

Instrumentation, Analysis & Testing Exhibition

31 March 2020, Silverstone Race Circuit

The Journey from IC to EVs: Challenges, Pitfalls and Opportunities



MINI SEMINAR PROGRAMME

10.30am KEYNOTE: Road to EV: Spark to Revolution - Dyrr Ardash, Williams Advanced Engineering

The 21st century is seeing mega trends of population growth, urbanisation and climate change, which is driving a seismic shift in personal transportation. Automotive focused industries are adopting an increasing trend of electrification to respond to these growing challenges. This presentation takes a customer-centric view on accelerating the attractiveness of electric vehicles to the mass market, where core customer attribute requirements of range, performance and safety need to be balanced. It considers the challenges and opportunities of an industry that has had over 100 years of internal combustion propulsion system only focus.

11.15am How Driver-In-The-Loop Simulation is Providing a Short Circuit to EV Validation - Gavin Farmer, Ansible Motion

Driver-in-the-Loop (DIL) simulation is currently being used to develop EVs, placing engineers and evaluation drivers into early and regular contact with proposed vehicles and on-board systems. Much of new car design is iterative, drawing on early models whereas with the creation of EVs there are fewer historical references to draw upon. Simulation is a powerful tool for overcoming these unknowns as well as reducing costs, lead times and improving the final product. Ansible Motion will explore use cases and diverse applications that show how EV developers can truly benefit from simulation. It will look at where simulation offers answers to the myriad of new scenarios engineers and consumers will face in the electric age.

11.45am Moving Forwards: Battery Propulsion for Rail Vehicles - Ben Parry, Bombardier

The rail sector has already paved the way in transitioning from internal combustion to electric vehicles. We have learned the hard way that the high cost of electrification infrastructure can slow down – or halt entirely - the complete adoption of electric rolling stock. The next frontier is electric trains with onboard traction batteries, allowing the remaining Diesel units on the network to be retired. Ben will talk through the market drivers in the rail sector, lessons learned and future challenges whilst attempting to draw parallels to the automotive market.

12.15pm Electric Vehicle Batteries as Weapons of Mass Destruction - Colin Freeman - Potenza Technology

All cars and systems are becoming more connected. A real danger is that warfare moves to a model where connected assets are attacked i.e. cars charging in garages. Compromising battery systems can lead to thermal events, a mass attack in the electrified future could result in a mass thermal event. This presentation discusses some of the measures we are employing to protect against this, how BMS currently protects a battery, and what we need to do differently.

1.00pm Design and Engineering of Fuel Cell Electric Vehicles - Professor John Jostins, Coventry University & CEO of Microcab Industries Ltd

Fuel cell vehicles have particular benefits as we progress to a future low carbon, zero emissions transport fleet. Giving only water vapour emissions at tailpipe and, in general, longer range than their battery-only counterparts they offer quick refuelling, typically filled in a few minutes. This presentation examines the main engineering considerations when designing fuel cell vehicles and the principles of the powertrain technology at work to deliver clean mobility as we move to a post-fossil fuel world.

1.30pm Influence of electric vehicle high voltage electromagnetic fields on NVH sensors - Bob Barrett, PCB Piezotronics

Assessment on the influence of electric vehicle HV EM fields on NVH measurement. Observations on vehicle locations and selection of microphones/accelerometers to yield the best signal quality results in these testing applications.

2.00pm The impact of EVs on the generation system and distribution networks including fast charging and using this to predict demand and the idea of wireless charging of electric vehicles including dynamic charging on the road - Professor Liana Cipcian, Cardiff University

The presentation will focus on the opportunities and challenges for decarbonising transport through electrification. There are many challenges facing EVs uptake but the opportunities for the EVs integration in Smart Grids are greater than the challenges the electricity system faces. For example smart charging can be used for peak shaving or demand side response supporting grid flexibility and encourage customers to get engaged with their electricity usage. All the challenges could be translated in opportunities for innovation and position the UK as a leader not only for the EVs adoption but for the technological advance. For charging 11 million EVs by 2030 and 36 million by 2040, as National Grid predicted in their Future Energy Scenarios, we will need innovation and diversification of the charging infrastructure and wireless charging, particularly dynamic charging on the road could offer an important alternative.