Webinar Summary – Development and Validation of an Integrated Functional Safety and Reliability Engineering Framework for Robust Electric Vehicles

27th May 2026

Presented by: Dr P. Arjunraj and M Sudalai

This webinar presented the development and validation of an integrated Functional Safety, Reliability Engineering, and Value Engineering framework for electric vehicles (EVs). The objective was to demonstrate how safety, reliability, performance, and cost considerations can be managed together throughout the EV development lifecycle to deliver robust and commercially viable products.

The speakers explained the relationship between Value Engineering (VE), Functional Safety (ISO 26262), and Reliability Engineering, highlighting that improving value should not compromise safety, quality, or reliability. Key concepts included Automotive Safety Integrity Levels (ASIL), Hazard Analysis and Risk Assessment (HARA), FMEDA, DFMEA, Reliability Block Diagrams (RBDs), fail-safe design, redundancy, and validation testing.

The framework was structured around staged design reviews, from concept development through system design, detailed design, integration, validation, manufacturing, and field monitoring. Examples included EV braking systems, where regenerative and hydraulic braking provide redundancy, and battery systems using parallel architectures to improve reliability and fault tolerance.

The speakers also discussed real-world reliability challenges such as environmental conditions, traffic patterns, component quality, supply-chain variation, battery management, and charging behaviour. They emphasised the importance of designing and validating products under realistic operating conditions rather than idealised assumptions.

The webinar concluded that integrating safety, reliability, and value engineering from the earliest design stages enables more reliable, safer, and cost-effective electric vehicle development.

If you are a SaRS Member and would like to watch the recording of the webinar please click here.