

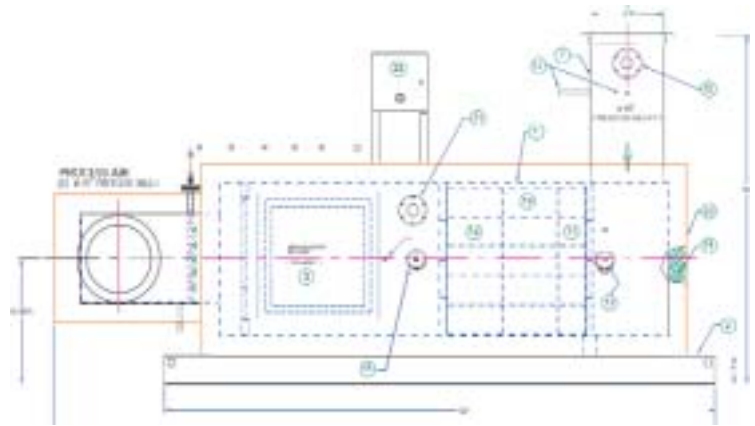
Northern California 1.0 MW COGEN Project Distributed Generation Power Project

The Problem . . .

A major manufacturer in Northern California needed reliable and economical electric and steam power as a utility to their production facility. Located in California, the home of the most stringent environmental regulations in the nation, the COGEN facility was required to meet rigorous air emission limits for both NO_x and CO. The problem of abating NO_x and CO from the exhaust of two Guascor 360GLD, 500 kW, natural gas fired, reciprocating engines was solved by CSM Worldwide, Inc.

The Solution . . .

The solution employed was the design, manufacture and installation of a custom CSM Model 28B-SCR/CO catalytic abatement system including Selective Catalytic Reduction (SCR) for the removal of NO_x and catalytic oxidation for the destruction of CO. The uniquely designed catalytic system simultaneously treats the exhaust from two lean burn Guascor 360GLD 500 kW, natural gas fired, reciprocating engines.



Utilizing CSM's proprietary Real Time Ammonia Control System, the injection of ammonia is regulated to achieve a precise ratio of ammonia to NO_x prior to the SCR catalyst. With this implementation of sophisticated technology, CSM Worldwide achieved NO_x 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 SCR reaction, where NO_x and NH₃ react across the SCR catalyst bed, converting to harmless N₂ and H₂O.

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.

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Technical Specifications

Application: COGEN System

Location: Northern California

Power Production: 1.0 MEGAWATT (MW)

Prime Mover: Two (2) Natural Gas Fired
Lean Burn Reciprocating Engines

Engine(s): Two (2) Guascor
360 GLD Engines

Controlled Emissions: NOx & CO

Performance: < 9 ppm NOx
< 30 ppm CO

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

Details: 1. Real Time Ammonia (NH₃) Control
2. Dual Engine Catalytic System
3. Engelhard SCR Catalyst (NOx)
4. Engelhard Oxidation Catalyst
(CO & Ammonia)

The Result...

CSM achieves a "first of a kind" solution by integrating a single, custom catalytic emission abatement system with two independent, lean burn, natural gas fired reciprocating engines used within a highly efficient COGEN system including multiple types of heat recovery.

The highest of performance standards were met by achieving less than 9 ppm of NOx and below 30 ppm of CO emissions in the combined exhaust of both engines. 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 single 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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