WIND TURBINE NOISE 2013
PROVISIONAL PROGRAMME

Tuesday 27 August 2013

13.00 – 17.00 Short Course on Noise
15.00 – 19.00 Registration
17.30 – 19.30 Exposition Reception (Joint with Noise-Con 2013)

Wednesday 28 August 2013

08.00 – 09.30 Plenary Lecture (Joint with Noise-Con 2013)
Wind Turbines: What's all the noise about? An American retrospective and prognostication
Mark Bastasch, USA

Low Frequency Noise and IS: Measurements

09.45 Infrasound measurement, interpretation and misinterpretation
Bruce Walker, USA

10.00 Measuring and analyzing wind turbine infrasound and audible immissions at a site experiencing adverse community response
George Hessler, USA

10.15 The measurement of infrasound and low frequency noise for wind farms
Steven Cooper, Australia

10.30 – 10.45 Discussion
10.45 – 11.15 Coffee Break

Low Frequency Noise and IS: Effects

11.15 Infrasound and the ear
Geoff Leventhall, UK

11.30 A proposed theory to explain some adverse physiological effects of the infrasonic emissions at some wind farm sites
Paul D. Schomer et al, USA

11.45 Perception of low frequency components contained in wind turbine noise
Sakae Yokoyama, Shinichi Sakamoto and Hideki Tachibana, Japan

12.00 – 12.15 Discussion
12.15 – 13.30 Lunch

Amplitude Modulation

13.30 Amplitude modulation and complaints about wind turbine noise
Joachim Gabriel et al, Germany

13.45 Audible amplitude modulation - results of field measurements and investigations compared to psycho-acoustical assessment and theoretical research
Mike Stigwood, Sarah Large and Duncan Stigwood, UK

14.00 Amplitude modulation noise analysis and first look at off-shore wind turbine aeroacoustics simulation study
Sidney Xue et al, China

14.15 Thump noise prediction
Rufin Makarewicz, Poland

14.30 Application of phased array techniques for amplitude modulation mitigation
Steven Buck, Scott Palo and Patrick Moriarty, USA

14.45 – 15.15 Discussion
15.15 – 15.45 Coffee Break

Transducers Instrumentation

15.45 Evaluation of secondary windshield designs for outdoor measurement of low frequency noise and infrasound
Kristy Hansen, Branko Zajamek and Colin Hansen, Australia

16.00 Improvement of regression analysis on wind noise effects for low frequency sound measuring in natural wind
Noboru Kamiakito et al, Japan

16.15 How frequency response influences measurement and audibility of periodic wind turbine sound
Werner Richarz, USA and Harrison Richarz, UK

16.30 Wind turbine noise measurements in practice
Carsten Thomsen and Simon Møller Nielsen, Denmark

16.45 Highly distributed data acquisition on wind turbines with PAK
Dejan Arsic and John Huff, Germany

17.00 – 17.30 Discussion

Thursday 29 August 2013
Session Room A

Aerodynamic Noise Generation and Control

08.00 Review of NACA 0012 turbulent trailing edge noise data at zero angle of attack
Con Doolan and Danielle Moreau, Australia

08.15 Wind turbine noise modelling based on Amiet's Theory
Y. Tian, B. Cotté and A. Chaigne, France

08.30 Broadband noise prediction of small horizontal wind turbine rotor
Bavuudorj Ovgor and Seungbae Lee, Republic of Korea

08.45 Hybrid methods for noise prediction in aeroacoustic simulations of small vertical axis wind turbines
Johannes Weber et al, Germany and Austria

09.00 Wake patterns and noise in a dual rotor wind turbine
K. Asfar and A. Mahasneh, Jordan

09.15 The effect on noise emission from wind turbine due to ice accretion on rotor blades
Peter Arbinge and Paul Appelqvist, Sweden

09.30 Noise prediction of wind turbine and low noise blade design
Kentaro Hayashi et al, Japan

09.45 Aeroacoustic noise mitigation investigation for wind turbine blades
Michael Asheim, Patrick Moriarty and David Munoz, USA

10.00 – 10.30 Discussion

10.30 – 11.00 Coffee Break

Structureborne Noise/Vibration

11.00 Noise from one stage of helical gears by wind turbine load
Chan IL Park, Republic of Korea

11.15 A validated virtual prototyping approach for avoiding wind turbine tonality
Goris Sonja et al, Belgium and Germany

11.30 Suppression of the structure-borne sound from a wind turbine generator using active vibration control devices: model experiment
Tetsuya Miyazaki et al, Japan

11.45 – 12.00 Discussion

Source Identification

12.00 Noise source localization on a 8kW wind turbine using a compact microphone array with advanced beamforming algorithm
Rakesh Chandran Ramachandran et al, USA

12.15 Acoustic array design for wind turbine noise measurements
Steven Buck et al, USA

12.30 Identification of wind turbine noise through signal analysis
Michael Medal et al, Canada

12.45 – 13.00 Discussion

13.00 – 13.45 Lunch

Session Room B

Effects of WTN on Individuals

08.00 Audit report: Literature reviews on wind turbine noise and health
Brett Horner, Carmen Krogh and Roy Jeffrey, Canada

08.15 Wind turbine noise: What has the science told us?
Loren D. Knopper et al, Canada

08.30 Perception change of soundscape as wind turbine alters community sound profile
William K.G. Palmer, Canada

08.45 Trading off human health: Wind turbine noise and government policy
Carmen Krogh et al, Canada

09.00 Wind turbine facilities' perception: a case study from Canada
Peter N. Cole and Carmen Krogh, Canada

09.15 Correlation between people perception of noise from large wind turbines and measured noise levels
Federica Andreucci et al, Italy Enrico Mazzocchi will give this paper.

