UPDATED INFORMATIVE DIGEST

REGULATION FOR IN-USE OFF-ROAD DIESEL VEHICLES

Sections Affected: Adoption of Section 2449; 2449.1; 2449.2; 2449.3, title 13, California Code of Regulations (CCR).

Background

Health and Safety Code (HSC) sections 43013(b) and 43018 provide broad authority for the Air Resources Board (ARB or Board) to adopt emission standards and other regulations to reduce emissions of toxic air contaminants (TACs), and other air pollutant emissions from vehicular and other mobile sources. Under HSC sections 43013(b) and 43018, ARB is directly authorized to adopt emission standards for off-road vehicular sources, as expeditiously as possible, to meet state ambient air quality standards. ARB is further mandated by California law under HSC section 39667 to adopt Airborne Toxic Control Measures (ATCMs) for new and in-use vehicular sources, including off-road diesel vehicles, for identified TACs, such as diesel PM.

Over 90 percent of Californians breathe unhealthful air at times. To improve air quality and human health, ARB establishes requirements to reduce emissions from new and in-use motor vehicles and engines, as well as other sources. Since 1992, ARB has adopted a series of regulations to reduce emissions from off-road vehicles. These regulations require that new 1996 and subsequent model year off-road compression-ignition (diesel) engines comply with increasingly stringent emission standards. The United States Environmental Protection Agency (U.S. EPA) has established similar regulations for new off-road engines in the same time frame. On December 9, 2004, the Board adopted a fourth phase of emission standards (Tier 4) that are nearly identical to those finalized by U.S. EPA on May 11, 2004, in its Nonroad Diesel Rule.[1] Starting in 2011, engine manufacturers will be required to meet aftertreatment-based exhaust standards for particulate matter and NOx that are more than 90 percent lower than current standards, putting off-road engines on a virtual emissions par with on-road heavy-duty diesel engines. However, significant opportunities exist to further reduce emissions from the nearly 180,000 in-use off-road vehicles that operate in the State.

Control of Toxic Air Contaminants

California's Air Toxics Program, established under California law by Assembly Bill 1807 (Stats. 1983, Ch. 1047) and set forth in HSC sections 39650 through 39675, mandates the identification and control of air toxics in California. The identification phase of the Air Toxics Program requires ARB, with the participation of other state agencies, such as the Office of Environmental Health Hazard Assessment, to evaluate the health impacts of,

[1] ARB's emission standards for new off-road compression ignition engines are codified at title 13, CCR, sections 2420-2427. U.S. EPA's final Nonroad Diesel Rule is set forth at 69 FR 38958 (June 29, 2004). The California term "off-road" and the federal term "nonroad" refer to the same sources and are used interchangeably.

and exposure to, various substances and to identify those substances that pose the greatest health threat as TACs. The ARB's evaluation is made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under HSC section 39670. Following ARB's evaluation and the SRP's review, the Board may formally identify a TAC at a public hearing. Upon identification, HSC sections 39658, 39665, 39666, and 39667 require ARB, with the participation of the air pollution control and air quality management districts (districts), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance and to adopt ATCMs.

In 1998, the Board identified diesel PM as a TAC with no Board-specified threshold exposure level. A needs assessment for diesel PM was conducted between 1998 and 2000, which resulted in ARB staff developing and the Board approving a Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel RRP) in 2000. The Diesel RRP presented information that identified the available options for reducing diesel PM and recommended regulations to achieve further reductions. The scope of the Diesel RRP was broad, addressing all categories of engines, both mobile and stationary, and included control measures for private and public fleets of off-road diesel vehicles, such as those covered by the proposed regulation. The ultimate goal of the Diesel RRP is to reduce California's diesel PM emissions and associated cancer risks from 2000 baseline levels by 85 percent by 2020.

