

Joint Conference: MFPT 2015 and ISA's 61st International Instrumentation Symposium

Technology Evolution: Sensors to Systems
for Failure Prevention

Joint Conference with Machinery Failure Prevention Technology
Conference 2015 (MFPT 2015)

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Tuesday, 12 May - Afternoon

	Session A1 Mediterranean Ballroom V	Session B1 Mediterranean Ballroom VI	Session C1 Venice Ballroom I	Session D1 Venice Ballroom II	Session E1 Barcelona
	MFPT Paper Session Diagnostics	MFPT Paper Session Health Management Successes, Perspectives and Practice	ISA Paper Session Control System Instrumentation	ISA Paper Session Communication	ISA Paper Session Process Measurement and Control
	CoChairs - Simon Jessop , Impact Technologies, A Sikorsky Innovations Company and Mark Hollins , US Navy	CoChairs - Chris Hockley , Cranfield University and Thomas Lagö , QirraSound Technologies Europe AB	Chair - Ruth Sikorski , Air Force Research Laboratory	Chair - Penny Chen , Yokogawa	Chair - Edward Naranjo , General Monitors
1:30 PM	<i>Planetary Gearbox Fault Detection Using Acoustic Emission Sensor</i> , Jae Myung Yoon , University of Illinois at Chicago V *	<i>The Hidden Delta for Maintenance Effectiveness</i> , Chris Hockley , Cranfield University, EPSRC Centre for Through-Life Engineering Services V *	<i>Precision Linear Position and Control for Flexible Wall Nozzle</i> , Scott Howard , Aerospace Testing Alliance	<i>A Research Framework for Industrial Wireless Sensor Networks</i> , Richard Candell , NIST	<i>Condenser Trip Protection Software for Industrial Turbo-Generators</i> , Jim Strausz , Cdn. Industrial Optimization Services
2:00 PM	<i>Non-Stationary Signal Analysis for Health Monitoring of an Internal Combustion Engine</i> , Prashanth Dalawai , Indian Institute of Technology Kanpur V *	<i>Experiences from CBM Educational Approaches in Sweden</i> , Thomas Lagö , QirraSound Technologies Europe AB V *	<i>A Continuous Acoustic Emission Source Orientation Method Based on Wave Field Mapping</i> , Weikui Wang , Beijing Research Institute of Telemetry	<i>Network Acceleration and Time Synchronization for Data Acquisition Systems using Commodity Networks and Operating Systems</i> , Jeffrey Shafer , University of the Pacific	<i>An On-line Soft Sensor for Wood Moisture</i> , Robert Spring , Norbord, Inc.
2:30 PM	<i>On the Use of Acoustic Emission Sensors with Low Sampling Rate for Low Speed Bearing Fault Diagnostics</i> , Brandon Van Hecke , University of Illinois at Chicago; presented by Jae Myung Yoon V *	<i>The Impact of Wind Speed and Direction Variation on the Performance of the Condition Monitoring System</i> , Junda Zhu , Renewable NRG Systems V *		<i>ISA100 Wireless Sensor Networks and its Applications</i> , Penny Chen , Yokogawa Corporation of America	<i>An Integrated Approach to Design Hybrid Independent Protection Layers</i> , Henry Johnston , Genesis Oil & Gas

3:00 PM

Break (Prefunction Space) - sponsored by



Session Continues	Session Continues	ISA Paper Session Cyber Security	ISA Tutorial	ISA Meeting Propulsion Instrumentation Working Group Business Meeting
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Chair - **John Causimano**,
aeSolutions

Dennis Coad,
The Boeing Company

3:30 PM *The Full Spectrum, a Dual Channel Measurement Used in Vibration Diagnostics*, **Preston Johnson**, National Instruments
V *

An Actuarial Approach to the Remaining Useful Life Estimation, **Eric Bechhoefer**, Green Power Monitoring Systems LLC
V *

Cross Domain Cyber Security for Industrial Control Systems, **Robert Lindeman**, Aerospace Testing Alliance
..

4:00 PM *A Pragmatic Approach to Machinery Diagnostics*, **Fred Discenzo**, Rockwell Automation and **Chris Nemarich**, US Navy Military Sealift Command HQ
V *

Neuro-Fuzzy Control for Cryo Electron Microscopy Data Acquisition on a JEOL Transmission Electron Microscope, **David Gil-Carton**, CIC bioGUNE
V *

A Cybersecurity Testbed for Rail Transportation Systems, **CheeYee Tang**, NIST
...