09.30 Masking of sage-grouse display calls by noise from wind turbines
Scott Noel, USA

09.45 – 10.15 Discussion

10.15 – 10.45 Coffee Break

Sound Immission Measurements Part 1

10.45 Noise's measure inside homes generated by the functioning of wind farm in southern Italy
Amelia Trematerra and Gino Iannace, Italy

11.00 Hiding wind farm noise in ambient measurements - noise floor, wind direction and frequency limitations
Steven Cooper, Australia

11.15 Tonality assessment at a residence near a wind farm
Jonathan Cooper, Tom Evans and Dick Petersen, Australia

11.30 Evaluation of wind turbine-related noise in western New York State
Martin T. Schiff et al, USA

11.45 The variability factor in wind turbine noise
Jim Cummings, USA

12.00 Annoyance from wind turbine noise – what can we learn from different assessment methods?
Sabine von Hünerbein, UK

12.15 – 12.45 Discussion

12.45 – 13.45 Lunch

Sound Immission Measurements Part 2

13.45 Simultaneous indoor low-frequency noise, annoyance and direction of arrival monitoring
Branko Zajamsek et al, Australia

14.00 Generating a better picture of noise immissions in post construction monitoring using statistical analysis
Payam Ashtiani, Canada

14.15 Wind farm noise commissioning methods: A review of methods based on measuring at receiver locations
Christophe Delaire et al, Australia

14.30 Assessment of wind turbine noise in immission areas
Hideki Tachibana, Hiroo Yano and Akinori Fukushima, Japan

14.45 – 15.15 Discussion

15.15 – 15.45 Coffee Break

Sound Emission Measurements

15.45 Wind turbine noise measurements - how are results influenced by different methods of deriving wind speed?
Sylvia Broneske, UK

16.00 RoBin: Meeting the requirements of the IEC 61400-11 standard for measuring the acoustic emission of wind turbines with a one-man operated system
D. Vaucher De La Croix, France and T. Klaas, Germany

16.15 Tonality in wind turbine noise. IEC 61400-11 ver. 2.1 and 3.0 and the Danish/Joint Nordic method compared with listening tests
Lars Sommer Søndergaard and Torben Holm Pedersen, Denmark

16.30 The production of a good practice guide to assess wind turbine noise in the United Kingdom using ETSU-R-97
Richard Perkins et al, UK

17.00 – 17.30 Discussion

19.00 – 22.30 Reception and Banquet at Denver Art Museum

Friday 30 August 2013

Propagation Wind Effects Modelling Part 1

08.30 Sound propagation from wind turbines under various weather conditions
Olof Öhlund and Conny Larsson, Sweden

08.45 Proposed method for characterizing wind turbine noise and their dependence on meteorological effects for validation of existing studies
David S. Woolworth, Roger Waxler and Jeremy Webster, USA

09.00 Wind farm layout optimization in noise constrained areas
Andrew Brunskill, Canada

09.15 Validation of WindPRO implementation of Nord2000 for low frequency wind turbine noise
Lars Sommer Søndergaard and Thomas Sørensen, Denmark

09.30 Environmental noise assessment of proposed wind farms using annual average Ldn
Mark Bliss, Canada

09.45 – 10.00 Discussion

10.00 – 10.30 Coffee Break

Propagation Wind Effects Modelling Part 2

10.30 Accuracy of noise predictions for wind farms
Jonathan Cooper and Tom Evans, Australia

10.45 Large-scale calculation of possible locations for specific wind turbines under consideration of noise limits
Fabian Probst, Wolfgang Probst and Bernd Huber, Germany

11.00 The new good-practice-guide to help assessment of wind turbine noise in Finland
Denis Siponen et al, Finland

11.15 Physics based spatial acoustics in virtual scenes with application to wind farm noise
Kevin Nelson and Steven G. Mattson, USA

11.30 – 11.45 Discussion

11.45 – 13.00 Lunch

Regulations & Policies Part 1

13.00 Which limits for wind turbine noise? A comparison with other types of sources using a common metric
Gaetano Licitra and Luca Fredianelli, Italy

13.15 International legislation and regulations for wind turbine noise
Kevin Fowler, USA, Erik Koppen,The Netherlands and Kyle Matthis, USA

13.30 New environmental regulation for wind turbines in Flanders (Belgium)
Arjan Goemé, Belgium

13.45 Danish regulation of low frequency noise from wind turbines
Jørgen Jakobsen and Jesper Mogensen, Denmark

14.00 Low frequency noise from wind turbines: Do the Danish regulations have any impact?
Bo Søndergaard, Denmark

14.15 – 14.30 Discussion

14.30 – 15.00 Coffee Break

Regulations & Policies Part 2

15.00 Low frequency noise proposed wind farm in Maastricht, The Netherlands
Erik Koppen, The Netherlands

15.15 How does noise influence the design of a wind farm?
Matthew Cassidy, Alden D'Souza and Jeremy Bass, UK

15.30 Wind power development trends in Denmark: Targets, legislation and social acceptance
Karina Lindvig, Denmark

15.45 Projected contributions of future wind farm development to community noise and annoyance levels in Ontario, Canada
Melissa L. Whitfield Aslund, Christopher A. Ollson and Loren D. Knopper, Canada

16.00 State of wind turbine developments in northeastern USA – 2013
James D. Barnes, Marc S. Newmark and Bill Yoder, USA

16.15 Recent developments in wind farm noise in Australia
Chris Turnbull and Jason Turner, Australia

16.30 – 17.00 Discussion

17.00 – 17.15 Closing Ceremony