

Expertise

- ⇒ Process and equipment design (distillation and heat exchange emphasis)
- ⇒ Process simulation (Aspen+®, Aspen Dynamics®, Aspen Exchanger Design & Rating (EDR), Aspen Energy Analyzer (Pinch), Aspen Capital Cost Estimator, and other AspenTech engineering suite tools)
- ⇒ Economic analysis and plant debottlenecking
- ⇒ Biofuel and chemical manufacturing technical support (emphasis on ethanol, commodity, and specialty chemicals troubleshooting and debottlenecking)
- ⇒ Project management
- ⇒ Process hazards analysis (HAZOP and What-If analysis)
- ⇒ Statistical process control

Work Experience

Feb 1997 – Present

President/Litzen Process Consulting, Inc. Co-Founder and Chief Technical Officer/KL Energy Corporation Process Engineering Consultant/Virtual Ideality

Responsible for providing engineering and economical evaluation services to a broad range of chemical, biological, and refining industries as a process chemical engineer.

- Founder and President of Litzen Process Consulting, Inc., a process engineering consulting firm specializing in biofuels and petrochemical design, simulation, and technical support
- Co-founder KL Energy Corporation (formerly KL Process Design Group, LLC) and subsidiary companies (KL Management, LLC; KL Energy, LLC; and Patriot Motor Fuels, LLC)
- Process design for several fatty acid generation/purification processes (Panama City Beach, FL; Dexter, MI)
- Process design for quartz purification process (Edgemont, SD)
- Process design and modeling for corn conversion to n-butanol process (Mountain View, CA)
- Process and environmental regulatory support for Deadwood Biofuels wood pellet plant (Rapid City, SD)
- Supporting engineer for the New Goodland Energy Center retrofit and restart (Goodland, KS)
- Supporting engineer for existing biodiesel plant, including new technology implementation and complete methyl ester still design (St. Joseph, MO)
- Simulation model development for biomass gasification process (Baltimore, MD)
- Plant simulation of various biomass biochemical conversion technologies (ethanol, biobutanol)
- Lead research engineer (with SD School of Mines & Technology) to develop proprietary biomass conversion process (patent pending) for cellulosic ethanol production; research developed into pre-commercial demonstration project, Western Biomass Energy, LLC, Upton, WY – first of its kind in US;
- Instructor at SD School of Mines & Technology, CBE 364 (fall) and CBE 465 (spring) senior design courses
- Lead engineer for proposed 85 MGY ethanol plant expansion at Midwest Renewable Energy, Sutherland, NE (\$90 million)
- Lead engineer for proposed 85 MGY ethanol plant expansion at North County Ethanol, Rosholt, SD (\$90 million)
- Lead engineer for proposed 25 MGY ethanol plant at Big Horn Basin Ethanol, Greybull, WY (\$33 million)
- Lead engineer for proposed 110 MGY ethanol plant at RiverWright, Buffalo, NY (\$72 million)
- Lead engineer on retrofit of Midwest Renewable Energy, providing process design, mechanical design, and operator training; newly designed plant operates at 80% above nameplate capacity (27 MGY) and is one of the most energy efficient in US (\$9 million); included air and water permit application development
- Provided project oversight (independent engineer) for two corn-to-ethanol plant construction projects – Tri-State Ethanol (\$20 million) and Siouxland Energy (\$22 million)
- Provided operator training and startup support to three ethanol plants (TEC, SLEC, and Quad County)
- Provided on-site and remote support to Tri-State Ethanol, including process and equipment design modifications, process troubleshooting, and air and water permit assistance
- Plant design and startup support provider for batch epoxy resins plant for Shell/Taiwan joint venture
- Developed process model for new Shell detergent alcohol facility in Geismar, LA (\$250 million)
- Instructor for Aspen physical property and simulation training courses at various Shell locations
- Led or participated in Shell plant and project process hazards analyses and plant startup safety reviews

David B. Litzen

Work Experience, cont.

Jun 1993 – Jan 1997 **Staff Engineer/Shell Westhollow Technology Center**

Responsible for manufacturing technical support and process improvement of several oxygenated solvents and chlorinated intermediate manufacturing facilities while promoting and providing training for process simulation throughout Shell Chemical Company.

- Designed process and Aspen simulation flowsheet for new acetone derivative solvent; (\$14 million) patent granted (US 5,583,263)
- Developed optimization technique for allyl chloride/epichlorohydrin process (\$2 million/year savings with additional \$3 million/year potential savings)
- Designed coke removal facility for allyl chloride process
- Designed and conducted Aspen physical properties and simulation training for several manufacturing locations
- Developed process to feed low grade feedstock to isopropyl alcohol plant (\$3 million/year savings and \$10 million capital aversion)

Aug 1987 – May 1993 **Sr. Process Engineer/Shell Deer Park Complex**

Responsible for support to isopropyl alcohol and acetone derivatives plants as a Process Engineering Coordinator/Process Specialist. Project leadership and group leadership for corrective action teams emphasis.

- Designed isopropyl alcohol extraction process and Aspen simulation flowsheet for isopropyl alcohol plant revision; patent granted (US 4,762,616)
- Led project to expand acetone derivatives plant, required Texas Air Control Board permitting (\$3 million)
- Organized corrective action team that determined root cause for recurring problem in isopropyl alcohol plant sulfuric acid system
- Modeled six-step isopropyl alcohol finishing process with Aspen process simulator
- Designed new ketone process; patent granted (US 5,583,263)
- Conducted HAZOP for propylene/propane/elastomers storage facility, isopropyl alcohol unit, and epichlorohydrin finishing unit

May 1984 – July 1987 **Process Engineer/Shell Deer Park Complex**

Responsible for technical support to plant operations for isopropyl alcohol plant. Project leader for capital projects and lead process engineer for major non-capital process revisions. Emphasis on separation and reaction processes.

June 1981 – April 1984 **Engineer/Shell Deer Park Complex**

Responsible for technical support to plant operations for epoxy resins plant. Project leader for capital projects and lead engineer for scaling up prototype epoxy resin formulations from research to plant scale. Emphasis on batch operations.

Education

Bachelor of Science – Chemical Engineering, 1981 with Honors
SD School of Mines & Technology, Rapid City, SD

Professional Qualifications

Texas Professional Engineer No. 74828 (inactive status)
American Institute of Chemical Engineers – Lifetime Member

Patents

Isopropyl alcohol purification process (US 4,762,616)
Process of making ketones (US 5,583,263)
Farrier's tool (US 6,540,027)

Additional Affiliations

Major shareholder and former board member, KL Energy Corporation
Professional Advisory Board, Chemical and Biological Engineering Dept., SD School of Mines & Technology
Former Board member, SD 2010 Center for Bioprocessing Research and Development
Former Board member, Western Research Alliance, Rapid City, SD
Partner and patent holder, Innovative Concepts (product development company)