

INTEGRATING ELECTRICAL AND ELECTRONIC VEHICLE SYSTEMS: EFFICIENT TECHNOLOGY SOLUTIONS.

Institution of
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ENGINEERS**

5 October 2010
Norwich

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ATTENDING WILL HELP YOU:

- Learn from industry experts with first-hand experience in integrating new electrical and electronic systems and technologies
- Network with potential new supply-chain partners and organisations involved in relevant fields
- Keep abreast of developments and advances in the implementation of electrical systems

INTEGRATING ELECTRICAL AND ELECTRONIC VEHICLE SYSTEMS: EFFICIENT TECHNOLOGY SOLUTIONS.

Electrical and electronic systems have become necessary features in modern vehicles due to the demand for constant improvements in energy efficiency, safety, ergonomics and passenger comfort.

This seminar will feature presentations from industry experts on approaches to identifying and overcoming technical issues associated with integrating electrical and electronic systems to the overall vehicle architecture.

THIS EVENT WILL ATTRACT:

Automotive OEMs, Tier 1 system suppliers, electrical device manufacturers, electronic control system designers and manufacturers, electrical harness, connector and loom manufacturers

TECHNICAL ADVANTAGES:

- Learn more about the highly desired new technologies targeted at energy efficiency, safety and ergonomics
- Assess how integrated electrical systems can help improve fuel economy
- Understand how technology combinations can be successfully integrated in order to deliver the desired vehicle attributes
- Discuss specific issues with industry experts and colleagues in similar fields
- Make significant savings in development and validation time

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INTEGRATING ELECTRICAL AND ELECTRONIC VEHICLE SYSTEMS.

5 OCTOBER 2010

HETHEL ENGINEERING CENTRE, CHAPMAN WAY, HETHEL, NORWICH NR14 8FB

09:00 REGISTRATION

09:30 CHAIRMAN'S WELCOME

Chris Wheelans, Chief Engineer – CAE, Lotus Engineering

09:40 KEYNOTE PRESENTATION

Dr Robert Hentschel, Director, Lotus Engineering

Dr Robert Hentschel earned his degree in electrical engineering and his doctorate (with honours) at Braunschweig University, Germany. He has previously held management positions at the engineering firm EDAG Group and served as COO of its North American operations in Michigan, USA. Dr Hentschel now directs Lotus Engineering's worldwide operations, a position he took up in January 2010.

10:10 THE COMMERCIALISATION OF EVS AND THE BARRIERS THAT NEED TO BE OVERCOME TO GET AN EV INTO THE MARKETPLACE

Doug MacAndrew, Technical Director, Tanfield Group

10:40 HYBRID VEHICLE SYSTEM INTEGRATION

Mike Richardson, Manager – Advanced Hybrids, Jaguar Land-Rover

Hybrid electric vehicles are an interesting systems engineering challenge. Modern vehicles have a number of functional and non-functional requirements, for example performance, driveability, functional and non-functional safety and legislation. These requirements need to be met with compatible systems on the vehicle, and the number of components and systems on the vehicle that require modification or change is quite significant.

The presentation will focus on the integration of hybrid systems into a vehicle in the context of delivery of these requirements, and will include an overview of some of the customer requirements, the vehicle systems affected and some specific examples of integration challenges.

11:10 REFRESHMENT BREAK

11:40 THE LAND 'GENERIC VEHICLE ARCHITECTURE' IN THE MINISTRY OF DEFENCE

Ian Burch, GVA Project Office Lead, Defence Equipment & Support, Ministry of Defence (MoD)

The pace of the changing threat to military-protected patrol vehicles within Afghanistan prompted the MoD to look at the way integration of new protection and mission systems is carried out on existing and future vehicles. The MoD and the defence industry have worked together to distil a set of standards in order to gain an open, modular and scalable electronic and electrical architecture across all the land-vehicle fleets. This paper gives context to the work, details the approach taken, highlights the contents the Defence Standard produced and suggests the future developments required to ensure long-term success.

