WRITTEN STATEMENT
OF THE
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION
ON THE
U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED
STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION
INTERNAL COMBUSTION ENGINES
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MECA is pleased to provide testimony in response to EPA's request for public comment on the Proposed Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. MECA believes an opportunity exists to significantly reduce emissions from new stationary compression ignition internal combustion engines. At the public hearings conducted in 2003 for EPA's Tier 4 nonroad diesel engine standards, MECA stated that emissions from nonroad diesel engines can be significantly reduced by utilizing an engineered systems approach that incorporated and combined advanced engine designs, advanced emission control technology, and very low sulfur fuel. MECA believes that this approach also can be applied to new stationary diesel engines to substantially reduce emissions from these engines. MECA believes that the general approaches recently used by the EPA to formulate emission reduction programs for highway heavy-duty diesel engines and nonroad diesel engines, requiring approximately 90% reductions in diesel particulate emissions and 90% reductions in NOx emissions versus engines certified without advanced emission control technologies, can be used as model for developing emission standards for new stationary diesel engines.

MECA is a non-profit association made up of the world's leading manufacturers of mobile source emission controls. MECA member companies have over 25 years of experience and a proven track record in developing and commercializing exhaust emission control technologies. A number of our members have extensive experience in the development, manufacture, and commercial application of emission control technologies for stationary engines.

TECHNOLOGICAL FEASIBILITY OF THE PROPOSED RULEMAKING FOR THE CONTROL OF AIR POLLUTION FROM COMPRESSION IGNITION STATIONARY ENGINES

Overview

MECA believes the proposed emission standards for stationary diesel engines, based largely on EPA's non-road diesel engine emission regulations, can be achieved in a cost-effective manner within the lead-time provided. Similar to programs finalized by EPA for on-road diesel engines in 2000 and non-road diesel engines in 2004, and as proposed by EPA for stationary diesel engines, achieving large reductions in particulate matter (PM), toxic hydrocarbons (HC), and oxides of nitrogen (NOx) emissions requires the use of very low sulfur diesel fuel (15 ppm maximum sulfur) in stationary diesel engines. Indeed, we anticipate that in response to a growing demand for low-emitting non-road and stationary engines, improved engine designs coupled with advanced particulate matter (PM), toxic hydrocarbon (HC), and oxides of nitrogen (NOx) emission control technologies will be available on some models of non-road engines in advance of the effective dates of the standards for use in those areas where 15 ppm sulfur diesel is available in advance of the 2010 fuel sulfur compliance deadline finalized for non-road diesel engines and proposed for stationary diesel engines.

Technologies to reduce diesel PM, such as diesel particulate filters and diesel oxidation catalysts, are commercially available today. In fact, the use of exhaust emission control technology for non-road diesel engines is not new. For over thirty-five years, non-road diesel engines used in the construction, mining, and materials handling industries have been equipped with exhaust emission control technology – initially with diesel oxidation catalysts (DOCs) and followed later by diesel particulate filters (DPFs). These systems have been installed on vehicles and equipment both as original equipment and as retrofit technology on over 250,000 non-road engines worldwide. These technologies have also been equipped on a variety of stationary diesel engines used for power production. The use of SCR technology for NOx control has already been commercially applied to these engines.

Technologies such as DPFs and NOx adsorbers, as well as the integration strategies being developed to meet the 2007/2010 heavy-duty on-road diesel engine standards and Tier 4 non-road diesel engine standards, can be applied to stationary diesel engines provided adequate lead-time is given. Also, SCR, which has been widely used on stationary engines and in some mobile source applications on a limited basis, is another possible NOx control option. Exhaust gas recirculation (EGR) technology, which is being used on highway HDEs and is being evaluated on non-road engines as a retrofit option, will also be an available option to help meet the proposed standards for stationary diesel engines. Finally, lean-NOx catalyst technology, which is an available retrofit technology for on-road HDEs, is a strategy that could be used to help meet the possible less stringent NOx standards being contemplated for several of the smaller engine categories of non-road and stationary diesel engines. A comprehensive list of references discussing the considerable progress in developing, optimizing, and applying advanced emission control technologies and strategies for reducing emissions from diesel engines can be found in *Diesel Emission Control: 2001 in Review*, SAE Paper No. 2002-01-0285 (2002 SAE Congress, Detroit), *Diesel Emission Control: 2002 in Review*, SAE Paper No. 2003-01-0039 (2003 SAE Congress, Detroit), and *Diesel Emission Control Technology: 2003 in Review*, SAE Paper No. 2004-01-0070 (2004 SAE Congress, Detroit). Emission control technology options for non-road diesel engines are also detailed in MECA's report "Exhaust Emission Controls Available to Reduce Emissions from Non-Road Diesel Engines" published in April 2003 and available on MECA's website at: www.meca.org.

