



E-NEWSLETTER

JULY 2011 ISSUE

THE SOCIETY OF ACOUSTICS, SINGAPORE

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CONTENTS

I. STATEMENTS BY PRESIDENT	page 2
II. RESEARCH NEWS	page 3
III. ANNOUNCEMENTS	page 25
IV. MEMBERSHIP NEWS	page 25
V. ARTICLES	page 26
VI. USEFUL LINKS	page 33

1. **STATEMENTS BY PRESIDENT**

Dear fellow members and friends,

The Society of Acoustics, Singapore, which was formed since 1989 is a society dedicated to the advancement of knowledge and information on all relevant aspects of acoustics. I am therefore very pleased to present to all of you our new format E-Letter for July 2011.

For your information, our society has been affiliated with the International Institute of Acoustics and Vibration (IIAV) since the mid 1990s. So I am doing a mass send out of the latest issue of the IIAV Digest to our members. The IIAV Digest is a monthly publication and is a good example for our Newsletter to follow. I will try to send this Digest to all our members for all the subsequent issues.

Also our society has signed an MOU with the Korean Society of Noise and Vibration Control Engineering and I will try to find out whether they can send us their newsletters and their journals regularly as a reciprocate arrangement.

Meanwhile, as we work to improve our Society, as well as our services to our members and to the public, we look forward to contributions and assistances from all members.

With best regards.

Dr. Woon Siong Gan
President, Society of Acoustics, Singapore
July 2011

II. RESEARCH NEWS

INTERNATIONAL SOUND AND VIBRATION DIGEST (ISVD)

Published by THE INTERNATIONAL INSTITUTE OF ACOUSTICS AND VIBRATION (IIAV)

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TODAY DIGEST CONTENTS

ITEM 1. INTRODUCTION.

ITEM 2. PHILIP E. DOAK (1921-2011).

ITEM 3. NEWS FROM IIAV-AFFILIATED SOCIETIES: The Acoustical Society of Italy (AIA) is arranging a conference on opera theatres to bring the celebration of the 150th anniversary of the Unification of Italy.

ITEM 4. The Noise and Vibration research group of the Department of Mechanical Engineering of the K.U. Leuven gives details about the 2011 intensive Courses on Applied Acoustics and Modal Analysis.

ITEM 5. The Paul S. Veneklasen Research Foundation (PSVRF) (Santa Monica, California, USA) announcement.

ITEM 6. CONFERENCE ANNOUNCEMENTS: 1) Sound and Resonance Conference, Stockholm, Sweden, September 20-21, 2011; 2) 15th workshop of the Aeroacoustic Specialists' Committee of the Council of the European Aerospace Societies (CEAS-ASC) and the 1st Scientific X-Noise EV network, EPFL Lausanne Switzerland, October 13-14, 2011; 3) European Symposium on Environmental Acoustics and on Building Acoustically and Sustainably, Caceres, Spain, October 26-28, 2011; 4) International Symposium on the Computational Modelling and Analysis of Vehicle Body Noise and Vibration, University of Sussex, Brighton, UK, March 27-28, 2012; 5) 3rd International Conference on NPP Life Management (PLIM) for Long

Term Operations (LTO) Salt Lake City, UT, USA, May 14-18, 2012.

ITEM 7. NATIONAL ACOUSTICAL LABORATORIES AND RESEARCH ACTIVITIES:

1)Ultrasound techniques used in Functional Morphological Hand Research, BioMed Institute and Jessa Hospital, University of Hasselt, Belgium. 2) Bioacoustics Laboratory, School of Engineering, Virginia Commonwealth University, Richmond VA, USA.

ITEM 8. INDUSTRIAL NEWS. 1) The ULTRAMIC200K, an ultrasonic USB microphone with 100 kHz bandwidth; 2)The Software GUIGUW v0.1, graphical user interface (GUI) for the computation of stress-guided wave dispersive features; 3) EKOS Corporation, EKOS EkoSonic Endovascular System, first endovascular device approved for the treatment of pulmonary embolism (PE); 4)3-D Vibration Measurement through Scanning laser Vibrometer.

ITEM 9. NEW BOOK ANNOUNCEMENTS: 1) Brake NVH: Testing and Measurements; 2) Sound-Engineering im Automobilbereich; 3) High Speed Ground Transportation Noise and Vibration Impact Assessment guidance manual.

ITEM 10. News from International Union of Theoretical and Applied Mechanics (IUTAM).

ITEM 11. The Transportation Research Board (TRB) of the National Academies recently selected HMMH to lead the research team conducting National Cooperative Highway Research Program (NCHRP) 25-34: Supplemental Guidance on the Application of FHWA Traffic Noise Model (TNM).

ITEM 12. Collaborative rail research project RIVAS starts on February 2, 2011.

ITEM 13. RESEARCH ON STEADY STATE FLEXURE VIBRATION OF ORTHOTROPIC CYLINDRICAL PANELS AND PLATE WITH CUTOUTS OF

ARBITRARY CONFIGURATION

ITEM 14. IIAV: Membership Application Form the INTERNATIONAL INSTITUTE OF ACOUSTICS AND VIBRATION (IIAV).

ITEM 1. INTRODUCTION.

We are pleased to bring you the June 2011 Issue of the INTERNATIONAL SOUND AND VIBRATION DIGEST (ISVD). The DIGEST is now being published by the INTERNATIONAL INSTITUTE OF ACOUSTICS AND VIBRATION (IIAV). The digest is free of charge to members of the IIAV. Non-members may also receive the digest in future if they log on at the IIAV website. The IIAV is a democratic international scientific society. Membership, as member or associate is open to individuals from all countries. In addition, 37 scientific societies and institutes have become affiliated with the IIAV as cooperating organizations. On behalf of Professor Hans Boden, KTH, Stockholm, Sweden, the President of the IIAV, and the officers and directors, it is our pleasure to invite you to consider becoming an IIAV member if you are not already. IIAV members receive, as part of their annual dues of 80 USD, not only the ISVD but also a refereed journal, the INTERNATIONAL JOURNAL OF ACOUSTICS AND VIBRATION (IJAV) which began publication in December 1996. Members also receive each year the proceedings of the International Congress on Sound and Vibration (ICSV). Non-IIAV members and libraries can subscribe to the JOURNAL (IJAV) for 100 USD per year by airmail, post paid. Complete details about IIAV are available on the worldwide web at <http://www.iiav.org>. A membership application form is enclosed as ITEM 14 of this issue. It can be submitted by e-mail, fax or airmail.

