

6th Rail Engineering & Maintenance Summit 2017

■ Main Summit: 23 & 24 August 2017 ■ Workshops: 22 & 25 August 2017 ■ Venue: Singapore

Leading Platform for Rail Asset Operators and Contractors Aimed at Maximising Infrastructure's Operational Capabilities, Life Cycle, Reliability and Optimising Asset Management Expenditure

2017 FACULTY SPEAKERS INCLUDE:



Duncan Weir
Head of Maintenance
Modernisation
Programme,
Transport for London



Ir. Jit Shiong Yeoh
Senior Manager -
Design Interface,
MRT Corporation



Gregory Lunn
Director Rail
Maintenance,
**Roads and Transport
Authority Dubai**



Vipul Kumar
Executive Director -
Civil Engg & Rail Track
Technologist,
India Railways



William Wing Hong Lam
Senior Manager, Inno-
vative Asset Manage-
ment and Governance,
MTR Hong Kong



Sanjay Kumar
Chief Engineer,
**Kolkata Metro
Railway Corporation**



Dr. Richard Dwight
Associate Professor,
**University of
Wollongong**



Dr. Hadi Sanei
Associate Director -
Rail,
CH2M



Ivan Tzanev
Design & Maintenance
Eng,
**Athens Urban Rail
Transport**



Dr. HongTao Zhu
Senior Lecturer -
School of Mechanical,
Materials & Mechatron-
ic Engineering,
**University of
Wollongong**

PLUS!!!

4 separately bookable workshops on 22 & 25 August 2017

Details on p3 & p6

- A** Predictive Maintenance and Condition-Based Monitoring to Improve Maintenance Performance, Rail Reliability and Extend Service Life
- B** Engineering, Designing And Maintenance Parameters for Permanent Ways and Tracks to Increase Rail Infrastructure Capacity
- C** Strategic Asset Management Programmes for Optimised Rail Asset Life Cycle
- D** Deliver Track Renewal Works for Optimal Life Cycle at Reduced Maintenance Requirements and Costs

CASE STUDIES

Each year, **over 16 Global leaders in rail infrastructure** are selected at the annual Rail Engineering & Maintenance Summit to present & exchange unique knowledge and best practices honed by decades of pushing the boundaries in **attaining greater rail operational capabilities, life cycle and reduced project expenditure**.

This August, Equip Global's **6th Summit Edition** on Rail Engineering & Maintenance will continue to deliver exclusive insights and actionable strategies with case studies from industry pillars and high-profile mega projects, including **MTR Hongkong, Roads & Transport Authority (Dubai), Transport for London, HS2, Alstom, Crossrail, MRT Corporation, Saudi Railways Organisation, ARTC, Transport for NSW, and many others**.

KEY ISSUES TO BE ADDRESSED

- ▶ Rail track integrated **Condition based monitoring (CBM), diagnostic technologies, inspection strategies and implementation of predictive maintenance**
- ▶ Determination of **measures against life-limiting factors affecting railway capacity & operational readiness**
- ▶ Digitisation approaches in **Maintenance Planning**: implementation, asset behaviour data selection and analyses of rail profile
- ▶ Various Case Studies on **Strategic Asset Management Programmes**
- ▶ Engineering & Maintenance for **electrification and signalling systems**
- ▶ **Track surface inspection & measurement systems** for defects reporting
- ▶ Rail asset predictive analyses and accuracy in **life cycle estimation**
- ▶ **Maintenance Requirements** during design, construction phases and before operations
- ▶ Designing & engineering permanent way to **handle increased traffic and axle loads and track geometry degradation prediction**
- ▶ Improving rail lifecycle and minimising degradation through **Rolling stock design that reduce dynamic forces on track Infrastructure**
- ▶ Address effect of **weather/climate conditions on rail operational readiness**: sand, flooding, extreme cold, soil condition, geotechnical movements
- ▶ **Maintenance & Renewal programmes** on legacy tracks

Researched & Developed by:

**EQUIP
GLOBAL**

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Andrew McCusker
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**SMART Facility
University of
Wollongong**



Gassim Al-Gassim
Former VP
Infrastructure / Act-
ing DCEO O&M,
**Saudi Railways
Organization**

MORE EXPERT SPEAKERS:



Simon Thomas
Programme Director -
Inland Rail,
ARTC



Michael Garrard
Consultant - Sydney
Metro Project Manager,
Transport for NSW



Mark Morris
Director of Asset
Management, Railway
Operations,
HS2



James Cronje
Trackwork Design
Manager - Cross Rail,
Alstom



Technical Director -
Rail & Transit Systems,
Metrolinx,
**MetroLinx, Parsons
(Canada)**

Equip Global's annual Rail Engineering summit provides excellent opportunity to deliberate among experienced decision-makers on problems and solutions envisaged by them. The summit contribution cannot be quantified!

