

# **UPDATE ON MODELING FOR EFFECTIVE DIESEL ENGINE AFTERTREATMENT IMPLEMENTATION -- MASTER PLAN, STATUS, AND CRITICAL NEEDS**

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An integrated diesel engine-aftertreatment-vehicle system is extremely complex with numerous interacting variables and an unlimited number of control options. An experimental approach to developing an optimized viable system is tedious, if at all possible. Sophisticated component, subsystem, and integrated simulation tools offer an excellent option of a virtual laboratory approach to the development of such a complex system. A viable and robust diesel engine aftertreatment system can thus be developed within optimum time and resources when this virtual simulation is integrated with selective hardware-based testing.

Detroit Diesel has developed an effective virtual laboratory integrated system package. A multi-level common platform embodies 0-, 1-, and multi-dimensional models of selected components and subsystems. Different models can be coupled or integrated, and simulated tests can be carried out in order to define optimum control parameters or to predict system response. This paper will present the technology development master plan, update technical status of the simulation fidelity, and outline critical needs that impact simulation tool development and serious application.