

# STRIVING FOR A MODEL RAILWAY USING THE CHALLENGES OF THE PAST TO ENGINEER THE RAILWAY OF THE FUTURE

Institution of  
**MECHANICAL  
ENGINEERS**

Railway Division  
**Seminar**

17-19 September 2014  
University of Birmingham.  
[www.imeche.org/events/S1818](http://www.imeche.org/events/S1818)



**ACCOMMODATION  
INCLUDED FOR  
18 SEPTEMBER**  
DETAILS INSIDE

**SPONSOR**



## INTRODUCTION

**To be a competitive mode of transport, rail has to evolve with its customers expectations. The industry needs to achieve this whilst also meeting the driving economic efficiencies. The challenge faced today is to deliver these improvements, using lessons learnt from other projects to ensure success.**

Discover how current industry projects are using lessons from the past to deliver the railway of the future. 'Striving for a model railway' has a unique combination of:

- Fascinating site visits
- Interactive workshops
- Real-life case studies best practice
- Informative lectures
- A cross-industry view of the challenges faced by the industry in developing the railway of the future

This annual seminar is highly valued, regarded and trusted by developing engineers. If you're a new graduate, you can gain a useful introduction to the railway sector. If you have been in the industry longer, take the opportunity to broaden your knowledge and develop insight into other industry areas.

<b>WHEN</b>	17-19 September 2014
<b>WHERE</b>	University of Birmingham
<b>BOOK ONLINE</b>	<a href="http://www.imeche.org/events/S1818">www.imeche.org/events/S1818</a>

## BENEFITS OF ATTENDANCE:

### FOR YOUR COMPANY:

- **Develop** the skill sets of your young engineers
- **Bring** new ideas and approaches into your workplace
- **Keep** your organisation informed of current industry topics
- **Learn** from other organisations' processes with our technical visits
- **Expose** staff to new and inter-related areas of the railway industry
- **Staff** competencies for chartered status

### FOR YOU:

- Gain knowledge of the latest industry projects and key issues
- Develop your project management and innovation skills through interactive workshops
- Understand best practice and lessons learnt from exciting case studies
- Expand your professional network with exposure to leading industry figures

## EVENT PARTNERS

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Railway Industry Association

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# PROGRAMME

## DAY 1

WEDNESDAY 17 SEPTEMBER 2014

### TECHNICAL VISITS

13:00 - 15:00

#### **TYSELEY DEPOT**

Tyseley Depot was first a steam locomotive depot but is currently operated by London Midland for maintenance of Class 150 and 172 diesel locomotives. The tour will show the facilities in operation for these diesel trains.

#### **SALTLEY WEST MIDLANDS SIGNALLING CENTRE**

The signalling centre's primary function is to house a number of signalling workstations that control most of the Midlands Railways / train movements in and out of the region. Full capacity has not yet been reached, but is expected to be reached by September 2015.

Support staff in the form of control technicians and telecom staff perform checks and attend to alarms and faults that occur. They also liaise with track-side teams and assist them with faults and line blockages.

#### **OXLEY DEPOT**

Alstom's traction and rolling stock maintenance depot at Oxley is used to maintain the Virgin Trains Pendolino stock for the West Coast Main Line. With the Pendolino being one of the fastest domestic electric multiple units operating in Britain, the tour provides an exciting opportunity to discover the maintenance procedures required for such high-spec technology and to get closer to the trains themselves.

#### **BIRMINGHAM CITY CENTRE TRAM CONSTRUCTION WORKS**

Midland Metro, which has now been operating for 15 years, has a long standing aspiration to expand. Funding was agreed in 2010 for a £122m first phase investment to include a city centre extension in Birmingham, a new fleet of trams and a major extension to the depot. The visit will view the ongoing works in Birmingham and take a ride on the existing line to the depot facility at Wednesbury to view the new tram fleet and depot extension. During the visit there will be the opportunity to discuss the technical challenges, funding and benefits of the scheme.

### PRE-SEMINAR PUB QUIZ

19:00

PUB QUIZ AT 'RAISING THE BAR' CAMPUS

## DAY 2

THURSDAY 18 SEPTEMBER 2014

09:00

REGISTRATION & REFRESHMENTS

09:30

WELCOME

09:40

**KEYNOTE SPEAKER: THE HISTORIC CHALLENGE OF STORING ENERGY FOR RAILWAY TRACTION**

**Felix Schmid, Professor of Railway Systems Engineering, University of Birmingham**

- Minimising energy storage volume and mass is a major challenge
- Early railway traction used inefficient bio-chemical energy storage
- Wood and coal fired stationary and motive boilers as major advances
- Diesel and petrol as highly efficient storage media
- What other easy and efficient options are there for storing energy?

