Vehicle Technology Resource Alerts

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Vehicle Systems Engineering and Product Development

- **What it is:** Vehicle Systems Engineering (VSE) is an interdisciplinary product development approach for creating successful products, systems and vehicles.
- **How it Works:** VSE focuses on defining customer needs and required functionality early in the product development cycle, documenting requirements, exploring alternative solutions, then proceeding with design synthesis and system validation.
- **Why it's Hot:** Vehicle complexity has doubled in the past four years, going from 27% to over 51% this year, making it a major challenge for performance aftermarket manufacturers. VSE helps you manage product development complexity, risk and cost.

Vehicle Systems Engineering Management

Systems Engineering integrates all the disciplines, specialty groups and technologies required to design, test, develop, validate and produce vehicle systems – from mechanical and electrical engineering to software and manufacturing engineering. VSE consists of two significant areas: the technical knowledge domain and the product development process. Vehicle Systems Engineering Management (VSEM) is a structured product development process that proceeds from concept to production to operation. VSEM considers both the business and the technical needs of all customers with the goal of providing a quality product that meets the user's needs for quality, performance, installation, operation and service. Today's vehicles are comprised of five major systems – body, chassis, powertrain, interior and electronics – and are essentially a system of systems.

Managing Complexity

Integrating innovative aftermarket products with advanced vehicle technologies challenges an organization's design, engineering and development processes. Original, as well as aftermarket specialty equipment products that once operated independently must now be being designed to work within systems of systems. To help manage this complexity the VSEM process balances the three primary project constraints of time, cost, and performance. Developing performance aftermarket products and successfully integrating them with today's vehicle systems creates additional complexity and requires a thorough understanding of the latest vehicle technologies and capabilities onboard new vehicles, as well as the interfaces, tradeoff decisions and regulations affecting overall vehicle and safety performance. Increasing complexity can drive up costs, impede innovation, and create risks that threaten your product and business success.

The challenges and risks of dealing with advanced vehicle technologies are substantial; however, aftermarket systems engineers are already adopting new product development practices and resources that support cross-discipline collaboration, enable model-based and math-based product simulation, and align hardware systems and software engineering development.

To learn more about how VSE and VSEM processes and trends are transforming the performance aftermarket industry and creating new business and product opportunities contact John Waraniak, Vice President of Vehicle Technology, or Bryan Harrison, SEMA Director of Networks.

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