PM, Toxic HC, NOx Emission Control Technology Capability and Experience for Stationary Diesel Engines

A number of advanced emission control technologies exist today to significantly reduce PM, HC, NOx and toxic emissions from diesel engines. These include DPFs, SCR, NOx adsorbers, lean NOx catalysts, EGR (exhaust gas recirculation), and DOCs. Crankcase emission control technologies will also be available to reduce crankcase emissions from these engines.

Diesel Particulate Filters (DPFs) – As noted above, DPFs are commercially available today. Over 200,000 on-road heavy-duty vehicles worldwide have been retrofit with DPFs and over one million new diesel passenger cars in Europe have been equipped with this technology since 2000. At least two engine manufacturers are already offering diesel engines for transit applications integrated with DPFs, with all heavy-duty engine manufacturers intending to include integrated DPFs with all new U.S. highway heavy-duty diesel engines starting in 2007 (to meet EPA's 2007 highway heavy-duty engine particulate standard of 0.01 g/bhp-hr). Engine manufacturers have also begun to include DPFs with new heavy-duty diesel engines in Japan to comply with Japan's 2005 heavy-duty particulate matter standard. In all cases these heavy-duty highway diesel engine applications in the U.S. and Japan will include active filter regeneration strategies to ensure that filter regeneration occurs under all engine operating conditions. In general these active regeneration strategies for highway diesel engine applications include advanced engine controls and/or diesel fuel injection strategies that serve to elevate filter temperatures to levels necessary to ensure regeneration occurs on the vehicle.

For nonroad engines, DPFs have been successfully installed and used on mining, construction, and materials handling equipment where vehicle integration has been challenging. These nonroad applications include the use of both passive and active filter regeneration strategies. Active nonroad DPF options include diesel fuel injection strategies, engine throttling strategies, the use of electrical heating elements, and fuel burners. Over 20,000 active and passive systems have been installed on nonroad applications as either original equipment or as a retrofit worldwide. Some nonroad filter systems have been operated for over 15,000 hours or over 5 years and are still in use.

Particulate filters, many employing active regeneration strategies such as fuel burners or electrical resistance heaters, have also been used on over 100 locomotives in Europe since the mid-1990s providing in excess of an 85 percent reduction in particulate matter (PM) emissions. Some of these systems have been operating effectively for over 650,000 kilometers. The European locomotive applications include DPFs installed on Caterpillar 3512 and 3516 engines powered at 1100 and 1500 kW, respectively. Currently, a DPF system is being installed on a 3000 kW diesel locomotive in Germany. Active DPF retrofit systems are also being evaluated in a railroad industry sponsored test program at Southwest Research Institute (San Antonio, TX) using a two-stroke, V-16 locomotive engine rated at 1490 kW @ 900 rpm. Active DPF systems have also been used in Europe on a limited number of commercial marine diesel engines including sight-seeing ships used on lakes in Switzerland.

Large stationary diesel engines used for both primary and back-up power generation have also been installed with DPF systems to control particulate emissions. Perhaps the most comprehensive information on the application of DPFs to stationary diesel engines can be found in the California Air Resources Board staff report issued in September 2003 to support ARB's air toxic control measure aimed at reducing particulate emissions from these engines (ARB staff report available at: www.arb.ca.gov/regact/statde/statde.htm). This report includes lists of DPF applications and reports on operating experience on large stationary engines in California. The California experience includes numerous DPF installations on large engines rated above 600 kW, including Caterpillar 3516 engines rated in the 1490-2120 kW range. Operating experience with these large engine DPF systems has been generally good with DPFs providing 85% or larger reductions in particulate matter compared to uncontrolled levels. More recently in July 2005 the California Energy Commission published a report detailing the emission performance of back-up diesel generators with a variety of power ratings equipped with exhaust emission controls including DOCs, passive DPFs, and active DPFs (this report is available at: www.energy.ca.gov/pier/final_project_reports/CEC-500-2005-049.html). The DPFs evaluated in this program were again found effective in reducing PM emissions by more than 85%

compared to uncontrolled baseline levels. Currently one manufacturer has been verified under ARB's diesel retrofit verification program with a DPF technology for stationary diesel engines. This DPF technology has been verified as a Level 3 technology (> 85% particulate matter reduction) for a wide range of diesel engines used in stationary applications covering model years from 1996 through 2003 engines. Additional verifications of retrofit DPF technologies for stationary engines are expected under this ARB program.

