

## UPDATED INFORMATIVE DIGEST

### AMENDMENTS TO THE VERIFICATION PROCEDURE, WARRANTY AND IN-USE COMPLIANCE REQUIREMENTS FOR IN-USE STRATEGIES TO CONTROL EMISSIONS FROM DIESEL ENGINES

**Sections Affected:** Amendments to title 13, California Code of Regulations (CCR), sections 2702, 2703, 2704, 2706, 2707, and 2709.

**Background:** In 1998, the Air Resources Board (ARB or the Board) identified diesel particulate matter (PM) emissions as a toxic air contaminant (title 17, CCR, section 93000). In 2000, the ARB adopted the Diesel Risk Reduction Plan (DRRP or Plan), which established a goal of reducing emissions and the resultant health risk from virtually all diesel-fueled engines and vehicles within the State of California by the year 2020. The Plan envisioned that diesel PM emissions would be reduced by 75 percent in 2010 and 85 percent in 2020. To achieve those goals, the Plan identified various methods including more stringent standards for all new diesel-fueled engines and vehicles, the use of diesel emission control strategies on in-use engines, and the use of low-sulfur diesel fuel.

Staff developed a verification procedure (Procedure) to ensure that effective emission control systems are available to reduce Californians' exposure to diesel PM. The Board adopted the Procedure at a May 16, 2002 public hearing. The Procedure includes emissions test procedures, warranty requirements, and in-use compliance requirements. The Procedure also set limits for secondary emissions from verified emission control systems. One common secondary emission is nitrogen dioxide (NO<sub>2</sub>). Some diesel emission control systems, while highly effective at reducing emissions of diesel PM, also increase emissions of NO<sub>2</sub>. NO<sub>2</sub> is classified as a criteria pollutant and has both federal and state ambient air quality standards. NO<sub>2</sub> emissions also contribute to formation of ozone and particulate nitrates. A limit for NO<sub>2</sub> emissions of 20 percent of the baseline oxides of nitrogen (NO<sub>x</sub>) emission level was adopted as part of the Procedure, effective in 2004.

In February 2004, the Board amended the Procedure. One of the key amendments was a three-year delay in the effective date of the NO<sub>2</sub> limit, to January 1, 2007. This was necessary because manufacturers were not able to meet the original 20 percent limit without sacrificing the robustness and breadth of applicability of their products. The purpose of the delay was to enable the continued implementation of efficient PM emission controls while staff reevaluated what level of NO<sub>2</sub> control was most appropriate and the potential impacts on air quality. This evaluation has been completed.

Staff concluded that most verified PM control devices remain unable to meet the NO<sub>2</sub> limit that begins next year. Therefore, if no change were to be made to the existing NO<sub>2</sub> limit, nearly all of the approved diesel particulate filters will lose their verifications

on January 1, 2007. With few PM emission control devices available for installation on in-use diesel engines, ARB's Plan would be stymied, and the health benefits of the Plan would not be achieved.

**Description of Regulatory Action:** Amendments to the Procedure were adopted by the Board at a March 23, 2006 public hearing. The most significant change was a revision to the NO<sub>2</sub> emission limit for verified emission control systems. The adopted amendments are summarized below.

### 1. NO<sub>2</sub> Emission Limit

The new NO<sub>2</sub> emission limit has a different form from the original and is not as stringent. The original limit restricted total tailpipe-out NO<sub>2</sub> emissions regardless of how much NO<sub>2</sub> is contributed by the engine. The new limit restricts the increase in NO<sub>2</sub> emissions over the baseline, not the total emissions level. Effective January 1, 2007, the maximum amount by which a retrofit may increase emissions of NO<sub>2</sub> from a diesel engine will be 30 percent of the total baseline NO<sub>x</sub> emissions. Most of the currently verified filters can meet this limit, and therefore will continue to be available for use in reducing diesel PM emissions. Effective January 1, 2009, the maximum increase will be reduced to 20 percent. New verification classifications designated by "Plus" (e.g., Level 3 Plus) will signify early compliance with the 2009 limit.

The new limits will result in higher NO<sub>2</sub> emissions from diesel engines than the current NO<sub>2</sub> limit. Modeling and analyses for Southern California for 2010 indicate higher NO<sub>2</sub> emissions will increase peak ozone levels by about one percent. Micro-scale analyses for high exposure scenarios show that local ambient NO<sub>2</sub> concentrations will increase, but will not exceed the current ambient air quality standard for NO<sub>2</sub>.

Staff believes the benefits of avoiding hundreds of premature deaths due to continuing use of PM control devices that reduce PM emissions by up to 85 percent clearly outweigh the adverse health impact of a relatively small increase in ozone.

### 2. Additional Pre-Conditioning Requirements

Another amendment defined additional pre-conditioning requirements for emission control systems whose NO<sub>2</sub> emissions may be influenced by the presence of soot and ash at the time of testing. The additional requirements cover pre-conditioning for the new and aged units in the original verification as well as units involved in the first-phase of in-use compliance testing. They include requirements that relate to filter condition, test cycles, duration of the pre-conditioning, test conditions, backpressure, and the test engine's condition and NO<sub>2</sub> emission level.

### 3. Other Amendments

The Board adopted several minor amendments as well. One clarified that in sections 2702(g) and (h), not all of the listed information is required. The "and" in the list of information was changed to an "or" to reflect the intended meaning. Another amendment extended the warranty reporting deadline specified in Section 2707(c), by

an additional two months. A third amendment added section 2706(l), to help clarify how verification interacts with regulations of other agencies and other legal requirements in general.

### **COMPARABLE FEDERAL REGULATIONS**

The United States Environmental Protection Agency (U.S. EPA) has published a draft document, “General Verification Protocol for Diesel Exhaust Catalysts, Particulate Filters, and Engine Modification Control Technologies for Highway and Nonroad Use Diesel Engines,” but has not promulgated formal regulations for this verification protocol. This verification protocol is intended to support the voluntary retrofit programs initiated by the U.S. EPA, while the Procedure with the amendments described herein supports the ARB’s Plan. Also, the U.S. EPA protocol does not limit or otherwise regulate changes in emissions of NO<sub>2</sub> caused by emission control systems.