

Technology Aims To Control Emissions

By Al Pickett
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Even in these uncertain times, there appear to be at least three sure things in life: death, taxes and ever-lower air emissions standards. At least that is the way it must seem to manufacturers, packagers and operators of natural gas-fired compressor engines.

The first phase of the U.S. Environmental Protection Agency's multitiered New Source Performance Standards (NSPS) for stationary spark-ignited engines called for maximum emissions of 2.0 grams of nitrogen oxide (NOx), 4.0 grams of carbon monoxide (CO) and 1.0 grams of volatile organic compounds (VOCs) per horsepower-hour. Those standards were implemented in stages starting in July 2007, according to engine type (rich-burn versus lean-burn) and unit horsepower ratings.

The EPA will lower those requirements when a new tier of even lower emissions standards goes into effect in 2010-11 to 1.0 grams NOx, 2.0 grams CO and 0.7 grams VOCs. Those new mandates are scheduled to begin in July 2010 for 500 horsepower and larger engines and January 2011 for engines below 500 horsepower.

According to Clint Schroer, off-highway communications manager for Cummins Inc., one of the challenges manufacturers have faced is trying to hit moving targets in designing engine and emissions control technologies. "We are working as many as four or five years out to keep up with the emissions rules," he says. "The 2007-08 NSPS regulations were a quick turnaround, but the new tier of NSPS mandates that takes effect in 2010-

11 has been on the radar for a while, so we have been working toward meeting those levels for a while."

More Pressing Concern

But even as engine and equipment manufacturers work toward satisfying the new federal emission levels, the more pressing concern in many cases is localized rules adopted by state and municipal governments as well as standards for nonattainment areas (regions that do not meet one or more of the national ambient air quality standards for the criteria pollutants designated in the Clean Air Act), points out Rick Fisher, vice president of sales and marketing at Continental Controls Corporation.

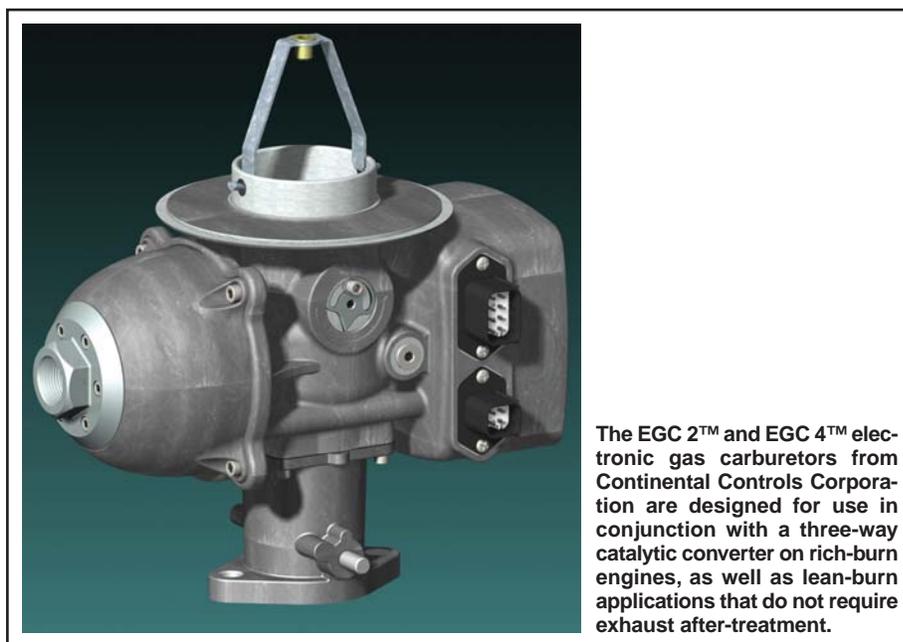
"In many cases, local standards are

even more stringent than the federal NSPS regulations," Fisher states. "So the first thing a compressor operator or packager has to do is decide what level of emissions he has to get to. That can be a lot easier said than done in many areas, where requirements continue to evolve at different levels of government."

That question is especially difficult to answer for rental fleet operators and large producers with compressor packages dispersed in producing regions across the country, Fisher adds.

EPA Certification

Whichever type of engine is selected, there is the issue of deciding whether to purchase a unit that has been certified by the EPA. According to Fisher, the manu-



The EGC 2™ and EGC 4™ electronic gas carburetors from Continental Controls Corporation are designed for use in conjunction with a three-way catalytic converter on rich-burn engines, as well as lean-burn applications that do not require exhaust after-treatment.



facturer is responsible for the setup and emissions performance of a certified engine, while the user has the responsibility for a noncertified engine.

“Unlike a noncertified engine, where the producer or fleet operator is responsible for emissions-site testing, the manufacturer is responsible for emissions control on a certified engine,” he says. “A certified engine is more expensive, and the user must do everything according to the manufacturer’s specifications, including routine maintenance such as changing spark plugs. If it does not, then the user becomes responsible.”

Electronic Carburetors

Purchasing or renting a new compressor package equipped with a state-of-the-art engine designed for NSPS compliance is one thing, but what about retrofitting the thousands of older units already in the field with new technology to meet tightening emissions targets? The good news for producers and rental fleet operators is that a number of component solutions

can be added to existing compressors to both reduce emissions and simultaneously enhance performance.

A case in point is two new models of electronic gas carburetors (EGCs) from Continental Controls Corporation, which Fisher says “simplify operators’ needs to meet emission requirements, increase fuel efficiency and reduce engine maintenance.”

According to Fisher, the electronic carburetors are designed for use in conjunction with a three-way catalytic converter on rich-burn engines, as well as lean-burn applications that do not require exhaust after-treatment. The EGC 2™ model is designed for gas engines up to 250 horsepower, while the EGC 4™ will work on engines from 250 to 500 horsepower (dual EGC 4s can be used on engines up to 1,000 horsepower).

“It is not unusual to realize significant fuel savings and other benefits such as lower exhaust temperatures, reduced maintenance and extended engine life from a lean-burn operation,” Fisher observes,

adding that Continental Controls defines lean-burn as an engine running greater than 4.0 percent oxygen in the exhaust. “What is unusual, however, and maybe even unprecedented, is being able to achieve emissions compliance without any additional exhaust after-treatment. By adding the EGC 2 or EGC 4, we are able to easily run at 7.0-8.0 percent oxygen in the exhaust, whereas the leanest a traditional carburetor may be able to run is 4.0-5.0 percent.”

On a rich-burn engine combined with a three-way catalyst, the carburetors can maintain emissions below 0.1 gram/horsepower-hour, according to Fisher. He says the EGC has a venturi mixer and an electronic pressure regulator that work together to provide precise air/fuel ratio control. “The wide-band oxygen sensor located in the engine’s exhaust stream continually maintains the desired air/fuel ratio for optimized performance, and onboard diagnostics notify the operator if there are any problems” he concludes. □

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