12:10 EV ELECTRICAL ARCHITECTURE

Jürgen Ohlson, Chief Engineer Electric Architecture & Energy System, Think Global AS

This presentation will address:

- Electric architecture
- Functional partitioning
- EV safety
- Function development and validation process
- Connectivity
- Serviceability
- Smart charging

12:40 CONNECTIVITY AND SAFETY SOLUTIONS FOR E-DRIVE TECHNOLOGIES

Uwe Hauck, Director Global Product Marketing and Brian Farren, Product Specialist, Alternative Power Systems, Tyco Electronics AMP GmbH

The safety of electrical power distribution plays a central role in alternative drive systems and leads to a new generation of automotive connector and power distribution technologies. The presentation will cover the HV connector technology, as well as contactor and other protection components.

Uwe Hauck holds a degree in Industrial Electronics and has more than 20 years' experience in automotive components, including relays, electronic modules and connectors. His experience with high-voltage products is based on active technical marketing support in the automotive industry. In his current position as Director Marketing Alternative Power Systems, Uwe has a global business and portfolio development responsibility for high-voltage components within Tyco Electronics' Global Automotive Division.

Brian Farren holds a degree in Technology and an MBA from the University of Paisley. He has been working with Tyco Electronics, initially with AMP of GB, for 14 years specialising in automotive terminals and connectors, cable assemblies, sensors and relays. Tyco Electronics Resident Engineer at Jaguar Land-Rover since 2005, he more recently moved into a sales and marketing position as Account Manager for Aston Martin Lagonda. In his position as Alternative Power Systems Product Specialist, Brian is the first point of contact for UK opportunities relating to Tyco Electronics' portfolio of high-voltage components.

13:10 LUNCH

14:10 LOTUS STRATEGY FOR A MODULAR FRAMEWORK FOR THE INTEGRATION OF FUTURE VEHICLES CONTROLS AND ELECTRONIC SYSTEMS

Colin Peachey, Group Chief Engineer Controls and Electrical, Lotus Engineering

The proliferation of alternative vehicle propulsion technologies for conventional, hybrid and electric vehicles has led to a multitude of possible vehicle drive system configurations. Lotus is developing a modular approach for both hardware and software systems that allows robust validation of individual component systems, and an interchangeable plug-and-play reconfiguration for different vehicles. An example of this is the electronics and control of the TSB fuel cell taxi, which can be reconfigured to form the basis for the Evora 414E hybrid, by unplugging the fuel cell module and replacing it with a range extender engine and adding in the torque vectoring module for twin motor drive. Significant savings in development and validation time are achievable by adopting this strategy.

Colin Peachey graduated from Durham University with first-class honours in Engineering Science in 1982. His career in the automotive industry started in 1984, working for Rover Group in Oxford in body structure NVH development. Over the next 16 years with Rover/BMW group he was also involved in research into structural bonding and management of door and closure system hardware development. He has worked for Lotus for ten years, managing the NVH group for over half of this period. Recently he has been accountable for the production of Active Noise technology and is now currently responsible for all the electrical and controls activities in Lotus Engineering, including the electric and hybrid vehicle group.

14:40 HYBRID POWERTRAIN DEVELOPMENT FOR STRAIGHTFORWARD VEHICLE INTEGRATION

Patrick Debal, Project Manager R&D, Punch Powertrain

Vehicle integration of non-conventional powertrains involves two important aspects: mechanical integration and powertrain control. For its application in a wide range of passenger cars, the hybrid powertrain developed by Punch Powertrain (a Tier 1 supplier) needs to provide an easy integration into most engine bays. Next to fuel saving, cost and driveability targets, hybrid powertrain size constraints were set at the beginning of the project. The hybrid powertrain was not allowed to be longer or higher than its conventional counterpart. At the hybrid powertrain control side, where Punch Powertrain relies on external ECU providers, a solution requiring minimal changes in engine control functionalities was needed. A cost-effective solution was developed and will be demonstrated.