The proceedings of the previous congresses are available. If you are interested in further information, please go to www.iiav.org or write to mam0066@auburn.edu.

We are pleased to inform you that back issues of the ISVD digest are available on the IIAV website.

We hope that you are finding the INTERNATIONAL SOUND AND VIBRATION DIGEST useful. We should be interested to hear your comments and to receive news items and technical information and articles for inclusion in the next issue. We hope to bring out the next issue of the DIGEST in early

August 2011, so don't forget to send your items soon! These should be sent to mam0066@auburn.edu.

Malcolm J. Crocker
Editor-in-Chief

Margarita Maksotskaya
Managing Editor

ITEM 2. PHILIP E. DOAK (1921-2011)

It is with sadness that we bring you the news of the passing of Professor Philip E Doak (1921-2011) who died at the age of 90, on May 30, 2011. In 1963, Phil was one of the charter members of the Institute of Sound and Vibration Research (ISVR), having previously held posts at Liverpool University, Manchester University and the Massachusetts Institute of Technology (MIT.) He is probably best known as the founding and longest-serving Editor of the Journal of Sound and Vibration (JSV.) Most of his research was devoted to aeroacoustics and its applications in the aviation industry. But he was also responsible for the acoustical design of the Turner Sims concert hall. Longer appreciations will doubtless be available soon and a more detailed obituary will be published in our next August 2011 issue of the ISVD.

ITEM 3. NEWS FROM IIAV-AFFILIATED SOCIETIES: By the end of this year, The Acoustical Society of Italy (AIA) will promote a conference on opera theatres to celebrate the 150th anniversary of the Unification of Italy. The conference will take place in Venice and will be co-organized by the AIA and the Venetian authorities interested in this topic (Giorgio Cini Foundation, La Fenice Theatre, Ca Foscari University IUAV), with the support of local institutions.

The event, which is planned to be strongly multidisciplinary, will be divided into different sections dealing with musical, historical, architectural and acoustical features, addressing topics such as: Birth and evolution of hymns, patriotic songs, opera arias, and so on, relevant to the spread of renaissance thinking; The role of opera houses as centres of dissemination of feelings and ideas of the Risorgimento; Cultural, historic and artistic aspects of sets and scenarios used in nineteenth-century opera houses; Architectural aspects of nineteenth-century opera houses; Acoustic

characteristics of the main Italian theatres; Issues related to the refurbishment, the restoration and use of the existing historic theatres; Coordination of the activities relating to historic theatres, and realisation of a large data- base of the acquired data.

The conference will last for two days. The first one will be dedicated to an audience with various backgrounds and will consider all of the different elements of this wide theme, the second one will be devoted to a specialist audience and it will deepen some aspects from a scientific - technical point of view.

More information on www.associazioneitalianadiacustica.it

ITEM 4. The Noise & Vibration research group of the Department of Mechanical Engineering of the K.U. Leuven is pleased to provide information about the 2011 intensive Courses on Applied Acoustics and Modal Analysis.

ISAAC22 is the 22nd edition of our annual course on Advanced Techniques in Applied and Numerical Acoustics which will take place from 20 to 21 September 2011 in Leuven, Belgium. It is set up as an extended overview of some recent techniques in applied and numerical acoustics with emphasis on background principles and on practical use of the techniques.

ISMA36 is the 36th edition of our intensive course on Modal Analysis which will take place from 20 until 21 September 2011 in Leuven, Belgium. The course gives a general introduction to modal testing with emphasis on data-acquisition and multi-channel modal testing. It is an intensive training course, where theoretical lectures are illustrated by integrated demonstrations and discussions on relevant industrial case studies.

TIRE-DYN is the first public workshop of the EU 7th Framework Project on Experimental and Numerical Analyses of the Dynamic Behavior of Rolling Tires which will take place on the 22nd of September 2011 in Leuven, Belgium. It gives an overview of the current state-of-the-art in experimental and simulation techniques to investigate rolling tire structural dynamics.

The full program of the courses and some practical information can be found at: <http://www.isma-isaac.be/>

ITEM 5. The Paul S. Veneklasen Research Foundation (PSVRF) (Santa Monica, California)

The Paul S. Veneklasen Research Foundation (PSVRF) (Santa Monica, California) has continued to be an active part of the acoustical community over the last year. Activities included the following: The Paul S. Veneklasen Research Foundation Anechoic Chamber was dedicated at the University of Hartford on October 15, 2010. The link below highlights the event.

[cid:image001.jpg@01CC1C39.5105CCF0]<<http://www.hartford.edu/daily/Articles.asp?MainID=9269&Category=1>>

CETA Names Anechoic Chamber after Paul S. Veneklasen Research Foundation<<http://www.hartford.edu/daily/Articles.asp?MainID=9269&Category=1>>

The PSVRF funded a grant to develop a cook stove that relies on thermo-acoustic energy. The positive implications for climate change and the health of families in developing countries is enormous, and the US DOE is considering an investment of \$12.5M on cook stove technology. Penn State Researcher Steve Garrett states, "The working prototype co-generator is due entirely to the generosity of the (Paul S. Veneklasen Research) Foundation." <http://cleancookstoves.org/>

In other news, the PSVRF funded a grant with the House Ear Institute in Los Angeles, California to research into Improving Music Appreciation for Cochlear Implant Users.

The year was rounded out with an internal grant to research Quantitative comparisons of resilient channel design and installation in single wood stud walls. This research was published and presented at the 20th International Congress on Acoustics (ICA 2010) in Sydney, Australia.

