TABLE OF CONTENTS

Volume 1

THE AUTHORS OF THE PAPERS BELOW WERE UNABLE TO ATTEND THE CONFERENCE

The Analysis of Acoustic Emission Signals from the Cylinder Head of a Diesel Engine for Fault Detection

F. Elamin, O. Glikes, F. Gu, A. Ball ............................................................................................................................... 1

A Complex Plain Analysis In Rotor Fault Detection Under Transient Operating Conditions

Piotr Czop, Grzegorz Wzolek ............................................................................................................................... 12

The Application Of A First-Principle Shock Absorber Model For Tracking The Variation Of Eigenvalues Under Arbitrary Load Signals

Piotr Czop, Grzegorz Wzolek ............................................................................................................................... 24

Wind Turbine Maintenance Optimization: A Holistic Approach

P. N. Botsaris, E. I. Konstantinidis ............................................................................................................................... 36

Single Record Order-Tracking

Michael D. Coats, R. B. Randall ............................................................................................................................... 47

1A TRAINED STRUCTURES AND STATISTICAL METHODS IN CONDITION MONITORING (SESSION 1)

Synthesis And Identification Of Hidden Markov Models Based On A Novel Statistical Technique In Condition Monitoring

Lev S. Kuravsky, Sergey N. Baranov, Grigory A. Yuryev .......................................................................................... 59

Application Of The Singular Value Decomposition Method In Steam Turbine Diagnostics

Tomasz Galka ....................................................................................................................................................... 82

The Application Comparison Of Ways And Methods For Diagnostics Of Rotor Blades Flutter In Axial Compressors

Victor P. Maximov, Victor I. Mileshin, Alexandr V. Stepanov .......................................................................................... 94

Application Of Support Vector Machine On Deterioration Condition Classification And Prediction Of Prognostics

Dongxiang Jiang, Chao Liu, Shaohua Li .................................................................................................................... 104

Estimation Of Goodness-Of-Fit Measures Accompanying The Identification Of Factor Models

Lev S. Kuravsky, Sergey N. Baranov, Paul A. Marmalyuk ....................................................................................... 105

On Using Long-Range Ultrasonics to Track Corrosion Rates in Pipelines via Adaptive Machine Learning

Rajprasad Rajkumar, Nik Ahmad Akram, Dino Isa, Zakria Hussain ............................................................................... 115

Diagnosing Non-Linearity of Restoring Force from the Structure's Response to Random Excitation

A. I. Menyailov, V. D. Sizarev ..................................................................................................................................... 127

Experimental Study On Fault Diagnosis For Reciprocating Air Compressor Valve Using P–V Indicator Diagram

Fengtao Wang, Lutao Song, Haiti Zhao, Liang Zhang, Haifeng Li .................................................................................. 128

3A TRAINED STRUCTURES AND STATISTICAL METHODS IN CONDITION MONITORING (SESSION 2)

State Classification of Reciprocating Compressor Valves Using Event per Cycle Measurements

Kurt Pichler, Andrea Scheerms, Matthias Huschenbett .............................................................................................. 135

Electronic Certification Of Tanks Using 3D Models Applying In Risk Estimation Computations And Condition Monitoring System

Khanukh M. Khanukhov, Mikhail A. Alakov ............................................................................................................ 146

Integrated Monitoring for Plant Assets Management

V. N. Panchikov ..................................................................................................................................................... 156
### 4A APPLICATIONS OF MACHINE LEARNING IN CONDITION MONITORING (SESSION 1)

- **Prediction Performance Improvement For Highly Imbalanced Monitoring Data**
  - Yuhua Li, Liam Maguire, Michael McCann, Adrian Johnston
  - Page 169
- **Study On Hyper-Sphere Support Vector Machine For Tool Wear State Recognition**
  - Tai-Yong Wang, Lu Liu, Yue-Qiao Ai, Yong-Xiang Jiang, Miao Hu
  - Page 177
- **Investigation of a Rotating Shaft with a Novel Integrated Wireless Accelerometer**
  - L. Arebi, J. Gu, A. Ball, F. Gu
  - Page 186
- **Bearing Fault Diagnosis Using Time Encoded Signal Processing and Recognition**
  - Shukri A. Abdusslam, F. Gu, A. Ball
  - Page 197
- **Diagnostic Feature Development based on Dynamic Time Warping of Dynamic Signals under Variable Machine Operating Condition**
  - D. Zhen, J. Gu, T. Wang, F. Gu, A. Ball
  - Page 206