In 1985 Patrick Debal graduated with an MSc in Mechanical Engineering at the University of Leuven, Belgium. He held several positions in R&D and development at industry leaders including Atlas Copco. In 1999 he joined the Flemish research institute Vito to investigate hybrid powertrains and low-emission vehicles. In this period, he became an authority on hybrid vehicle technology, presenting at conferences and as an expert participating in meetings of the International Energy Agency. Following the takeover of ZF Getriebe (now called Punch Powertrain) by Punch International in 2006, Patrick established a team for developing a next-generation, high performing hybrid powertrain. Last year the team proudly presented a demonstrator vehicle driven by this newly developed hybrid powertrain.

15:10 REFRESHMENT BREAK

15:40 ENERGY STORAGE: LI-ION BATTERY CHEMISTRY

Dr Allan Paterson, Senior Electrochemical Engineer, Axeon Technologies

Analysis of emerging cost-effective, high-performance, battery chemistries for low-carbon electric and hybrid electric vehicles. Consideration of the benefits of current and near-term cathode and anode chemistries, as well as a view of emerging cell technology and future battery system possibilities.

Allan Paterson is Senior Electrochemical Engineer at Axeon Technologies, investigating new battery technologies and their application in next-generation low carbon EV and HEV applications. He has over ten years' experience in the field of lithium batteries, including developing novel high-energy density electrode materials and the development of next-generation battery systems such as rechargeable lithium-air. His PhD in Chemistry from University of St Andrews involved development of advanced manganese-based cathode materials for rechargeable lithium ion batteries.

16:10 'BRIDGING THE GAP', THE ROLL-OUT OF UK INFRASTRUCTURE TO SUPPORT THE ULCV REVOLUTION

Ian McDonald, Technical Director, Future Transport Systems

- Overview of major infrastructure initiatives – the last three years
- Charging technologies – from trickle to rapid, inductive to battery swap
- Plugged-in places infrastructure projects
- Domesticating your ULCV – home charging
- Customer network access – what is accessible and how
- Future commercial opportunities

16:40 CLOSING COMMENTS

17:00 CLOSE OF SEMINAR

This programme is subject to change.

Automobile Division Organising Committee:

Chris Wheelans, Lotus Engineering

Alice Arnott, Lotus Engineering

The Committee would like to thank the following supporters:

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FORWARD THINKING

**14 OCTOBER 2010
LONDON
2010 AUTOMOBILE DIVISION CHAIRMAN'S
ADDRESS LECTURE**

Reducing Carbon Emissions – Can the automobile make a positive contribution? Prof Peter White will examine this question, taking into account technical innovation, energy sources, trends in vehicle ownership and socio-economic behaviour. Free evening lecture.

www.imeche.org/events/L159

**2 NOVEMBER 2010
LONDON
ENGINE DOWNSIZING**

This seminar will provide an essential guide to the technology solutions available to achieve medium and high-level downsizing and how this can contribute towards low carbon vehicle solutions.

www.imeche.org/events/s1558

**30 NOVEMBER 2010
LONDON
FUELS FOR LOW CARBON TRANSPORTATION**

The one-day seminar will explore the latest thinking and information on 'well to wheels' analysis and fuels options, examining the competitive and regulatory landscape for fuel and propulsion choices.

www.imeche.org/events/s1542

**7 DECEMBER 2010
BRISTOL
UNMANNED MILITARY VEHICLES**

With presentations from leading UMV manufacturers and military technology companies, this event will provide a comprehensive guide to the immediate and longer-term future for UMVs.

www.imeche.org/events/s1548

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INTEGRATING ELECTRICAL AND ELECTRONIC VEHICLE SYSTEMS: EFFICIENT TECHNOLOGY SOLUTIONS. BOOKING FORM

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Venue

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