UREA/DIESEL CO-FUELING

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Urea selective catalytic reduction (SCR) is an established method to reduce NO_x in dilute exhaust gas. The method is being used currently with stationary powerplants, and successful trials on motor vehicles have been published, with additional trials now underway in North America and Europe. The reason most often cited for rejecting urea SCR is lack of urea supply infrastructure, yet urea and other high-nitrogen products are distributed and are being used every day throughout the world wherever crops and lawns are being fertilized. The issues remaining are to select the preferred form of urea to be distributed and to deliver this to vehicles. For a subset of commercial vehicles, urea, or some high concentration of ammonia carrier, can be provided by service personnel at designated terminals. But, this approach does not support long-distance carriers and personal-use vehicles. Further, a requirement to service the urea supply, accompanied by a warning to the driver that the urea system must be serviced, could anger some drivers, causing them to attempt to disable the system.

The preferred method to deliver urea is to accomplish this with no incremental actions required of the driver beyond current operation and service. This is achieved by providing the urea during vehicle refueling through a common fuel nozzle/fill pipe interface: urea/diesel co-fueling. Aqueous urea is well suited to delivery in this fashion. The person fueling the vehicle needs no new skills or knowledge to add urea, and may not even be aware of the second fluid, depending on choices made for display and pricing on the dispenser.

A Urea Supply Team has been formed within the Diesel Cross-Cut Team to carry the co-fueling concept forward to demonstration. Comprised of heavy-duty engine manufacturers and light-duty vehicle manufacturers, the Team also calls upon urea suppliers, fuel retailers, and station equipment builders for needed input. A fuel nozzle/fill pipe interface has been designed that will provide independent flow on/off of two fluids and deliver separated fluids into distinct tanks with minimal cross-contamination. The design will be presented, and the impact on heavy duty and light duty vehicles will be described. Representatives of affected industries (urea supply, fuel retailing, station equipment) will be requested to assess the concept. A demonstration will be provided to supplement the presentation. A co-fueling dispenser, nozzle, and fill-pipe display will allow participants the opportunity to examine the concept and provide comment.