

DIESEL EMISSIONS CONTROL SULFUR EFFECTS (DECSE) SUMMARY OF PM RESULTS AND DATA

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The Diesel Emissions Control - Sulfur Effects (DECSE) program, jointly supported by the US Department of Energy (DOE), the Engine Manufacturers Association (EMA), and the Manufacturers of Emissions Controls Association (MECA), is in its final stages of the Phase I test program. Published program reports and other information are available on the DECSE website: <http://www.ott.doe.gov>.

This presentation will review important program observations on diesel particulate material (PM) emissions levels and aftertreatment control device effects on PM emissions. The impact of fuel sulfur levels on the function of these control devices was the primary objective of these test programs. The Phase I program has looked at several technologies: Diesel Particulate Filters (DPFs) of two types, Continuously Regenerating DPFs (CR-DPF) and Catalyzed DPFs (CDPF); Lean

NO, Traps (LNT); Diesel Oxidation Catalysts (DOC); and NO_x Adsorbers (NA). Phase I has been based on 1998-1999 heavy duty diesel engine and fuel technology levels.

Results for each of the technologies will be described in terms of engine-out emissions of PM, catalyst-out emissions of PM, fuel sulfur effects on PM, and catalyst aging effects of PM. The PM analyses included total PM, PM sulfate content (SO₄), PM soluble organic fraction (SOF), and PM nitrate (NO) content. Conversion of fuel sulfur to secondary sulfate formation can be very significant for some of the technologies studied.

Phase II of the DECSE program is leading to the DOE Advanced Petroleum-Based Fuels program and additional testing of combined technologies over the next 4-5 years.