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December 3, 2008

RE: California Air Resources Board (ARB) "PROPOSED REGULATION TO REDUCE GREENHOUSE GAS EMISSIONS FROM HEAVY-DUTY VEHICLES"

Honorable Mary Nichols
California Air Resources Board
1001 I Street
Sacramento, CA 95814

ORIGINAL: Board Clerk
Copies: Executive Officer
Chair

Honorable Mary Nichols,

The California Air Resources Board (ARB) "PROPOSED REGULATION TO REDUCE GREENHOUSE GAS EMISSIONS FROM HEAVY-DUTY VEHICLES" is a valuable contribution to the pursuit of a cleaner environment. However the regulation may severely limit the programs success by the strict reliance on the voluntary EPA SmartWay (SW) program to identify viable aerodynamic technologies. I recommend the regulation adopt a process that employs a broad set of data and information sources to evaluate and certify cost effective and operationally practical aerodynamic technologies that reduce fuel use and reduce emissions. Aerodynamic technology certification should rely upon all Society of Automotive Engineers (SAE) and Technology and Maintenance Council (TMC) of the American Trucking Association, aerodynamic technology test procedures as well as in-use Industry data for the evaluation and certification of technologies. The regulation should not limit itself to a single test process as specified by the EPA SW program.

The EPA SW program is not a regulatory activity but has been established to serve the needs of the member organizations. As a voluntary program SW has not established and may never establish a clear set of industry-relative scientific, engineering, and user-based criteria for the certification of aerodynamic technologies. A review of the EPA SW document "U.S. EPA Certified SmartWay Transport, Technical Specifications and Requirements, 2007 Tractor and 2007 Trailer, EPA420-F-08-015" contained in Appendix D of Staff Report: "Initial Statement of Reasons (ISOR)" shows a representative set of the limiting criteria in use by the EPA to certify aerodynamic technology. Of particular interest are the criteria listed for trailer aerodynamic fairings on pages 3, 4, and 5. These criteria are a combination of very specific and limiting restrictions that appear to be based upon specific devices offered by particular manufacturers combined with the requirement to conduct SAE/TMC Type II testing. These highly limited and device specific criteria

will; restrict the options available to fleets; stifle competition and innovation; and result in higher costs and a reduced ability of the subject regulation to achieve emission reduction goals.

Specific limitations of the SmartWay SAE/TMC Type II test requirements are;
- can not assess aerodynamic performance of a vehicle or vehicle component (this can only be performed in a wind tunnel)
- provides only an indication of fuel savings, test must be repeated with the exact same equipment to determine a fuel savings value. (SW does not require a repeat test)
- can not account for cross-flow (crossflow effect on fuel savings vary up to 100%)
- can not account for changes in speed (speed effect on fuel savings vary up to 30%)
- can not correct for temp. and humidity (environ. Effect on fuel savings vary up to 20%)
- is affected by all operational systems and driver behavior (driver effect on fuel savings vary up to 20%)
- can not account for real world wind interference effects (interference effect on fuel savings vary up to 20%)

In contrast the TMC Type IV test process as well as in-use testing accounts for many of the limitations associated with the Type II process noted above.

In addition to fuel economy testing it is critically important that aerodynamic technologies be subjected to rigorous wind tunnel testing in accordance with published procedures, guidelines, and criteria established by the Society of Automotive Engineers (SAE) and the Subsonic Aerodynamic Testing Association (SATA). The aerodynamic study of a tractor-trailer is very challenging due to the highly complex flow conditions that occur on and around the vehicle. Tractor-trailers are geometrically complex and the air passing over a tractor-trailer is a combination of attached and separated flows. The effect of the attached and separated flow areas on vehicle aerodynamics will vary with changes in atmospheric conditions, vehicle speed, cross-flow angle, and air disturbances from traffic and road-side structures. To measure the aerodynamic forces on a tractor-trailer one must isolate the aerodynamic forces from all other forces acting on the vehicle. This measurement can only be performed in a wind tunnel under industry established test guidelines and criteria.

The real life environmental and economic consequences that result from the decision facing the ARB are in stark contrast to the insulated and lack of real world consequences facing the SW program. The ARB should look beyond the limitations and limited intent of SW to ensure that a broad set of viable aerodynamic technology options is available to the freight industry. Certification of aerodynamic technology should rely upon all data derived from SAE and TMC aerodynamic and fuel economy testing procedures as well as Industry generated data sets from in-use testing. Adopting a more inclusive rather than exclusive set of criteria will allow the Industry to realize fuel savings and emission reductions far greater than those proposed. An inclusive criteria set will promote competition and innovation providing Industry and the ARB with the best solution that will lead to far greater fuel savings and emission reductions than those called for in the regulation.

I recommend the subject regulation adopt a process that employs a broad set of data and information sources to evaluate and certify cost effective and operationally practical aerodynamic technologies that reduce fuel use and reduce emissions. The regulation should rely upon in-use Industry data as well as wind tunnel testing and fuel economy testing conducted in accordance with published standards from the Automotive Engineers (SAE) and Technology and Maintenance Council (TMC) of the American Trucking Association (ATA).

If there are any questions or requests for additional information please feel free to contact me by email at Richard.wood@solusinc.com or by phone at 757-486-3570.

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