### 5A APPLICATIONS OF MACHINE LEARNING IN CONDITION MONITORING (SESSION 2)

- **Early Failure Detection and Diagnostics of Self-Aligning Journal Bearing through Vibro-acoustic Analysis**
  - P. Raharjo, J. Gu, Y. Fan, F. Gu, A. Ball
  - Page 216
- **Performance Evaluation of Suspension Malfunctions in a Student Formula Car Using ADAMS Model**
  - Zhanqun Shi, Robert Palmer, Hitesh Beyani
  - Page 226
- **Russian Experience on Application of NPP Monitoring and Diagnostics Systems**
  - G. Arkadov, A. Usanov
  - Page 238

### 6A REAL-TIME CONDITION MONITORING OF EQUIPMENT (SESSION 1)

- **Real-Time Condition Monitoring Of Equipment**
  - Vladimir N. Kostyukov
  - Page 239
- **Comprehensive Analysis Of The Vibration Reliability Turbo**
  - Alexandr I. Kumenko
  - Page 247
- **Experience In Integrated Diagnostics And Eliminating Vibration Turbo 300-800 MW**
  - Alexandr I. Kumenko
  - Page 267

### 7A APPLICATIONS OF MACHINE LEARNING IN CONDITION MONITORING (SESSION 3)

- **Bending Vibration of an Automotive Turbocharger under the Influence of Rotor Imbalance**
  - Hao Zhang, Zhanqun Shi, Fengshou Gu, Andrew Ball
  - Page 274
- **The Monitoring of Cavitation in Centrifugal Pumps Based on the Analysis of Vibro-acoustic Measurements**
  - F. Al Thobiani, F. Gu, A. Ball
  - Page 286
- **Assessing The Effects Of Power Quality On Partial Discharge Behaviour Through Machine Learning**
  - V. M. Catterson, S. E. Rudd, S. D. J. McArthur, S. Bahadoorsingh, S. M. Rowland
  - Page 287
- **Technique of Gas Turbine Technical State Diagnostics on the Base of Stochastic Optimization Methods**
  - V. Afanasjevskaya, A. Tronchuck, M. Uglyumov, Y. Li
  - Page 299

### 8A DIAGNOSTICS FOR ELECTRIC MACHINES AND DRIVES

- **Diagnosis Of Bearing Damage In Induction Motors By Instantaneous Power Analysis**
  - Ariel Dwonkowski, Leon Swedrowski
  - Page 300
- **An Intelligent Health Monitoring Framework For A Motor-Driven Actuator**
  - Paul Phillips, Dominic Diston
  - Page 312
- **An On-Line Damping And Monitoring Of Severe Vibrations In A Power Plant – Granö In Sweden**
  - Henrik Åkesson, Andreas Sigfridsson, Thomas L. Lagö
  - Page 322
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eccentricity And Broken Rotor Bar Detection Using MCSA In Induction</td>
<td>332</td>
</tr>
<tr>
<td>Motors Fed By Supplies</td>
<td></td>
</tr>
<tr>
<td>Oscar Duque-Perez, Daniel Morinigo-Sotelo, Marcelo Perez-Alonso</td>
<td></td>
</tr>
<tr>
<td>Models Of Cage Induction Motors For Current Monitoring</td>
<td>344</td>
</tr>
<tr>
<td>W. Bradley, J. Victory, A. Nikravshir, M. Ebrahimi, A. Wood</td>
<td></td>
</tr>
</tbody>
</table>

