

**STATEMENT OF THE
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION
ON THE IMPACTS OF THE ECONOMY ON THE AIR RESOURCES BOARD'S
REGULATIONS COVERING IN-USE ON-ROAD DIESEL TRUCKS/BUSES AND IN-
USE OFF-ROAD DIESEL-FUELED FLEETS**

December 9, 2009

MECA is pleased to provide comments on the impacts of the current economic recession on ARB's regulations covering in-use on-road diesel trucks and buses, and in-use off-road diesel vehicles. MECA members are committed to continue to develop and verify the VDECS technologies that will be needed to meet the emission reduction targets by the implementation date of this regulation in 2010.

MECA is a non-profit association of the world's leading manufacturers of emission control technology for motor vehicles. Our members have over 35 years of experience and a proven track record in developing and manufacturing emission control technology for a wide variety of diesel and gasoline on-road and off-road vehicles and equipment. A number of our members have extensive experience in the development, manufacture, and application of PM and NOx control retrofit technologies including a majority of the devices on ARB's verified technology list.

The ARB Diesel Risk Reduction Plan, including regulations adopted by the Board to reduce emissions from in-use trucks, buses, and off-road equipment, are critically important to meeting the state's federally mandated air quality requirements and provide significant health care benefits for the residents of California (estimated by ARB to be equal to a large multiple of the estimated costs of compliance with the regulations). These ARB diesel risk reduction regulations also provide a significant climate change co-benefit associated with the large reductions in black carbon emissions that are a major component of diesel particulate matter emissions from mobile sources. Black carbon's contribution to climate change is viewed by many leading climate experts (including Dr. Mark Jacobson of Stanford University, Dr. V. Ramanathan of the Scripps Institute at the University of San Diego, and Dr. Charles Zender of the University of California - Irvine) as second only to carbon dioxide. In addition, these ARB diesel emission regulations are helping to push California into a sustainable green economy by retaining and creating jobs associated with the diesel exhaust emission control technologies that MECA member companies and others have developed, verified for their performance and durability (e.g., using the available ARB diesel retrofit verification requirements), and are now manufacturing in California and elsewhere in North America.

Today's economic environment has put a significant strain on businesses of all sizes including manufacturers of retrofit technologies. Our members have invested and continue to invest significant resources in developing and verifying diesel retrofit technologies for the whole range of in-use diesel engines currently operating in California, including on-road, off-road, and stationary sources. A survey of our members conducted in late 2008 shows that our industry contributes over 65,000 green jobs around the country including more than 1,000 jobs in

California. These jobs include technical and service personnel responsible for developing, installing and maintaining diesel retrofit devices.

An independent economic analysis completed in early 2009 (available on MECA's diesel retrofit website, www.dieselfretrofit.org, under "Useful Documents") translates investments in clean diesel vehicles and diesel retrofit technologies into jobs associated with manufacturing, sales, installation, and maintenance of advanced emission control technologies. Every million dollars spent on diesel retrofit technology creates or preserves about 21 jobs, and every million dollars spent on replacing older vehicles and equipment with newer clean diesel vehicles creates or preserves about 15 jobs.

As an example, ARB's projected annual compliance costs for their diesel truck and bus regulations that were adopted in December 2008 are approximately \$1.25 billion in the early compliance years when significant numbers of trucks and buses will need to either install verified retrofit technologies or be replaced by new clean diesel vehicles. That translates to about 21,000 jobs that will be saved or created to manufacture, install, and maintain the clean diesel retrofit and vehicle emission control technologies associated with this single ARB regulation. Many of these jobs will be in California. End users that have to comply with ARB's various diesel risk reduction regulations can make use of federal economic stimulus funds, state incentive funds and loan programs to help pay for clean diesel technologies and vehicles that comply with these regulations. These investments in clean diesel technologies and vehicles, in turn, create jobs in California.

New diesel emission control products continue to be added to ARB's list of verified retrofit technologies. The number of VDECS suitable for off-road vehicles has more than doubled in the past 18 months, including four passively regenerated Level 3 DPF devices. Manufacturers are expected to verify even more passive and active filter technologies in the coming year for on-road and off-road applications to further expand the options available to fleet owners to comply with ARB's requirements. Recently one manufacturer has verified a Level 3 DPF + 40% NO_x reduction technology based on HC-SCR/ Lean NO_x catalysts for off-road applications. Several manufacturers are closely engaged in verifying urea-SCR retrofit technology with ARB for both on-road and off-road applications, and these efforts should lead to additional commercial, verified NO_x reduction retrofit technologies. Beginning in January of this year, tighter regulations on retrofit technology require lower NO₂ emission from retrofit devices. In order to obtain a plus designation, a PM retrofit device can emit no more than 20% higher NO₂ than the baseline engine-out emissions. Manufacturers have made significant investments in re-verifying retrofit PM reduction technologies to the plus designation to comply with this change in regulation. Manufacturers of retrofit technologies need regulatory stability in California in order to continue to make the necessary investments needed to support ARB's Diesel Risk Reduction Plan. ARB also needs to continue to provide adequate resources to their diesel retrofit verification program in order to ensure that verified technologies have an efficient pathway to reach the California marketplace.