Attainment of Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires U.S. EPA to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health, including fine particulate matter (PM2.5) and ozone. Set to protect public health, the NAAQS are adopted based on a review of health studies by experts and a public process. Ambient PM2.5 is associated with premature mortality, aggravation of respiratory and cardiovascular disease, asthma exacerbation, chronic and acute bronchitis and reductions in lung function. Ozone is a powerful oxidant. Exposure to ozone can result in reduced lung function, increased respiratory symptoms, increased airway hyper-reactivity, and increased airway inflammation. Exposure to ozone is also associated with premature death, hospitalization for cardiopulmonary causes, and emergency room visits for asthma.

Areas in the State that exceed the NAAQS are required by federal law to develop State Implementation Plans (SIPs) describing how they will attain the NAAQS by certain deadlines. NOx emission reductions are needed because NOx leads to formation in the atmosphere of both ozone and PM2.5; diesel PM emission reductions are needed because diesel PM contributes to ambient concentrations of PM2.5. Currently, the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD) have submitted to U.S. EPA SIPs which demonstrate attainment of the federal 8-hour ozone standard by 2024. To attain the federal ozone standard, NOx reductions of nearly 90 percent (from 2006 levels) are

needed in the SCAQMD, while NOx reductions of about 80 percent are needed in the SJVAPCD.

With respect to the federal PM2.5 standard, the SCAQMD has submitted a SIP which demonstrates attainment of that standard by 2014, but only after achieving emission reductions of nearly 55 percent in NOx and 15 percent in PM2.5, from 2006 levels. The SJVAPCD is in the development phase of a PM2.5 SIP, which is also expected to demonstrate attainment of the federal PM2.5 standard by 2014. ARB and SJVAPCD staffs estimate that to attain the federal PM2.5 standard, NOx emissions will need to be reduced by 50 percent, and PM2.5 emissions will need to be reduced by 25 percent.

Emission Reductions and Projected Public Health Benefits

The regulation will significantly reduce emissions of diesel PM from in-use off-road diesel vehicles. Diesel PM emission reductions are needed to reduce the premature mortality, cancer risk and other adverse impacts from exposure to this TAC. The regulation will achieve the 2020 goal set forth in the 2000 Diesel RRP of reducing the risk associated from diesel PM by 85 percent from 2000 baseline levels. Staff projects that the regulation will reduce in-use off-road vehicle diesel PM emissions from the 2000 baseline by 36 percent in 2010 and 92 percent in 2020.

The regulation will also reduce diesel PM and NOx emissions that contribute to exceedances throughout the State of the NAAQS for both PM2.5 and ozone. In 2020, the regulation is expected to reduce diesel PM emissions by 5.1 tons per day and NOx emissions by about 47 tons per day statewide, which represents a 73 percent reduction in diesel PM and a 31 percent reduction in NOx from emission levels anticipated in the absence of the regulation. These reductions are critical in meeting the emission reduction commitments contained in the SCAQMD and the SJVAPCD SIPs.

The cumulative emission reductions from the regulation are expected to prevent 4,000 premature deaths.

Although some actions required by the regulation will result in a fuel economy penalty, slightly increasing carbon dioxide (CO_2) greenhouse gas emissions, other actions required by the regulation will reduce idling, increase the use of electric vehicles, and reduce emissions of black carbon (a likely contributor to global warming), and are expected to offset any fuel penalty effect and will have no global warming effect.

Description of the Regulatory Action

Applicability

The fleet requirements of this regulation apply to any person, business, or government agency who owns vehicles with affected engines in California. Affected engines include diesel-fueled engines with a maximum power of 25 horsepower (hp) or greater that are

used to provide motive power in a workover rig or to provide motive power in any other motor vehicle that (1) cannot be registered and driven safely on-road, and (2) is not an implement of husbandry or off-highway vehicle (recreational). The proposed regulation only addresses engines that drive self-propelled vehicles (i.e., it does not apply to stationary equipment or portable equipment like generators).

Industries such as construction, mining, landscaping, airlines, retail, wholesale, equipment rental, ski, oil and gas drilling, recycling, utilities, telephone and cable, and many others will be subject to the regulation. Government agencies engaged in road maintenance, park maintenance, and other activities that operate covered vehicles will also be affected.