As part of their work on controlling particulate emissions from stationary diesel engines ARB has conducted a test program to evaluate a number of emission control technology options on a stationary engine. Some discussion of this test program is also included in ARB's staff report referenced above. Options evaluated included a passive DPF approach an active DPF approach utilizing electric resistance heaters. Both of these technologies were reported to reduce particulate emissions by more than 90% on a 2000 model year Caterpillar 3406C engine.

Where diesel fuel with <15 ppm sulfur is used, precious metal catalyst-based diesel particulate filters (CB-DPFs) have consistently demonstrated the capability to reduce PM emissions on a mass basis by up to 90 percent or more. In addition, this technology has proven effective in reducing the carbon-based PM by up to 99.9+ percent, while significantly reducing particle numbers over the full range of particle size, including ultra-fine particles. CB-DPF technology, has also demonstrated the capability to reduce a wide range of toxic hydrocarbon species and PAHs by up to 80 percent or more.

Particulate filter systems are emerging that are specially designed to provide exhaust flow turbulence and increased particulate residence time, and have achieved PM reductions in the 40 to 65+ percent range. These filter designs are often termed "open" filters to distinguish them from the high-efficiency, wall-flow type filters used most commonly in DPF retrofit applications or in future U.S. 2007-compliant, on-road heavy-duty diesel engines. A version of this "open" particulate filter technology is currently offered in Europe as a retrofit technology for reducing diesel particulate emissions from late model diesel passenger cars and being evaluated for heavy-duty diesel retrofit applications in the United States. A similar filter design is being evaluated for original equipment passenger car applications in Europe (see, e.g., *New Diesel Catalyst systems to Achieve European Legislation – Tested on a Volvo S60 Passenger Car*, 24th Vienna Motor Symposium, May 15-16, 2003, Vienna, Austria), and will be available from one European heavy-duty engine manufacturer on a Euro 4-compliant heavy-duty diesel engine. Other "open" filter designs have been verified by EPA and ARB for use as a diesel retrofit technology. An "open" filter design is also being developed by a different manufacturer for nonroad engine applications, including engines under 37 kW.

Diesel Oxidation Catalysts (DOCs) – DOC technology is available today and represents a cost-effective, interim PM control strategy. Over 250,000 nonroad vehicles and equipment, including mining vehicles, skid steer loaders, forklift trucks, construction vehicles, and stationary engines, as well as over 50,000,000 diesel passenger cars and over 1.5 million trucks and buses worldwide have been equipped with DOCs. Control efficiencies of 20-50% for particulate matter (PM), up to 90% reductions for CO and HC, including large reductions in toxic hydrocarbon species have been achieved and reported in tests of DOCs on a large variety of on-road and nonroad diesel engines. With respect to particulate emissions, the wide range of PM reductions observed with DOCs reflects the fact that DOCs oxidize soluble hydrocarbons associated with PM (the so-called soluble organic fraction [SOF] of PM). The SOF content of PM is related in part to the oil consumption characteristics of diesel engines.

Although the application of DOCs to stationary diesel engines is limited, the technology has been applied to some large, stationary diesel engines. An example of this is the installation of DOCs on an emergency generator in California in 2000. The engine is a Cummins KTA50-G9 rated at 1,650 kW. The DOC installed on this large diesel engine provides odor control as well as reducing PM, CO, and hydrocarbon emissions. Several other DOC installations on stationary engines or tests of DOCs on stationary engines are listed in the ARB staff stationary engine report referenced previously in discussing DPF experience. Oxidation catalysts have also been installed on ferries operating around Hong Kong and have been effective in reducing particulate emissions.