**9A INTEGRATION OF CONDITION MONITORING AND NDT SYSTEMS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of Condition Monitoring and NDT into Manufacturing Systems – Tools and Approaches</td>
<td>357</td>
</tr>
<tr>
<td>Radislav Smid</td>
<td></td>
</tr>
<tr>
<td>Distributed Classification In Wireless Sensor Networks For Machine Condition Monitoring</td>
<td>363</td>
</tr>
<tr>
<td>Jan Neužil, Radislav Šmíd, Ondrej Kreibich</td>
<td></td>
</tr>
<tr>
<td>Non-contact NDE of Thin Aluminium Plate Using EMAT System</td>
<td>N/A</td>
</tr>
<tr>
<td>M. Kublinyi</td>
<td></td>
</tr>
<tr>
<td>Probability Of Detection And False Alarms For Metallic Aerospace Panel Health Monitoring</td>
<td>374</td>
</tr>
<tr>
<td>Claudio Sharafzadi, Andrea Manes, Marco Giglio</td>
<td></td>
</tr>
<tr>
<td>Laser Produced Grinding Burns For Barkhausen Noise Measurement Result Validation</td>
<td>388</td>
</tr>
<tr>
<td>Savi Santa-Aho, Aki Sorsa, Mynnami Vippola, Jyrki Latokartano, Mari Lindgren, Toivo Lepistö</td>
<td></td>
</tr>
<tr>
<td>Acoustic Emission Technology As A Complementary Tool For Providing Early Warnings Of Serious Equipment Problem In Industrial Rotating Machinery: Defect Detection, On-Line Condition Monitoring, Diagnostic And Prognostic</td>
<td>400</td>
</tr>
<tr>
<td>Shuib Husin, R. I. Raja Hamzah</td>
<td></td>
</tr>
<tr>
<td>Beyond the Steady State: A New Perspective on Synergy with an Application to the Avoidance of Premature Failure in Offshore N-line Riser Tensioning Systems</td>
<td>412</td>
</tr>
<tr>
<td>V. Leavers, H. Middleton</td>
<td></td>
</tr>
</tbody>
</table>

**1B CONDITION MONITORING OF TRIBOLOGICAL SYSTEMS, WEAR DEBRIS AND LUBRICATION MANAGEMENT**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection Of Bearing Failure By Acoustic Emission</td>
<td>422</td>
</tr>
<tr>
<td>Z. Quiney, A. W. Lees, A. Ganji</td>
<td></td>
</tr>
<tr>
<td>Condition Monitoring for Tribological Contacts</td>
<td>N/A</td>
</tr>
<tr>
<td>Ling Wang</td>
<td></td>
</tr>
<tr>
<td>On-Line Ferrous Debris Density Monitoring In Sliding Area Contacts Under Boundary Lubrication</td>
<td>435</td>
</tr>
<tr>
<td>Regime</td>
<td></td>
</tr>
<tr>
<td>A. Torres Pérez, M. Hadfield, S. Austen</td>
<td></td>
</tr>
<tr>
<td>Anomaly Detection Of The Tapered Roller Bearings With Statistical Data-Driven Approaches</td>
<td>445</td>
</tr>
<tr>
<td>Intelligent Wear Monitoring of Lubricated Metal on Metal Rolling-Sliding Contacts Using Multiple Sensors</td>
<td>464</td>
</tr>
<tr>
<td>Robert Hanzal, Ling Wang, Robert J. K. Wood</td>
<td></td>
</tr>
<tr>
<td>Site-Direct Oil Analysis - Virtual Machine Diagnostics™</td>
<td>465</td>
</tr>
<tr>
<td>Jack Poley</td>
<td></td>
</tr>
<tr>
<td>Latest Developments in Online Oil Condition Monitoring Sensors</td>
<td>476</td>
</tr>
<tr>
<td>Andrew Baldwin, Stuart Lunt</td>
<td></td>
</tr>
<tr>
<td>Modelling The Properties Of Oil With Various Contaminants</td>
<td>494</td>
</tr>
<tr>
<td>Michael J. Knowles, David Baglee</td>
<td></td>
</tr>
</tbody>
</table>