Paul S. Veneklasen Research Foundation Research in Acoustics
www.veneklasenresearchfoundation.org<<http://www.veneklasen.com>>

ITEM 6. CONFERENCE ANNOUNCEMENTS:

1) The Sound and Resonance Conference will be held in Stockholm, Sweden, September 20-21, 2011;

The first conference on the use of sound and vibration technologies for improving biological processes and industrial optimization will be held in Stockholm, September 20-21, 2011, with lectures, exhibition and World Caf[©] discussions. For more information please go to:

<http://www.afconsult.com/resonance2011> or contact Lars Landstrom:
lars.landstrom@ingemansson.se

2) 15th workshop of the Aeroacoustic Specialists' Committee of the Council of the European Aerospace Societies (CEAS-ASC) and the 1st Scientific X-Noise EV network will be held in EPFL Lausanne Switzerland, October 13-14, 2011;

The yearly joint workshop of the Aeroacoustic Specialists' Committee of the Council of the European Aerospace Societies (CEAS-ASC) and the X-Noise EV network will be held at EPFL Lausanne (Switzerland) this year, on October 13-14. The topic of the workshop will be: Acoustical Liners and Associated Propagation Techniques.

Attenuation of engine noise by acoustical liners in turbofan ducts remains one of the most effective methods of achieving aircraft noise reduction. Acoustical liners are routinely installed in the intake, bypass and inter-stage regions of turbofan engines to reduce fan noise, and in the hot stream exhaust ducts to mitigate turbine and combustion noise. Their presence attenuates selectively the acoustic modes excited by these sources and redistributes the transmitted acoustic energy to the far field. Predicting far field EPNL in the presence of liners demands the use of analytical, numerical or data-based prediction models to account for the effects of lined surfaces and geometry changes in the ducted sections of the engine as the sound propagates to the far field. Contributions are invited to the above workshop which touches on all aspects of liner modelling, liner impedance prediction, in situ liner performance and propagation methods. In particular, submissions are invited in the following areas: Novel liner concepts, passive and adaptive; Measurement of liner impedance, techniques and applications; Analytical, numerical and empirical methods for predicting liner impedance; Analytic, numerical and empirical methods for predicting the effect of liners on the far field sound pressure; Optimization of liners to reduce community and/or interior noise. More information can be found at:

http://x3noise.epfl.ch/events/2011/2011_XNoise_Workshop

3) European Symposium on Environmental Acoustics and on Building Acoustically and Sustainably will be held in Caceres, Spain, October 26-28,

2011;

An overview of the problems in Environmental Acoustics and in Acoustically Sustainable Buildings will be presented at the Symposium, as well as an analysis of the main aspects related to different European legislations, and the solutions proposed to diminish the Acoustical Pollution, both in the environment and in buildings.

More information at: <http://www.sea-acustica.es/index.php?id=499#c600>

An extended version of the best papers presented at the symposium will be published in a regular issue of the journal of Archives of Acoustics.

<http://acoustics.ippt.gov.pl/>

GRANTS FOR YOUNG RESEARCHERS

ICA and SEA will support four foreign young researches and students with grants of 500 EUR to assist with their participation at the Symposium. This grant also includes free registration.

More information at: <http://www.sea-acustica.es/index.php?id=459#c547>

4) International Symposium on the Computational Modeling and Analysis of Vehicle Body Noise and Vibration to be held at University of Sussex, Brighton, UK, March 27-28, 2012;

Call for Papers

The analysis of automotive vehicle body noise, vibration, and harshness (NVH) requires the use of verified modeling and computational tools which are capable of handling a wide array of uncertainty that normally arises within production vehicles. Confident and efficient prediction of both structural and acoustical responses to a wide variety of dynamic loadings is needed across a wide frequency range taking into account any significant uncertainty.

This Symposium will create an opportunity for industrial and academic researchers to present and discuss, in a single-session event, new vehicle-body NVH results in the areas of modeling, computation, analysis, experimental measurement, and verification.

For full details of the Symposium, including the scope, go to:

<http://www.sussex.ac.uk/comvebonov/> or contact Julian Dunne comvebonov.symposium@sussex.ac.uk

5) 3rd International Conference on NPP Life Management (PLIM) for Long Term Operations (LTO) Salt Lake City, UT, USA, May 14-18, 2012

Nuclear power plant life management (PLIM) has gained increased attention over the last decade and the PLIM programme is an effective tool that allows an operator to safely and cost-effectively manage ageing effects in system, structure and components (SSCs). PLIM helps to facilitate decisions concerning when and how to repair, replace or modify SSCs in an economically optimized way, while assuring that a high level of safety is maintained. The main objectives of the conference are to: Emphasize the role of PLIM programmes in assuring a safe and reliable NPP operation; Provide a forum for information exchange on national and international PLIM programmes, regulatory practises and the application in ageing management; and Provide key elements and good practices related to safety aspects of ageing management and long term operation.

Topics will include: Approaches to Plant Life Management; Economics of Plant Life Management; Ageing Management and Related Operational Programme; SSC Design Modification, Modernization, Refurbishment and Replacement; Managerial Issues Concerned with Plant Life Management; Application of Advanced Technologies; Regulatory Issues Concerned with Plant Life Management. Details of the meeting are being posted on the IAEA website: www.pnnl.gov or for more details contact Leonard J. Bond, the US Host Committee: Leonard.Bond@pnnl.gov

ITEM 7. NATIONAL ACOUSTICAL LABORATORIES AND RESEARCH ACTIVITIES:

1)Ultrasound techniques used in Functional Morphological Hand Research, BioMed Institute and Jessa Hospital, University of Hasselt, Belgium.