Vipul Kumar
Executive Director - Civil Engg & Rail
Track Technologist,
India Railways

**KEY BENEFITS OF ATTENDING
6TH RAIL ENGINEERING & MAINTENANCE SUMMIT 2017**

- Minimise loss of economic and time resources from time-directed, overhaul & indiscriminate preventive maintenance & replacement
- Contributory to minimising track intervention and traffic speed reductions
- Increase rail life cycle while minimising life cycle costs
- Manage associated risks with rail infrastructure
- Take control of dynamic forces with implications on asset service lives
- Effective coordination of all corrective, preventive and predictive maintenance approaches
- Improving effectiveness in inspection and maintenance in less time
- Protect rail tracks against critical deterioration
- Technology choices and responsibility of funding agencies

WHO WILL YOU MEET AT THE SUMMIT:

Heads/Directors/Managers/Masters/ Project managers/Project engineers:

- Track / Track maintenance / Maintenance
- Rail Asset Management (Asset Manager / Asset Management Policy)
- Permanent Way (Construction/maintenance/design)
- Project / Infrastructure programme
- Infrastructure management
- Reliability Engineering
- Reliability Improvement
- Signalling
- Systems Engineering
- Rolling stock
- Programme improvement
- Performance & reliability
- Quality
- Safety
- Risks

From the following (but not limited to):

- Rail Assets Operators
- Rail Assets Developers and Owners
- Urban Transport Authority: Rail Transport, Roads and Land transport
- Ministries/Departments of Transport

8.00am

Morning registration and refreshment

1.30pm

4.30pm

WORKSHOP A

PREDICTIVE MAINTENANCE AND CONDITION-BASED MONITORING TO IMPROVE MAINTENANCE PERFORMANCE, RAIL RELIABILITY AND EXTEND SERVICE LIFE

Predictive maintenance and condition based monitoring are some of the latest trends growing in the railways operation sector as most operators and infrastructure owners become more and more eager to implement practical, beneficial predictive asset management programmes which allow well planned maintenance, renewal works at significantly reduced cost. Such implementation comes at various costs beside significant capital investment on tools and technologies, including the complex decision-making processes involved in technology choices, system integration, data source selection, analytics & data-driven insights, intervention with tracks, and many other issues.

Without abandoning the basics, this workshop will enable participants to have a lively heated debate on the best practices of implementation or improvement of the predictive maintenance and CBM, in addition to discussion on best maintenance planning, scheduling and operations. Key benefits of attending this workshop:

- Analyse methodologies in track monitoring, techniques and technologies that reduce frequency of maintenance while keeping long service life for tracks
- Integrate condition monitoring systems with minimal disruption on infrastructure
- Address challenges from selecting, analysing data from various sources. Determine data sets that matter to track degradation
- Access actionable insights from predictive analytics for real-time condition measurement, appropriate asset maintenance
- Planning for maintenance and inspection at design phase, construction phase and prior to handover
- Improve predictive maintenance on both new tracks and legacy tracks
- Maximise service life and reliability of rail infrastructure
- Reduce downtime during maintenance and manage issues with track accessibility during maintenance

About Your Workshop Leader:



Gregory Lunn
Director for Rail Maintenance,
Roads & Transport Authority
(RTA)

Mr. Gregory is presently Director for Rail Maintenance at Road Transport Authority in Dubai.

He has over 17 years of directorship & managerial experiences in rail engineering and construction at Carillion, Network Rail, Invensys Rail, Balfour Beatty Rail, Morgan Sindall – mostly in UK before UAE.

Since 2001 he has held various positions as Operations Director Territory Maintenance Director, Delivery Director, Rail Electrification Operations Director and presently in charge of general maintenance methodology and performance advising RTA.

