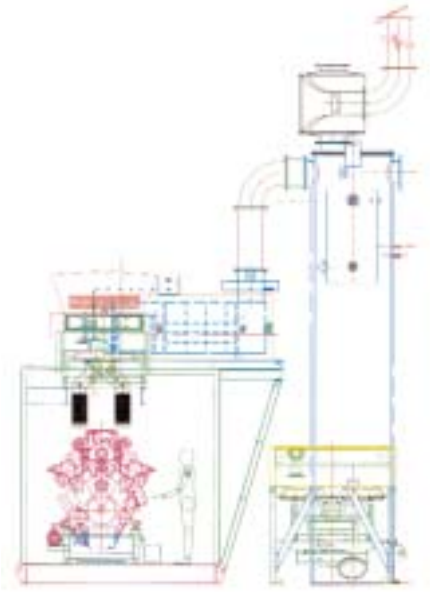
CSM Worldwide

Case History

# Southern California 1.0 MW COGEN Project
# Distributed Generation Power Project

## The Problem . . .

A major beverage manufacturer in Southern California needed reliable and economical electric and steam power as a utility to their production facility. Located in Southern California's South Coast Air Quality Management District (SCAQMD), the center of the most stringent environmental regulations worldwide, the COGEN facility was required to meet BACT for the SCAQMD, including rigorous air emission limits for NOx, CO & VOC. The problem of abating all three from the exhaust of a Guascor 560GLD, 1.0 MW, natural gas fired, reciprocating engine was solved by CSM Worldwide, Inc.



## The Solution . . .

The solution employed was the design, manufacture and installation of a custom CSM Model 25B-SCR/CO catalytic abatement system including Selective Catalytic Reduction (SCR) for the removal of NOx and catalytic oxidation for the destruction of CO and VOC. The uniquely designed catalytic system treats the exhaust from the lean burn Guascor 560GLD, 1.0 MW, natural gas fired, reciprocating engine.

Utilizing CSM's proprietary Real Time Ammonia Control System, the injection of ammonia is regulated to achieve a precise ratio of ammonia to NOx prior to the SCR catalyst. With this implementation of sophisticated technology, CSM Worldwide achieved NOx levels well below the regulated limit of 9 ppm, while maintaining an ammonia slip level well below 5 ppm.

CSM's custom Ammonia Injection Grid (AIG) was used for this "first of a kind" application; the engine exhaust is injected with anhydrous ammonia which is used as the reductant for the

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## Technical Specifications

**Application:** COGEN System

**Location:** Southern California - SCAQMD

**Power Production:** 1.0 MEGAWATT (MW)

**Prime Mover:** One (1) Natural Gas Fired Lean Burn Reciprocating Engines

**Engine(s):** One (1) Guascor 560 GLD Engine

**Controlled Emissions:** NOx, CO & VOC

**Performance:** < 9 ppm NOx
< 30 ppm CO
BACT for VOC

**Technology:** CSM's Catalytic Abatement System Selective Catalytic Reduction (SCR) with Catalytic Oxidation for CO

**Details:** 1. Real Time Ammonia ($NH_3$) Control
2. Engelhard SCR Catalyst (NOx)
3. Engelhard Oxidation Catalyst (CO & Ammonia)

SCR reaction, where NOx and $NH_3$ react across the SCR catalyst bed, converting to harmless $N_2$ and $H_2O$.

Applying technology that here-to-fore was available only in the largest and most sophisticated SCR systems employed in power utilities and chemical plants, CSM uniquely provides this technology for small scale COGEN and Distributed Generation (DG) facilities.

## The Result…

CSM achieves the highest of performance standards of less than 9 ppm of NOx, less than 30 ppm of CO and below current BACT VOC emission levels from the exhaust of this 1 MW, lean burn, natural gas fired, engine. By providing a “seamless solution” to the complex problem of integrating emission control and air permit compliance with the necessity of waste heat recovery through a highly efficient steam boiler, CSM Worldwide helped this facility to exceed all expectations.

COGEN system designers then focused on implementing other significant, energy recovery features resulting in an overall COGEN design which includes “Tri-Generation” or the concurrent production of electric power, steam and hot water for use at the site.

## For More Information:

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