In the past few years, various photo-acoustic approaches have been applied to visualise soft tissues of healthy small joints of the finger, especially their tendons and ligaments (Wang et al., 2007, Optics Letters, 32, 20, 3002-3004; Sun et al., 2009, Journal of Biomedical Optics, 14, 6, 064002, 1/5). Results in vitro and in vivo respectively, were matched to cross-sectional histological images and to in vivo MRI cross-sections from similar joints. Especially the images by Wang and co-workers realistically display micro-anatomical positions of the extensor assembly's lateral tendon bands relative to the trochlea and the proper collateral ligaments, at the level of the proximal interphalangeal (PIP) joint. In 2010, a comparable matching of HR MRI cross-sections of a PIP joint in vitro was

performed, relative to healthy PIP joints in vivo both in extension and flexion, visualised by HR Ultrasound (Philips iU 22, linear probe, 5-14 MHz, with a water-based ultrasound gel). These detailed techniques were supervised by C. Thywissen, Radiology, Jessa Hospital, Hasselt and K. J. van Zwieten in cooperation with P.L. Lippens, K. P. Schmidt and I. Lambrichts, Functional Morphology, University of Hasselt. Thus, the lateral bands positions at various PIP flexion stages in vivo showed fair matches with previous in vitro observations (Van Zwieten et al., 2008, Journal of Hand Surgery, 33, 1, 170-171). (See: <https://uhdSPACE.uhasselt.be/dSPACE/handle/1942/11210>).

2) Bioacoustics Laboratory, School of Engineering, Virginia Commonwealth University, Richmond VA, USA.

In the first report on hearing airborne ultrasound and high frequency audio frequencies through the eye (Lenhardt, International Tinnitus Journal; 2007, 13, 1, 3-10) the mechanism of sound propagation from the eye through the brain and cerebral spinal to the inner ear was proposed. Once the impedance mismatch from air to the eye is overcome the remaining elements in the path have virtually the same tissue density allowing vibration to efficiently reach the cochlea. The eye as a window to the cochlea explains the mechanism with which airborne ultrasonic components of music stimulate the auditory central nervous system and influence perception. Further, it offers an examination of how intense industrial airborne ultrasound can cause hearing loss. If a vibrator is placed on the eye, audio frequencies and ultrasound are detected with similar efficiency as standard bone conduction hearing (Sinha, Lenhardt, Bhatt, ITJ, 2011). The sound perception is clear and appears to by-pass the middle ear mechanical effects (senior design project).

A balloon skull model was developed to simulate the mechanisms of eye hearing (M.S. project). It was discovered that pressurizing the balloon brain and forcing the skull into vibration with an external source resulted in a damping of the acoustic spectrum as measured on the eye. This was also observed in vivo using the valsalva maneuver, which temporally elevated intracranial pressure. Typically what was found was a decrease in amplitude and a spreading of frequencies consistent with a damped waveform. Both the model and the human valsalva data suggest that the eye may provide a non-invasive means of detecting increased intracranial pressure (Sinha and Lenhardt, ITJ, 2011). Even though the pressure of the brain and eye differed, the acoustical damping effect on a noise delivered

to the head was similar. The feasibility of using the eye acoustics to provide a non-invasive measure of intracranial pressure was explored with five patients with ventriculostomy catheters placed in their skulls for a direct pressure measurement. While preliminary, the eye acoustics revealed a linear change with various levels of elevated intracranial pressure (Lenhardt et al, ITJ, 2011). Laboratory and clinical research is continuing to develop a non-invasive intracranial pressure monitor using the responses of the eye (current Ph.D. project).

ITEM 8. INDUSTRIAL NEWS.

1) The ULTRAMIC200K an ultrasonic USB microphone with 100 KHz bandwidth;

The ULTRAMIC200K an ultrasonic USB microphone with 100 kHz bandwidth. Ultramic200K is an ultrasound microphone with integrated digital to analog converter with 200 kHz sampling rate. The USB Full speed port 2.0 allow an easy connection to any PC or Mac computer; the device is recognized as an HID (human interface device) microphone so no driver installation is required.

It appears as a single channel audio input device; however if recording in stereo the two channels will appear identical.

The MEMS (Micro Electro-Mechanical Systems) microphone is very sensitive with a good signal/noise ratio and small form factor. An integrated low pass 8TH order filter is provided in order to reduce aliasing artifacts.

The parabolic structure of the front plastic cover allows some directionality in the receiving of the ultrasounds.

Characteristics:

200 thousand samples per second. True 16 bits resolution. Frequency range up to 100 kHz. MEMS high sensitivity Surface Mount Wide-band Ultrasonic Acoustic Sensor. High quality and low noise analog amplification. USB device full speed port with a mini B USB connector. 32 bit 80 MHz integrated microcontroller. Dimensions: 130 mm length x 20 mm diameter. 8th order antialiasing low pass filter.

2) The Software GUIGUW v0.1, a graphical user interface (GUI) for the computation of stress-guided wave dispersive features;

The software GUIGUW v0.1, a graphical user interface (GUI) for the computation of stress-guided wave dispersive features, exploits semianalytical finite-element (SAFE) formulations for the calculation of wave-propagation characteristics. The interface allows for the selection of geometrical, mechanical, and frequency-related parameters for the computation. Isotropic and anisotropic materials with linear elastic and linear viscoelastic rheological behaviors can be considered, and any waveguide cross section can be modeled. For each existing wave, the dispersive results can be represented in terms of wave number, wavelength, phase velocity, group velocity (for undamped waveguides), energy velocity, and attenuation (for damped waveguides). By simply working with the GUI, original results for guided stress waves can be obtained. The article may be accessed via one of the following links: URL: <http://link.aip.org/link/?QCP/25/202>

DOI: 10.1061 (ASCE) CP. 1943-5487.0000081

Issue Table of Contents: <http://link.aip.org/link/?QCP/25/3/htmltoc>

the software and all the necessary information on it can be downloaded for free at www.guiguw.com.

For more information on GUIGUW v0.1 contact Alessandro Marzani <http://alessandromarzani.people.ing.unibo.it/>

3) EKOS Corporation Receives CE Mark to Treat Massive and Sub-Massive Pulmonary Embolism.