WORKSHOP B

ENGINEERING, DESIGNING AND MAINTENANCE PARAMETERS FOR PERMANENT WAYS AND TRACKS TO INCREASE RAIL INFRASTRUCTURE CAPACITY

Beside necessary improvements on maintenance planning and asset management practices, designers, constructors are to take into consideration of future increase in capacity requirements on rail infrastructure, from track bed, rail profile, rail geometry strength, wayside monitoring equipment etc. This workshop is specially designed for rail infrastructure engineering, construction, maintenance operators so they could benefit from topics including:

- Assess the future capacity requirements for track load bearing and effects of increased operations and speed
- Upgrade track gauges for better axle load handling
- Techniques to minimise rail profile and geometry deterioration
- Drive predictability into rail geometry monitoring
- Adoption of wayside monitoring equipment
- Planning for effective spares management
- Choices of materials in construction: synthetic materials; plastic composite, steel
- Choices of technologies and influences from funding agencies
- Innovations and upgradation on signalling equipment

About Your Workshop Leader:



Vipul Kumar
Executive Director –
Rail Track Technologies,
Indian Railways

Vipul is a civil engineer from Delhi college of Engineering, University of Delhi, India, a gold medallist from 1983 graduation. In his 30-year career, he has handled maintenance & construction works on railway tracks, bridges and other civil infrastructure including rail track design aspects. After obtaining experience in construction of Oil field installation through 4 years work with Oil India Ltd., Vipul joined Indian Railways in 1988. He has provided service for various capacities in Indian railways including Track maintenance and Rehabilitation Manager; Construction Chief Engineer; Executive Director for Track as well as SBU head of Bridge and Tunnel wing of RITES Ltd.

In 1999 and 2002, Vipul was an international track expert for Uzbek Railways and advised on Elastic fastening & sleeper for deciding new track structure on Tashkent-Samarkand rehabilitated line.

Vipul has been instrumental in designs of many track products for IR Research Designs & Standards Organisation, the research wing of Indian Railways. Some of these products include Ballastless track with low cost indigenous fastening systems, improved toe load tension clamp, wider sleeper and rail free fastening system for girder bridges. He has contributed significantly in drafting first ever Noise and Vibration Guidelines for metro systems in India.