10:10

**ACCIDENT INVESTIGATION**

**Carolyn Griffiths, Chief Inspector, Rail Accident Investigation Branch (RAIB)**

- How the RAIB contributes to the improvement of the safety of the railway – what the outputs of the organisation are and how these are used
- How accidents are analysed and root causes determined
- How the work of the RAIB has led to changes in the industry

10:30

**LEVEL CROSSINGS**

**Darren Furness, Programme Manager, Network Rail**

- Identifying level crossings involved with a high number of incidents
- Using improved technology to upgrade them to better and safer systems

10:50

DISCUSSION SESSION

11:00

NETWORKING REFRESHMENT BREAK

## PROGRAMME

### DAY 2

THURSDAY 18 SEPTEMBER 2014

11:20

#### CROSSRAIL

**Jon Jarrett, Head of Maintenance and RAM, Crossrail**

- Knowing your product first
- Influencing design now for future operations and maintenance requirements
- The application of technology to deliver risk-based intervention
- Maximising predictive Crossrail maintenance - no surprises
- Application of best practice – leading edge or cutting edge?

11:40

#### TRANSFORMATION PROJECT

**Jane Simpson, Technical Services Director, Network Rail**

- What is the Transformation Project?
- What is required to achieve a railway that has no performance-affecting failures?

12:00

#### MODELLING OF FRICTION TRAIN ARRESTOR

**Toby Oliver, Project Engineer – Track Partnership, Transport for London**

- A look back at accidents in terminal stations
- The London Underground sub-surface railway upgrade programme
- Friction train arrestor impact modelling

12:20

#### APPLYING LESSONS LEARNT - A PERSONAL PERSPECTIVE

**Andy Course MBE, Chief Operating Officer, Eversholt Rail**

- An engineer's lesson when 'all at sea'
- How lessons learnt in ships have helped with trains

12:50

#### DISCUSSION SESSION

13:00

#### LUNCH

14:00

#### TEAM CHALLENGE

Over the course of Thursday afternoon teams will work on a practical engineering challenge. The groups will build and test their designs, focusing on meeting the set requirements and delivering a sustainable and economical product. The practical activity will give evidence for competencies B1, B3 and E3 from the UK-SPEC.

17:00

#### CLOSE OF TEAM CHALLENGE

19:00

#### FORMAL DRINKS RECEPTION AND DINNER

### DAY 3

FRIDAY 19 SEPTEMBER 2014

09:00

#### TEAM CHALLENGE

Following the build and test, teams will be given the opportunity to present their design. The presentations will help to develop the participants ability and confidence in communicating technical information. Another aspect to be explored will be the behavioural side of the process – encouraging team members to analyse the way they worked and what their role in the team was. The session will provide evidence for competencies D2 and D3 from the UK-SPEC.

11:00

#### NETWORKING REFRESHMENT BREAK

11:20

#### CONVERSION OF THE 25KV TRACTION POWER SUPPLY TO AUTO-TRANSFORMER FEEDING

**Ellen Wintle, Senior Route Asset Manager, Network Rail**

- Overview of the WCML Power Supply Upgrade Project
- What have been the key challenges?
- How do we learn from these for our future electrification schemes?

#### Organising committee:

- Philippa Wardle, Eversholt Rail
- David Lawes, Transport for London
- Leigh Hopcroft, Wabtec Rail

## PROGRAMME

**DAY 3** **FRIDAY 19 SEPTEMBER 2014**

- 11:40** **CLASS 321 DEMONSTRATOR**  
**Mark Wallace, Engineering Project Manager, Wabtec Rail**  
Procurement of a new fleet is a costly exercise
- Disposal of an ageing fleet has significant economic and environmental impacts
  - Modernising existing fleets can give the look and feel of a new fleet for a fraction of the cost
- 12:00** **DISCUSSION SESSION**
- 12:10** **LUNCH**
- 13:10** **EUROPEAN RAIL TRAFFIC MANAGEMENT SYSTEM - ERTMS**  
**Robert Watson, Consultant, Rail Control Systems, Interfleet**
- The challenges of delivering safety and capacity for the railway
  - All about ERTMS – what it is, why have it, how it works and its implications for the UK railway
  - Work being carried out to deliver ERTMS for the UK
- 13:30** **HS2: REDEFINING BRITAIN'S RAILWAYS**  
**Amanda White, Senior Route Engineer (North West), HS2 Ltd**
- The project, the network and timescales
  - Technology challenges and route engineering
  - Lessons learnt and why it's not just a 'copy and paste' railway
  - Opportunities
- 13:50** **DISCUSSION SESSION**
- 14:00** **QUESTION TIME**  
A panel of industry speakers and senior managers debate the hot topics that confront railway engineers today.
- 15:00** **CLOSE OF EVENT**