**3B MEASUREMENT TECHNIQUES IN CONDITION BASED MAINTENANCE**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubrication And Wearing Of Machine Elements – A Review</td>
<td>504</td>
</tr>
<tr>
<td>Pekka O. Vähäoja, Lari J. Kela</td>
<td></td>
</tr>
<tr>
<td>Fault-Impact Enhancement Using Adaptive Filtering For Condition Monitoring Of Ball Bearings</td>
<td>517</td>
</tr>
<tr>
<td>Patrik Pääjärvi, James P. Leblanc</td>
<td></td>
</tr>
<tr>
<td>Methodologies For Prediction Of Bearing Wear With Application In Arctic Railway Maintenance</td>
<td>528</td>
</tr>
<tr>
<td>Jan Lundberg</td>
<td></td>
</tr>
<tr>
<td>An Experimental Study Of Applying Machine Vision Technology In Online Solid Debris Analysis Of Rolling Oil Of A Cold Rolling Stand</td>
<td>540</td>
</tr>
<tr>
<td>Harri V. S. Pikkarainen, Pekka O. Vähäoja</td>
<td></td>
</tr>
</tbody>
</table>
4B EXPERIMENTAL AND VIRTUAL MODELS FOR MACHINES AND PLANTS DIAGNOSTICS

Virtual Model Of A Mirror Orientation Mechanism In Solar Energy Applications, To Evaluate Its Pointing Accuracy In Presence Of External Excitations ................................................................. 553
  A. Lucifredi, P. Silvestri, A. Della Rovere

Modeling And Experimental Analysis Of A 6-High Industrial Rolling Mill Vibration Response ................................................................. 566
  Konstantinos C. Gryllias, Ioannis A. Antoniadis

Development Of Criteria For Vibration Qualification Of Mechanical Components Through LMS Test Lab Mission Synthesis Software ........................................................................................................ 578
  A. Lucifredi, P. Silvestri, F. Tripepi

Performance Analysis And Evaluation Of The Effectiveness Of An Active Noise Control Using Experimental Models................................................................................................................................. 590
  A. Lucifredi, P. Silvestri, E. Luciano

Neural Network Based Authentication Mechanism For Individuals Using Biometric Features ................................................................................................................................. 602
  K. Selvakumar, J. Kamalakannan, S. Prabu

5B INNOVATIVE SIGNAL PROCESSING AND CONDITION MONITORING (SESSION 2)

Generalised lp Norms in Vibration Analysis of Process Equipments................................................................................................................................. 614
  Sulo Lahdelma, Esko Juuso

Requirements For Wheel Bearing Diagnostics................................................................................................................................. 627
  Jens Strackeljan, Stefan Goreczka

Automatic Parameter Setting for the Signal Processing in Rolling Bearing CM ................................................................................................................................. 637
  Stefan Goreczka, Jens Strackeljan

6B ADVANCED SIGNAL PROCESSING IN CONDITION MONITORING (SESSION 3)

Life Cycle Costs in Industrial Fan Drives – Case Study ................................................................................................................................. 647
  Jussi Tamminen, Tero Ahonen, Jero Ahola, Juha Kestilä

Improved Simulations For Fault Size Estimation In Rolling Element Bearings ................................................................................................................................. 656
  Nader Sawalhi, Robert B. Randall

Prediction Of Residual Lives Of Rolling Element Bearing Using Vibration Signature Analysis................................................................................................................................. 668
  N. C. Murmu, S. C. Nidhi, A. P. Harsha

7B NOVEL SENSING AND ANALYSIS METHODS FOR HEALTH MONITORING

Handling Sparse Data Problems In The Context Of Monitoring Multiple Parameters In Complex Systems ................................................................................................................................. 675
  S. King, P. Flint, S. Sundaram

Development of an Intelligent System for Detection of Exhaust Gas Temperature Anomalies in Gas Turbines ................................................................................................................................. 687
  Andrew D. Kenyon, Victoria M. Catterson, Stephen D. J. McArthur

AURA-Alert: The use of Binary Associative Memories for Condition Monitoring Applications ................................................................................................................................. 699
  Jim Austin, Grant Brewer, Tom Jackson, Victoria J. Hodge

Stable Distributions for Heavy-Tailed Data and Their Application in Asset Health Monitoring ................................................................................................................................. 712
  S. Sundaram, K. McDonald, D. A. Clifton