12.00pm

Networking Luncheon

SUMMIT DAY ONE - 23 August 2017

8.25am	Registration and Welcome Coffee			
9.00am	Welcome Address by Chairman			
9.10am	OPENING PANEL DISCUSSION: Rail Infrastructure Leaders Introducing Projects, Challenges in Maximising Track Reliability, Service Life and Reducing Cost This opening panel discussion will shape the focus for the summit over the next 2 days, by having expert speakers around the world listing legacy, technical and implementation challenges in rail asset maintenance and capacity-expansion projects. Topics of discussion include: <ul style="list-style-type: none">Challenges in renewing and maintaining legacy rail infrastructureGrowth in traffic demands, speed requirements, axle loads and implication on track capacity and durabilityInspection, monitoring and maintenance requirements in design and construction phases and prior to handoverRecent successes and failures in predictive maintenance investment Moderator: <ul style="list-style-type: none">Vipul Kumar, Executive Director - Civil Engg & Rail Track Technologist, India Railways Panellists: <ul style="list-style-type: none">Dr. Hadi Sanei, Associate Director - Rail, CH2MGassim Al-Gassim, Former VP Infrastructure / Acting DCEO O&M, Saudi Railways OrganizationProgramme Director - Inland Rail, ARTCDr. HongTao Zhu, Senior Lecturer - School of Mechanical, Materials & Mechatronic Engineering, University of Wollongong	1.35pm	Case Study: Maintenance Modernisation Programme for London Underground - Noise & Vibration Minimisation Maintenance and Renewal on Legacy Tracks <ul style="list-style-type: none">Improve accuracy in identifying tracks' defects (geometry shifts, wear & tear ...), and analysing possible life extensionDecision-making process on determining level of quality improvements throughout overhaul renewal worksChallenges and maintenance solutions on noise and vibration issuesReduce traffic intervention and disturbanceMethods and practices to improve sustainability of tracks and reduce renewals frequencyTrack & signalling modificationSwitch and crossings failures: maintaining switch health Duncan Weir , Head of Maintenance Modernisation Programme, Transport for London (TFL)	
9.55am	Case Study: Roads and Transport Authority (Dubai) Implementation of Condition Based Monitoring and Predictive Maintenance <ul style="list-style-type: none">Reviewing systems participating throughout the implementation of condition based monitoringBasic data requirements on condition based monitoring:<ul style="list-style-type: none">✓ Geometry measurements✓ Layout & operating✓ Measurements (inspections of general condition, fastening, sleeper condition, rail failure, wear, corrugation, ballast ...)✓ Superstructure & infrastructure (subgrade, sleepers, rails, structures...)Challenges in collecting, analysing, modelling multi-source basic dataDeveloping diagnostic systems and technologiesCondition analyses and maintenance planningEffective collaboration between preventive maintenance and predictive maintenance Gregory Lunn , Director - Rail Maintenance, Roads and Transport Authority (Dubai)		2.20pm	Case Study: MRT Corporation (Malaysia) Maintenance Considerations in Underground Railway Design <ul style="list-style-type: none">How do you impose maintenance requirements in a railway design?What's the criteria for material selection with maintenance in mind?Maintenance space, for human or do we hire monkeys?Maintenance & replacement route considerationBIM in maintenance Jit Shiong Yeoh , Senior Manager - Design Interface, MRT Corporation Sdn Bhd
10.40am	Morning Tea and Networking Break		3.05pm	Afternoon Tea and Networking Break
11.00am	Case Study: MTR Corporation Improve Predictability of Track Condition: Real-time Asset Condition Measurement and Data Analytics on Railway Systems <ul style="list-style-type: none">Failure mode analysis: Methods to identify failures, indicate causes and components' conditionsCondition monitoring technology and methodology: Overcoming challenges in system integrationsData analytics and system behaviours: Understanding how defects are propagated and translated into failuresPrediction methodology: failures and predictive modelling and understanding systems' behaviours through incident frequency reviews and performance feedback loops William Lam , Senior Manager - Innovative Asset Management and Governance, MTR Corporation		3.25pm	PANEL DISCUSSION: Approaches in Employing Predictive Maintenance and Condition Based Monitoring Tools with Minimised Track Intervention <ul style="list-style-type: none">Availability of simple, integrated condition monitoring platforms providing ready access to all relevant statuses for predictive maintenance and asset managementHow to ensure effectiveness and low investment capitals of integrating wayside conditioning monitoring system?Considerations of modular hardware design, remote terminal unit, hot-swappable I/O modules, standard programming languages and SCADA softwareTrack and switch condition monitoring Moderator: <ul style="list-style-type: none">Vipul Kumar, Executive Director - Civil Engg & Rail Track Technologist, India Railways Panellists: <ul style="list-style-type: none">Gregory Lunn, Director Rail Maintenance, Roads and Transport Authority DubaiWilliam Lam, Senior Manager - Innovative Asset Management and Governance, MTR Hong KongMark Morris, Director of Asset Management, Railway Operations, HS2Ivan Tzanev, Design & Maintenance Eng, Athens Urban Rail
11.45am	Case Study: Engineering and Constructing Kolkata East West Metro Rail project Towards Facilitating Effective CBTC Systems Rail Asset Condition Measurements and Accuracy of Life Cycle Assessment <ul style="list-style-type: none">Unique features in East West Line. Scope of S&T works (technical) as per contract. Interfacing issues & Challenges with S&T and Rolling Stock.Proposed solution and Contractual challenges.Tools and technologies assisting accurate analyses of rail asset life cycleElectrification and signalling systems designing, engineering & maintenanceOptimising railway asset life cycle performance through continuous improvement processFeasibility of Adoption of CBTC in KMRC: Major benefits of CBTC system: CBTC architecture & operating principlesAdvantages of the implementation of CBTC system over DTG Sanjay Kumar , Chief Engineer, Kolkata Metro Rail Corporation Ltd		4.10pm	Case Study: Indian Railways Designing & Maintenance Considerations for Permanent Way to Handle Increased Traffic Requirements and Axle Loads <ul style="list-style-type: none">Recognising continuously growing requirements on rail capacity due to increasing speeds, frequency and axle loads on trackNumerical analysis of increased axle load on track bedIncreasing capacity of rail infrastructure with efficient signalling systemsOvercoming challenges in gauge constraint and increase axle loads on narrow gaugeNecessary upgrades on signal and train control systemsMaterials considered in track design Vipul Kumar , Executive Director - Track, Indian Railways
12.30pm	Lunch and networking break		5.00pm	Closing address by Chairman
			5.10pm	End of Summit Day One