The regulation contains different requirements for fleets of differing sizes. A fleet consists of one or more vehicles. Fleets are defined in the regulation as either small, medium, or large. Small fleets include: (1) fleets with total horsepower of less than or equal to 2,500 hp; and (2) all fleets in low population county local municipalities irrespective of total horsepower. Medium fleets are defined as those with total horsepower less than or equal to 5,000 hp that are not small fleets. Large fleets are defined as those with total horsepower greater than 5,000 hp. All state and federal agencies are considered large fleets.

The proposed regulation also imposes requirements on sellers of new and in-use vehicles to disclose the regulation's potential applicability to buyers of the vehicles.

Fleet Requirements

In general, the regulation requires owners to modernize their fleets by replacing engines with newer, cleaner ones (repowering), replacing vehicles with newer vehicles equipped with cleaner engines, retiring older vehicles, operating higher emitting vehicles less often (designating them as low-use vehicles) or by applying exhaust retrofits that capture and destroy pollutants before they are emitted into the atmosphere.

The regulation establishes fleet average emission rate targets for both diesel PM and NOx. By the applicable compliance date each year, the regulation requires each fleet to demonstrate that it meets either the fleet average emission rate target for diesel PM or that it has applied the highest level verified diesel emission control system (VDECS) to 20 percent of the total horsepower of its fleet in the past year. The highest level VDECS is only required if a system has been verified by ARB to be effective and durable for the engine on which it will be installed, and if the system can be used safely. The regulation does not penalize fleets if an appropriate VDECS is not available for a given engine or vehicle. The ARB's verification program, previously adopted by the Board,[2] ensures that a diesel emission control system achieves the advertised emission reductions and has been evaluated for durability. Also, to receive ARB verification, the device manufacturer is required to provide a warranty valid over the VDECS's useful life, and protecting against engine damage caused by the device.

[2] Title 13, CCR, sections 2700-2710.

For NOx, the regulation requires large and medium fleets to demonstrate that they meet the fleet average emission rate target for NOx, or that they turn over a certain percent of the fleet's total horsepower by the applicable compliance date each year. Small fleets are exempt from this provision. The mandatory turnover rate is eight (8) percent per year until March 1, 2015. Then, after this date, it is 10 percent per year. If retrofits that reduce NOx emissions become available, they may be used in lieu of turnover.

The targets decline over time, requiring fleets to reduce their emissions as time goes on. As stated, to meet the diesel PM or NOx fleet averages, fleets may retrofit their vehicles' exhaust systems with verified emission control devices to reduce PM and/or NOx emissions, repower existing vehicles with cleaner engines, retire higher-emitting vehicles and/or replace them with newer, cleaner vehicles, or designate high-emitting vehicles as low-use vehicles. Under the regulation, vehicles designated as low-use are not included in calculating the fleet average and are exempt from the retrofit, turnover, and fleet average requirements.

Fleets have the option of satisfying either the fleet average requirements or the mandatory retrofit and/or turnover requirements each year. Satisfying either is an acceptable way to demonstrate compliance with the regulation.

Finally, the regulation requires that operators of off-road diesel vehicles shut down their vehicles rather than idle for more than five minutes, unless such idling is necessary for the proper or safe operation of the vehicle.

Labeling, Recordkeeping, and Reporting Requirements

All fleets are required to report their affected equipment and associated engine and retrofit data to ARB beginning in 2009. Annually thereafter, fleets need to report any changes made in the prior year. Fleets are also required to label all affected equipment with a unique equipment identification number assigned by ARB. Fleets are required to keep records of all data reported, as well as any changes made since their last reporting, until 2030, or as long as the owner still owns the fleet.

Schedule

The reporting requirements begin for all fleets subject to the regulation in 2009. The first fleet average targets take effect in 2010 for the largest fleets and in 2013 for medium fleets. Small fleets have until 2015 to comply with the PM retrofit or PM fleet average requirements.