Selective Catalytic Reduction (SCR) Technology – SCR technology is a proven NOx control strategy. SCR has been used to control NOx emissions from stationary sources for over 15 years. More recently, it has been applied to select mobile sources including trucks, marine vessels, and locomotives. In 2005, SCR using a urea-based reductant is expected to be introduced on a large number of on-road diesel heavy-duty engines to help meet the Euro 4 heavy-duty NOx emission standards. SCR is also being given serious consideration by engine manufacturers for complying with future on-road heavy-duty diesel engine emission standards in both the U.S. and Japan (in the 2009-2010 timeframe). Applying SCR to diesel-powered engines provides simultaneous reductions of NOx, PM, and HC emissions. Since the mid-1990s, SCR technology using a urea-based reductant has been installed on a variety of marine applications in Europe including ferries, cargo vessels, and tugboats with over 100 systems installed on engines ranging from approximately 450 to 10,400 kW. These marine SCR applications include the design and integration of systems on a vessel's main propulsion engines and auxiliary engines. A smaller number of SCR systems have also been installed on diesel locomotives, largely in Europe.

SCR has also been combined with DPF technology to provide simultaneous large reductions in NOx and PM emissions as well as reductions in CO and hydrocarbon emissions. In California, a 300-ton gantry crane powered by a turbocharged, after-cooled diesel engine rated at 850 kW was equipped with such a combined emission system in 2001. The expected emission reductions were an 85% reduction of particulate matter and a 90% reduction in NOx. A few combined SCR/DPF systems have also been installed on stationary diesel engines used for power production including six Caterpillar 3516B engines operating in southern California. Volvo AB recently announced in the summer of 2004 the launch of 27 diesel transit buses in Sweden that are operating with a combined SCR/DPF system to reduce PM and NOx emissions below the European Euro 5 heavy-duty emission limits that do not come into force until 2008. A number of small test fleets of heavy-duty over-the-road diesel vehicles are also operating within the U.S. to demonstrate the capabilities of combined PM and NOx control using SCR and DPFs. DOE's (U.S. Department of Energy) APBF-DEC program includes the evaluation of two different combined SCR/DPF systems on a 12 liter heavy-duty diesel engine. Results on this program were reported at the 10th Annual DEER (Diesel Engine Emission Research) Conference during the week of August 29, 2004. These results included the operation of these two different SCR/DPF systems for 2000 hours of durability with emission performance near the EPA 2010 heavy-duty on-road emission limits. A final report on this APBF-DEC project is expected in late 2005 detailing the performance of these SCR/DPF systems through 6000 hours of engine aging.

NOx Adsorber Technology – MECA believes that NOx absorber technology will also be an available NOx control strategy to help reduce NOx emissions from stationary diesel engines.

NOx adsorber catalysts are currently being used commercially in light-duty gasoline direct injection (GDI) engines sold in Europe and Japan. This technology continues to undergo extensive research and development in preparation for the U.S. 2007/2010 on-road heavy-duty and Tier 4 nonroad diesel engine requirements. The progress in developing and optimizing this technology has been extremely impressive. Indeed, the Clean Diesel Independent Review Panel, charged by EPA to assess the technological progress in meeting the 2007/2010 standards, concluded in latter part of 2002, that NOx adsorber technology development was on track to help meet the on-road heavy-duty engine standards and no technological roadblocks were identified. The recent EPA *Highway Diesel Progress Review Report 2* (March 2004) also summarizes recent results from the DOE APBF-DEC program that demonstrate the ability of a NOx adsorber/DPF system to maintain 90% NOx efficiency on a heavy-duty diesel engine for more than 1500 hours of operation. Information presented at DOE's 10th Annual DEER Conference during the week of August 29, 2004 updated information on this heavy-duty NOx adsorber/DPF system test program and showed that this 90% NOx efficiency level was maintained through 2000 hours of durability including numerous high temperature desulfation events.

The current focus of NOx adsorber technology development and optimization is on: 1) expanding the operating temperature window in which the technology will perform, 2) improving the thermal durability of the technology, 3) improving the desulfurization methods and performance, and 4) improving system packaging and integration. The progress being made in these areas continues to be impressive. In light-duty applications, several automobile manufacturers are conducting in-vehicle tests with NOx adsorber/DPF systems (see for example, SAE Paper No. 2004-01-1791 for EPA's emission tests of prototype vehicles equipped with NOx adsorber/DPF systems) and one manufacturer has introduced a diesel-powered passenger car in Europe and a diesel-powered light-duty truck in Japan with a combined NOx adsorber/DPF system in late 2003.