Identification of Combustion Failures in Gas Turbines Using Principal Component Analysis ................................................................................................................................. 722
  Misha Singh

8B PROGNOSTICS: A KEY CONDITION MONITORING ENABLER

Prognostics: A Key Condition Monitoring Enabler ................................................................................................................................. 732
  Vern Fox

Local Damage Diagnosis in Gears Using Band Sampling ................................................................................................................................. N/A
  L. Gelman, P. Sydor

Diagnostics The Harbinger of Prognostics and Condition Monitoring ................................................................................................................................. 737
  Jim Lauffer
Machine Condition Monitoring Enables Dynamic Equipment Health Management .................................................. 749
Victor Lough
Automated Generation of Knowledge for Intelligent Machine Failure Prevention ................................................. 767
R. Gegusch, J. Hu, G. Seliger

9B ADVANCES IN NDT AND NDE

Condition Assessment Of Concrete Bridge Decks: The Past, The Present And The Future ........................................ 776
Nenad Gucunski
Eddy Current Image Normalization In Non-Destructive Testing ........................................................................ 789
Luka Kafnin, Artur L. Ribeiro, Helena M. G. Ramos
Validation Of Acoustic Emission Monitoring Techniques For Damage Detection In Concrete
Structures ......................................................................................................................................................... 801
Timothy P. Bradshaw, Jonathan R. Watson, Rhys Pullin, Karen M. Holford, Mark Eaton, Robert J. Lark, Elena Barton, Befa Zhang
Capacitive Imaging Technique For Condition Monitoring ................................................................................ 813
X. Yin, D. A. Hutchins
Towards Automatic Flaw Sizing Using Ultrasonic Time-Of-Flight Diffraction ...................................................... 832
A. Al-Ataby, W. Al-Nuaimy, O. Zahran
The VISIR™ Project – An Open Source Software Initiative For Distributed Online Laboratories ............................. 841
Ingvar Gustavsson, Johan Zackrisson, Lars Håkansson, Ingvar Claesson, Thomas Lagö

1C CONDITION MONITORING OF EMBEDDED MEASURING INSTRUMENTS

Metrological Self-Check as an Efficient Tool of Condition Monitoring .................................................................. 852
Roald Taymanov, Ksenia Sapozhnikova
Condition Monitoring for Ship Fuel (Bunkering) Applications ........................................................................... 864
Manas P. Henry
Performance Improvement of Advanced Capacitive Displacement Sensors in Industrial Applications ................... 875
Stoyan Nihtianov
Metrological Self-Check of Pressure Sensors ..................................................................................................... 885
Yulia Baksheeva, Ksenia Sapozhnikova, Roald Taymanov
Integrated Diagnostic and Control Functions of Frequency Inverters with ProfiBus Interfaces .............................. 897
JerzyŚwider, Mariusz Hetmanczyk
Evaluation of Ghazlan Power Plant Experience in Moving from the Preventive (Time Based) Maintenance Concept to Condition Based Maintenance ................................................................. 906
G. Al-Qahtani

3C CONDITION MONITORING AND MAINTENANCE

A Service Oriented Architecture To Enable A Holistic System Approach To Large System
Maintenance Information ........................................................................................................................................... 907
Jerker Delsing, Jonas Gustafsson, Jan Van Deventer
Large Area Corrosion Mapping and Critical Defect Detection ......................................................................... 915
Joe Buckley, Tim Berry, Tom Marshall, Wayne Woodhead
Prognostic Solution for Real-time Lubricant Quality Health .............................................................................. 916
C. Byington, R. Brewer, N. Mackos, G. Argenna
Condition Monitoring In An On-Ship Environment ........................................................................................... 917
Michael J. Knowles, David Baglee

4C CONDITION BASED MAINTENANCE: CLASSIFICATION ISSUES AND POSSIBILITIES

Self-Organising Feature Maps For Automated Rolling Element Bearing Vibration Monitoring .......................... 929
Jay R. Nkuna, Johan Enslin
EMERG-1, A Wireless Emergency System For A Safer Environment .................................................................. 942
Henrik Åkesson, Andreas Sigfridsson, Thomas Lagö, Peter Berg
Proper Scaling Practices for Condition Based Monitoring Data ................................................................. 948
Thomas L. Lagö, Henrik Åkesson, Andreas Sigfridsson