EKOS Corporation has announced that the EKOS EkoSonic Endovascular System is the first endovascular device approved for the treatment of pulmonary embolism (PE). The EkoSonic System, which was originally designed and approved to dissolve blood clots in the arms and legs, now has the added indication for treating this major unmet medical need. Robert W. Hubert, President CEO said, The CE mark is an important milestone for EKOS and a clear demonstration of our ongoing commitment to champion a better solution for treatment of PE. Hospitals in Europe may now begin ordering and using the EKOS device for this indication. Pulmonary embolism occurs in approximately 1 million patients in Europe annually (600,000 in the US), causing or contributing to 300,000 deaths each year. A PE is caused when a large blood clot obstructs the major blood vessels leading from the heart to the lungs. The victims heart is suddenly overwhelmed with the task of pushing blood past this obstruction. Symptoms are similar to a heart attack. About 5 percent of

PEs are massive; resulting in rapid heart failure and shock. Without immediate therapy death can occur. A large dose of clot-dissolving drug called a thrombolytic, delivered to a vein was the only approved therapy for these patients; however, unintended bleeding, often fatal itself, is a much feared side effect. Up to 40 percent of PE victims have less critical obstructions, often called submassive PE, which are currently treated with anti-coagulant medication. These medications do not remove clot; they simply prevent the clot from growing larger.

Recent studies suggest that failure to remove these sub-massive clots may have long-term adverse events including recurrent PE, chronic pulmonary hypertension, and death. Up to 22 percent of these patients will die within 90 days. The EKOS EkoSonic System provides a new life saving therapy for these patients. Until now, drugs were the only approved treatment.

Prof. Nils Kucher from the University Hospital of Bern (Switzerland), principal investigator of the Ultrasound Accelerated Thrombolytic of Pulmonary Embolism (ULTIMA) trial launched in 2010, emphasized, Because the EKOS system incorporates into the catheter body small ultrasound transmitters which condition the clot to more rapidly absorb the thrombolytic drug, it can dissolve the clot faster than thrombolytic drug alone. Dr. Tod Engelhardt, cardiothoracic surgeon from East Jefferson General Hospital (New Orleans, LA) added that, Faster response with less thrombolytic drug means patients may recover within hours and the risk of bleeding is substantially reduced. I have treated 30 patients with the EKOS system. All have done remarkably well and I know we have saved lives. The patients treated were all in serious condition and within a few hours of commencing treatment were asymptomatic.

Dr. Peter Lin, vascular surgeon from Baylor College of Medicine (Houston, TX) commented that there are frustratingly few tools available today to help the seriously ill patient with pulmonary embolism. Having now treated over 35 PE patients with the EKOS system within the past 2 years, I have adopted EKOS as our standard of care; a valuable addition to our armamentarium for pulmonary embolism.

Robert W. Hubert, President of CEO concluded that, Since 2004, the EKOS system has been cleared for use by the U.S. FDA and European authorities for use in clearing blood clots in the arms and legs. EKOS pursued CE Mark for treating PE based on receiving positive results from physicians treating these patients with the EkoSonic system, along with several centers publishing their findings in peer reviewed journals.

About EKOS Corporation: EKOS Corporation pioneered the development and

Clinical application of ultrasound infusion technologies in medicine, introducing its first system for the treatment of vascular thrombosis in 2005. For more information visit www.ekoscorp.com or contact Pauline T. Mayer: PTM@ptmhcm.com

4)3-D Vibration Measurement through Scanning laser Vibrometer
The scanning laser vibrometer removes many of the limitations of traditional contact transducer methods. By mounting a 3-D scanning vibrometer to a multi-axis industrial robot, Robot based Scanning laser Vibrometer is engineered to be a stable, auto-configurable 3-D vibration measurement station for whole-body vibration mapping of complex-shaped objects. This combination of technologies can reduce test times for experimental modal analysis (EMA) from weeks to days and from days to hours. The points to be measured can be derived from finite element (FE) models, thus facilitating model updating. The major drawbacks of the use of contact transducers which include defining and marking measurement points, mounting hundreds of sensors and dummy masses, cabling, checking for cross-wiring, sensor calibration and dismantling are overcome by this technique. Unique features of this system are: Uses existing geometry data from a coarsened FE model for measurement point definition; no sensor mounting for visible parts; software controls robots and scanning process - fully automated after setup; high point density in a short time - perfect FE model update; no supervision needed during scan; can be clustered by using additional robots or linear stages - gain flexibility; results are given at nodal points of the FE mesh - direct interface to post-processing in modal analysis.

ITEM 9. NEW BOOK ANNOUNCEMENTS:

1) Brake NVH: Testing and Measurements by Dr. James K. Thompson

Hardcover: 156 pages

Publisher: SAE International (March 2011)

ISBN 978-0-7680-3480-6

Price: USD 79.95 List, USD 63.96-71.95 SAE Member

WARRENDALE, Pa. (May 10, 2011) â SAE International recently published Brake NVH: Testing and Measurements, which covers the

current trends and developments in brake engineering.

Brake NVH: Testing and Measurements a book by Dr. James K. Thompson, provides readers with a fundamental understanding of current practices for measuring and testing brake noise, vibration and harshness. From coverage of basic definitions and concepts to in-depth analysis of on-road testing procedures, it will serve as a comprehensive reference guide for brake test technicians, test engineers, lab managers, and others who work on making brakes quieter, smoother, more refined, and more reliable. With consumers increasingly emphasizing a quiet and refined ride, mobility professionals must be aware of the negative effects that factors like brake noise and vibration issues can have on a vehicle. These issues are discussed extensively in the book. In addition, Brake NVH: Testing and Measurements discusses several major topics in the field, including: common brake noise and vibration issues, instrumentation, transducers, and other technical details, measurement practice for laboratory and on-road testing, brake pad damping and natural frequencies and current trends in brake noise and vibration measurements. The book will be of use to mobility professionals, particularly automotive engineers, lab managers, and executives in the automotive industry. The book also will be of particular interest to professors and students who wish to effectively understand the current trends in the field.

Dr. James K. Thompson has more than 35 years of experience in the fields of NVH, finite element analysis, experimental mechanics and testing. He was the executive director of sales, marketing, and NVH at Link Engineering Company and served as a consultant on brake NVH issues to OEMs and Tier 1 and Tier 2 suppliers. Dr. Thompson chairs the SAE International Brake NVH Standards Committee and the SAE Noise and Vibration Conference. He developed SAE's brake NVH course, which he has taught for the past five years.