**Find out more about our speakers at [www.imeche.org/events/S1818](http://www.imeche.org/events/S1818)**

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

## SPEAKERS AND CONTRIBUTORS

### **FELIX SCHMID** KEYNOTE SPEAKER

#### **PROFESSOR OF RAILWAY SYSTEMS ENGINEERING, UNIVERSITY OF BIRMINGHAM**

Felix Schmid moved to Britain after studying electrical engineering at the Swiss Federal Institute of Technology (ETH) in Zürich, changing discipline to a Locomotive Control Engineer with GEC Traction of Manchester, now part of the Alstom group. In 1993, Felix was seconded to the Swiss Federal Office of Transport, leading to a position with the Advanced Railway Research at the University of Sheffield, where he and colleagues from the Universities of Birmingham, Loughborough and Imperial College created the MSc programme in Railway Systems Engineering that had its first intake in autumn 1995. Felix is the Education Director at The Birmingham Centre for Railway Research and Education (BCRRE) and supervises research on railway capacity, systems engineering, human factors and railway control.

### **ELLEN WINTLE**

#### **SENIOR ROUTE ASSET MANAGER, NETWORK RAIL**

Ellen Wintle has over 20 years experience in railway electrification. She was previously the Engineering Manager for Network Rail during the development and implementation of the 25kV Auto-Transformer traction power supply system as part of the West Coast Route Modernisation. Ellen moved into a Programme Management role and led the further development of 25kV Auto-Transformer traction power conversions for key sections of the East Coast and West Coast Main Lines. She is now responsible for Signalling, Power and Buildings on the London North Western (LNW) Route.

### **CAROLYN GRIFFITHS**

#### **CHIEF INSPECTOR, RAIL ACCIDENT INVESTIGATION BRANCH (RAIB)**

Carolyn Griffiths joined British Railways in 1979. In 1987 she worked alongside the Singapore Government to set up and run the maintenance of what was the world's most advanced mass rapid transit system. In 2003 she was appointed by the Secretary of State for Transport in the UK to create and lead the independent Rail Accident Investigation Branch UK (RAIB). The RAIB is now a leading world-class organisation which undertakes around 25 investigations a year.

## **SPEAKERS AND CONTRIBUTORS**

### **ANDY COURSE MBE**

#### **CHIEF OPERATING OFFICER, EVERSOLT RAIL**

Andy Course is responsible for managing the Eversholt rolling stock asset base, including the safety, heavy maintenance update, upgrade and refurbishment of current trains as well as the delivery into service of new trains. After joining the Royal Navy, Andy served for over 20 years as an Engineer Officer both at sea and ashore, including roles within the Ministry of Defence, the Defence Intelligence Staff and the MoD Procurement Agency. Following this, he spent six years advising private and public sector clients as a Strategy Consultant and Director at PwC.

### **TOBY OLIVER**

#### **PROJECT ENGINEER – TRACK PARTNERSHIP, TRANSPORT FOR LONDON**

Toby Oliver graduated from The University of Sheffield with an M.Eng in Mechanical Engineering in 2005. He worked in the Energy sector and as an academic researcher before joining London Underground where he has practiced the art of track engineering ever since.

### **JANE SIMPSON**

#### **TECHNICAL SERVICES DIRECTOR, NETWORK RAIL**

Jane Simpson's rail career started 18 years ago as a graduate entrant into British Rail, the year it was privatised. She led the Over Head Line (OLE) depots between Euston and Rugby, being the first female OLE engineer within the maintenance organisation. Since then Jane has worked at Marconi Communications, delivering projects, before returning to Network Rail in 2004, working in projects and then latterly in maintenance. In 2011 Jane was appointed as Director Route Asset Management (DRAM) for London North Western Route.

### **MARK WALLACE**

#### **ENGINEERING PROJECT MANAGER, WABTEC RAIL**

Mark Wallace is responsible for managing the design and development of significant rolling stock upgrades and refurbishments at Wabtec Rail. Before joining Wabtec as a Project Engineer, he completed a four year graduate development programme at Interfleet Technology. In November 2013, Mark completed the engineering design and development of the Demonstrator Train for Eversholt Rail Group. The train is now in full time passenger service, has featured in all the major rail publications and has received accolades throughout the industry.

### **AMANDA WHITE**

#### **SENIOR ROUTE ENGINEER (NORTH WEST), HS2 LTD**

Amanda White has been responsible for the Manchester route development for three years. She previously worked for Network Rail for seven years, starting as a Graduate Electrification Engineer and moving into Railway Systems. Amanda also sits on the executive board of the Institution's Railway Division.