SUMMIT DAY TWO - 24 August 2017

8.25am	Registration and Welcome Coffee		
9.00am	Welcome Address by Chairman		
9.10am	<p>Minimising Risks of Losses in Resources in Project Delivery and Mathematical Modelling of Predictive Maintenance</p> <ul style="list-style-type: none"> Case Study: Reviewing of rail asset management effectiveness Lesson learned: benefits in risk-based approaches asset management: quantifying potential efficiency opportunities Efficient delivery of project through integrated systems engineering Considerations in preventing losses of resources Realising benefit of decreased maintenance cycles with individual assets' risk based maintenance <p>Dr. Hadi Sanei, Associate Director - Rail, Cross Rail Project PDP Head, ch2m</p>	2.20pm	<p>PANEL DISCUSSION:</p> <p>Extending Rail Life Cycles and Minimising Renewal Capitals</p> <ul style="list-style-type: none"> What are the effective techniques for asset life extension validation? How to best control rail life cycle costs? Testing, measuring and increasing track structural & gauge strength Rail fastener performance and shock-absorbent track fastening: How to improve? Improved rolling stock engineering for reduced dynamic forces and degradation on rail track, improving life cycle <p>Moderator:</p> <ul style="list-style-type: none"> Vipul Kumar, Executive Director - Civil Engg & Rail Track Technologist, India Railways <p>Panellists:</p> <ul style="list-style-type: none"> Duncan Weir, Head of Maintenance Modernisation Programme, Transport for London Ir. Jit Shiong Yeoh, Senior Manager - Design Interface, MRT Corporation James Cronje, Trackwork Design Manager - Cross Rail, Alstom Michael Garrard, Consultant - Sydney Metro Project Manager, Transport for NSW
9.55am	<p>Best Practices in Developing Strategic Asset Management Programmes</p> <ul style="list-style-type: none"> Techniques for analysing asset conditions and asset capability Data collection in operational costs, delays, faulty Calculation of associated risks based on infrastructure failure and degradation patterns Explore asset management strategies that realise significant operational cost reduction and improve train reliability <p>Ivan Tzanev, Design & Maintenance Eng, Athens Urban Rail Transport</p>		
10.40am	Morning Tea and Networking Break		
11.00am	<p>Data analytics in understanding rail degradation behaviour and predictive modelling</p> <ul style="list-style-type: none"> MRX testing and statistical analysis of rail surface degradation (RCF and squat) along the tracks Metallurgical examination of origin and growth of the squat in railway networks Predictive modelling of wheel and rail interface Understanding rail strategy against the rail degradation <p>Dr. HongTao Zhu, Senior Lecturer - School of Mechanical, Materials & Mechatronic Engineering, University of Wollongong</p>	3.05pm	Afternoon Tea and Networking Break
11.45am	<p>Determination of Measures Against Life-Limiting Factors Affecting Railway Capacity & Operational Readiness</p> <ul style="list-style-type: none"> Reviewing common factors affecting service life of components <ul style="list-style-type: none"> ✓ Material aging ✓ Weather & corrosion ✓ Wear & tear, operating cycles ✓ Metal fatigue Affected equipment and possible life extension measures Minimise equipment obsolescence with condition based monitoring <p>Mark Morris, Director of Asset Management - Railway Operations, HS2</p>	3.25pm	<p>Asset management development programs in a rail environment: role of simulation, modelling, and post-graduate education</p> <ul style="list-style-type: none"> Simulation and modelling in the context of Asset Management Platform crowding with changing socio-demographics and ripple effects along a rail network Asset life related decision processes in a rail context Simulation and modelling for asset systems to maximise capacity and asset life Predictive modelling and rail degradation informed maintenance programs and direct business outcomes Role of education in successful Asset Management <p>Dr. Richard Dwight, Associate Professor, University of Wollongong</p>
12.30pm	Lunch and networking break		
1.35pm	<p>Proper Determination of Track Geometry Shifts and Structure Condition</p> <ul style="list-style-type: none"> Predict and prevent track geometry degrades and derailments Minimising replacement and maintenance costs due to rectification of poor track geometry through predetermined inspection and planned maintenance Identifying proper track geometry indicator, predicting track geometry behaviour Reduce complexity in predicting, modelling track geometry degradation maintenance Defining length sections considered for degradation & maintenance analyses and planning track maintenance activities Estimation of effectiveness in manual intervention, tamping and recovery of track geometry maintenance Scheduling geometry recovery operations <p>James Cronje, Trackwork Design Manager - Cross Rail, Alstom</p>	4.00pm	<p>Case Study: Sydney Metro Project Geological Studies and Asset Condition Assessment in Railway Infrastructure Project Design</p> <ul style="list-style-type: none"> Assessing and engineering geological conditions and seismic risks Considerations in track possession management and rail operational readiness Route selection of railway line <p>Michael Garrard, Consultant - Sydney Metro Project Manager, Transport for NSW</p>
		4.40pm	<p>Case Study: Inland Rail Project Overcoming Challenges and Innovative Approaches in Delivering Rail Engineering and Maintenance Project</p> <ul style="list-style-type: none"> Rail infrastructure projects investment's socio-economic evaluations Considerations in design, procurement and installation of assets Project phasing and reliability targets Maximising maintainability of railways with big data initiatives (BIM, GIS, IRmap) Standardisation of components, procurement, and system engineering initiatives Optimising rail infrastructure engineering & maintenance projects' expenditure and minimising life-cycle renewal cost <p>Programme Director - Inland Rail, ARTC</p>
		5.25pm	Closing address by Chairman
		5.35pm	End of Summit Day Two