More information is available about the book at <http://books.sae.org/book-r-399>.

Other related titles from SAE International include: Brake Design and Safety, Third Edition (due out in June): <http://books.sae.org/book-r-398>; Principles of Vibration Analysis with Applications in Automotive Engineering: <http://books.sae.org/book-r-395> ; Brake Technology Handbook: <http://books.sae.org/book-r-375>

SAE International is a global association of more than 128,000 engineers and related technical experts in the aerospace, automotive and commercial-vehicle industries. SAE International's core competencies are life-long learning and voluntary consensus standards development. SAE

International's charitable arm is the SAE Foundation, which supports many programs, including A World In Motion and the Collegiate Design Series.

2) Sound-Engineering im Automobilbereich

Hardcover: 600 pages

Publisher: Auflage (2010)

ISBN 978-3-642-01414-7

Price: USD 199.00

This book discusses sound engineering in the automotive sector and methods for measuring and analyzing noise and vibration. Due to increasing demands for comfort of customers in the automotive field, sound design and comfort are increasingly important. Many engineers in the automotive and supplier sector work from the design phase to component and vehicle development through the production phase on the optimization of these topics. It is necessary, in industrial practice for the vehicle acoustics to be treated in the context of other development areas (such as propulsion, aerodynamics, design, package, chassis, safety). Such areas are often considered in isolation. The reader has an opportunity to approach the topic quickly to be able to access specific details and the fundamentals.

3) HMMH Begins Work on NCHRP 25-3

Harris Miller Miller & Hanson Inc. was recently selected by the Federal Railroad Administration to review and update the High Speed Ground Transportation Noise and Vibration Impact Assessment guidance manual in order to properly assess the potential impacts of and provide mitigation for high-speed rail (HSR) in the United States. The manual was developed starting in 1995 and approved for use in 2005, and has been used on high-speed ground transportation projects, both steel rail and maglev, throughout the U.S. The update will consider recent noise and vibration developments of HSR from Europe and Asia. The updated guidance manual is expected to be released in October 2011.

ITEM 10. News from International Union of Theoretical and Applied Mechanics. The website of IUTAM has been redesigned. The International Union of Theoretical and Applied Mechanics (IUTAM) is

pleased to announce that the website of IUTAM has been redesigned. IUTAM is also pleased to announce The Rodney Hill Prize In Solid Mechanics founded and sponsored by Elsevier Limited (awarded under the auspices of IUTAM) Elsevier Limited has established a prize named The Rodney Hill Prize in Solid Mechanics. This prize, which consists of a plaque and a check for USD 25,000, is to be awarded in recognition of outstanding research in the field of solid mechanics. The prize is to be awarded every four years, to coincide with the quadrennial International Congress of Theoretical and Applied Mechanics (ICTAM). The first prize was awarded at ICTAM 2008 in Adelaide and the second will be awarded at the ICTAM 2012 in Beijing. For more information please visit: www.iutam.net.

ITEM 11. The Transportation Research Board (TRB) of the National Academies recently selected HMMH to lead the research team conducting National Cooperative Highway Research Program (NCHRP) 25-34: Supplemental Guidance on the Application of FHWA's Traffic Noise Model (TNM).

March 29, 2011: Burlington, MA

The goal of the 30-month research effort is to provide guidance on the best modeling practices for scenarios for which there is currently limited or no technical guidance. In addition to recommending best practices, the research team will assess both the sensitivity of the model to the proposed methodologies and the accuracy of the results obtained using these practices.

Contact:

Doug Barrett

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www.hmmh.com

ITEM 12. Collaborative rail research project RIVAS starts on February 2, 2011.

On February 2, 2011 the International Union of Railways as coordinator kicked-off the FP 7 project RIVAS (Railway Induced Vibration Abatement Solutions) together with 25 partners from all over the European railway sector such as train operating companies, infrastructure managers, manufactures, suppliers consultancies and associations.

UIC's Director General Jean-Pierre Loubinoux pointed out that RIVAS aims at reducing the environmental impact of ground-borne vibration

while safeguarding the commercial competitiveness of the railway sector. For several areas of concern, vibration should be reduced to near or even below the threshold of perception. The project's goal is therefore to provide the tools to solve vibration problems for surface lines by 2013. It therefore aims to contribute to relevant and world leading technologies for efficient control of human exposure to vibration and vibration-induced noise caused by rail traffic.

RIVAS will focus on low frequency vibration from open lines which is a concern mainly for freight traffic. However, it can be anticipated that RIVAS results will also be applicable to suburban, regional and high-speed operations.

Finally, the RIVAS results will contribute to European standards in particular to a harmonisation of metrics.

The project examines all vibration effects and aspects of the system: vehicle, track, propagation, freight and high speed rail services.

WP1 will establish the test procedures to monitor and control the performance of vibration mitigation measures under realistic conditions.

WP2 will develop and evaluate mitigation measures based on reducing the excitation of vibration at the vehicle-track interface by improved maintenance.

WP3 will develop and evaluate mitigation measures for ballasted and slab tracks

WP4 will develop and evaluate mitigation measures based on sub-grade improvement and ground barriers within the railway infrastructure

WP5 will address the impact of the vehicle.

Each of the solutions is to be validated with field tests on the major European rail networks represented in RIVAS.

The key deliverables of the RIVAS project are: assessment of the benefits of mitigation measures in terms of human response and agreed protocol for the evaluation of annoyance and exposure to vibration; agreed measurement protocols to assess and monitor the performance of antivibration measures; agreed protocol to characterize vibration response properties of soils; guidelines for track and vehicle maintenance geared towards low vibration; mitigation measures for ballasted and slab track; guidelines for the design of transmission mitigation measures under/next to the track; Guidelines for the design of low vibration vehicles

Seminar on Vibrations- Annoyance, Acceptance and Assuming the challenge to find solutions

A seminar open to the public will take place in Madrid on September 14, 2011.

