



**Carmagen Engineering, Inc.**  
**Coker Consulting Capabilities/Experience**

Carmagen Engineering, Inc. (CEI) has over 180 consulting engineers with process engineering, equipment engineering, and project management services experience. The average experience level of the CEI staff is 30+ years. A number of these specialists have practical hands on experience in the design, operation, troubleshooting, turnaround (T/A) and start-up/restart of Fluid Solids Units, including Delayed Cokers. The following is a partial list of the capabilities that these specialists can provide to clients and some of the recent experience that CEI has had in the Coker area.

- Capabilities
  - Process assistance during the design, operation, shutdown, T/A, and restart of various fluid solids process units, including Delayed Coker, FCCU, Fluid Coker, and FLEXICOKING units.
  - General T/A planning and execution consulting to clients to be sure that the right work scope is being executed in the most effective/efficient manner. CEI specialists have been Mechanical/Maintenance managers in refineries and have developed cost-effective T/A processes for major worldwide refining clients.
  - Civil/Mechanical/Materials consulting for Coker repairs/upgrades associated with T/A projects. CEI has a number of equipment specialists that have consulted on numerous refinery T/A projects, including Coker T/As.
  - Lift/Jacking planning and safety reviews for Coke Drum foundation repairs. CEI has industry-recognized specialists familiar with lift and jacking procedures and the industry practices required for the safe and efficient execution of major refinery T/A projects.
- Representative Experience
  - Carried out lift planning, safety/operability reviews and participated during the lifts for the repair of Coke Drum foundations at three refineries in the US Gulf Coast region.
  - Performed detailed engineering studies to define the expandability of a Fluid Coker unit for a major domestic refiner.
  - Participated in “Peer Review” of Fluid Coker unit T/A plans for a domestic refiner.
  - Performed finite element, thermal/mechanical analysis for existing coke drum leading to a replacement, slotted support skirt design to be installed during a T/A.

- Examples of CEI personnel experienced in Fluid Solids unit design, operation and T/A consulting activities
  - Steve Sparks: Resid Conversion and Delayed Coking Specialist who led the development of “Best Practices” in Delayed Coking for a major international integrated petroleum company. He was also recognized as the leading network contributor for very significant annual operating benefits improvements for the same international petroleum company.
  - Ralph Puente-Duany: Process consultant with exceptional background in Fluid Coking and FLEXICOKING. He participated in numerous designs, start-ups, revamps, turnarounds, and troubleshooting assignments at most of the existing Fluid Coking units.
  - Art Leitz: Process Operations/Turnaround Management specialist. Art combines operations, maintenance, and turnaround planning skills. He co-chaired a Turnaround Network which dealt with technology applications, turnaround management, and turnaround efficiency reviews for a major domestic refiner. He participated in turnarounds of many fluid solids units, including two FLEXICOKING units (i.e., a Fluid Coker with a Gasifier).
  - Walt Lambertin: Reliability and Maintenance specialist with expertise in refinery technical organizations, mechanical and technical procedures, and cost-effective work practices. As an ex-Worldwide Maintenance Manager for a major integrated petroleum company, he led an international team that re-engineered and implemented the maintenance practices circuit-wide (over 40 refineries).
  - Don Shaw: Mechanical Specialist with strong background in Fluidized-Solids units. Acted as a worldwide expert/technology leader for a major integrated petroleum company’s FCCU and Fluid Coker units. Participated in start-ups of four grass roots Fluid Coking units and one FLEXICOKING unit.
  - TH Chen: Mechanical Specialist with strong background in Delayed Coking Units and Fluidized Solids Units.
  - John Aumuller: Mechanical Specialist with extensive background in FCCU and Delayed Coking Units. Has extensive experience in the analysis of Delayed Coking Unit drums.
  - Rob Hontz: Project/Construction Management Specialist with emphasis in the areas of Heavy Lift/Jacking Plan development and execution.