### **ROBERT WATSON**

#### **CONSULTANT, RAIL CONTROL SYSTEMS, INTERFLEET**

Robert Watson started his career as a researcher at Imperial College London, where he completed his PhD on the subject of energy modelling of high speed rail. After winning an international student essay competition he participated in the 7th UIC Congress on High Speed Rail in Beijing in 2010 and was also a visiting researcher at the Railway Technical Research Institute in Tokyo, Japan, studying the Shinkansen high speed rail system. Since joining Interfleet Technology in 2012, Robert has worked on a variety of projects including rolling stock design (both modification to existing trains and new build) and ERTMS implementation.

### **JON JARRETT**

#### **HEAD OF MAINTENANCE AND RAM, CROSSRAIL**

Jon Jarrett is currently the Head of Maintenance and RAM at Crossrail, with a portfolio spanning a variety of areas of compliance to ensure standards, procedures and processes are maintained. Prior to working at Crossrail, Jon's career began at British Rail/Railtrack, covering engineering and manager posts, before moving onto train service delivery as a Performance Manager at Railtrack. He then joined Network Rail as Maintenance Contract Area Manager, advancing to a Maintenance Delivery Manager and then Special Project Manager for Crossrail.

# BOOKING FORM

SEMINAR CODE:  
S1818AB

**STRIVING FOR A MODEL RAILWAY**  
17-19 SEPTEMBER 2014  
UNIVERSITY OF BIRMINGHAM,  
EDGBASTON, BIRMINGHAM, WEST  
MIDLANDS, B15 2TT

## REGISTRATION Please complete in capitals.

Family Name	Title (Mr, Mrs, Miss)
First Name	Job Title
Membership No	Institution
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Address for correspondence	
Town/City	
Postcode	
Contact Telephone	
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Do you have any special requirements?	

How did you hear about this event?  Direct mail  Website  Colleague  Other  
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Please tick the boxes below to let us know what you're interested in:

- Events and training opportunities  
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 Services and offers from our preferred partners

## FEES AND CHARGES Please complete the appropriate box.

Registration fees include entry to the sessions, refreshments, lunch and a copy of the event proceedings.

	FEE	VAT	TOTAL	£
Member, Institution of Mechanical Engineers	£390.00	£78.00	£468.00	
Member, supporting organisation	£390.00	£78.00	£468.00	
Non-member	£460.00	£92.00	£552.00	
Wednesday Evening Accommodation	£38.50	£7.70	£46.20	
Technical Visit	£5.00	£1.00	£6.00	
Invoice charging (if applicable)	£10.00	£2.00	£12.00	
			<b>TOTAL</b>	

### Site visits

Please indicate your first and second choices by writing 1 and 2, as places are offered on a first-come, first-serve basis.

- Tyseley Depot  Saltley West Midlands Signalling Centre  
 Oxley Depot  Birmingham City Centre Tram Construction Works

## PAYMENT DETAILS

Payment must accompany this registration form. Registration will be confirmed only on receipt of full payment.

### PLEASE INDICATE METHOD OF PAYMENT:

- Cheque** Cheques should be made payable to IMechE and crossed. Please note international delegates may pay only by credit card, BACS or banker's draft. A copy of the draft must accompany this form. It is the delegate's responsibility to pay any bank charges.
- Credit Card**  
Card type:  Visa  MasterCard (please note we cannot accept American Express, Diners Club or Maestro)  
Card No \_\_\_\_\_ Valid From \_\_\_\_\_ / \_\_\_\_\_ Expiry Date \_\_\_\_\_ / \_\_\_\_\_  
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- Invoice (UK residents only)** Delegates wishing to be invoiced must provide an order number. If your company does not use order numbers please include a formal request for invoicing on your company's letterhead. A charge of £10 +VAT will be made to cover additional administration costs. Invoices are payable on receipt and no alterations to these terms will be accepted.
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- 4 Post completed booking form to:  
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- 5 Fax:  
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Completed application forms should be returned to the address above, along with the correct payment. Attendance at the event will be confirmed on receipt of the full balance. All participants are advised to bring a copy of their confirmation with them on the day, to ensure the fastest possible entry.

### SPECIAL REQUIREMENTS

Please inform us of any special requirements, ie. dietary or access, on the relevant section of this form.

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15 October 2014  
London

### RAIL RELIABILITY, CAPACITY AND PERFORMANCE 2014

Rail Reliability, Capacity and Performance 2014 will provide an opportunity to understand practical, technological and human facing solutions to the challenges posed by increased demands on the UK's rail infrastructure to reduce delays, increase the performance and reliability of the fleet without compromising capacity.

[www.imeche.org/events/S6168](http://www.imeche.org/events/S6168)



26 November 2014  
London

### INTEROPERABILITY - SAFER, CHEAPER, EASIER

This seminar will showcase experience and best practice for the implementation of technical interoperability on UK railways for both trains and infrastructure.

[www.imeche.org/events/S1830](http://www.imeche.org/events/S1830)

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