Life, Work, and Hobbies - Maintaining Balance

- for a full description see Page 18

Meeting Open to PIWG Members Only

4:30 PM

5:00 PM - 8:00 PM

Exhibitors' Reception (Mediterranean Ballroom)

Wednesday, 13 May - Morning

From 7 AM

Breakfast (Mediterranean Ballroom) - sponsored by



	Session A2 Mediterranean Ballroom V	Session B2 Mediterranean Ballroom VI	Session C2 Venice Ballroom I	Session D2 Venice Ballroom II	Session E2 Barcelona
	MFPT Paper Session Signal Analysis	MFPT Paper Session Condition Based Maintenance	ISA Paper Session Process Safety	ISA Paper Session Test and Measurement	MFPT Paper Session Failure Analysis
	CoChairs - Bob Randall , University of New South Wales and Suri Ganeriwala , SpectraQuest Inc	CoChairs - Daniel Wade , US Army AMRDEC and Rachel Moss , MFPT Society	Chair - Edward Naranjo , General Monitors	Chair - Steve Allison , Emerging Measurements Co.	Chair - Bob Ware , US Air Force Research Laboratory
8:30 AM	<i>A Systematic Processing of a Gearbox Vibration Signal with Defective Rolling Element Bearing</i> , Nader Sawalhi , SpectraQuest Inc; presented by Suri Ganeriwala V *	<i>High-Accuracy Diagnostics from HUMS in Noisy Environments</i> , Rodrigo Teixeira , University of Alabama in Huntsville V *	<i>Incidents that Define Safe Automation</i> , Angela Summers , SIS-TECH ...	<i>Mechanical Waveguide Temperature Sensors for Turbine Inlet Measurement</i> , Richard Roth , Etegent Technologies ...	<i>Uncontained Electrical Fault in an Aircraft Fuel Pump</i> , Bob Ware , US Air Force Research Laboratory V *
9:00 AM	<i>Cepstrum Analysis Basics for the Interested</i> , Thomas Lagö , QirraSound Technologies Europe AB V *	<i>Machine Learning Algorithms for HUMS Improvement on Rotorcraft Components</i> , Daniel Wade , United States Army AMRDEC V *	<i>Meeting AMS2750 Accuracy Requirements for Calibration</i> , Ned Espy , Beamex ...	<i>A Laser-based Calibration System for Heat Flux Sensor of Hypersonic Aircraft</i> , Feng Wang , Beijing Research Institute of Telemetry V *	<i>Integrated Approach to Engineering Design and Analysis, Vibration Failure Analysis, Prevention and Life Extension Using Feedback Control System Concept</i> , Dr J Pattabiraman , Former Professor, Dean, Principal V *
9:30 AM	<i>Blind Enhancement of Modal Information in Time Signals Using the Real Cepstrum</i> , Bob Randall , University of New South Wales V *	<i>Advanced Neural-Networks for Mechanical Health Diagnostics</i> , Kevin Albarado , Dynetics, Inc. V *	<i>Integrated Control and Safety System to Avoid Explosion Using Common Industrial Protocol Based on IEC 61508 Standards in Oil and Gas Industry</i> , Pradeepraj D , Kumaraguru College of Technology	<i>Using Viscosity Meters to Control Batch Polymerization Reactions</i> , Corentin Thierry , Sofraser ...	<i>Finite Element Analysis on Damping Characteristics for Vibration Impact of Integral Shroud Blade</i> , Nanfei Wang , Tsinghua University V *
10:00 AM	Break (Mediterranean Ballroom)				

Session Continues	Session Continues	Session Continues	Session Continues	MFPT Paper Session Structural Life Management
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Chair - **Onome Scott-Emuakpor**,
Air Force Research Laboratory

