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09.20 **Plenary Keynote Lecture - [101] Thermal analysis: condition monitoring or non-destructive testing?** ..... N/A

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Author - Mr T Clausing, President of the American Society for Nondestructive Testing

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[4]BillerudKorsnäs, Karlsborgsverken

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Author - Prof L Swedrowski, Poland Chair - Prof L Gelman

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[1]The University of Birmingham [2]Ingeteam Service
[3]Indra Sistemas [4]Universidad de Castilla-La Mancha

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Chair: ***Dr S Ganeriwala 2C – Charlbury Room***

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Author - S Ganeriwala SpectraQuest

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[2]AMRC with Boeing
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Authors - S Muthuraman, J Twiddle, L Varley, J Rongong and N Noor

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Authors - S Muthuraman, B Staneff, M Singh, A Patel and J Twiddle
Cranfield University

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[1]University of Genova
[2]CSS Engineering – Crane, Safety and Security Engineering

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[3]Orona EIC S Coop

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[1]Universidad Nacional de Colombia
[2]Instituto Tecnologico Metropolitano [3]Pontificia Universidad Javeriana

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[301] Mathematical modelling of mechanical systems ..... N/A

Author - Prof G Singh (India) Chair: Prof L Gelman

09.00 **Plenary Keynote Lecture - [249] Title to be confirmed** ..... N/A

Author - Prof I Gray CBE, UK Chair - Prof L Gelman

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Czech Technical University in Prague

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Czech Technical University in Prague

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Chair: ***Prof L Gelman*** ***7B – St Johns Room***

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Authors - L Gelman and T Patel Cranfield University

09.50 **[306] Novel vibration diagnostics of rumble gas turbines** ..... N/A

Authors - L Gelman[1], I Petrunin[1], M Walters[2] and C Parrish[2]

[1]Cranfield University [2]Rolls-Royce

10.10 **[309] Modelling for NDT in civil engineering** ..... N/A

Authors - L Gelman and L Fragonara Cranfield University

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Author - I Taylor Mistras Group Ltd

11.20 **[314] Title to be confirmed** ..... N/A

Authors - To be confirmed AE Working Group

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Author - D Blazina Shell

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Author - T Nowell Intertek Farnborough

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Author - D Manning-Ohren ERIKS UK

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Author - G Pisarenko and A Mailo
National Academy of Sciences of Ukraine

Energy conservation by addressing resonance of VFD driven condensate extraction pump at DTPS 679

Authors - H M Bari, A A Deshpande and S S Patil
Department of Maintenance Planning, Condition Monitoring Cell,
Reliance Energy, Mumbai, INDIA.

This paper shares a success story out of the Implementation of CM techniques at DTPS, wherein imminent Resonance problem of VFD driven 650 Kw HT auxiliary Condensate Extraction Pump – 2B was diagnosed. In 2007, VFD was retrofitted for reducing pump speed in order to achieve energy conservation. Reducing pump speed with control valve full open condition after VFD installation achieves Deaerator level control as well as reduction in power consumption. On 17/07/2014, Pump Mechanical seal replaced to attend leakage & pump again put back in service. On 22.07.2014, it was observed that only Motor DE bearing vertical vibrations deviated from 0.6 to 3.1 mm/sec (RMS) between speed ranges of 1310 to 1335 rpm in VFD mode. From vibration spectrum analysis, suspected Electrical or Mechanical resonance problem. VFD -THD measurement carried out but all readings found within limits which eliminated possibility of electrical resonance. To pinpoint mechanical resonance, Bump test carried out. It showed natural frequency of system 1320 rpm which is very close to operating speed of Pump in VFD mode.

After studying all data, it was noticed that vibration of Motor increased only after Mechanical seal replacement. Hence, concluded that rise of vibration might be happening due to disturbance in contact area of new seal w.r.t. old seal which changed the stiffness of Pump & ultimately shift of natural frequency near to operating speed creating resonance in Pump, resulting in high vibration. By Observing increasing vibration trend, decided to changeover pump. During maintenance, pump seal removed. Cleaning, Inspection & Mechanical seal re-fitting done. The catastrophic failure of Motor & Pump is 2 avoided ,thus prevented downtime & achieved desired energy conservation. The importance of Vibration & Bump test measurement helped in diagnosing the exact root cause of abnormity well in advance which could have caused total cost of £3,129.

A self-organising communication system of a sensors network, based on the swarm algorithm 690

Author - Krzysztof Stankiewicz Institute of Mining Technology, Poland

An idea of a self-organising system to transfer of measuring data, based on swarm algorithm, with a special attention to the new approach to the routing of a data packet in communication networks of the mesh structure, has been presented. The system is designed mainly to be used in mine sensory networks of a static or slow-changing structure. An impact of the subject system on effectiveness of a communication network has been presented as well as an increase of the functional safety of the machines and equipment, in which similar multi-redundant solutions of transfer of measuring data are used, has been indicated.