Registration: <http://www.uic.org/forms/spip.php?article1323>

More information: enno.wiebe@uic.org, or contact Rupert Thornely-Taylor: rmtt@ruperttaylor.com

ITEM 13. RESEARCH ON STEADY STATE FLEXURE VIBRATION OF ORTHOTROPIC CYLINDRICAL PANELS AND PLATE WITH CUTOUTS OF ARBITRARY CONFIGURATION

I would like to inform readers about my current research which involves theory that takes into consideration shear displacements. The problem includes steady state flexure vibration of simply supported cylindrical non-shallow panels and plates with cutouts of arbitrary geometrical form, orientation, and locations. It also includes different types of boundary conditions with their contours (supported cutout, free cutout etc.) The solution is built on the basis of the indirect boundary element method. The Greens function is found using the sequential approach to the representation of the Dirac delta function and the Fourier method. The boundary value problems are reduced to systems of integral equations that are solved using the collocation method. For more information, please contact Dr. Tetyana Shopa: tetyana.sh@gmail.com

ITEM 14. IIAV: Membership Application Form the INTERNATIONAL INSTITUTE OF ACOUSTICS AND VIBRATION (IIAV)

President: Hans Boden, [Sweden]

Vice Presidents: Marek Pawelczyk, [Poland] Eleonora Carletti, [Italy]

Secretary: Semyung Wang, [South Korea]

Treasurer: Zhuang Li, [United States of America]

Executive Director: Malcolm Crocker, [United States of America].

The International Institute of Acoustics and Vibration (IIAV) incorporated in June 1995, is a non-profit scientific society whose membership is open to qualified individuals in all countries.

PURPOSE The Institute has been created to advance the science of acoustics and vibration by creating an international scientific society that is

responsive to the needs of scientists and engineers in all countries whose primary interests are in the fields of acoustics and vibration. The Institute shall cooperate with scientific societies in all countries and with other international organizations with the aim of increasing information exchange by sponsoring, cosponsoring or supporting seminars, workshops, congresses and publishing or providing journals or other publications. The Institute will provide an electronic International Sound and Vibration Digest (ISVD) and a paper refereed journal (the International Journal of Acoustics and Vibration) for all members as part of their dues.

MEMBERSHIP There are six classifications of membership in the Institute including: Fellow, Member, Associate, Student Member, Emeritus Member, and Honorary Fellow. All memberships entitle a member to receive the publications of the Institute and to attend Institute meetings. Those entitled to vote at Institute meetings are restricted to Fellows, Members and Emeritus Members. Fellows, Members, Emeritus Members and Honorary Fellows are eligible to hold office. Membership as Member is open to all those who have at least a baccalaureate degree or its equivalent from an accredited institution and who are employed or have been employed in an activity related to acoustics and/or Vibration. Membership as Associate is open to all persons who wish to support and promote the activities of the Institute, but who do not meet the criteria for membership as Member.

DUES The membership dues are \$80 per year. Membership dues for those from some countries will be at a lower rate. Members will begin receiving the electronic ISVD and the journal immediately on joining the Institute.

OFFICERS AND DIRECTORS The officers of the Institute are the President, the President-Elect, the Immediate Past President, the Vice President for Professional Relations, and the Vice President for Communications, the Secretary and Treasurer. The President, President-Elect and Immediate Past President hold office for two years. The other officers hold office for four years. The directors of the Institute hold office for four years. The officers and directors are elected by the members of the Institute.

COOPERATING SCIENTIFIC SOCIETIES The Institute recognizes that many scientific societies with interests in acoustics and/or vibration exist in different countries. It is the purpose of the Institute to supplement their activities and to cooperate with them for the good of scientists and

engineers throughout the world. To that end, existing scientific societies will be encouraged to become affiliated with the Institute as cooperating member societies.

IIAV MEMBERSHIP APPLICATION FORM

If you are interested in joining the IIAV, please fill in the form and return It by fax or e-mail (see following).

Malcolm J. Crocker
Fax 334-844-3306
Mechanical Engineering Department
270 Ross Hall
Auburn University
Auburn, AL 36849, USA
e-mail:crockmj@auburn.edu mam0066@auburn.edu

Application form: () Member () Associate

1)
Name: _____

2)
Address: _____

Fax: _____ E-mail: _____

3) Degrees (Institutions and dates):

4) Employment (with dates):

5) Signature &

Date: _____

III. ANNOUNCEMENTS

Date and time: 27 July 2011(Wednesday) at 4pm.

Venue: Staff Club(formerly known as Faculty Club), NUS. The address is No.30, Lower Kent Ridge Road, NUS,opposite Eusof Ishak House.

Meeting Agenda:

1. Any suggestions to amendment of Minutes of AGM2009.
2. Comments on the Financial Statements for the year ended December 2010.
3. Election of Officers for the year 2011.
4. Other matters.

IV. MEMBERSHIP SUBSCRIPTION

Fellow	S\$70
Member	S\$50
Associate	S\$30
Student	S\$15
Corporate	S\$200

FEE BASED ON ANNUAL RATE

FOR MORE INFORMATION PLEASE CONTACT: Dr.Gan at
email: wsgan@acousticaltechnologies.com

V. ARTICLES

ACOUSTICS IN HOSPITALS: Key Issues

Dr. Tan Kok Yang

PhD(NE), MScBldgSc, BScBldg.

Principal Consultant, Acoustical Laboratory Pte Ltd

INTRODUCTION

Hospitals and other health care centres are places where patients are treated for various medical conditions and where special emphasis must be placed on health, safety, security and comfort for staffs, patients as well as visitors. Also, specialist or general hospitals are usually places where recuperation for patients takes place and so a peaceful and restful environment is essential and desired. Furthermore, hospitals are where loved ones as well as health care workers spend their time helping the patients to get well. These groups of people, too require good aural environment and acoustics.

In view of these considerations, one area of special interest to the owners, developers, building professional, designers as well as the occupants and users of the hospitals and health care centres, is that of ensuring that the acoustics of the medical facilities are able to provide aural comfort, speech privacy as well as the absence of annoyance noises.