Demonstration projects such as the off-road showcase, supplemental environmental projects (SEPs), and a variety of on-road and off-road retrofit demonstrations in California and across the country are an essential part of the verification process. The showcase alone

represents 24 new retrofit devices that are in the process of being verified. Local Law 77 in New York City is responsible for putting retrofit devices on a wide variety of city-owned and contracted construction equipment. For example, the Croton Water Treatment Project in North Bronx, NY, successfully installed PM and NO_x control devices (including passive and active DPFs) on over 30 pieces of construction equipment, including excavators, bulldozers, backhoes, and cranes. For example, an SCR+DPF system was installed on a 170 hp John Deere compressor engine at the Croton site. Over 50,000 active and passive DPF retrofit systems have been installed worldwide on off-road applications. More than 20,000 of these filters have been successfully employed in Europe on construction equipment used in tunneling projects. The durability and performance of PM control technologies is being demonstrated on OEM on-road applications beginning with the 2007 model year. Since 2007, nearly every new diesel vehicle sold in the U.S. or Canada has been equipped with a high efficiency diesel particulate filter to comply with the U.S. EPA's 2007/2010 on highway regulations. This represents over 800,000 new trucks operating on DPFs mostly in the U.S. In 2010 the same new highway trucks will be required to reduce NO_x emissions by 90% relative to pre-2007 requirements and will be equipped with NO_x control technologies such as lean NO_x trap catalysts, urea-SCR catalysts and high flow EGR systems.

For over 30 years, off-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, including construction and mining equipment where vehicle integration has been challenging. An important requirement for installing emission control technology on off-road equipment is to ensure that the device can withstand the vibration and/or extreme operating conditions that the vehicles experience in every day use. Emission control technology can be designed, installed, and operated to provide effective, reliable, and durable performance under these extreme conditions. This has been demonstrated by the particulate filter systems that have been used in underground mining applications for over 15,000 hours in rugged work environments and continued to provide effective emission reduction performance. A 2003 survey (SAE Paper 2004-01-0076) of 3,848 construction retrofit installations from 2001 to 2003 in Europe found a failure rate of 1-2 percent. The failures were identified as a combination of fuel/lubricant, operator, and product issues, which have been addressed through further product improvements.

Despite the ever growing experience base with off-road retrofit devices, the diversity in design and duty cycle of off-road applications pose engineering challenges and special requirements. Proper integration of emission control technology on off-road vehicles and equipment is important for three reasons: 1) to ensure the system is installed at the appropriate place in the exhaust system to optimize effectiveness, 2) to ensure the system physically fits in the available space and minimizes the impact on operator visibility, and 3) to ensure safe operation of the vehicle and safety to the operator. Safety is an essential component of the engineering and installation of retrofit emission control devices. Over 30 years of experience in integrating emission control technologies on a variety of diesel and spark-ignition vehicles and equipment ranging from <25 hp to over 750 hp provides a clear indication that emission control technology can be successfully integrated on a wide range of vehicles to meet ARB's proposed

standards and ensure the safety of the vehicle operator and others. In addition, exhaust emission control technology has been integrated on to vehicles to address special operating concerns and environments. For example, where equipment is used in explosive operating environments, such as underground coal mines, emission control technology has been designed to meet special surface temperature requirements. Surface temperature measurements conducted by MECA members have demonstrated that DPF surface temperatures are no higher than those measured on OEM mufflers and in some cases actually lower. As for OEM installed mufflers, surface temperature issues are often addressed by the use of heat shielding in cases where vehicle operators or maintenance personnel may inadvertently come in close proximity to hot surfaces. In certain instances, international standards have also recognized that the use of mirrors and CCD cameras can be successfully used on off-road equipment to ensure adequate operator visibility.

MECA and our members are actively involved with ARB staff to further clarify criteria used in granting exemption from retrofit requirements for applications or installations deemed to be unsafe. Having a well defined review process in place ensures that implementation of the proposed regulations are accomplished with minimal administrative delays or judgments. We look forward to working with Cal/OSHA, ARB and interested stakeholders to develop effective and realistic amendments to the California Code of Regulations that will serve to ensure that modifying construction equipment with VDECS is done with consideration to the safe operation of the vehicle, the operators and workers on construction sites.

A safe work environment must also consider the hazards associated with the ambient air quality at the work site. A 2004 study conducted in the Northeastern United States at five construction sites measured air quality at the perimeter of the site and within the cab of construction equipment. Analysis of measurement results found that construction workers were exposed to up to 16 times more PM_{2.5} than the average ambient level outside the construction site and peak concentrations during active work may present acute health risks to workers and nearby residents. When averaged over 24 hours, in cabin measurements of PM_{2.5} were shown to exceed the National Ambient Air Quality Standard (NAAQS) by 4-6 times. The study also found elevated levels of benzene, 1,3-butadiene, formaldehyde, acetaldehyde and heavy metals commonly found in diesel fuel and lubricants. The levels of some of these compounds exceeded the 8-hour exposure limit established by the American Conference of Governmental Industrial Hygienists or ACGIH. The catalysts and filters that are components of Level 2 and 3 VDECS are designed to substantially remove these pollutants and air toxics from diesel exhaust and in effect serve as engineering controls for a safer work environment on construction sites.

We commend the Air Resources Board for its continuing efforts to provide the people of California with healthy air quality and for demonstrating true leadership in their Diesel Risk Reduction Plan that will significantly reduce PM and NOx emissions from in-use, off-road and on-road diesel vehicles operating in the state. We urge the Board to remain vigilant on any attempts to stay or delay the overall goals of ARB's various in-use fleet rules or ARB's broader Diesel Risk Reduction Plan. These important emission reductions strategies not only protect the health of all the citizens of California but also provide an important source of economic growth and green jobs for the state. We also wish to thank the ARB staff for its willingness to work

closely with all interested parties throughout the regulatory process. Our industry pledges its continued support and commitment to do its part to help achieve the goals of these regulations.

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