Condition Monitoring Solutions as a Tool to Saving Maintenance Cost .......................................................... 954
Thomas L. Lagö, Henrik Åkesson, Andreas Sigfridsson

Fault Diagnosis Of Rolling Element Bearings Using An EMRAN RBF Neural Network- Demonstrated Using Real Experimental Data ................................................................. 962
Ihab Samy, Ip-Shing Fan, Suresh Perinpanayagam

5C CONDITION BASED MAINTENANCE IN POWER PLANTS

Introduction Of Universal Methodology Of Specimen Free Nondestructive Inspection (Control) Of Mechanical Properties Of Equipment Metal ................................................................. 972
M. Bakirov

Condition Monitoring Pertaining To Maintenance Optimization At Nuclear Power Plants ........................................ 975
Peter Trampus

Model-Based Diagnostics of Rotors on Roller Bearings ...................................................................................... N/A
M. Leontiev

6C DAMAGE MONITORING (SESSION 2)

The New Techniques Based on the Higher Order Spectra for Damage Diagnosis ..................................................... N/A
L. Gelman, T. Kwiatkowski

Extended Diagnostics System For Earth Fault, Duplicate Address Detection And Noise Detection In AS-Interface Networks ......................................................................................... 987
Piotr Michalski, Jerzy Swider

An Innovative Approach to Electromechanical Actuator Emulation and Damage Propagation Analysis ........................................................... 994
Neil Kunst, Chris Lynn

7C DAMAGE MONITORING (SESSION 3)

Advanced On Line Measurement Capabilities: High Speed Infrared On Line Monitor Validation for True Condition Based Assessment .................................................................................. 1006
P. Zombo

Implementation of Key Processing Steps and Integrated Software Suite for Component Prognostics ....................... 1007

Damage Detection and Condition Monitoring for UAVs Using Neural Networks .................................................. 1008
L. Lopez-Mejia, A. Savvaris

Model-Based Prognostics Of Gear Health Using Stochastic Nonlinear Dynamical Models .................................. 1009
Matej Gašperin, Dani Juricic, Pavle Boškoski, Jože Vižintin

Simulation-Based Agent Decision-Making For Water Pipe Condition-Monitoring .................................................. 1021
B. Sharp, L. Noriega

8C CONDITION MONITORING OF RAIL WHEELSETS

SAFERAIL - Development of Novel Inspection Systems for Railway Wheelsets ......................................................... 1029

Full Matrix Capture Inspection Of Railway Axles And The Potential For Real Time Measurement ......................... 1030
Miles Weston, P. Ian Nicholson, Anthony J. Peyton, Claire L. Davis

Condition Monitoring of Railway Wheelsets Using Acoustic Emission Technology .................................................. 1042
S. Kerkryas, Y. Kerkryas, A. Anastassopoulos, K. Bollas, A. C. Franco, D. Dias, M. Papaelias, T.-H. Gan

Condition Monitoring of Railway Wheelsets Using High-Frequency Vibration Technology .................................. 1043
F. Vermeulen, T. Vanhonacker, M. Laemans

Application Of Phased Array Ultrasonic Testing (PAUT) For Inspection Of Railway Axles .................................. 1048
Dimosthenis Liaptisis, P. Ian Nicholson, Joana A Courinha, César A. Boynard, Margarida Pinto
9C CONDITION MONITORING CASE STUDIES AND CERTIFICATION

Combining Acoustic Emission and Vibration Sensing Technology to Enhance Condition Monitoring ......................................................... 1060
T. Bradshaw, R. Genesi, M. Burch, P. Cole

Training And Qualification In Condition Monitoring ...................................................................................................................... 1061
Simon Mills

Visual Insight Into Bearing Defect Detection Using Vibration .............................................................................................................. 1075
Dean Whittle, Jason Tranter

The “Gauss Transform” for CBM Applications ................................................................................................................................. 1082
Thomas L. Lagö, Ingvar Claesson, Lars Håkansson

