Engine Control Systems

March 22, 2006

Clerk of the Board
Air Resources Board
1001 "I" Street, 23rd Floor
Sacramento, California 95814

Dear Members of the Board:

Re: Proposed Regulatory Amendments to the Verification Procedure, Warranty and In-use Compliance Requirements for In-use Strategies to Control Emissions from Diesel Engines

Engine Control Systems ("ECS") have had the opportunity to review the above mentioned amendments. ECS appreciates the opportunity to provide the following comments and associated recommendations for the Board's consideration.

ECS supports staff's efforts to complete this regulatory amendment package to facilitate the continued implementation of diesel particulate reduction initiatives under the Diesel Risk Reduction Program and other related diesel emissions reduction programs such as the Carl Moyer Memorial Air Quality Standards Attainment Program, the Lower-Emissions School Bus Program, and the Public Bus Transit Fleet Rule.

ECS commends the efforts of ARB staff to ensure progress is made towards these diesel risk reduction goals. We realize this particular rulemaking is a principal component in ensuring ultimate success. We are impressed with the staff's ability to continue to work closely with technology providers and end-users alike on matters both technical and practical in nature. We look forward to a continued and collaborative relationship with ARB towards the common goal of improved air quality in California.

We offer comments organized in the following format for ARB consideration.

NO_2 Emissions Limit

ECS continues to support that the stringency of a NO2 limit should be based upon modeling and analyses of potential ambient air effects on health to insure the maximum reduction in premature deaths. ECS supports staff's determination that the proposed NO2 Emissions Limit accomplishes this goal. The staff report clearly identifies that the proposed NO2 Emissions Limit results in an overwhelmingly favorable reduction in the projected number of premature deaths

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avoided. The staff report also identifies that if the Limit were set lower than the current proposal that the program goals would be greatly compromised due to the number of products de-verified and the reduction in Level 3 verified control strategy implementation.

ECS has identified in previous comments that inclusion of engine-out NO2 in the limit definition presented a serious barrier to manufacturers to demonstrate compliance. The revised NO2 limit definition based upon the incremental NO2 associated with the use of a control strategy makes it possible for manufacturers to suitably develop products to maximize passive particulate reduction and to warrant compliance to the prescribed limit.

The proposed phased implementation of the NO2 limit also provides manufacturers with suitable time to properly refine technologies for compliance if required while insuring durability and appropriate application to the broadest range of in-use engines.

ECS believes without this phased implementation approach that the implementation of Level 3 devices as well as ARB program goals would be significantly hindered resulting in continued preventative premature deaths.

ECS can conditionally support much of the proposed amendments, including the Level / Level + designations, as we believe they ultimately create further stability for the development of verified products and further regulations.

However, ECS' first recommendation is that the board defends to all parts of the California government, including staff and elected officials, that the Level / Level + designations must form the sole basis of consistent future policy in the defining of BACT status for all diesel particulate reduction programs in the future. ECS supports that any requirements increasing the stringency of BACT ultimately results in a reduction in Level 3 / Level 3+ verified control strategy implementation which hinders the goals of the Diesel Risk Reduction Program.

The necessity for consistent future policy should also be addressed in Section 8.6 of the staff report, "Potential Impact on Business Competitiveness of the staff report."

The defining of BACT status must be consistent with the verification of control strategies to insure open market competition. To allow additional requirements on BACT status outside of requirements defined under the verification procedure only serves to dissuade investment in retrofit technology development. Paramount to investment is the perception of open access to a defined market. Inconsistent BACT requirements, especially those that apply to retrofit PM emission reduction device funding create the perception of additional business risk.

Additional Pre-Conditioning Requirements

ECS requests board confirmation that paragraphs two and three of Section 3.3 of the "Staff Report: Initial statement of Reasons" outline distinct amendments for the pre-conditioning of new and aged units respectively.

Additionally, ECS requests that staff still be allowed to accept other pre-conditioning procedures (i.e. 2007 new engine certification procedures) for new and aged units if such procedures are

equally or more stringent as supported by engineering arguments. ECS recommends to the board that ARB staff should be allowed to accept alternative pre-conditioning requirements to facilitate introduction of future new emission control strategies or in cases where other procedures may be more cost effective for the manufacturer but equally or more stringent than the proposed amendment.

Test Engine Requirements

Engine Control Systems does not support this amendment as written and asks the board to either reject the proposed 15% NO2 limit for test engines, or, alternatively, the board could direct ARB staff to conduct further study in this area and delay implementation of this requirement until 2009.

ECS has been advised by ARB staff that the current proposed 15% NO2 limit for test engines represents two standard deviations from the average of data reviewed by staff to date.

ECS advises the board that basing a limit on this criterion does not adequately address issues related to the variability in engine-out NO2 emissions observed from identical test engines.

The variability in engine-out NO2 levels are presented in the Table below. All engine-out NO2 measurements are reported to be made with the current ARB NO2 measurement procedure. All NO2 measurements were made at a highly reputable, independent third party test facility which is commonly used in retrofit manufacturer's verification test programs. This facility conducts testing as per the ARB protocol without any intentional bias.

Table. Variable Engine-out NO2 levels from identical test engines over various test dates.

Test Engine	Relative Test Date (approximate)	Engine-Out NO2/NOx ratio (%)
Test Engine 1; 275hp; 1991	Original Test Date	18.3%
	One month later	7.5%
	5 months later	14.7%
	2.5 years later	11%
Test Engine 2; 250hp; 1999	Original Test Date	21.5%
	33 months later	10%
Test Engine 3; 400hp, 1998	Original Test Date	13%
	2 weeks later	12%
	38 months later	7%

It is important to highlight that for NO2 measurement made in any specific test date / program, the NO2 measurements appear to be consistent between the engine-out/baseline and the incremental values observed for the control strategy tested as part of that specific test program. This indicates that the NO2 increase measured over the device is likely accurate and can be used with regards to compliance to the proposed NO2 limit for control strategies. However, the variability between test dates / programs for the same test engines are of concern.

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The issue ECS wishes to highlight is that the observed variability is monetarily disadvantageous to manufacturers who conduct independent third party testing. Previous NO2 measurements made by third party testing facilities may show the engine in compliance to the proposed NO2 engine-out limit for test engines as measured by the ARB test protocol. The retrofit manufacturer can wait months for available test cell time, and after significant investment to install, run-in and emissions baseline the test engine find out that it exceeds the recommended 15% NO2/NOx test engine criterion and cannot be used. This would either force a manufacturer to install another test engine at additional cost, or, the manufacturer may be forced out of the cell due to previous contracted commitments of the test facility.

Again, the difference between the engine-out NO2 measurement and that associated with the use of the control strategy in all these test programs appears to produce an accurate measurement that can be used for compliance to the proposed NO2 limit for control strategies.

However, due to the observed variability as shown in the above table, ECS recommends that the ARB board either not adopt the 15% Engine-Out NO2/NOx limit for test engines or delay implementation until 2009 and instruct ARB staff to conduct additional investigative testing to determine whether further test protocol refinements are necessary to properly measure NO2.

ECS has submitted a more detailed table and references to ARB staff in a confidential submission.

In closing, ECS can conditionally support these proposed amendments based upon the issues addressed in our comments.

If you should have any questions, or need additional information, please do not hesitate to contact me. Thank you.

Yours truly,

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