<p>10:30 AM <i>Real-Time Fast Tracking of Varying RPM Using an On-Line Method without a Tachometer</i>, Thomas Lagö, QirraSound Technologies Europe AB V *</p>	<p><i>Degradation Analysis of Ball Screw Lubrication Starvation Using Sensor-Less and Sensor-Rich Approaches</i>, Wenjing Jin, University of Cincinnati; presented by David Siegel V *</p>	<p><i>Safety Earphones</i>, Agalya R, Kumaraguru College of Technology</p>	<p><i>Transitioning from Test Cell Instrumentation to Engine Health Monitoring Systems</i>, Ruth Sikorski, USAF</p>	<p><i>Multiaxial Fatigue Behavior Study on Vibration and Servohydraulic Loaded Aluminum</i>, Onome Scott-Emuakpor, Air Force Research Laboratory V *</p>
<p>11:00 AM <i>Interference of Variable Frequency Drive (VFDs) on Rotating Machine Fault Diagnosis Using Vibration Analysis</i>, Suri Ganeriwala, SpectraQuest Inc V *</p>	<p><i>Vehicle Payload Estimation Investigation Using Vehicle Data Bus Parameters</i>, Scott Pflumm, Applied Research Laboratory At The Pennsylvania State University V *</p>	<p><i>Benfits of Integrated Plant Control, Safety, Security and Communication Systems</i>, Bhavesh Patel, Fluor V *</p>		<p><i>Lamb Wave Based Damage Detection Using PZT Fiber Sensor Array</i>, Gang Wang, University of Alabama in Huntsville V *</p>
<p>11:30 AM <i>Tool Wear Monitoring in Drilling By Spectral Analysis of Vibration Signals and Verification through Finite Element Analysis</i>, Nakandhrakumar Ramasamy, Hindustan University V *</p>				<p><i>Integration of an Effective SHM System in a Model Steel Bridge</i>, Mohammad Azarbayejani, University of Texas-Pan American, Civil Engineering Department V *</p>

12:00 PM

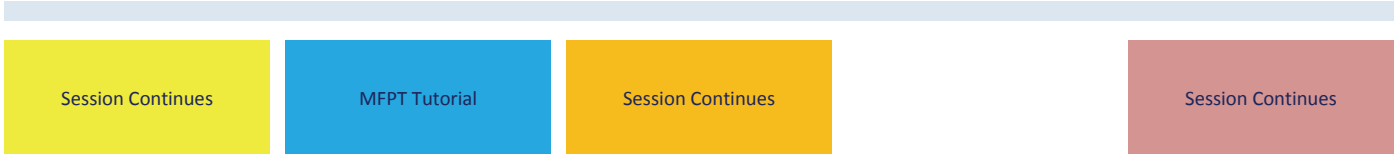
Lunch (Mediterranean Ballroom)

Special Presentation by **Cameron Sinclair**, BINDT

"How to Improve Safety, Reliability and Growth: A Personal UK View of the Testing and Monitoring Landscape "

Wednesday, 13 May - Afternoon

	Session A3 Mediterranean Ballroom V	Session B3 Mediterranean Ballroom VI	Session C3 Venice Ballroom I	Session D3 Venice Ballroom II	Session E3 Barcelona
	MFPT Paper Session Fault Detection	MFPT Paper Session Data Networks and Analysis	ISA Paper Session Aerospace	ISA Paper Session Test and Measurement	MFPT Paper Session Failure Prevention
	Chair - Michael Lipsett , University of Alberta	Chair - Ash Thakker , Global Technology Connection, Inc	Chair - Ruth Sikorski , Air Force Research Laboratory	Chair - Steve Allison , Emerging Measurements Co.	Chair - Paula Dempsey , NASA Glenn Research Center
1:30 PM	<i>Improving Leak Detection for Freight Rail Wagon Airbrakes in Cold Weather Conditions</i> , V. Poddar , University of Alberta; presented by Michael Lipsett V *	<i>Advanced Analytics for Remote Monitoring Applications – Methodology and Case Study</i> , David Siegel , Predictrionics Corp V *	<i>Nanotechnology for Improvement and Control of Power Systems</i> , Dale Teeters , University of Tulsa	<i>Potential of Using Triboluminescence to Detect Damage of Impacts in Spacecraft</i> , William Hollerman , University of Louisiana V *	<i>Detection of Spiral Bevel Gear Damage Modes Using Oil Debris Particle Distributions</i> , Paula Dempsey , NASA Glenn Research Center V *
2:00 PM	<i>Classification Accuracy of Automated Railway Wheel Fault Detection Technologies</i> , Laura Ibarra , University of Alberta; presented by Michael Lipsett V *		<i>Instrumentation Development for Nuclear Fusion Propulsion Facility</i> , Erin Gish , The Boeing Company	<i>Recent PIWG Efforts to Develop New Instrumentation</i> , William Stange , USAF V *	<i>Best Practices for Condition Monitoring Using Ultrasound</i> , Adrian Messer , UE Systems Inc V *
2:30 PM	<i>Wayside Wheel Temperature Detector Data Mining to Predict Potential Sensor and Railcar Component Failures</i> , Marghoub Shadkar , University of Alberta; presented by Michael Lipsett V *		<i>Thermal Properties of Phosphor Materials and Their Effect on Temperature Measurement</i> , Greg Walker , Vanderbilt University		<i>Toxic Metal Reduction and Life Extension of Gun Barrel Liners Through Cold Sprayed Refractory Metals</i> , Blake Barnett , US Army Research Laboratory; presented by Marc Pepi V *
3:00 PM	Break (Mediterranean Ballroom) - sponsored by		 A Sikorsky Innovations Company		