Low-Pressure EGR – This technology is being successfully demonstrated in retrofit applications on trucks, buses, and other applications. Over 2000 systems are running worldwide. Low-pressure EGR has demonstrated a NOx control capability in the range of 30 to 60 percent. ARB recently verified a low-pressure EGR/DPF system with 40% NOx reduction for a range of on-road diesel engines. With an active DPF and <15 ppm sulfur diesel, NOx control levels as high as 80 percent may be achievable. Current experience with low-pressure EGR is in the 140-330 kW range, with a new larger EGR valve now being offered to cover diesel engine applications up to 750 kW. Low-pressure EGR systems are currently being developed for stationary diesel engines rated at up to 2200 kW.

Lean NOx Catalyst (LNC) Technology – This technology has been verified by the California Air Resources Board (25 percent NOx control) for specific on-road diesel retrofit applications. This technology, which is being used in combination with both DPFs or DOCs, is being also demonstrated and commercialized for a variety of non-road applications, including heavy-duty earthmoving equipment, locomotives, agricultural pumps, and portable engines.

Crankcase Emission Controls – Crankcase emissions from diesel engines can be significant and can be controlled by the use of a multi-stage filter designed to collect, coalesce, and return the emitted lube oil to the engine's sump. Filtered gases are returned to the intake system, balancing the differential pressures involved. Typical systems consist of a filter housing, a pressure regulator, a pressure relief valve and an oil check valve. These systems have the capability to virtually eliminate crankcase emissions. This technology is currently being used in

Europe on new engines as well as the United States on a retrofit basis. Closed crankcases with filtration systems will be required on new heavy-duty on-road and non-road diesel engines as part of EPA's regulatory programs covering these applications. Although not specifically discussed in EPA's proposal covering diesel stationary engines, MECA assumes and recommends that stationary diesel engines would and should also be required to control crankcase emissions.

THE NEED FOR LOW SULFUR DIESEL FUEL

15 ppm Sulfur Limit

The adverse impacts of sulfur in diesel fuel on catalyst-based diesel particulate filters and NOx adsorbers is now clearly established and is well documented in the EPA on-road and non-road diesel emission programs. As is the case with meeting the 2007/2010 on-road HDE standards and the Tier 4 non-road standards, <15 ppm diesel sulfur fuel is absolutely essential for meeting EPA's proposed PM standards for stationary diesel engines rated from 25 to >750 hp.

Sulfur affects precious metal catalyst-based diesel particulate filter performance by inhibiting the performance of catalytic materials upstream of or on the filter. This phenomenon not only adversely affects the ability to reduce emissions, but also adversely impacts the capability of these filters to regenerate – there is a direct trade-off between sulfur levels in the fuel and the ability to achieve regeneration. Sulfur also competes with chemical reactions intended to reduce pollutant emissions and creates particulate matter through catalytic sulfate formation. The availability of very low, <15 ppm sulfur fuel will enable these filters to be designed for improved PM filter regeneration and emission control performance, as well as to minimize any increase in sulfate emissions. Indeed, diesel fuel containing <15 ppm sulfur is required to ensure maximum emission control performance on the broadest range of diesel stationary engines possible.

Diesel fuel with less than 15 ppm sulfur is absolutely essential to commercializing NOx adsorber systems that can function effectively both for on-road, non-road, and stationary diesel engine applications. At higher sulfur levels, a NOx adsorber quickly becomes ineffective as the sulfur attaches to the sites meant to "trap" the NOx. The sulfur remains attached to these sites until high temperature, rich conditions, which are not characteristic to normal diesel engine operation, are met.

Also, while a sulfur regeneration mode or desulfurization cycle will need to be employed in any case, the frequency of desulfurization must be kept to a minimum to avoid substantial fuel economy penalties and perhaps a degradation of the NOx adsorber performance that, in turn, will require an even more frequent desulfurization. As the sulfur level increases, the frequency, as well as the severity, of regenerations needed increases.

