering system to provide low-Btu fuel gas to a municipal power generator. Study included evaluation of nitrogen removal technologies and planning options to grow system capacity beyond city's needs for pipeline sales.
- Preliminary engineering study for converting a two-train gas plant into a single train gas plant as volumes decreased. Compared recovery reductions of the single train operation to the two-train operation and also fuel gas and utility requirements for both to determine economics.
- Performed a study for the removal of arsenic, sulfides, and benzene from a natural gasoline product stream. Evaluated technologies and performed high level cost estimates.
- Conceptual study comparing capital and operating costs for ethylene recovery processes from steam crackers and from a new ethylene technology.
- Flare radiation measurement and testing. Conducted flare tests to measure the actual emissivity from a plant flare. Developed a testing plan and coordinated with operations to perform flaring at constant composition and rates. Performed calculations to compare to vendor information and reported findings.
- Conceptual engineering and client representation for an offshore development in South Africa. Offshore facilities included separation, hydrate management, and compression on a TLP. Onshore receiving terminal included slug catcher, dew point control facilities, condensate stabilization and storage, and sales gas compression. Performed a pipeline study to determine pipeline size optimized with compression costs.
- FEED engineering for an offshore deepwater tie-back to an existing floating facility. Facilities included a slug catcher, hydrate management, separation, and tie-ins to existing facilities.
- Process evaluation and selection for converting an existing propane recovery plant to ethane recovery. Performed simulations incorporating existing plant equipment and new equipment. Recommended final process configuration to the client based on cost estimate, minimal downtime, and ease of operations.
- Offshore facility consolidation study. Evaluated different options of consolidating offshore gas facilities operated by two different major oil companies. Evaluated spare capacity and determined different pipeline options for consolidation.
- Gas Processing Training. Prepared and presented different training sessions focused on process engineering and gas processing.

SUMMARY OF QUALIFICATIONS – (continued)

River City Engineering, Inc.

- Process consulting/development support for a Gas-to-Liquids (Synthesis Gas and Fischer-Tropsch) facility with full product separation and treating. Support included development of fully integrated HYSYS process models for material and energy balances for economic evaluations of various processing schemes.
  - Conceptual Engineering Studies – Performed various conceptual studies for potential site locations. This included upstream development as well as GTL facilities.
- Engineering support for a 500 MMSCFD/100,000 BPD offshore FPSO in Indonesia. Facilities included oil separation, compression, H_2S removal, dehydration, LPG recovery, and fractionation.
  - Conceptual Engineering – Performed early evaluations to justify LPG recovery. Performed detailed study comparing LPG recovery processes from which the final process was selected. Assisted with preparation of bid document for EPC bid.
  - Detailed Engineering – Worked as client representative with engineering contractor during all aspects of detailed engineering. Areas of input included layout, PFD's, P&ID's, vendor bid review and selection, equipment inspection and testing, control system narratives, participation in HAZOP, operating guides, and start-up planning. Additionally was responsible for continual simulation modeling updates and evaluation of off-design conditions.
  - Commissioning and Start-Up – Provided assistance for onshore and offshore commissioning. Provided start-up assistance and troubleshooting analysis. Planned and prepared for performance testing.
  - Operations Support – Continue to provide operations assistance as needed. Have assisted in evaluation of heat exchanger and pump performance problems.
- Process evaluation and selection for a gas plant expansion. Evaluated and compared many available propane recovery processes. Recommended final process for client to specify for contractor.
- Preliminary engineering for relocating an existing plant to a new site. Determined cost effectiveness of modifications and developed an engineering task list for detailed engineering. Developed PFD;s, "as-built" PID's, demo P&ID's , and new relocated plant P&ID's.
- Preliminary and detailed engineering for a propane/butane pipeline export and truck loading facility at an existing plant. Specified tie-ins required, equipment, valves, etc. to allow the plant to export batches of propane and butane via pipeline. Also, added capabilities to export via truck loading.
- Conceptual and preliminary engineering for a major gas transportation system in Indonesia. Evaluated and determined most cost effective way to deliver gas from nine fields to Singapore. Compared different pipeline operation modes such as dry gas, wet gas, and deuse phase. Determined most cost effective routing and operating pressures. Provided key support to contract specifications.
- Preliminary engineering support for a mobile offshore gas production unit. Support included subsea flowline sizing and interface, compression requirements, and facilities. Worked closely with engineering contractor and client.
- Start-up support for a 120 MMSCFD offshore gas processing plant in Venezuela. Troubleshooting and performance evaluation in preparation of performance testing.
- Conceptual engineering for a subsea LPG offloading system utilizing a turret. Investigated and compared on-shore fractionation and storage to offshore fractionation and storage on an LPG tanker.

SUMMARY OF QUALIFICATIONS – (continued)

River City Engineering, Inc.