8.00am

Morning registration and refreshment

1.30pm

4.30pm

WORKSHOP C

STRATEGIC ASSET MANAGEMENT PROGRAMMES FOR OPTIMISED RAIL ASSET LIFE CYCLE

Effective asset management policy and strategies are key to understand asset behaviour and deciding best actions in mitigating asset degradation and failure. There are no single best asset management strategies, though such policy and strategies must be facilitated by full awareness of actionable information, procedures and effective communications with stakeholders. This workshop has been designed to enable rail Asset management leader to

- Assess effectiveness of existing assessment management systems
- Calculation of risks associated with asset life
- Understand factors affecting life services of rail assets
- Identify measures against asset deterioration, affected equipment
- Predict and prevent equipment obsolescence

About Your Workshop Leader:



William Lam
Senior Manager – Innovative Asset
Management & Governance,
MTR Corporation

Mr. William Wing Hong Lam is presently Senior Manager, Innovative Asset Management & Governance for MTR Corporation (Hong Kong).

Presently, William is responsible on new initiatives driving transformation of asset management practices and focused on improving track condition's predictability, real-time measurement of asset conditions and digitised data analytics on railway infrastructure.

He's been a key instrument in analysing rail condition failure mode using predictive maintenance through collecting and analysing data with sensor technologies, understanding systems defects and how they propagate into failures.

William's presentation at 6th Rail Engineering & Maintenance Summit will be "Improve Predictability of Track Condition: Real-time Asset Condition Measurement and Data Analytics on Railway Systems".

WORKSHOP D

DELIVERING TRACK RENEWAL WORKS FOR OPTIMAL LIFE CYCLE AT REDUCED MAINTENANCE REQUIREMENTS AND COSTS

Legacy tracks require significant financial investment on maintaining and preventing degradation annually. Failure to optimise tracks monitoring could also lead to underperforming maintenance and renewal decisions, which could result in significant damage and losses during rail operations. What are the techniques to improve accuracy in track geometry monitoring? How can renewal works investment be minimised? What are opportunities to maximise tracks' service line and reducing maintenance cycles?

This workshop has been designed to answer such critical questions. Topics of discuss will include:

- **What are success factors in delivering track renewal works? Minimising maintenance/renewal costs, reduce replacement intervals and improve service readiness**
- **Taking opportunities to extend life cycle for critical infrastructure!**
- **Challenges in modification of track layout to meet updated operational requirements**
- **Best practices in reducing time required for renewal programmes**
- **Improving safety and efficiency for manpower**

About Your Workshop Leader:



Duncan Weir
Head of Maintenance Modernisation
Programme,
Transport for London (TFL)

Duncan is presently Head of Maintenance Modernisation Programme at Transport for London's Underground Rail networks.

He leads the maintenance modernisation programme for London Underground, where his main responsibilities include reviewing and transforming delivery of maintenance across Fleet, Track, Signals and Stations Directories.

Duncan also leads London Underground's Operational Engineering - a group consisted of 240 engineers providing in-house technical supports and assurance for operating business, process change and Business Improvement team.

A Chartered Engineer and a Fellow of the Chartered Management Institute, Duncan has spent more than 15 years with in rail industry including Network Rail, Metronet Rail, and Transport for London (London Underground). Over the last 8 years Duncan has continuously held key position in managing maintenance development & training (track & signals); communication & electrical systems; subsurface lines and most recently, Head of Operational Upgrades & Asset Development

12.00pm

Networking Luncheon

Limited Sponsorship & Exhibition Opportunities are still AVAILABLE!

