



UTILITIES AND OFFSITES CONSULTING SERVICES



Carmagen Engineering – Where Experience Counts

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UTILITIES AND OFFSITES CONSULTING SERVICES

EXPERIENCE COUNTS: Carmagen’s staff has extensive, demonstrated expertise in performing technology assessments, feasibility studies, conceptual designs, process designs and procurement evaluations, and in project and construction management of projects supporting utilities and offsites.

Every plant requires Support Facilities to supply “utilities,” to distribute feedstocks, intermediates and finished products, and to discharge waste streams through balance of plant facilities sometimes referred to as “offsites.” These systems are designed to be a highly reliable and integrated part of the infrastructure.

UTILITIES AND OFFSITES SERVICES:

- Evaluate existing equipment or systems
- Develop master plans. (Aimed at supporting current/future major plant modifications, meeting future regulatory impacts, and budgeting/funding of utility and offsites system infrastructure.)
- Conduct conceptual design screening studies
- Prepare process/utility design packages

UTILITY TECHNOLOGY EXPERIENCE:

- Raw Water Treatment (Clarification, Chlorination, Filtration)
- Seawater Treatment (Desalination)
- Boiler Feedwater Treatment (Demineralization, Softening, Reverse Osmosis, Deaeration)
- Steam Generation and Distribution
- Condensate Recovery and Treatment (Polishing, Deaeration, Deoiling)
- Air Supply (Plant and Instrument Air Storage, Drying, Delivery, Distribution)
- Fuel Systems (Oil, Gas, Solids)
- Inert Gas Supply
- Cooling Water Systems (Open, Closed, Reduced Plume)
- Other Water Systems (Chilled Water, Electronic Grade, Water for Injection (WFI)-Pyrogen-free, Purified Water)
- Cold/Hot Oil Belt Systems
- Water Reuse/Recycle

<p>OFFSITES TECHNOLOGY EXPERIENCE:</p>	<ul style="list-style-type: none"> • Safety Relief Systems (Flares) • Storage (Tankage, Tank Farms, Local) • Loading and Unloading Facilities (Pigging) • Blending (In-line, In-tank) • Shipping (Jetty, Rail, Road) • Firewater • Interconnecting Piping • Refrigerant Systems • Materials Handling • Sulfur Storage, Handling and Shipping (Prilling) • Flushing Oil Systems • Chemical Handling and Distribution • Slop Systems
<p>TYPICAL PROJECTS PERFORMED BY OUR SPECIALISTS:</p>	<ul style="list-style-type: none"> • Prepared the basic design packages for all of the infrastructure support facilities at a downstream refinery in South America. Utility systems included water treatment (potable, fresh water – iron reduction, boiler feedwater, cooling tower makeup), steam generation, condensate recovery, refinery fuel gas pretreatment, plant and instrument air, inert gas distribution, closed and open cooling water systems including oil removal equipment. Offsite systems included two flare systems (normal and sulfur), tankage, loading/unloading facilities, in-tank blending, shipping, firewater, chemical handling, sulfur handling, coke handling, flushing oil, slops and interconnecting piping. • Developed a process design or revamp for utilities and offsite systems for an existing Singapore Lube Plant to produce new products. New equipment was designed that would operate in parallel with existing facilities. Systems included water treatment, condensate collection system, fuel systems, cooling water, tankage, wastewater treatment, flares, slop, firewater, chemical handling and blending. Considerable vendor contact was required to ensure compatibility of new equipment with existing systems and controls. • Prepared basic engineering design for the offsites and utility systems of a grass roots USA based silicon materials facility to operate at a design temperature of -40°F. Use of treated municipal wastewater was investigated as a possible source of plant makeup water supply. Prepared equipment specifications for electronic grade water production and cooling tower makeup and circulation systems.

**TYPICAL PROJECTS
PERFORMED BY OUR
SPECIALISTS, continued:**

- Prepared process design package including requisitions for utility and offsite equipment at a solid waste facility in Illinois. Utility systems included BFW treatment, steam generation, steam desuperheating, cooling water supply and distribution.
- Designed seawater treatment, cooling water distribution, steam generation, condensate return and plant/instrument air system at a middle-eastern refinery.
- Designed a new seawater intake station, desalination unit and distribution piping to increase the available once-through cooling water supply for a Caribbean refinery.
- Upgraded a refinery flare system to handle increased flare load capacity including staging of releases to multiple flares.
- Designed refinery tankage allocation and piping to handle increased product loading and shipping capability.
- Debottlenecked a plant air system generation and distribution system.
- Designed a feedstock and product storage and distribution system for a pharmaceutical production facility.
- Developed utility balances for steam and air generation and distribution systems for a pharmaceutical manufacturing plant.
- Developed utility balances, generation and distribution systems for a grass roots power generating station.
- Performed site investigation, heat balances and hydraulic studies to improve the cooling water system for an operating plant.
- Developed P&IDs for an operating plant to update piping system drawings for interconnecting piping between existing units and the offsite auxiliary systems.
- Developed systems to cogenerate power and steam for existing plants and new process plants.
- Prepared detailed hydraulic calculations for interconnecting steam, condensate and demineralized water piping between a power plant and a process plant for a cogeneration system involving these two plants located a few miles apart.
- Specified equipment and designed the distribution system for a refrigerated water facility for both a pharmaceutical plant and a silicon wafer facility.
- Specified equipment for ammonia and propane refrigeration systems.
- Designed a firewater supply and distribution system for a grass roots power plant.

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**Plant Operations
Support**

**Process -
Offsites**