- Preliminary engineering for upgrading an existing plant in Kentucky. Determined that plant could achieve higher recoveries with same horsepower while delivering at a higher residue pressure.
- Preliminary and detailed engineering support for a gas plant expansion from 650 MMSCFD to 750 MMSCFD.
- Preliminary and detailed engineering design for a grass roots 40 MMSCFD compressor station.
- Preliminary engineering, startup support, and performance testing for a 100,000 BPD Gulf coast fractionator.
- Process Hazards Analysis (PHA) for numerous gas processing, liquids handling and fractionation, and compression facilities.
- Expansion, performance, troubleshooting, and optimization studies for numerous gas plants.
- Numerous relief and flare studies.

KENT A. PENNYBAKER

PREVIOUS EXPERIENCE

CONOCO, Inc., Ponca City, Oklahoma, USA 1987-1994

Senior Engineer providing process design and technical support for the Conoco upstream operating groups. This included oil production and gas processing facilities, both onshore and offshore, domestic and international.

Major Projects:

- District Process Engineering Coordinator for West Texas District, which includes seven gas processing plants and associated gathering systems with approximately 50 compressor stations. Support included troubleshooting, project identification, and major projects. Simultaneously handled several projects ranging from $10M to $5MM. Also, coordinated PSM efforts and conducted PHA's.
- Lead Process Engineer on the process design and detailed engineering of a 100,000 BPD ($127MM) offshore drilling and production platform for Indonesia (Belida DPP'A'). This facility started up ahead of schedule and under budget.
- Performed feasibility and conceptual engineering studies for a 40,000 BPD NGL Fractionation Expansion (Gulf Coast).
- Application and interpretation of Conoco's dynamic multiphase flow simulator (ConOLGA). Bridged the transition from a research project to value adding applications throughout the company.
- Designed and developed a computer program (GASNET) that models gas gathering and distribution networks.

Woodward-Clyde Consultants, 1986-1987
Overland Park, Kansas

Staff Engineer responsible for the development and application of groundwater and contaminant flow models. Work included EPA Superfund sites. Developed and published a method to analyze relief well performance behind levees.

University of Kansas, 1986-1987
Lawrence, Kansas

Teaching Assistant responsible for the classroom instruction of approximately 100 students for "An Introduction to Computers in Engineering".

EDCON, 1983-1986
Lakewood, Colorado

Borehole Gravity Engineer responsible for the collection, processing, and interpretation of field data. The collected data was combined with other geophysical data to develop a reservoir or structural model.

KENT A. PENNYBAKER

EDUCATION

University of Kansas
Lawrence, Kansas

M.S. (Honors) Chemical Engineering, 1986-1987

- Named "Outstanding Graduate Student", 1987
- Thesis title, "Development of the Computer Based Laboratory Test Facility and its Use in the Investigation of Discrete-Time Proportional-Integral Control Algorithms"

B.S. Chemical Engineering, 1979-1983

PROFESSIONAL MEMBERSHIPS

Professional Engineer, Kansas and Oklahoma
American Institute of Chemical Engineers
Society of Petroleum Engineers, Director at Large (1990-1992)
Society of Exploration Geophysics
Tau Beta Pi
Theta Tau

PUBLICATIONS/PATENTS

Summary of Technologies Available to Upgrade Gas Quality, Pennybaker, K., 17th Oil Recovery Conference, North Midcontinent PTTC, Wichita, Kansas, April 5th, 2007.

State of Mercury Removal Technology, Ruddy, T., Pennybaker, K., and Goethe, A., 86th GPA Convention, San Antonio, Texas, March 12, 2007.

Low-BTU Gas in the Permian Chase Group in the Ryersee Field in Western Kansas: A Case History where Technology Creates a Marketable Commodity, Newell, K. D., Corsair, S., Chafin, S.W., and Pennybaker, K.A., Kansas Geological Survey, Open File Report 2003-57, 2003.

A Comparative Study of Ethane Recovery Processes, Pennybaker, K.A., et. al., 79th GPA Convention, Atlanta, Georgia, March, 2000.

A Comparative Study of Propane Recovery Processes, Pennybaker, K.A., et. al., 78th GPA Convention, Nashville, Tennessee, March, 1999.

Optimizing Field Compressor Station Designs, Pennybaker, K.A., SPE Gas Technology Symposium, Calgary, Alberta, Canada, 1998.

Layer Density Determination Using Surface and Deviated Borehole Gravity Values, Pennybaker, K.A., US PATENT 5,218,864, June 15, 1993.

Borehole Gravity Drift Correction: A New Approach, Pennybaker, K.A., Geophysics, Vol 53, No. 10, October, 1988, p.1343-1346, 7 Figs.

Groundwater Flow Modeling Pressure Relief Wells, Ritchey, J.D., Studer, J.E., and Pennybaker, K.A., Conference on Solving Ground Water Problems with Models, National Water Well Assoc., 1987.