Acoustic Emission Crack Detection in Gear Teeth Through Signal Fingerprint Comparison ......................................................... 1089
T. Bradshaw, R. Pullin, A. Clarke, M. J. Eaton, K. M. Holford, J. McCrory

Design of a Minimal OSA-CBM Model for an Aircraft Generator ........................................................................................................ 1090
T. Sreenuch, A. Tsourdos, L. Gelman

1D INNOVATIVE SIGNAL PROCESSING AND CONDITION MONITORING (SESSION 1)

About Periodicity And Signal To Noise Ratio - The Strength Of The Autocorrelation Function .......................................................... 1102
Nadine Martin, Corinne Mailhes

On-Line Monitoring Of Transitory Variations In Hydraulic Power Plants Pressure Pipes ................................................................. 1115
S. Charbonnier, G. D’Urso, J. L. Ballester

Surrogate-Based Diagnosis Of Mechanical Faults In Induction Motor From Stator Current Measurements ........................................... 1127
Marie Chabert, Baptiste Trajcin, Jérémi Regnier, Jean Faucher

A Procedure Of Vibration Analysis From Planetary Gearbox Under Non-Stationary Cyclic Operations For Instantaneous Frequency Estimation In Time-Frequency Domain ........................................ 1133
Radoslav Zimroz, Fabien Millioz, Nadine Martin

Automotive Diagnostic And Monitoring Using Magnetism ................................................................................................................ 1146
A. Le Goff, C. Servière, J. L. Lacoume, R. Blanpain, S. Dauvè

Bayesian Curve Fitting By Using Smooth Transition Regression Models .............................................................................................. 1155
Matthieu Sanquer, Florent Chatelain, Mabrouka El-Guedri, Nadine Martin

Vibration Diagnosis On A Torsional And Bending Coupled Rotor System .......................................................................................... 1169
Tadashi Tsuji, Hiroyuki Fujisawa, Osami Matsushita

The Potential Of Signal Processing For The Purpose Of Machine Oil Diagnostics ................................................................................. 1181
Gabrijel Peršin, Boris Kržan, Jože Vižintin, Dani Juricic

3D DAMAGE MONITORING (SESSION 1)

Gearbox Damage Diagnosis Using Novel Wavelet Technology ............................................................................................................ 1194
L. Gelman, K. C. Gryllias, B. Shaw, M. Vaidhianathasamy

Investigation of the Fatigue-induced Failure of Ti-Ni Base Devices and Using Fullerene-like Nanoparticles to Mitigate the Phenomena .................................................................................................................. 1203

Spall Propagation Characteristics of SAE 52100 and AISI M50 Bearings ............................................................................................... 1204
Nelson H. Forster, Kevin L. Thompson, Timothy N. Baldwin

A Comparison of Methods for the Separation of Deterministic and Random (Including Cyclostationary) Signals ................................................. N/A
R. B. Randall

4D HEAVY MACHINERY DIAGNOSTICS AND CONDITION MONITORING (SESSION 1)

Heavy Machinery Diagnostics And Condition Monitoring ................................................................................................................ 1216
Walter Bartelmus

Model Based Explanation Of Properties Of Signal Generated By Planetary Gearbox With Local Damage In Non-Stationary Operations .................................................................................................................. 1227
F. Chaari, R. Zimroz, W. Bartelmus, T. Fakhfakh, M. Haddar

Wireless Condition Monitoring Of Idler Rolls In Heavy Duty Belt Conveyors ...................................................................................... 1238
Gabriel Lodewijks, Adriana López De La Cruz, Hans Veeke
Bearings Fault Detection In Gas Compressor With High Impulsive Noise Level...................................................... 1251
Tomasz Barszcz, Radoslaw Zimroz, Adam Jablonski, Walter Bartelmus

Comparison Of Advanced Fault Detection Methods For Rolling Bearings Fault In Wind Turbines ......................... 1264
Tomasz Barszcz, Jacek Urbanek, Tadeusz Uhl

5D HEAVY MACHINERY DIAGNOSTICS AND CONDITION MONITORING (SESSION 2)

