



SECOND WORLD CONGRESS ON CONDITION MONITORING

MARINA BAY SANDS, SINGAPORE

2-5 DECEMBER, 2019



Digitalisation in Condition Monitoring - Value our People, Plants and Assets

CALL FOR PAPERS

Following the successful inaugural World Congress on Condition Monitoring (WCCM) 2017 in London, the International Society for Condition Monitoring (ISCM) and the Non-Destructive Testing Society Singapore (NDTSS) are proud to invite you to the 2nd World Congress at the Marina Bay Sands in Singapore from 2nd to 5th December 2019. The congress will be held in conjunction with the Singapore International NDT Conference and Exhibition (SINCE2019). This will create one of the largest combined events within the region, which will see communities and societies from both condition monitoring and NDT converge at a single venue to exchange ideas and network at an international level. As Singapore is an industrial hub, the event will also include participation from many major sectors including aerospace, civil, oil and gas, marine, railway, and manufacturing industries.

The theme of the event will focus on digitalisation with the advent of the fourth industrial revolution (Industry 4.0) and the Internet-Of-Things (IOT), which are expected to give significant improvements in productivity and asset value. The digital transformation also triggers opportunities and technologies in new and growing fields including data analytics, artificial intelligence, automation and robotics. Advancements in digital technologies for the industry like augmented reality (AR) and virtual reality (VR) will also see valuable changes and developments in education and training delivery for qualification and certification.

The congress cordially invites papers from academics, practitioners, and innovators who have views, engagements and breakthroughs to share in all aspects of condition monitoring. A list of provisional session titles and an extended topic list is provided below.

The scientific programme will feature keynote presentations from an invited panel of internationally-renowned experts and thought leaders representing the condition monitoring world geographically and technologically including:

- Professor Robert Randall, University of New South Wales, Australia
- Professor Andrew Ball, University of Huddersfield, UK
- Professor Tat-Hean Gan, Brunel Innovation Centre, UK
- Professor Fulei Chu, Tsinghua University, China
- Professor Zhongqing Su, Hong Kong Polytechnic University, Hong Kong SAR
- Professor Philippus Stephanus Heyns, University of Pretoria, South Africa

Full event details are available at

<https://wccm2019.org>



Provisional Session Titles and Extended Topic List

CM Methods and Technologies

- Equipment trouble shooting
- Methods for fault severity estimation
- Future directions for CM
- CM methods and technologies
- Condition monitoring via machinery performance parameters
- Stress/Strain analysis
- CM: Case Studies

Instrumentation and ITC for CM

- Wireless techniques and systems for CM
- Architecture of CM systems
- ITC for CM
- CM systems
- Hardware and software platforms for CM systems
- High performance computing for CM systems
- Robotics for CM
- Off board and off board CM systems
- OSA-CBM for CM
- Integrated condition monitoring technologies and systems
- Communication for CM
- Internet of things and services for CM
- Data storage and backup for CM

Certification, Education and Training for CM

- Engineering standards for CM
- CM education including CPD
- CM training
- CM certification

Asset Management

- Asset management systems
- Asset management via CM
- Optimal asset replacement
- Asset databases
- Improvement of asset safety via CM

NDT Methods and Technologies

- NDT methods and technologies
- Fusion of CM/NDT methods and technologies
- NDT: Case Studies

Signal and Image Processing, Pattern Recognition, Finite Element Modelling and Simulation for CM

- Decision support for CM
- Data mining and fusion
- Optimisation in CM
- Linear, non-linear, time, frequency and time-frequency signal processing techniques for CM
- Signal processing techniques for non-stationary conditions
- On-line and off-line adaptations of CM technologies
- Feature extraction and pattern recognition for CM
- Linear and non-linear finite element modelling for CM
- Computational Fluid Dynamics
- Linear and non-linear multi-freedom dynamical analysis of complex systems for CM
- Modal analysis for CM
- Simulation of linear and non-linear complex systems for CM
- Computational methods for CM
- Probabilistic and statistical methods for CM

Sensors and Actuators

- Standard sensors and actuators
- New and advanced intelligent sensors and actuators
- Embedded sensors and embedded calculations in sensors and actuators
- Sensor fusion
- Energy harvesting

Root Cause Analysis of Faults/Failures

- Fault free analysis
- Root cause analysis: Ishikawa Diagram, 5 Whys, Eight Discipline Problem Solving, Scatter Diagrams, Is-Is not, etc.
- Human and latent root causes of faults/failures
- Root Cause Analysis: Case Studies

Structural Health Monitoring

Maintenance

- Maintenance planning, scheduling and control
- Repair, replacement and overhaul
- Management of enterprise shutdown and overhauls
- Life-cycle cost benefit analysis for maintenance and CM
- Failure effects and consequences
- Through-life support
- Risk assessment and management
- Risk-based maintenance
- Reliability centred maintenance and reliability improvement
- Classical and advanced software for maintenance: CMMS, RCM++, ERP, etc.
- Human errors in maintenance
- Maintenance: Case Studies

Prognostics for CM

- Model driven prognostics
- Data driven prognostics
- Fatigue and fracture prognostics
- Models for fault propagation
- Condition indicators for prognostics
- Prognostics: Case Studies

Materials

- Materials manufacturing
- Materials characterisation

Damage, Fault and Failure

- Failure assessment methods
- Physics of failure, fault/failure modes
- Fatigue and fracture

Design and Manufacturing for CM and Maintenance

- Materials manufacturing
- Design and life-cycle integrity
- Design for optimal maintainability
- Design improvement via CM
- Simulation models and software for optimal asset design and manufacturing

Nano-Technologies for CM

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<https://wccm2019.org>