Chris Pomfret,
MFPT Society

3:30 PM *Control of Signal Bandwidth to Improve Fault Detection, Eric Bechhoefer, Green Power Monitoring Systems LLC*
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4:00 PM *When To Replace Plant/Facility Electronics/Software, Klaus Schug, Arnold Engineering Development Complex - ATA/ITO*
√

4:30 PM *When To Replace Plant/Facility Electronics/Software, Klaus Schug, Arnold Engineering Development Complex - ATA/ITO (Continued)*
√

Perspectives on Generating Business Case Analyses for Implementing Health Management Capabilities

- for a full description see Page 18

Phosphor-Doped PDMS and Aerogel Investigations, Stephen Allison, Emerging Measurements

Photoluminescence Lifetime in Proton Irradiated Phosphors, Greg Walker, Vanderbilt University

A Research Review of Highly Triboluminescent Europium Tetrakis Dibenzoylmethide Triethylammonium Phosphors, Ross Fontenot, University of Louisiana

Proactive Shop Strategy for a Successful Turbine-Generator Rotor Outage, Zlatan and Marin Racic, Z-R Consulting
√

In-situ Study of Strain Energy Density at Notch Roots Using Digital Image Correlation, Casey Holycross, US Air Force Research Laboratory
√

From
5:00
pm

Close for Day

Thursday, 14 May - Morning

From 7 AM Breakfast (Mediterranean Ballroom)

	Session A4 Mediterranean Ballroom V	Session B4 Mediterranean Ballroom VI	Session C4 Venice Ballroom I	Session D4 Venice Ballroom II	Session E4 Barcelona
	MFPT Paper Session Sensors	MFPT Tutorial	ISA Paper Session Propulsion Instrumentation Working Group	ISA Paper Session Process Technologies	MFPT Paper Session Mechatronics
	CoChairs - Chris Nemarich , US Navy Military Sealift Command HQ and Bill Stange , Universal Technology Corporation	Bob Randall , University of New South Wales	Chair - Gustave Fralick , NASA Glenn	Chair - Edward Naranjo , General Monitors	Chair - Ahmed Onsy , University of Central Lancashire
8:30 AM	<i>Mechanical Waveguide Vibration and Temperature Sensors for Monitoring Gas Turbine Engines</i> , Richard Roth , Etegent Technologies	Envelope Analysis - for a full description see Page 19	<i>Blade Tip Clearance Sensor Evaluation Rig</i> , Jacob Harding , Honeywell	<i>Estimating the Probability of Abnormal Situations: Research and Industrial Application</i> , Jeffrey Arbogast , American Air Liquide	<i>Development of an Advanced Gas Emissions Monitoring System for Oil and Gas Production Sites</i> , Sara Al Bulushi , University of Central Lancashire
9:00 AM	<i>Fiber Optic Sensors for Harsh Environment Applications</i> , Scott Hoover , Oxsensis Ltd		<i>Introducing CAN-MD: A Bus Based Digital Smart Acceleration Network for Machinery Health Monitoring and Diagnostics</i> , Kevin Westhore , Dytran Instruments	<i>Automating Smart Instrument Configuration</i> , Kash Behdinan , PLCs Plus International Inc, California State University of Bakersfield	<i>Remotely Operated Solar Panel Automated Cleaning System</i> , Ali Al Harrasi , University of Central Lancashire; presented by Sara Al Bulushi
9:30 AM	<i>Field Programmable Vibration Sensors an Effective Approach for Machinery Protection and Monitoring</i> , George Zusman , ViCont, Inc.		<i>Surface Temperature Measurements from a Stator Vane Doublet in a Turbine Engine Afterburner Flame using a YAG:Tm Thermographic Phosphor</i> , Jeffrey Eldridge , NASA Glenn	<i>New Technology for Toxic and Flammable Gas Detection</i> , Jason Schexnayder , Senscient	<i>Improved RHEX Robot Design; Towards Low Cost RHEX Robot</i> , Ehab Ali , MTC; presented by Mohamed Hagag
10:00 AM	Break (Mediterranean Ballroom)				

Session Continues

MFPT Paper Session
Data Handling and Management

Session Continues

Session Continues

Session Continues

Chair - **Preston Johnson**, National Instruments

10:30 AM *High-Confidence Signal Validation for Online Sensor Calibration Assessment*, **Jamie Coble**, The University of Tennessee, Department of Nuclear Engineering
V *