In the planning and design of hospitals in term of acoustics, it is important to consider the following factors so that when completed the acoustics in the hospitals is of acceptable standard and that problems related to noise, vibration and aural discomfort can be greatly or if not totally eliminated.

In short, it is better to plan ahead before the infra structure of the hospital is up then having to adopt 'fire fighting' approach when problems related to acoustics in the hospital arise upon complement.

ISSUES RELATED TO NOISE IN HOSPITALS

As hospitals are open to public, inevitably there will be issues related to noise, especially in wards, common waiting areas and in areas where sizable crowd of people can be found throughout the day and night. So the question as to why our hospitals are indeed noisy is a relevant one. Studies in the United States show that basically there are two main problems contributing to this problem,

Firstly, equipment alarms, monitors, ventilation and people in constant movement are sources of the problem.

Secondly, hard and easy to clean surfaces make up powerful echo chambers for the noise to bounce around in.

According to researchers at Johns Hopkins University, noise levels in hospitals throughout the world have been increasing by about 0.4 decibels per year since 1960. Their findings indicate that average daytime hospital sound levels on a global basis have risen from 57 to 72 decibels since 1960 and that hospital noise at night has gone up from 42 decibels to 60 decibels.

According to the report from Johns Hopkins, current sound levels are now sufficiently high to be a concern to patient safety.

(Source of information:

<http://www.ecophon.com/en/Acoustics/Healthcare/Hospital-specific/challenges/>)

ACOUSTIC DESIGNS CONSIDERATIONS

In view of the need to ensure good standard of health care and aural comfort for patients, staff and visitors of hospitals, it is important that at the planning stage of any hospital project, the following factors have to be considered:

Environmental Acoustics (due to effect of outdoor noise)

1. Site Planning & Selection
2. Layout planning for various facilities, i.e. operating rooms, wards, consultancy rooms, nursing room, meeting rooms, stores and other.

Building Acoustics

1. Identifying critical areas where good acoustics is needed.
2. Specifying the acoustic criterion, speech privacy, speech intelligibility, sound insulation, etc.
3. Selection of building materials and systems
4. Specifying materials of building components such as doors, partitions, ceiling, flooring etc.
5. Incorporating building acoustic design to cater for AV systems.

Building Services Noise

1. Specifying limit of noise level due to building services, i.e. NC levels.
2. Noise control requirements for building services related to hospitals.

COMMON ACOUSTIC NOISE CRITERIA FOR HOSPITAL FACILITIES

Table 1
Recommended Acoustic Criteria, NC

<u>TYPICAL FACILITIES WITHIN A HOSPITAL</u>	<u>NOISE CRITERIA</u>
DEVELOPMENT ASSESSMENT ROOM	NC 25-30
CHILD HEARING SCREENING ROOM/AUDOMETRY	NC 25-30
ULTRASOUND ROOM	NC 25-30
MAMMOGRAPHY	NC 25-30
LIBRARY	NC 25-30
CONFERENCE ROOM/OFFICES , COMPUTER ROOMS/CONSULTANCY ROOMS	NC 30-35
PHARMACY/LABORATORIES/OPERATING THEATRES	NC 30-35
CORRIDORS/CIRCULATION/WAITING AREAS	NC 35-40
M & E PLANT ROOM	NC 45

ACOUSTIC REQUIREMENTS

Below are some of the key requirements for some of the typical facilities found in hospitals:

Space /Rooms	Considerations	Remarks
Consulting Rooms	Doctor-Patient communication requires good speech privacy.	Good noise insulation required for partitions and doors.
ICU	High standard of Hygiene & Infection Control Calm and Peaceful setting to avoid stress and disorder & enable staff to respond to medical alarm system quickly.	Noise from medical equipment.
Operating Theatres	Total concentration of medical specialists and nurses is vital in OT. As such, there should be no unnecessary irritating and noisy equipment.	Patients must also feel that the overall environment is peaceful and calm, should not be disturbed by unwanted high frequency sound from equipment
Ward Rooms	Speech privacy to ensure good communication between patients, medical workers and visitors.	Ward rooms should have aural environment that is conducive to good rest and sleep for the patients.
Receptionist and circulation areas.	Acoustics in these areas should support any AV system as well enable proper staff-visitors oral communication to take place.	Use of proper acoustic ceiling and wall panels can improve the acoustics in these areas.

CONCLUSION

The negative effects of hospital noise on patient outcomes and on the efficiency of health care workers have been subject to much studies and research. High noise levels can directly or indirectly affect the users of hospitals. As had been shown in some of the overseas studies, hospital noise can increase a patient's anxiety and decreases patient's confidence in the clinical competence of the health care workers.

As such, it is important that the planning, design and construction of hospital, should also take into account, besides other key medical, physical and environmental considerations, also the acoustic aspects of the various spaces.

SOME RELATED ACOUSTIC TERMS

NC Noise Criteria, which is a single number rating which takes into account the sound pressure level in the octave bands 31.5Hz - 8kHz inclusive. This is generally used to assess noise from mechanical services. The higher the NC, the higher the noise level.

STC Sound Transmission Class, which is a measure of the acoustic effectiveness of a building partition, door or other building element in blocking noise transmission from one side of the element to the other. This value is determined in accordance with American Standards for measurements in acoustic laboratories. The higher the STC, the better the acoustic performance.

Speech intelligibility

Speech intelligibility is dependent on the level of background noise, reverberation time and the shape of the room. Different methods are used to evaluate speech intelligibility, the most common ones are RASTI and STI

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July 2011

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VI. USEFUL LINKS

Acoustical Societies worldwide

www.acousticssingapore.com

Government Bodies

www.mom.gov.sg

www.nea.gov.sg

Technical and Research Sites

Corporate Sites

www.acousticaltechnologies.com

www.noisecontrols.com

(The Society welcomes interested parties to contribute relevant websites to the above e useful links. For more information, please contact us. Thank you.)

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President: Dr. Gan Woon Siong
Editor of E-Newsletter: Dr. Tan Kok Yang