The effectiveness of other NOx control technologies, such as SCR and lean NOx catalyst technology, that may play a role in reducing emissions from stationary diesel engines would greatly benefit from the use of <15 ppm in terms of improved emission control performance and minimization of the sulfate formation when precious metals are used. Finally, while DOC technology will function effectively with <500 ppm fuel, the availability of 15 ppm will improve overall catalyst PM control efficiency by reducing the sulfate production and will enable the utilization of more active catalyst formulations that could provide greater reductions in toxic HC and the soluble organic fraction (SOF) of the PM emissions.

MECA supports the proposal of extending the 15 ppm sulfur limit to diesel fuel sold for use by all stationary diesel engines, including engines with a displacement of 30 liters per cylinder or more. We believe with the availability of 15 ppm sulfur fuel and with adequate lead-time significant emission reductions from stationary diesel engines could be achieved using advanced emission control technology.

COSTS

History has shown that advanced emission control technologies have been applied to a wide variety of mobile source applications in a cost-effective manner. Indeed the cost of meeting new, stricter emission requirements has always been less than initially anticipated. We believe that new strict emission standards for stationary engines will also be met in a cost-effective manner given adequate lead-time. MECA and its members have provided catalyst cost estimates to EPA for DOCs, DPFs, and SCR catalysts as part of their on-road and non-road diesel engine rulemaking process. MECA believes that the EPA cost estimates included in the Regulatory Impact Analysis for both the on-road and non-road diesel engine regulatory programs are in a reasonable range.

ARB in their stationary engine staff report referenced previously, estimated costs for a DPF on a stationary diesel engine rated at 440 kW to be $22,400.00 for equipment and installation (approximately $50/kW). DOC costs for a similarly sized stationary engine were estimated to be $6150.00 (about $14/kW). In a July 2002 report a CALSTART study sponsored by DOE, the Gas Technology Institute, and the Department of Transportation (DOT) evaluated various options for reducing emissions from passenger ferries operating in the San Francisco Bay Area. Included in these options were equipping EPA Tier 2 compliant engines with a catalyst-based DPF, with SCR, and with a combined SCR/DPF system (DPF operating at 90% PM reduction efficiency, SCR operating at 80% NOx reduction efficiency). The estimated installed costs from this study were $20/kW for the DPF option, $71/kW for the SCR option, and $91/kW for the combined SCR/DPF option. Current large-scale commercial marine SCR-only applications in Europe are in the $22-$45/kW range.

SPECIFIC COMMENTS RELATED TO THE PROPOSED EMISSION STANDARDS FOR VARIOUS ENGINE CATEGORIES

Engines < 75 hp – MECA supports the EPA position that the results of the planned 2007 non-road diesel engine technology review focused on these smaller diesel engines should apply to stationary diesel engines as well. MECA believes some very promising technologies are emerging that could be applied to smaller non-road and stationary diesel engines to provide meaningful PM, NMHC, and NOx emission reductions at a reasonable cost with good performance. These technologies include such concepts as "open" DPFs and lean NOx catalyst discussed above.

Non-generator, stationary engines with hp > 750 – MECA believes that NOx standards for non-generator, stationary engines with horsepower ratings > 750 should be equivalent to

NOx standards proposed for generators. SCR systems have already been installed on stationary engines in this size range and can provide high efficiency NOx reductions in a cost effective manner. MECA believes that installation issues with SCR on non-generator engines are no different than those associated with generator engines.

Engines with displacements between 10 and 30 liters per cylinder – MECA supports the EPA position that a review of proposed standards for these stationary diesel engines should be done once EPA promulgates new emission standards for diesel marine engines, including diesel marine engines in this displacement range. MECA believes that exhaust emission control technologies targeted for use to comply with EPA's Tier 4 non-road diesel engine program have applicability on marine and stationary diesel engines in this size range.

CONCLUSION

While we recognize that reducing emissions from stationary diesel engines present engineering challenges, we also believe these challenges can and will be met. Our industry has successfully provided cost-effective emissions control technologies for over 25 years and believes that cost-effective, high performance solutions can be found for stationary diesel engines. The key will be to employ the same systems approach on stationary diesel engines that was identified by EPA in their on-road and non-road diesel engine emission programs: combining advanced engine designs, advanced emission control technology, and low sulfur diesel fuel. Our industry is committed to do its part to ensure that, if the proposed stationary diesel engine emission standards and diesel sulfur limits are adopted, the desired emission reductions will be achieved at a reasonable cost and with very good performance.

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