Integrated Vehicle Health Management in the Era of Big Data: A Shipping Industry Focus, **Gabriele Manno**, DNVGL
V *

Further Progress of a Cross Correlation based Optical Strain Measurement Technique for Detecting Radial Growth in a Rotating Disk, **Gustave Fralick**, NASA Glenn

Applying ISA-95: a Start-up Targets Application Development in an Emerging Automation Vertical., **Holly Beum**, Interface Technologies

Monitoring of Upper-Limb EMG Signal Activities Using a Low Cost System; Towards a Power-Assist Robotic Arm, **Ahmed Azab**, MTC; presented by **Mohamed Hagag**
V *

11:00 AM *Optical Torque Sensor for Propulsion Engine Performance Optimization and Reliability*, **Chris Nemarich**, US Navy Military Sealift Command HQ
V *

Managing Sensory Data and Flow in a Distributed Fleetwide Prognostics and Equipment Health Monitoring Application, **Preston Johnson**, National Instruments
V *

Microwave Sensing System for Ceramic Bearings, **Michael Platt**, Mechanical Solutions

NRC's Small Modular Reactor Design-Specific Review Standard Chapter 7: Instrumentation and Controls, **Timothy Mossman**, US Nuclear Regulatory Commission

11:30 AM

Durability Testing for Turbine Engine Instrumentation, **Michael Platt**, Mechanical Solutions

Techniques for Improving the Response of On-Line Process Analytics That Use Wet Chemistry, **Timothy Deschaines**, Metrohm USA

12:00 PM

Awards Luncheon (Mediterranean Ballroom)

Thursday, 14 May - Afternoon

	Session A5 Mediterranean Ballroom V	Session B5 Mediterranean Ballroom VI	Session C5 Venice Ballroom I	Session D5 Venice Ballroom II	Session E5 Barcelona
	MFPT Paper Session Prognostics	MFPT Paper Session Health Management Tools and Capabilities	ISA Paper Session Propulsion Instrumentation Working Group	ISA Paper Session Student Papers	MFPT Tutorial
	Chair - Joe Sheeley , Arnold Engineering Development Center (AEDC), US Air Force	Chair - Link Jaw	Chair - Gustave Fralick , NASA Glenn	Chair - Aubri Hanson , Gulf Coast State College	John Lucero , NASA Glenn Research Center
1:30 PM	<i>Improved Prognostics through Integration of Operational Data with Diagnostics</i> , Joe Sheeley , Arnold Engineering Development Center (AEDC), US Air Force V ^	<i>Aircraft Landing Gear Shock Strut Readiness Monitoring System</i> , Jake Siegel , Luna Inc. V ^	<i>Wireless Avionics Intra-Communication (WAIC): A Robust Network for Airborne Wireless Applications</i> , David Redman , Texas A&M University V ^	<i>Fabry-Perot Interferometer Fabricated on a Ceramic Coaxial Cable for Temperature Sensing</i> , Baokai Cheng , Clemson University	Systems Engineering - for a full description see Page 20
2:00 PM	<i>Pattern Tracking for Predicting Unscheduled Maintenance Actions of Military Ground Vehicles</i> , James Kozlowski , Penn State Univ/ARL V ^	<i>EMC Safety for All Sensitive Electrical Systems</i> , Daniel Soleil , SPGS Surgelab America; presented by George Zeigler V ^	<i>Characterizing Airplane Environments in Commercial Airplanes using On-Board Test Vehicles to Evaluate State-of-the-Art Lead-Free Alloys</i> , David Redman , Texas A&M University V ^	<i>Special Consideration for Use of Tip Timing for Health Monitoring of Large Wind Tunnel Compressor Blades</i> , Peter Wetzel , Mississippi State University	
2:30 PM	<i>Condition Prediction Using Degradation Feature Extraction with Variational Mode Decomposition</i> , Chao Liu , Department of Thermal Engineering, Tsinghua University V ^	<i>Enhancing Helicopter Health and Life Cycle Management through Shared Data Bases and Analysis Tools</i> , Lex ten Have , National Aerospace Laboratory NLR V ^		<i>Potential of Using Luminescent Materials for Space-Based Radiation Sensors</i> , Stephen Williams , University of Louisiana	
3:00 PM	Break (Mediterranean Ballroom)				

Session Continues

3:30
PM

Measuring the Luminescent Properties of Magnesium Tetrakis Dibenzoylmethide Triethylammonium, **Sara White**, University of Louisiana

4:00
PM

SEM Analysis for a Selection of Troboluminescent Materials, **Jacque Meche**, University of Louisiana

4:30
PM

Conference Close

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