

Title: Using Simulation Based Design Methods in Aftertreatment Systems

Aftertreatment systems are self-contained chemistry labs that perform small miracles in the control of Diesel emissions.

While performing their duty, these units undergo severe flow, thermal and stress cycling that must be understood. A key factor in the durability of the component is a balancing of both the thermal and vibratory design issues, which are often in conflict with each other. Over the years CD-adapco has succeeded in applying a variety of analytical techniques in both assessing and improving the reliability of such systems.

The basis of the approach involves studying the complex fluid-structural interaction (FSI) through simulation.

Methods will be discussed that will show how CFD and FEA are used jointly in characterizing the factors that affect performance and durability.

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For the past 10 years I have played an integral role in mitigating problems faced by industrial and manufacturing clients in both CFD and FEA arena. Current technological advances in computing power and software development has allowed myself and my team at CD-adapco to push the envelope in the simulation environment. The past few years have allowed us to include the latest simulation algorithms to solve some of the worlds most challenging problems.

Most recently our simulations have been geared towards the national effort in "green technology". As this push continues, CD-adapco and the Structural/Thermal group continue to assist companies with challenging design updates that are necessary to meet current world emission standards. We continue to do extensive simulation related to emissions systems and work simultaneously with design teams to meet the 2010 design deadline.