Exemptions, Compliance Extensions and Special Circumstances

The regulation contains special, less strict provisions for all fleets in counties that currently are in attainment with the federal ambient air quality standards for ozone and particulate matter, as well as less strict provisions for public fleets in rural counties with

low populations. The regulation also exempts low-use vehicles (vehicles used less than 100 hours per year), emergency equipment, and vehicles used only to remove snow from public roads from all but the recordkeeping and reporting requirements.

The following vehicles are exempt from the mandatory turnover requirements:

- All vehicles in small fleets,
- Vehicles less than 10 years old,
- Specialty vehicles for which no used equipment or repowers are available,
- Vehicles retrofit with best available technology in the past 6 years, and
- Tier 4 and interim Tier 4 engines.

The following engines are exempt from the retrofit requirements:

- Engines in vehicles less than 5 years old,
- Engines for which there is no retrofit available or for which a retrofit cannot be safely installed.
- New engines that come with a diesel particulate filter, and
- Engines that have already been retrofitted with the best available control at the time of installation.

The proposed regulation further provides that fleets will not be found to be in noncompliance if caused by manufacturer delays in the availability of retrofits, repowers, or new engines needed for compliance with the regulation.

Finally, the regulation provides that fleet owners will be subject to penalties for noncompliance consistent with the penalty provisions set forth in the Health and Safety Code.

At the hearing, the Board considered and approved for adoption the following modifications to the regulation for the purpose of achieving additional emission reductions and providing compliance flexibility:

Defining Non-Profit Training Center to refer to 26 U.S.C. subsections 501(a) and (c)(3), (5) and (6);

- modifying the regulation to reflect that, on or after March 1, 2009, a fleet that permanently retires a Tier 0 vehicle from service within California may count that vehicle in meeting both the diesel PM BACT requirements and the NOx BACT requirements to achieve equivalent emission reductions relative to the retrofit requirements; and .

- Including a program entitled Surplus Off-Road Opt-in for NOx (SOON) Program that will achieve additional oxides of nitrogen (NOx) emission reductions by requiring the largest fleets that operate vehicles in air districts that elect to participate in the SOON program to take additional actions to reduce NOx emissions if the district provides the fleets with incentive funding .

Comparable Federal Regulations

As stated, U.S. EPA has promulgated federal emission standards for new nonroad engines. However, no federal standards have been promulgated addressing emission reductions from in-use diesel vehicle engines. Indeed, under the CAA section 213, U.S. EPA is without authority to adopt in-use standards for nonroad engines. In fact, unless specifically preempted under Section 209(e)(1) of the federal CAA, California is the only state allowed to adopt emission requirements for in-use off-road engines.[3]

While the section 209(e)(1) specifically preempts states, including California, from adopting requirements for new off-road engines less than 175 horsepower that are used in farm or construction equipment, the proposed regulation addresses in-use rather than new off-road engines. Under section 209(e)(2), California may adopt and enforce emission standards and other requirements for off-road engines and equipment not expressly subject to federal preemption, so long as California applies for and receives authorization from the Administrator of U.S. EPA. To obtain authorization, the Board must make a finding that the California adopted standards will be, in the aggregate, at least as protective of public health and welfare as the applicable federal standards,[4] and the Administrator must grant the authorization unless he finds that the determination by the Board is arbitrary and capricious, that California does not need the standards to meet compelling and extraordinary conditions, and the standards and accompanying enforcement procedures are not consistent with CAA section 209. In adopting the regulation, the Board made such a finding, and directed the Executive Officer to request that U.S. EPA grant California authorization to enforce the regulation or confirm that all or parts of the adopted regulation fall within the scope of a previously granted authorization.

[3] See *Engine Manufacturers Association v. U.S. EPA* (D.C. Cir. 1996) 88 F.3d 1075.
[4] CAA section 209(e)(2)(A)