Condition Monitoring for Passengers Escalators and Lifts ..................................................................................... 1276
George H. Yebra, Steve Thacker

Condition Monitoring Development for Escalators Main Drive Shafts ................................................................. 1301
George H. Yebra, Steve Thacker

A Comparison of Results Obtained from Alternative Digital Shearography and ESPI Inspection Methods ................ 1311
Dirk Findeis, Jasson Gryzagoridis

6D HEAVY MACHINERY DIAGNOSTICS AND CONDITION MONITORING (SESSION 2)

Electromagnetic Brakes - Weight Test Avoidance ........................................................................................................ 1322
George H. Yebra

Bulk Temperature Measurements On Gears For Scuffing Monitoring ................................................................. 1334
I. Mazzitelli, F. S. Guerrieri Paleotti, P. Forte, E. Cialli, M. Amorena, A. Polacco

On The Development Of Three Instructive Test Rigs For Efficiency Determination Of Gear Boxes And Fault Diagnosis Of Joints, Roller Bearings And Gears ............................................ 1345
B. Van Hooreweder, D. Moens, R. Boonen, P. Sas

7D MEASUREMENT AND PROCESSING OF BIOSIGNALS AND IMAGES FOR THE ASSESSMENT OF MUSCLE FATIGUE AND BACK PAIN

An Overview of the Diagnosis of Back Pain .................................................................................................................. N/A
R. Allen

Electrophysiological Assessment Of Shoulder Movement Using Wireless Data Acquisition And Remote Signal Processing .................................................................................................................. 1354
Anthony C. Fisher, David Hawkes, Omid Alizadehkhaiyat, Graham J. Kemp, Simon P. Frostick

Fusion of Data from Crew and High Speed Marine Craft for the Monitoring of Fatigue ........................................... N/A
D. Nikolic

Fatigue Assessment of the Muscles of the Back ............................................................................................................. N/A
J. R Collier

8D ADVANCED REASONING AND DIAGNOSIS IN CONDITION MONITORING

Intelligent Scaling of Features in Fault Diagnosis ........................................................................................................ 1358
Esko Juuso, Sulo Lahdelma

Novel Method for Detecting Cavitation in Centrifugal Pump with Frequency Converter ............................................. 1373
Tero Ahonen, Jussi Tamminen, Jero Ahola, Juha Kestilä

Simulation Of Fault And Clearance Induced Effects In Rolling Element Bearings .................................................. 1386
Tahsin Doguer, Jens Strackeljan

A 3D-Ball Bearing Model For Simulation Of Axial Load Variations ....................................................................... 1398
Petro Tkachuk, Jens Strackeljan

Linguistic Equation Models for Failure Mode Identification from Multisensor Vibration Analysis ............................ 1408
Esko Juuso, Mika Ruusunen, Guillaume Perigot

9D REAL-TIME CONDITION MONITORING OF EQUIPMENT (SESSION 2)

Diagnostics And Condition Monitoring Of Piston Compressors ............................................................................. 1421
Alexandr P. Naumenko

Development of the Woodpecker Tap Tester ............................................................................................................... 1432
P. Rogger
Development Of Stress Models For Fossil Fuel Power Plants / HRSG Pressure Parts Assessed Life Calculations .................................................................................................................................................. 1443
Faizan Patankar, John Twiddle, Richard Walton
Dynamic Balancing Of 100 MW Steam Turbine After Removal Of Last Stage Blades................................. 1455
Final Quality Assessment System Of Electronically Commutated Motors .......................................................... 1464
Pavle Boškoski, Janko Petrovic, Bojan Musizza, Danijuric
Pre-Filtered Hankel Total Least Squares Method For Condition Monitoring Of Wet Friction Clutches .......... 1476
Agusmian P. Ompusunggu, Paul Sas, Hendrik Van Brussel, Furid Al-Bender, Jean-Michel Papy, Steve Vandenplas
An On-line Monitoring and Mitigation of Forced Excitation Vibrations in a Soccer Stadium – Gamla Ullevi in Sweden ........................................................................................................................................ 1488
H. Åkesson, A. Sigfridsson, T. L Lagö
Author Index