Equip Global's **Rail Engineering & Maintenance Summit series** is the leading and well researched platform that attracts Project leaders from global authorities & operators of **rail infrastructure and rail transportation**. Every year infrastructure asset management and project leaders return at the summit to uncover exclusive case studies around the world on major challenges in:

- ▶ Implementing Predictive Maintenance and Condition Based Monitoring to Maximise Rail Reliability & Serviceability
- ▶ Rail Asset Management for Maximising Asset Service Life, Reliability & Availability
- ▶ Design, Engineering & Upgrading Rail Infrastructure and Permanent Way Capacity To Meet Increased Traffic Demand

WHO SHOULD SPONSOR

As the leading meeting place dedicated for the Asian region in the domain of Rail Engineering & maintenance, our selectively chosen speakers and targeted delegates are actively seeking out for technologies that help improve their project delivery, optimize investment, minimize life cycle cost, and maximize asset reliability and maintainability. The 6th Rail Engineering & Maintenance Summit 2017 represents an unrivalled sponsorship opportunity to meet & generate meaningful business relationship with project leaders who are identifying improvements, mainly, in the following aspects:

Rail Design, Engineering & Construction

- ▶ Repairing, rebuilding, renewal
- ▶ Recycling railway track
- ▶ Construction
- ▶ Design
- ▶ Feasibility studies, planning, project management
- ▶ Track laying machines
- ▶ Geological assessment

Maintenance & Monitoring Contractors AND / OR Technologies

- ▶ Predictive maintenance & Condition based monitoring solutions
- ▶ Smart sensor systems
- ▶ Data analytics
- ▶ AI-based analytics
- ▶ BIM
- ▶ GIS
- ▶ Rail profile inspection

Main Asset Manufacturers

- ▶ Mechanical and electrical systems
- ▶ Ties, sleepers, fasteners
- ▶ Trackside/wayside machines
- ▶ Track (hybrid, plastic composite, steel ...)
- ▶ Point machines
- ▶ Asset, Supply chain management
- ▶ Electrification
- ▶ Rail cutters & drilling
- ▶ Wrenches for railway bolts
- ▶ Track gauge measuring devices
- ▶ Buffer stops



Contact us now at **+65 63760908** or email **enquiry@equip-global.com** to discuss how we can tailor our sponsorship packages to achieve your business objectives.



6th Rail Engineering & Maintenance Summit 2017

22 - 25 August 2017, Singapore

Please complete in BLOCK CAPITALS as information is used to produce delegate badges

Please photocopy for multiple bookings. Your priority registration code is printed below. Please quote it when registering - **Event Code: CS10031.006**

PRICING & DISCOUNTS

	Price in SGD	Early Bird Price (until 28 April 2017)	Standard Price
<input type="checkbox"/>	Summit + 4 Workshops (Workshop A + Workshop B + Workshop C + Workshop D)	S\$8,895.00 S\$6,995.00 (Save S\$1,900.00)	S\$8,895.00 S\$7,495.00 (Save S\$1,400.00)
<input type="checkbox"/>	Summit + 3 Workshops (3 out of 4 choices from Workshop A, Workshop B, Workshop C, Workshop D)	S\$7,496.00 S\$5,946.00 (Save S\$1,550.00)	S\$7,496.00 S\$6,446.00 (Save S\$1,050.00)
<input type="checkbox"/>	Summit + 2 Workshops (2 out of 4 choices from Workshop A, Workshop B, Workshop C, Workshop D)	S\$6,097.00 S\$4,897.00 (Save S\$1,200.00)	S\$6,097.00 S\$5,397.00 (Save S\$700.00)
<input type="checkbox"/>	Summit + 1 Workshop (Workshop A or Workshop B or Workshop C or Workshop D)	S\$4,698.00 S\$3,848.00 (Save S\$850.00)	S\$4,698.00 S\$4,348.00 (Save S\$350.00)
<input type="checkbox"/>	Summit only	S\$3,299.00 S\$2,799.00 (Save S\$500.00)	S\$3,299.00
<input type="checkbox"/>	Workshop only (Workshop A or Workshop B or Workshop C or Workshop D)	S\$1,399.00	S\$1,399.00

TEAM DISCOUNTS

Equip Global recognises the value of learning in teams. Group bookings at the same time from the same company receive these discounts:

3 or more **7%**
5 or more **10%**

This offer is exclusive of the early bird discount. Call us for a special discount rate for teams of 8 and above. Not applicable to workshop(s) and/or site visit(s) only bookings.

CONFERENCE DOCUMENTATION

I cannot attend the event. Please send me a set of the conference documentation at SGD 999.

VENUE & ACCOMMODATION

York Hotel Singapore

21 Mount Elizabeth Singapore 228516
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Email: enquiry@yorkhotel.com.sg

Hotel accommodation and travel costs are not included in the registration fee. A reduced corporate room rate has been arranged for attendees at this conference at this hotel. To take advantage of this special rate, please process the hotel room reservation form provided upon confirmation of your attendance.

PAYMENT TERMS & CONDITIONS

All 'Early Bird', 'Super Saver' Discounts or any discounts offered by Equip Global require payment at time of registration and before the cut-off date in order to receive any discount. All discount offers cannot be combined with any other offer. - 100% payment is required upon receipt of invoice and includes lunches, refreshments and detailed conference materials. - Registration made within 14 working days of the conference/training must be paid by credit card. - No delegate will be allowed into the conference or training unless all payments are received prior to the conference or training - Discounts do not apply to workshop(s) only bookings. - Please note that creditcard payments will incur a credit card charge of 3.4% + SGD 0.50. - Payment not made at the time of registration will be subject to a SGD99 processing fee.

EQUIP GLOBAL PAYMENT, CANCELLATION, SUBSTITUTION AND POSTPONEMENT POLICY

Substitution of delegate places is permitted, provided that Equip Global is given reasonable advance notice in writing. *For any cancellations received in writing not less than fifteen (15) working days prior to the Conference or Training, you will receive a 90% credit to be used at another Equip Global conference which must occur within six months from the date of issuance of such credit. An administration fee of 10% of the registration fee will be retained by Equip Global for all permitted cancellations. No credit will be issued for any cancellations occurring within fourteen (14) working days (inclusive) of the conference or training. *In the event that Equip Global postpones an event for any reason and the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit for 100% of the registration fee paid. You may use this credit for another Equip Global event to be mutually agreed with Equip Global, which must occur within six months from the date of postponement. *Except as specified above, no credits will be issued for cancellations. In any circumstance, no refund will be made for cancellations. All cancellations must be made in writing. *Equip Global is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. Equip Global shall assume no liability whatsoever in the event this conference is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, unforeseen occurrence or any other event that renders performance of this conference impracticable, illegal or impossible. For purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labor strike, extreme weather or other emergency. *While speakers, topics and session timings were confirmed at the time of publishing, circumstances beyond the control of the organizers may necessitate substitutions, alterations or cancellations of the speakers and/or topics and/or session timings. As such, Equip Global reserves the right to alter or modify the advertised speakers and/or topics and/or session timings if necessary without any liability to you whatsoever. Any substitutions or alterations will be updated on our web page and all marketing collaterals as soon as possible.

REGISTRATION DETAILS

Title	Mr.	Mrs.	Ms.	Dr.	Other
First Name				Last Name	
Company				Department	
Job Title				Email	
Address					
Country				Postcode	
Phone				Fax	
Approving Manager Name					
Email				Phone	
Delegate Signature		Manager Signature		Date DD/MM/YYYY	
<input type="checkbox"/> I agree to Equip Global's payment terms					

If you have not received an acknowledgement before the conference, please call us on +65 63760908 to confirm your booking.

PAYMENT METHODS

I WISH TO PAY BY CHEQUE/BANK DRAFT: Made payable to Equip Global Pte. Ltd

I WISH TO PAY BY CREDIT CARD: Please debit my credit card

Card Type	VISA	MASTER	Name Printed on Card
Card Number	Expiry		MM/YYYY
CVC	Signature	Date	

I WISH TO PAY BY DIRECT TRANSFER: Please quote CS10031.006 with remittance advice.

Equip Global Bank Details: AccountName: Equip Global Pte Ltd
Account Number: 630-824993-001
Swift Code: OCBSCGSG
Bank Code: 7339
Bank Address: Overseas-Chinese Banking Corporation Limited
65 Chulia Street, OCBC Centre, Singapore 049513
Intermediary Bank: JP Morgan Chase Bank, New York, USA
Swift Code: CHASU33

All bank charges to be borne by the payer. Please ensure that Equip Global receives the full invoiced amount.